

Antarctica and Ecotourism

By Walt Anderson

Antarctica is special. Not just for its extremes as a continent (highest, coldest, driest, windiest), but also for its governance and for its explicit emphasis on environmental protection. Twelve nations claim sovereignty over parts of the continent, but management is framed by the Antarctic Treaty signed in 1959 (Secretariat of the Antarctic Treaty 2016a). In addition to the 12 signatory nations, there are 17 additional countries that, by conducting significant research in the area, are consultative (voting) members with them at annual Antarctic Treaty Consultative Meetings (ATCM). An additional 24 non-consultative parties may attend the meetings without voting privileges.

Conservation was a key element of the original treaty, which declared the entire continent "a natural reserve, devoted to peace and science" (IAATO 2016a). Later documents resulted in more explicit protection, especially through The Protocol on Environmental Protection to the Antarctic Treaty (also known as the Madrid Protocol) (CEP 2016). The protocol establishes Antarctica as "a natural preserve, devoted to peace and science," prohibits mining and mineral extraction, requires environmental protection in the planning and execution of all activities, provides a framework for assessing environmental impacts, requires safety and emergency contingency plans, and sets up the Committee for Environmental Protection (CEP 2016). The protocol took force in 1978, and the CEP meetings are concurrent with those of the ATCM.

Until the Antarctic Treaty came into effect, Antarctica (S of 60°S) and the southern oceans were subject to some of the most sordid examples of wildlife resource exploitation (Shirihai 2007). Seals in the early 19th century, penguins in the late 19th, and the great whales in the early 20th century were slaughtered in almost unimaginable numbers. Introduced species in the sub-Antarctic (40-60°S) islands also led to wildlife devastation. The Antarctic Treaty and other conservation measures have had positive effects, with seal and penguin numbers rebounding to nearly pre-exploitation numbers. However, the large baleen whales, especially the blue whale, remain at very low populations, perhaps in part to their slow reproductive rates, but also perhaps because of over-harvest of krill and changing climate (Shirihai 2007).

Tourism arrived in this remote continent fairly late. Chile and Argentina brought fare-paying customers to the South Shetland Islands in the late 1950s. Antarctica tourism in its present form started in 1966, when Lars Eric Lindblad pioneered expedition travel to the continent. A few years later he had the famous Lindblad Explorer built, a model for ship-based tourism to this day. The Explorer had a designated lecture hall, and presentations by expert guides have become standard on trips of this type.

Lindblad was also involved in the establishment of IAATO (the International Association of Antarctic Tour Operators) in 1991. This consortium has more than 120 members who ascribe to its principles and guidelines. In fact, they have contributed most of the recommendations adopted by CEP to fulfill the Antarctic Treaty.

The guidelines provided by IAATO are quite strict. They provide rules regarding landings, tourist behavior with respect to wildlife, and specially protected sites. For example, the visitor site guide for Hannah Point describes the site and its wildlife, dictates the landing site and visitation vs. closed areas, allows one ship at a time and no more than 100 tourists on shore at a time (no more than 50 visitors at a

time at The Point), specifies a guide-to-visitor ratio of 1:20, and discourages visitation to The Point during the penguin breeding season of October to mid-January (Secretariat of the Antarctic Treaty 2016b). This was done as a precautionary act because IAATO parties believed that the nature of the site created some vulnerability to the colonies. This has had a direct effect on reducing tourism at this site, thus protecting sensitive wildlife while allowing carefully controlled visitation. This could provide an effective model for curbing excessive visitation at sites deemed sensitive to disturbance (Bender et al. 2016).

The short visitation season, remoteness, and high costs of travel to Antarctica places strong limits to total numbers of tourists. The majority of tourists arrive by organized tour ship where they are taught how to react on shore and are supervised by knowledgeable guides. Some ships merely cruise and sightsee without coming ashore; these have negligible effect on wildlife other than the potential for a ship accident that could create pollution. As far as ships that have landings, numbers have varied from a low in 2002-03 of 13,571 to a high of 33,054 in 2007-08. Numbers then declined to a recent low of 19,445 in 2010-11, partly because of global economic downturn (IAATO 2016). Numbers have crept upward again to totals landed of 27,607 in 2015-16 and then dramatically higher in 2016-17 with a new high of 33,237 (IAATO 2017).

The majority of tourists in 2016-17 came from five countries: USA (33%), China (12%), Australia (10%), United Kingdom (9%), and Germany (9%). The most dramatic increase in visitation has been by China, which only entered the top five in 2012-13. There has been a large increase in Chinese travel companies promoting Antarctic tourism, and this trend is expected to continue (Bender et al. 2016).

Because the Antarctic Treaty specifically takes environmental impacts seriously and charges the CEP to study and upgrade tourism standards, there have been studies to address potential impacts. De Villiers (2008) reviewed in narrative form possible human disturbance effects on wildlife. The author concluded that in certain areas and for certain species, human activities caused little discernible effect on wildlife populations compared to natural fluctuations within these extreme environments. In some cases, penguin populations actually grew as tourism increased, and habituation in frequently visited sites reduced measured stress.

In other cases, there appeared to be impacts that could and should be addressed by more-detailed work and possible revision of restrictions (“one size does not fit all”). In fact, restrictions on or cessation of human activities in some areas resulted in population increases, so clearly negative impacts (e.g., on physiology, energetic, movements, and breeding success) do occur. Two species (Gentoo Penguins in some areas and Southern Giant-Petrels in general) were noted as particularly sensitive to disturbance, and certain regulations with respect to those already exist. Some of the negative effects were related to aircraft overflights (mostly related to operations at stations), research (involving handling, like banding or measuring or attaching telemetry devices), or boat activity, including effects on the underwater sonic environment, as contrasted with shore activities by tourists. De Villiers (2008) noted that more long-term studies on more species are needed and that cumulative effects are especially important to study. In addition, human influences on climate change, incidental mortality related to offshore fishing, changes to food webs and trophic structure, and synergistic interactions among multiple variables need consideration.

Roura (2012) took a novel approach to assessing human impacts by analyzing behavior reported in 50 travel blogs from the period of 2007-2010 at one site, Deception Island. There were far more examples of compliance than non-compliance with environmental regulations.

Coetzee and Chown (2015) conducted a major meta-analysis of wildlife studies in the sub-Antarctic and Antarctic region. They narrowed their search results to 62 studies that met their criteria for analysis; 4 mammal and 17 bird species were included in their interpretation. Typical studies involved paired comparisons of animals subjected to actual or simulated human disturbances versus control animals that were not. They followed the recommendations of Koricheva et al. (2013) to deal with sample sizes/variation, and they recognized that there can also be “publication bias,” in which positive effects may be more likely to be submitted and/or accepted for bias than would negative effects.

The meta-analysis found negative effects for birds (but not mammals) for physiological and population-level responses but not for behavioral responses. Since human approach-distance recommendations state that stopping or backing off should occur if changes in behavior are shown, there should be attention to increasing limits on approach distances, since behavioral responses may not reflect underlying physiological or longer-term population responses. The negative effects were generally small to medium in size, and there was considerable variation in effect among the studies. Perceived impacts on wildlife can also be affected by the sampling methods (e.g., drawing blood) used, so the true impacts of tourism may be less than suggested.

The CEP Tourism Study (2012) found that “For the most part tourism impacts would seem to be absent (i.e., tourism is having no affect on local physical or biological systems), or any impacts are subtle and cumulative and undetectable at the current (low) levels of monitoring.” The more-rigorous meta-analysis by Coetzee and Chown (2015) did reveal some negative impacts, even if fairly minor. It is clear that to achieve the highest standards of ecotourism in Antarctica, the precautionary principle is worth following when it comes to regulations.

Vehicle uses (e.g., helicopter or snowmobile) in the vicinity of research stations may have had more impacts than pedestrian approaches by tourists, so it is important that researchers try to minimize impacts of their studies. In fact, because tourism is transitory, short-season, and ship-based, its effects constitute only about 1% of human impacts (Headland 1994) or 5% of the “person-days ashore” compared to scientific and government personnel at land-based stations (Jabour 2009).

It should also be noted that ecotourism participants in Antarctic and sub-Antarctic trips are typically wealthy and well-educated; expensive cameras and lenses of some visitors are perhaps the most conspicuous field marks of this type of tourist. This group in general is more likely than average to value wildlife and engage actively in conservation, even upon returning to the country of origin, so there is some mitigation to effects of this tourism (CEP 2012). The presence of tourists can also help deter illegal activities and exploitation. Remote areas without a vocal contingency of supporters, such as those who participate in these high-end experiences, are considered more vulnerable to neglect and exploitation. The animated movie, “Happy Feet,” brought a lot of attention to penguins (though highly anthropomorphized). Direct experience, however, presumably provides deeper knowledge and commitment to conservation of all Antarctic wildlife, not just charming caricatures.

My (WA) experience with Cheesemans’ Ecology Safaris (CES) in Antarctica convinced me that the organization was deeply committed to offering the highest-quality tourism experience it can. Guides were professional, knowledgeable, and conscientious, so educational outcomes were high, and environmental responsibility on shore was stringently enforced. In fact, the main expedition leader, Ted Cheeseman, is an active participant in the IAATO meetings that regulate tourism. Thoughtful decisions to forego landings and avoid treacherous ice reduced risk to participants and to accidents that might

cause pollution or other disturbance. CES also encouraged participants to buy offsets for the carbon footprints such travel inherently creates. They have raised funds for removing invasive rats from South Georgia Island, the largest habitat restoration project ever there, and they organized a tour in which the paying participants supported and assisted scientists in Wandering Albatross surveys, making it possible for the government of SG to fulfill at far lower cost its obligation to the Agreement for the Conservation of Albatross and Petrels (ACAP) for a decadal survey of Wanderers (Ted Cheeseman, pers. comm., 25 May 2015).

I acknowledge that CES may represent the upper end of the tourism spectrum, and it would behoove the industry to convince all operators to increase their commitments to environmental responsibility. Stonehouse (2000:232) asserted that while self-regulation is a blessing, it may not be enough. "Should we even consider leaving regulation largely to the industry, when for every Lindblad, there are a dozen opportunists?"

In summary, Antarctic tourism currently is limited in scope, highly regulated through effective collaboration among an industry group (IAATO), and subject to adaptive management as research suggests further restrictions on its activities. Management guidelines must be science-based and employ the precautionary principle. Given the extreme remoteness of this destination, tour operators should contribute to data collection for science. Unlike nearly everywhere else on earth, there are no indigenous people, so local economies and community-based conservation are not factors. Tourist effects, while present, are negligible compared to potential impacts of climate change, invasive species, and even the activities of governments and scientists at land-based stations. However, the large spike in land-based tourism in 2016-17 and projections of continued growth remind us that efforts to minimize and mitigate human impacts may have to step up accordingly.

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