

## **Towards an Antarctic Tourism Policy: A framework for policy analysts**

Few places on Earth have the power to invoke the imaginative potential of the human mind as great as Antarctica. The place draws connotations of heroism, hardship and unique natural beauty, as well as a recent reinvention as a talisman in the Climate Change debate. So it should not come as a surprise that the demand for Antarctic tourism is high and increasing.

Tourism in Antarctica provides some unique challenges to policymakers. The policy development process, whether through the Antarctic Treaty System (ATS) or through self regulation through the International Association of Antarctic Tour Operators (IAATO), is very different to that faced by domestic policy specialists. Yet the potential for negative impacts on the pristine Antarctic environment means that regulation is required to mitigate and minimise harmful effects.

This essay sets out the first stage towards a policy analysis of the Antarctic tourism industry, exploring the current state of the industry, potential impacts that the tourism industry may have on the Antarctic environment, along with characteristics of Antarctic tourism that exacerbate the risk of these impacts, and finally a brief look at recent debates within the ATS regarding the future regulation of tourism. These three sections are designed to provide the context that is required for the future development of an Antarctic Tourist policy.

A basic model of policy development, as outlined in Politt and Bouckhardt (2004), consists of three conceptual components. The first, termed *alpha*, is the situation as it is prior to the policy process, the empirical circumstances that the policy will seek to alter. The second, termed *beta*, is the desired situation, the state of affairs that the policy will attempt to bring about. The final category, termed *omega*, is the trajectory connecting the two states, the existing state and the desired state. The trajectory will be one or a group of policies designed to achieve the stated aim.

While this is a very simple model of policy development, it is useful in structuring our analysis of the Antarctic tourism industry and environment and discussion of policy

options for the regulation of the industry. The current state of Antarctic Tourism, our alpha, will be the focus of this essay. The ultimate aim however is to build up the three components of the model in order to achieve a better institutional regime within which Antarctic tourism can flourish, bringing this special part of the world to people, while minimising the impact that the industry has on the priceless Antarctic environment.

## 1. The Contemporary Antarctic Tourism Industry

The first stage in developing policy recommendations for regulating Antarctic tourism is to understand the current characteristics of the Antarctic Tourist industry and the history and trends that have shaped the contemporary picture. In Pollitt and Bouckaert's framework (2004) this is fleshing out the empirical *Alpha* situation.

There are three distinct trends and two relatively stable characteristics of the Antarctic tourism industry that are key to understanding the contemporary context that this chapter will describe in detail, which are summarised in Table One.

Table One: Outlining the Contemporary Antarctic Tourism Industry

<u>Trends</u>	<u>Stable Characteristics</u>
Increasing tourist numbers	Concentration of visit sites
Increasing vessel size	Demography of tourists
Increasing diversity of tourist activities	

### 1.1 Tourism Trends and History

Tourism is not a new activity in the Antarctic. With a sufficiently broad definition of what activities constitute tourism, Antarctic tourism could be argued to have began with the first paying participants on otherwise exploratory voyages during the early 20th Century (The £1000 donation that Apsley Cherry-Garrard made to the *Terra Nova* expedition was significantly more than most tourists pay today (Cherry-Garrard, 2003 [1922])), or early whalers and sealers who took time off from their work to explore the local region. This activities would certainly meet a functional definition of tourism, in that a number of the places that were visited by early visitors to the

Atlantic were visited for no practical reason other than to enjoy the aesthetic qualities of the landscape.

It would be harder to argue that these activities were the forerunners of the current Antarctic tourism industry, however. While commercial tourism was present in the Antarctic treaty region as early as 1957, as seen in Figure 1 below, modern commercial tourism is usually dated in the literature as 1970 with the launch of the *MS Lindblad Explorer* in Antarctic waters, the first purpose-built vessel for Antarctic tourism (Headland, 1994). The model of Antarctic tourism that was developed by Lars Eric Lindblad, utilising small, ice-strengthened vessels with small groups of tourists (usually defined as <200 passengers) has been the dominant model for Antarctic tourism since then.

Since Lars Eric Lindblad initiated the modern Antarctic tourism industry three broad trends have emerged that are of concern to policymakers: the rise in tourist numbers, particularly since the late 1980s; the increasing size of the vessels that are involved in Antarctic tourism; and the increasing diversity of activities that are involved in Antarctic tourism. Each of these trends will be discussed in detail in this chapter.

### *Trends in Commercial Tourism Numbers*

The first and most frequently discussed trend in Antarctic tourism is the increased and accelerating numbers of tourists visiting the Antarctic, as can be seen in Figure One.

Figure 1: Shipborne Tourists to the Antarctic, 1957-2007/08



Sources: Bastmeijer and Roura, 2004; UNEP/ASOC, 2005; IAATO 2005b, 2006, 2007, 2008b.

From the late 1960s, when the first annual tourist voyages started to take place, through to the late 1980's Antarctic tourism was a very small-scale, niche industry with annual tourist numbers below 1,000 per year. Numbers grew steadily throughout the late 1980's and early 1990's, with tourists outnumbering national programme officers for the first time in 1993-4 (Enzenbacher, 1994). Steady growth between 1986 and 2002 then saw another acceleration from 2002 on to the latest season, as can clearly be seen in Figure One.

Antarctic tourism tends to operate with a significant lag time, with tourists booking their trips well in advance. This makes it difficult to predict what and when the impact of the current global financial crisis will be on tourist numbers in the coming years. While there may be a temporary plateau or even short-term decline in Antarctic tourism numbers that results from the financial crisis, in the medium to long term there is still reason to believe that tourist numbers will continue to increase in the absence of regulation restricting tourist volumes.

The number of tourists under represents the impact of tourism on the Antarctic environment, as for every two tourists, there is an additional staff or crew member, a ratio that has stayed relatively stable over the past 20 years (Naveen, 2001; UNEP/ASOC, 2005; IAATO, 2008b). For example in the 2007/08 season the 46,069

tourists were joined by a further 3,282 staff and 24,727 crew, for a total number of person voyages<sup>1</sup> of 74,078 (IAATO, 2008b).

*The rise of cruise-only Antarctic tourism and the increase in vessel size*

Figure One hides an important trend in Antarctic tourism during the last decade, however, the increased number of cruise only passengers. Cruise-only passengers have increased from negligible numbers prior to the 1999/2000 season, to a significant minority of passengers (13,015) in 2007-08 (IAATO, 2008c:6). This shift is expected to continue and increase in the next 10-15 years as smaller ships are phased out and replaced with larger ships (IAATO, 2008c:7). An emblematic event in this trend towards larger vessels was the first voyage of the 4,160 capacity<sup>2</sup> MS *Golden Princess* into Antarctic waters (Bertram, Gunn and Stonehouse, 2007), the largest tourist vessel to date to travel to the Antarctic Peninsula.

It could be argued that the increase in large ships conducting Antarctic tourism operations could lead to a benefit in terms of the environmental impact per capita, as larger ships (>500) are not permitted to undertake landings under current IAATO regulations (though do so outside of the IAATO framework), and tend to spend a shorter period of time in Antarctic waters (3-4 days according to IAATO, 2008c:6). This assumption is debatable, with ASOC arguing that this assumption does not necessarily hold due to increased risks associated with larger vessels (ASOC, 2007:8).

Where the MV *Explorer* or MV *Ushuaia* could be assisted by one or two similarly sized vessels when they faced difficulties, the MS *Golden Princess* would require a substantial proportion of the existing Antarctic fleet to assist in evacuation or require assistance from the South American continent, which could take days. This search and rescue function has been discussed at the latest Antarctic Treaty Consultative Meeting (ATCM), led by the USA (ATS, 2008). As the burden for search and rescue

<sup>1</sup> As many of the staff and crew would be the same across the season, these numbers count each trip separately, so a crew member that participated in 10 trips over a season would be counted 10 times. This enables comparison with tourist numbers.

<sup>2</sup> The *MS Golden Princess* is certified to carry 3,100 passengers and 1,060 staff. The first cruise carried slightly less than this maximum with 1,100 staff and 2,425 passengers (Bertram, Gunn and Stonehouse, 2007).

operations tends to fall on the closest party to an event, the increase in tourism to Antarctica places significant risk on the national science programmes of Antarctic Treaty Consultative Parties (ATCPs), who are likely to be incorporated into rescue efforts, and have been in the cases of the MV Explorer and MV Ushuaia.

These additional risks have led ASOC to call for a possible future cap on the maximum tonnage or maximum total passenger/crew numbers of vessels that are able to enter Antarctic waters, as well as calling on the ATS to regulate against vessels with over 500 passengers making landings (ASOC, 2007).

### *Diversity of Tourism Activities*

The third major trend in Antarctic tourism is the increasing diversity of activities being conducted by tourists in the Antarctic. While cruise-based tourism is by far the largest sector of Antarctic tourism, small niche-tourism enterprises are starting to increase and raise concern (Murray and Jabour, 2004; Jabour, 2005). Extreme adventure activities have been established in Antarctica since Adventure Network International (ANI) started operations in 1985, with ANI now offering trips to Mt Vinson and skiing trips to the South Pole from their station in the Patriot hills (ANI, undated).

Independent expeditions have increased in recent years and have frequently required the assistance of national program base when they have encountered difficulties (Murray and Jabour, 2004:313-314). This places strain on the resources of these national programmes and has the potential to disrupt science activities if significant resources need to be diverted to search and rescue efforts. IAATO is also concerned in the activities of "mega-yachts", very high-end luxury yachts that are acting outside the IAATO and ATS systems (ATS, 2008b:7-8). While to date there have been few incidents involving these vessels, as technology improves there is the potential for increased activity in this area. These emerging areas highlight a weakness in the self-regulating system of IAATO when some groups can simply choose not to participate in the system. Regulation of Antarctic tourism will be discussed further in section two below.

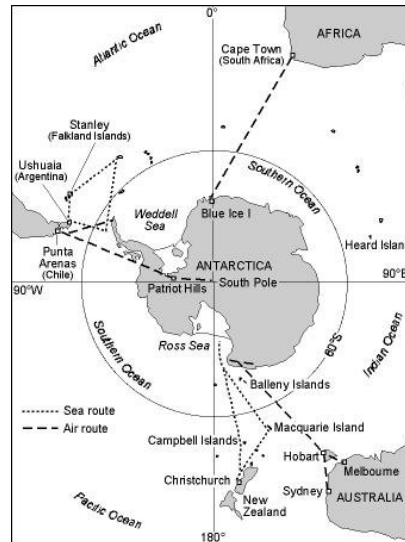
### 1.2 Contemporary Characteristics of Antarctic Tourism

There are two further characteristics of Antarctic tourism that are relevant to policymakers attempting to grapple with the issue: The geographical concentration of Antarctic tourism, particularly in the Antarctic peninsula region; and the demographics of Antarctic tourism.

The logistics of Antarctic tourism are such that there are only a handful of 'gateway' cities that act as jumping off points, including Ushuaia, Punta Arenas, Stanley,

Christchurch, Hobart and Cape Town (see Figure Two). The relative ease of passage from each of these gateway cities have also led to a concentration of tourism in the Antarctic Peninsula.

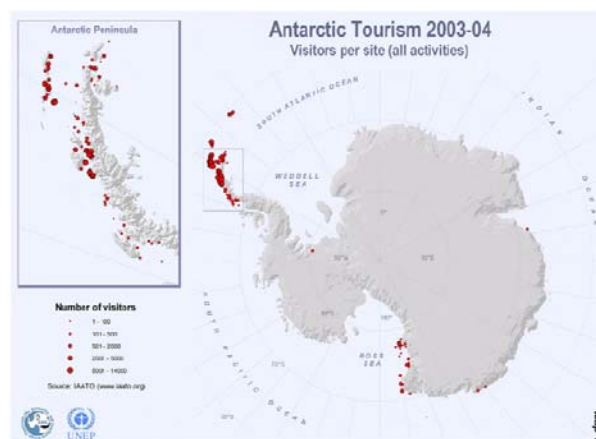
Figure Two: Pathways to the Antarctic



Source: Kriwoken and Rootes, 2000.

The Antarctic Peninsula accounts for over 95% of all Antarctic tourism, as can be seen in Figure Three, with the Ross Sea region accounting for the majority of the remaining tourist activities. Even within these regions concentration is significant, with 87% of all zodiac landings in the 2007/08 season occurring at the 30 most frequently visited sites in the Antarctic peninsula (IAATO, 2008), a point we will return to when discussing the impacts of Antarctic tourism in section three.

Figure Three: Concentration of Sites Visited by Antarctic Tourists





Source: UNEP/ASOC, 2005:7

Concentration of activity and the limited number of gateway cities increase the impacts of tourism at the most frequented sites, but also present an opportunity for policymakers in developing advanced site management plans and using the gateway ports to enforce and monitor regulation at a lower cost than would be likely if there were far more exit points.

### *Demography of Antarctic Tourism*

The final important characteristic of Antarctic tourism that needs to be highlighted is the demographic composition of Antarctic tourists. As Figure Four displays, the vast majority of Antarctic tourists come from the affluent West, particularly the United States, the United Kingdom, Australia, Western Europe, New Zealand and Argentina.

Importantly the countries that supply the vast majority of tourists are all signatories to the Antarctic Treaty and have consultative status under the ATS. This gives the ATS more control over the actions of tourists than would be the case otherwise, particularly regarding extra-territorial legislation.

**Figure Four: Nationality of Antarctic Tourists 2003-04**



### 1.3 Chapter Conclusion

This section has outlined the rough contours of the contemporary tourist industry, focusing on the areas of particular relevance to policymakers. The chapter argued that the most significant trends that have shaped the contemporary tourism industry are the increasing number of tourists that are visiting Antarctica annually, the increasing size of vessels that are visiting Antarctic waters and the increasing diversity of activities that constitute Antarctic tourism.

As well as these dynamic trends, there are some consistent features of Antarctic tourism that are of relevance to a policy discussion regarding tourism regulation, particularly the geographical concentration of the industry in terms of sites visited and the gateway cities that act as entry and exit points, and the demographics of tourists to the Antarctic.

The next section will go on to develop this picture of Antarctic tourism by discussing the impacts of tourism, both in practice and possibility.

## 2. Impacts of Antarctic Tourism:

"There appears to be general agreement that the hundreds of thousands of tourists who have visited Antarctica in the half-century of commercial tourism have left surprisingly few traces." (Stonehouse and Snyder, 2007:34)

As Stonehouse and Snyder observe in the above quote, to date the record of Antarctic tourism has been very good in respect to negative environmental impacts. However, there are exceptions to this general rule, and reasons to believe that this record may not be sustainable in the medium term. A burgeoning literature addresses exploratory research into actually occurring impacts of tourism (Chown and Gaston, 2000; Pfeiffer and Peters, 2004), or more commonly, the potential future impacts of tourism (Polk, 1998; Bastmeijer & Roura 2004, Molenaar 2005)

The few systematic studies of the environmental impact of tourism have found no direct negative impact of ongoing tourist activities (as opposed to the impact of misadventure such as the Bahia Paraiso event). A census of seabirds in the Antarctic Peninsula between the period 1994-2000, which included a number of sites of high tourist activity, including Port Lockroy, found significant declines in only one of the species surveyed, the Blue-eyed shag (Naveen, 2000). The study concluded, however, that the sites that had experienced significant declines in Blue-eyed shag numbers were either inaccessible or had experienced limited tourist visits over the period (and prior to the census) and therefore attributed the declining numbers not to tourism but alternative factors, including climate change, and changes in prey availability and distribution (Naveen, 2000:331).

While the current impact of tourism seems relatively benign, there are a number of complicating factors that suggest that the Antarctic community should not be complacent about the impact that tourism is having on the environment. Four of the most significant complicating factors that policymakers need to consider during the development of tourism policy will be examined in further detail: The geographical

and seasonal concentration of Antarctic tourism; Climate change; The Science/Tourism impact debate; and ecosystem susceptibility.

### *2.1 Impact concentration: Geographical and Seasonal*

While Antarctica is a huge continent, taking up 10% of the total landmass of Earth, less than 0.5 % of the surface area is free of permanent ice, with the largest single land area free of ice, the McMurdo Dry Valleys, only 2,500 square kilometres (Cessford, 1997:7). This situation still overstates the amount of land used for human and wildlife activity as some of the small land area clear of ice consists of mountainous areas and nunataks within the Antarctic continent, so the amount of land in coastal areas clear of ice could be estimated at less than 0.5%.

This geographical concentration of human activity is exacerbated by a concurrent seasonal concentration of activity over the Antarctic summer months (November to February) when the sea ice is limited and access to landing sites is easiest. So the vastness of Antarctica masks the reality that the interaction between human activity and the Antarctic ecosystem occurs in a small number of relatively fertile sites around the perimeter of Antarctica during a short summer season. As Cessford argues, in this context "the presence and behaviour of even relatively small numbers of people take on added significance" (1997:8).

Tourism landings are highly concentrated in certain sites of particular interest to tourists, usually those with high wildlife, cultural, historic or aesthetic value. An early census of zodiac landings in the period 1989-1999 (Naveen et al, 2001) found that zodiac landings increased from just 164 to 858 over the period. IAATO (2008) statistics show that this number has increased remarkably since 1999 with the total number of small boat landings in the 2007/08 season reported as 218,856. While a total of 205 sites were visited over the season, landings were highly concentrated, with over 55% of all landings occurring in the 8 most visited sites (see Table 2), and 87% of all landing occurring in the top 30 sites (IAATO, 2008).

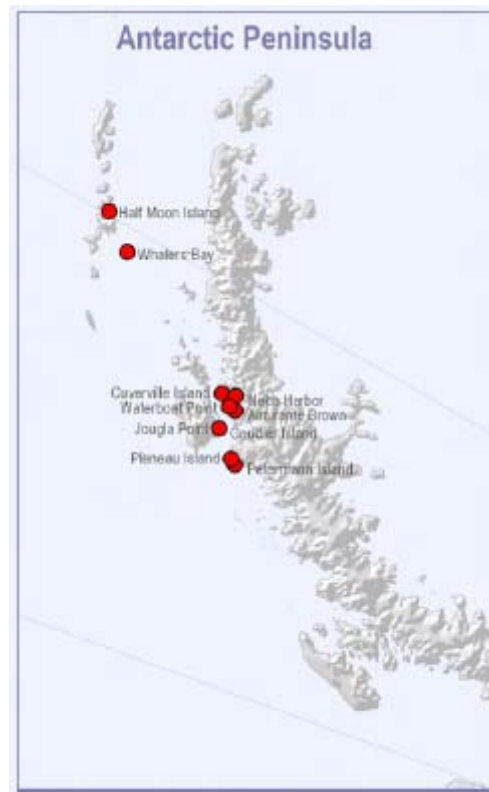
Table 2: Eight most visited sites 2007/2008

	Site	Small Boat Landings
1	Goudier Island	18,397
2	Half Moon Island	18,184
3	Whalers Bay	16,849
4	Neko Harbor	15,719
5	Cuerville Island	13,723
6	Petermann Island	13,437
7	Almirante Brown	12,102
8	Jougla Point	11,993
	<b>Total (Top 8 sites)</b>	<b>120,404</b>
	<b>Total All 205 sites)</b>	<b>218,856</b>

Source: IAATO (2008)

These sites are all located within two small regions of the Antarctic Peninsula with the majority located in one localised region (see Figure Six). While there has been some significant changes in the location of sites over the past two decades, with only six sites (Aitcho Island, Hannah Point, Penguin Island, Paulet Island, Cuerville Island and Vernandsky Station) occurring in the top 25 most visited sites at both the start and end of the 1989-1999 survey period and the 2007-08 period, and only one of these (Cuerville Island) saw more than 10,000 landings last season (Naveen et al, 2001; IAATO, 2008), as the industry grows and matures the most common sites seem to be settling down, with the top 8 sites fairly consistent from year to year over the past five years (IAATO, 2005b, 2006, 2007, 2008b).

Figure Six: Top 10 landing sites (2003-04 season)



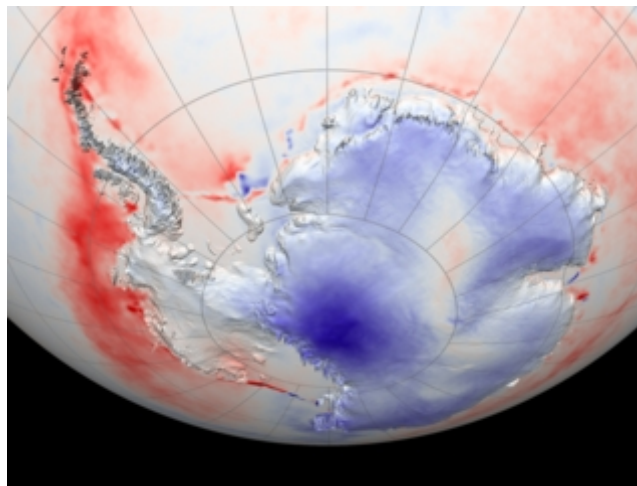
Source: UNEP/ASOC 2005:8

In an information paper tabled at ATCM XXVIII (IAATO, 2005), IAATO discussed a number of issues that the trends in zodiac landings were showing. Of particular environmental concern are: that while there is strong growth in the total landings per season there is little growth in the total number of sites being visited, there is growing concentration in a small number of sites, and a growing number of sites are experiencing multiple daily visits (2005:3). These findings mirror the observations of from the data above. This paper suggested that site guidelines needed to be strengthened to minimise the impact of landings at frequently visited sites. A number of site guidelines have been developed for many of the most visited sites in the Antarctic Peninsula, with four more added at the most recent ATCM in Kyiv, bringing the total to 18 (ATS, 2008). However their effectiveness in altering the behaviour of tour operators has not been researched.

## *2.2 Climate Change*

Surface air temperatures have been found to be rising by up to 0.5 degrees per decade since the 1960s in some areas of the Antarctic Peninsula (Comiso, 2000: 1674). Figure 7 shows the heating and cooling trends over and around Antarctica. Blue indicates cooling trends and red indicates warming trends, in a range of -0.2 (Deep Blue) to +0.2 (Deep Red) degrees Celsius per year. In contrast to a general cooling trend across inland Antarctica, there is a clear warming trend around the Antarctic Peninsula, the region where the vast majority of tourism takes place.

Figure 7: Climate change trends in the Antarctic



Source: NASA/Goddard Space Flight Center Scientific Visualization Studio (undated)

The climate changes that are taking place in the Antarctic Peninsula region complicate the situation for determining the impact of tourism on the local environment. As the area is experiencing significant regional and local change as a result of changes in climate, it is difficult to explicate any changes to the environment that result from tourism activity from those that result from climate change.

## *2.3 Relative impacts of Tourism and Science*

There is debate around the relative impact of tourism and science activities on the environment in the Antarctic peninsula. Cessford argues that the environmental

impact of science programmes is more likely to be significantly detrimental and that it is only legitimate to regulate tourism exclusively (as opposed to broad regulation of all human activities in the Antarctic Treaty area) when there is a direct threat to natural and historical values (1997:9).

The co-location of the tourism industry and much of the Antarctic science programmes, particularly in the Antarctic Peninsula region, also adds to the difficulty in isolating the impact of tourism from impacts that are the result of the ongoing science programmes and the logistics efforts that support them.

#### *2.4 Ecosystem Susceptibility*

The Antarctic marine ecosystem, while diverse, exhibits a condensed food web, with phytoplankton and krill connecting most of the ecosystem in short food chains (Polk, 1998). This condensed food web magnifies the impact that environmental pollution can have on the ecosystem, with a pollutant that impacts on either krill or phytoplankton numbers likely to have significant and unpredictable effects throughout the system.

#### *2.5 Potential Impacts of Antarctic Tourism*

##### **Biosecurity**

Biosecurity refers to the introduction of alien species or diseases into an ecosystem. In this case the concern is the introduction of alien species into the Antarctic Peninsula and Ross Sea ecosystems, both unique maritime environments, as a result of tourist activity through mechanism such as ballast water (collected from non-Antarctic waters and released into the Southern Ocean), attached to the clothing and shoes of tourists and crew, or attached to supplies and equipment used by tourist vessels.

The threat represented by biosecurity has been realised in a number of cases, such as in the sub-Antarctic Islands (Bergstrom and Chown, 1999). The threat is



exacerbated by the nature of Antarctic tourism whereby tourists 'hop on and off' a number of sites over the period of a trip which can lead to 'island-hopping' by alien species where once an alien species become viable at one site in the Antarctic Peninsula it may quickly be spread to other sites through tourism (Chown and Gaston, 2000).

### ***Threat Analysis: Very High***

Biosecurity must be a central concern for Antarctic policymakers. The impact that an invasive species could have on the Antarctic ecosystem is very high compared to the largely localised impacts that could be expected from operator misadventure. The threat is heightened by all of the complicating factors introduced in the first part of the chapter. The geographical and seasonal concentration of tourism exacerbates the probability of island-hopping and means that invasive spores could potentially be entering the environment at the most opportune time for development. Climate Change is altering the environment of the local ecosystem and is making the Antarctic Peninsula more suitable to potential invasive species from South America. The susceptibility of the Antarctic Ecosystem means that any invasive species that interferes with the central elements of the food web, particularly krill and phytoplankton, could have an inordinate impact on the ecosystem as a whole. The threat of biosecurity threatens the value of the scientific effort in the Antarctic Peninsula, which is based in part on the study of the unique Antarctic environment.

### **Marine Pollution**

The Antarctic ecosystem is overwhelmingly a marine ecosystem. The potential for tourist vessels to emit pollutants into the marine ecosystem presents both a local and a regional threat. The most obvious threat is the potential for oil spills resulting from tourist vessels running aground. This threat has already been realised in the Antarctic Peninsula. In 1989 an Argentinean tourist vessel, the *Bahia Paraíso*, ran aground spilling over 150,000 gallons of oil into the marine environment, with devastating impacts on the local environment including the deaths of all the newborn skua in a nearby colony, the death of penguin chicks in the vicinity (Seach,

1991: 123). The oil spill also killed over half the limpets in the area and had negative impacts on local seal, sponge and kelp numbers (Polk, 1998:1400).

### ***Threat Analysis: Moderate (Regional) to High (Local)***

The sinking of the *M/V Explorer* in 2007 (Austen, 2008) and the grounding of the *M/V Ushuaia* in 2008 (Revkin and Robbins, 2008), while having a limited impact on the marine environment compared to the *Bahia Paraíso*, show that the risk of significant marine pollution over a local area as a result of vessel misadventure are very real. The impact of the Bahia Paraíso demonstrate the seriousness of the impact to the local environment that results from a oil spill. This combination of high relative likelihood compared with strong impact make marine pollution a high threat at the local level.

The second aspect of marine pollution, the gradual cumulative build-up of marine pollutants as a result of the ongoing activities of the industry is more difficult to measure. The geographical concentration of tourism makes the risk greater than the absolute scale of Antarctic tourism suggests, and the susceptibility to change that the ecosystem demonstrates, especially considering background variability due to climate change, suggests that the assimilative capacity of the environment may be lower than would otherwise be the case. For these reasons the threat to the regional environment of cumulative marine pollution is rated as moderate, with more data required on the assimilative capacity of the ecosystems involved.

### **Intereference with Antarctic Fauna and Flora**

Polk (1998) highlights there are a number of pathways through which the local flora and fauna may be disturbed as a result of the Antarctic tourist industry, including both marine pollution and invasive species described above. Other related impacts include the modification or destruction of species habitats as a result of trampling of local flora (as local flora is dominated by lichen, tourists may be unaware of lichen in an area) (Polk, 1998:8), or the impact of repeated anchorage on the local marine environment (Molenaar, 2005); Increasing stress of levels of wildlife, particularly

nesting birds at the frequently visited sites through noise pollution and the simple presence of tourists in close proximity to nesting areas (Polk, 1998:9).

These potential impacts are heightened in the context of climate change which could be expected to disturb local environments, making fauna and flora particularly susceptible to additional effects.

### ***Threat Analysis: Flora (High), Fauna (Low to Moderate)***

The very long regrowth rates of local flora, the limited geographical scope of flora, and the low visibility of lichens mixed with the potential for tourists to be less vigilant in self-monitoring their action in relation to fauna, make the threat to flora high.

With the narrowly defined niches that many Antarctic flora inhabit, they are particularly susceptible to small climate changes and the increased pressure of tourism adds to the generally high threat faced by these species.

Antarctic Fauna faces better prospects for two main reasons. Firstly the tourists themselves are more aware of the threats they represent to seabirds due to the information campaigns that accompany most Antarctic trips. The second is the relatively robust populations of fauna in the Antarctic, which while local populations may be at risk due to localised impacts, could be expected to be more resilient at the regional level.

### **Human Waste**

In addition to the marine pollutants mentioned earlier, Antarctic tourism can release other waste pollutants into the environment through littering and the disposal of human waste into the environment (Polk, 1998:9). Products may also enter the environment via the degradation of equipment and clothing brought into the area by tourists, such as nanomaterials and flame retardant solutions from clothing, or paint chips from equipment<sup>3</sup>.

### ***Threat Analysis: Low***

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<sup>3</sup> Thanks to Dr Alan Hemmings for making me aware of this issue.

Compared to the impacts discussed above, litter and human waste represent a lower risk. While there are certainly impacts associated with human waste, they can for the large part be well managed by the tourist operators themselves. If the structure of the industry changes this may well change, but at the moment human waste and litter remain a low risk to the Antarctic environment.

### **Infrastructure Development**

As tourist numbers grow the call for supporting infrastructure on land rises, including paths at frequently visited sites, accommodation on land in the area, support services at national programme stations and emergency services.

The science versus tourism debate is most relevant to this issue. Science programmes have extensive on-shore infrastructure, why should tourism, a legitimate activity in the Antarctic as is frequently affirmed within ATS, be subjected to stricter regulation regarding infrastructure development than national programmes must face? This issue makes the regulation of infrastructure development for tourist purposes a thorny issue.

### ***Threat Analysis: Low to Moderate***

Infrastructure on land represents the first permanent impact that tourism would have on the Antarctic environment. The impact of the initial developments, such as pathways and support facilities is likely to be low to moderate with the potential for high impact development in the future.

## *2.6 Section Conclusion*

This section has fleshed out the picture of Antarctic tourism that section one began by looking at the impacts that Antarctic tourism could potentially exert on the Antarctic environment. The section discussed four factors that amplify the impacts that the tourism industry could be potentially have on the Antarctic environment:

- The Geographical and Seasonal concentration of tourism activity;
- Climate Change;
- Relative Impacts of Tourism and Science; and
- Ecosystem Susceptibility.

A number of the impacts that have been discussed in the literature were explored and an analysis of the relative threat that each possesses was undertaken. The discussion argued that Biosecurity represented the threat with the highest potential for catastrophic impact, with marine pollution, interference with flora and fauna, and infrastructure development all impacts that represent at least a moderate risk to the Antarctic environment as a result of tourism activities.

### 3. Regulating Antarctic Tourism and the ATS: The Current Debate

*There's been kind of an explosion of tourism in Antarctica. Do we want this to become Disneyland or do we want some controls?"*

Jim Barnes, executive director of ASOC (quoted in Austen, 2008)

Tourism is regulated in two main forms under the ATS, through recommendations and resolutions adopted at ATCMs and through the system of Environmental Impact Assessment. Due to time constraints, this section will not explore the existing regulation of tourism, but will focus on recent debates within ATS about the need to improve existing regulation, develop a forward agenda that agrees on prospective measures and improve monitoring and evaluation of impacts to develop an evidence base to improve policy development.

A major form of regulation of tourism impacts under the ATS is through the system of Environmental Impact Assessment (EIA). All human activities in the Antarctic need to be assessed as to their expected environmental impact prior to taking place, with different levels of assessment depending on whether the activity is expected to have a 'less than minor and transitory', 'minor and transitory' or 'greater than minor and transitory' impact. To date all tourism activities have been assessed as having a minor and transitory impact or lower, i.e. no tourist activity has yet to complete a Comprehensive Environmental Evaluation (CEE), the highest level of EIA under the treaty system.

This system has a number of significant flaws when applied to tourism in the Antarctic. The first is in the vagueness of the notion of minor and transitory as evaluative criteria for measuring impact, a point raised by several Antarctic Treaty Consultative Parties (ATCPs) at the last ATCM (ATS, 2008:44). The second is in the weakness of the system in addressing the cumulative impacts of ongoing activities such as tourism. The system developed to monitor the activities of state science programs, and is ill-equipped to deal with the impacts of tourism (Hemmings and

Roura, 2003). Under the system tourist operators each submit their EIA to the respective ATCP that they operate under (assuming they operate under an ATCP, which is true of the vast majority of operators, a growing minority of operators are operating under flags of convenience). As this information is rarely shared the cumulative impact of the industry cannot be gleaned from individual EIAs.

This is important as even if the terms minor and transitory were well defined, a single tourist cruise could easily fall well below the assimilative capacity of the environment (in terms of pollutants, broadly defined to include noise and the stress on wildlife caused by the proximity of tourists) and be adjudged 'minor and transitory', legitimately, under the EIA system. However, as the environment is being polluted by a series of these cruises, each below the crucial limits individually, the cumulative impacts of the pollutants may be greater than the assimilative capacity of the system. This issue was raised by France in a working paper (#34) submitted to the last ATCM titled *A Mechanism for Centralizing Tourism and Non-governmental Activity Declarations and Authorization Requests Suitable for Taking Cumulative Impacts into Account* (ATS, 2008c). The paper outlines the issue discussed above and suggests a mechanism for sharing the information contained in the EIAs submitted individually by IAATO operators. The suggestion was discussed and received some support from other ATCPs, while other parties were more cautious (ATS, 2008:47).

While this suggestion goes some way to addressing the issue of inadequate data for evaluating the overall environmental impact of the tourism industry as a whole, it would only be a partial solution if implemented, as the requirements and interpretation of impacts would vary greatly from jurisdiction to jurisdiction. There is also an issue with the EIAs being undertaken by the tourist operators themselves. To get a better picture of the impact of the tourism industry as a whole, a CEE conducted by an independent body that looked at the cumulative impacts of the industry across the season is required.

Monitoring the impacts of Antarctic tourism raises some difficult issues of measurement in addition to the limitations of the EIA system. As R.Tucker Scully

points out in the *Chairman's Report from the Miami Meeting on Antarctic Tourism*<sup>4</sup>, "[m]onitoring the impacts of tourism in Antarctica poses particular challenges because they are likely to be sub-lethal, chronic and/or cumulative and they must be teased out against a background of extreme and growing variability in environmental conditions" (IAATO, 2008c:10). This raises three issues that hamper the monitoring of tourism impacts: the cumulative nature of impact, discussed above, the difficulty in monitoring small changes to variables in an environment that is poorly understood, and the difficulty in distinguishing impacts from tourism from broad environmental changes from climate change, other human activities, particularly fishing, and adjustment to previous activities, such as sealing and whaling.

These issues have been acknowledged by both the ATCPs, with the US proposing that the Committee for Environmental Protection (CEP) look into ways of improving the measurement of tourist impact (ATS, 2008:47). Both the UK within the ATS and IAATO have called for a 'strategic vision' to be developed that outlines the future regulatory regime for Antarctic tourism, with the United Kingdom putting forward a working paper to develop a vision for tourism out of session, with the aim of having this ready for ATCM XXXII in 2009 (ATS, 2008d; IAATO, 2008c:10-11). However, the UK's proposal is not designed as a regulatory instrument, it is described as a non-mandatory and aspirational tool as a first step towards taking a more proactive approach to the management of Antarctic tourism (ATS, 2008d).

The uncertainty inherent in the measuring and monitoring the impact of tourism in the Antarctic has led to some commentators calling for the application of the precautionary principle in the case of Antarctic tourism (Bastmeijer and Roura, 2004), or argue that there is a 'huge anomaly' between the treatment of mining and tourism under the ATS and that tourism should be regulated to the same degree (i.e. limited or banned) (Scott, 2001). Arguments that call for much tighter regulation of Antarctic tourism based on the precautionary principle have some resonance with ATCPs with 'many parties' agreeing that "a precautionary approach was necessary

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<sup>4</sup> The Miami Meeting was convened by IAATO, with the participation of a number of ATCP delegates as well as IAATO representatives, to discuss the future of Antarctic Tourism in March 2008. The Chairman's report from this meeting is IP19 from ATCM XXXI.



especially when information was limited" (ATS, 2008: 44, point 183). However, the precautionary position has not advanced far beyond rhetoric because of the difficulty in tying specific effects to tourism, even conceptually. While there is broad agreement that there is the potential for cumulative impacts and adverse damage to the environment, there seems to be little in the way of theoretical models of damage that could be used to justify the implementation of the precautionary principle.

*Concluding remarks for this section*

This brief discussion highlights the latest debates in the ATS regarding the regulation of Antarctic tourism. The trends in Antarctic tourism discussed in section one and the potential impacts that burgeoning tourist numbers may have, discussed in section two, mean that improved regulation is required. Most parties within the ATS seem to regard improved regulation of tourism positively.

The previous three sections draw out the context within which the development of new policies for Antarctic tourism must be developed within.

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