Antarctic shipborne tourism: facilitation and research at Arctowski Station, King George Island

ABSTRACT: The tradition of the Department of Antarctic Biology, Polish Academy of Sciences, of welcoming visitors from cruise ships to their Antarctic research station Henryk Arctowski, has in recent years been strained by increasing numbers of visits and visitors, following an unsteady but positive expansion of the industry during the last decade. The Department has developed a policy to manage the increased numbers more effectively, at the same time enabling studies on several aspects of tourism-related research. This paper reports on the start of a three-year introductory programme of visitor management and research, in cooperation with the Polar Ecology and Management Group of the Scott Polar Research Institute, University of Cambridge, UK.

Key words: Antarctica, tourism, Arctowski Station.

Introduction

This study arose from a need for the Department of Antarctic Biology, Polish Academy of Sciences, to consider ways of managing increasing numbers of visits by shipborne tourists to Henryk Arctowski Station, King George Island, South Shetland Islands, Antarctica (Fig. 1). Since its foundation in 1977 the station – almost uniquely among Antarctic scientific stations – has consistently welcomed tourists, balancing the inconvenience of visits during the station’s working hours against the manifest interest of the visitors in meeting research and support staff, and seeing aspects of life at an operational Antarctic research station (Dona-chie1994, Ciaputa and Salwicka 1997).
The station is conveniently placed to be a first or final visit for cruise ships that use Punta Arenas or Ushuaia, Tierra del Fuego, as their servicing ports. For many years, while there were fewer than two visits per week during the November-to-March tourist season, no special facilities for tourist guests were needed. One or two members of staff showed visitors around, coffee was served in the living room, and a small shop sold maps, postcards, booklets and souvenirs in the library. This proved immensely popular with tourists. However, numbers of visits and visitors have increased substantially during the past few years, imposing an unwelcome strain on the time and resources of station personnel. The industry predicts further increases in numbers of voyages and of passengers visiting Antarctica during the next few years (NSF/IAATO 1997), and requests from tour operators to visit Arctowski Station are considered likely to increase in proportion.

Rather than restricting visits, the Department decided to seek ways of managing visitors more effectively, involving methods designed to enhance their experience of an Antarctic station, while at the same time relieving pressure on station facilities. This initiative involved no intention to attract more visitors: it sought only to cope more efficiently with existing numbers, and with the increased numbers projected for the near future. There is currently no way of judging whether recre-
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ntional and educational facilities will make Arctowski Station more or less popular with tour operators, or enhance or detract from the experience of station visits for the tourists themselves.

As leader of the Polar Ecology and Management Group, Scott Polar Research Institute, I was at that time seeking a station from which to continue and develop research concepts and projects, begun during Project Antarctic Conservation, a recently-completed seven-year study of Antarctic shipborne tourism (Stonehouse and Crosbie 1995, Stonehouse, in press). Professor Stanisław Rakusa-Suszczewski kindly invited me to spend several weeks at Henryk Arctowski Station in late 1996, to examine possibilities for the simultaneous development of both (a) enhanced facilities for tourists at the station, and (b) a programme of tourism-related research in the area. It quickly became apparent that Henryk Arctowski Station had many of the qualities required both for a focal point of tourist interest in the Maritime Antarctic region, and for a centre of tourist-oriented research. This paper summarises some of the findings and possibilities revealed by our survey.

Immediate objectives for the three-year programme were:
- topographical: to define the border between the station area and SSSI No. 8 both on the map and on the ground, and to map topographically and ecologically a buffering border zone:
- visitor management: to develop a system of routes or trails around the station area, and recommend small-boat operations nearby, that would broaden the experience of visitors and relieve visitor pressure on the station:
- tourism-related research: to investigate possibilities and define topics for tourism-related studies of local botany and wildlife, including the designation of a reference area, somewhere close by, for monitoring natural environmental changes.

Topographic and ecological mapping

Though the Admiralty Bay area and the immediate environs of the station were already accurately-mapped on a range of scales, no map was sufficiently detailed to show either the precise course of the boundary between the station area and SSSI No. 8, or the current position of penguin breeding areas, seal wallows and vegetation in relation to the boundary – both important points in planning tourist movements within the station area.

Boundary of SSSI No. 8

It was necessary first to define the border between the station area and SSSI No. 8, and to identify a border zone, about 200 m wide, for special studies of ecological impacts arising from activities of both tourists and station personnel within the station area. Though for most practical station-based purposes the exact loca-
tion of this border was not important, the presence of two tourist attractions—a breeding colony of Adélie penguins *Pygoscelis adeliae* and a wallow of moulting elephant seals *Mirounga leonina*—close to the border at Rakusa Point, made clearer definition essential.

The problem arose from ambivalent wording in the published definition. The Annex to Recommendation X-5 (reproduced for example in Heap 1990: 3308–09), defined SSSI No. 8 (“Western shore of Admiralty Bay, King George Island”) as lying:

“...south of a line connecting Jardine Peak and the shoreline immediately to the north of a prominent group of rocks characterized by a covering of orange lichens bearing approximately 068° from Jardine Peak....”

There are several possible groups of lichen-covered rocks in the area, and from a point 2.15 km away, an approximation of 1° of arc introduces an error of 37.5 m on the shore—enough to include or exclude significant amounts of wildlife. The crude map accompanying this designation of the boundary, on a scale of about 1:100,000, did not provide the necessary detail, and not surprisingly, maps and charts derived from this source show substantial variation.

While most tour operators and tourist expedition leaders have interpreted the penguin colony to be within SSSI No. 8 and the seal wallow to lie outside, some visiting expedition leaders have produced printed maps that showed part at least of the penguin colony outside the SSSI, and therefore capable of being visited. This has at times led to unnecessary friction and misunderstanding, best remedied by defining and clearly marking the boundary.

A line was selected that (a) fitted the terms of the description and (b) represented what was believed to be the original intention—to enclose all the Rakusa Point penguin colony within the SSSI. This boundary, defined in the field by K. V. Blaiklock, an experienced Antarctic surveyor, starts close to the shore at a point now marked by a cairn; its direction is marked by two smaller cairns sited 100 m and 200 m toward Jardine Peak. A notice board prepared by the Polish National Academy of Sciences stands on the boundary. The line so defined has the full concurrence of Dr Wayne Trivelpiece, a US scientist who has for many years used SSSI No. 8 as a penguin study area.

The elephant seal wallow lies alongside the new boundary and can be viewed from nearby vantage points. The penguin colonies can be viewed only from a distance of 70–80 m, but many hundreds of birds pass across the shore en route to their nests, providing an interesting spectacle outside the SSSI area. Abandoned nest sites indicate that the colony has in the last 20 years retreated about 70 m uphill, *i.e.* into the SSSI, from the position of the boundary so defined.

**Defining a boundary zone**

Although this newly-defined boundary lies almost 100 m closer to the station than some alternatives, it continues to exclude from SSSI No. 8 several areas of
particular biological interest and vulnerability, that need to be identified, mapped, and given special protection. These include:

- three or four territories of brown skuas *Catharacta antarctica lonnbergi* between the boundary and the station;
- three rocky reefs that are particularly well endowed with mosses and lichens, and also contain nests of Wilson’s petrels *Oceanites oceanicus*; and
- an area of special scenic and botanic interest marked on some maps as “Jasnorzewski’s Garden”, lying below the hilltop grave of the distinguished naturalist and photographer Włodzimierz Puchalski.

We have thus defined a “boundary-zone study area”, extending over the whole of Rakusa Point and roughly 100 m to the north of the boundary as now drawn, in which special baseline surveys will be made of the remaining Adélie penguins, skuas and petrels, and the local vegetation. Three small colonies of gentoo penguins *Pygoscelis papua*, numbering in total about 150 pairs, were present in this area when the station was established, but have gradually declined: the birds failed altogether to return to these colonies in 1996–97 (author, personal observation).

Visitor management

Objectives of this part of the study were (a) to develop a system of marked routes or trails around the station area and environs, both as an educational facility for tourist visitors and to define routes for station personnel across sensitive vegetation-covered areas, (b) to identify one or more areas close by for zodiac (inflatable boat) cruises, (c) to consider possibilities for a visitor centre in or close to the station, including locations and objectives.

Routes

The need for routes around the station area arose primarily from the numbers of passengers currently visiting *Arctowski* each season. Hitherto the living quarters of the station building had been the main attraction. Trails were intended to divert visitors away from this toward alternative attractions in the station area. An alternative and no less important need was to provide recognized paths for use by station personnel across the vegetation beds of the station area. Staff who need to cross the beds currently do so on several routes. In consequence extensive areas are trampled, and little vegetation remains completely undamaged.

The routes have been designed to provide interesting educational experiences for all tourists who are capable of using them. They are designed also to monitor and test techniques of tourist management in an Antarctic setting. To this end they are self-explanatory, though souvenir leaflets for passengers and more detailed “Notes for guides” will be available on request. It is intended that trails will be equipped with permanent information boards of durable materials, and temporary
bulletin boards in weatherproof casings, giving notice of recent developments. Text on information boards and bulletin boards will be in English: leaflets will be available initially in English and German, later in other languages.

Constraints in designing the routes included the close proximity of SSSI No. 8 along the south side of the station area, and the requirements of ongoing scientific research in the station area. Routes have been carefully chosen to avoid areas of existing or future scientific research, and will not be varied without the full agreement of local scientists. There was an overall need to ensure that the routes enhanced rather than reduced the amenities of the station, and a particular need to ensure that they were safe for the use of visitors, many of whom are elderly or unable to walk far on rough ground.

Three routes have been designated:

**Route A.** — An easy “tourist trail” on level ground around the station area, starting at the landing site (the most-often used landing, by the lighthouse, now the site of the visitor centre, see below), taking visitors past the whalebones (relics of the early-century whaling industry), lagoon, seal wallow, penguin colony, vegetation beds, alga-covered reefs, fresh-water streams, and ending at the visitor centre of the station: time approximately half to one hour. This route is safe, self-explanatory, and requires no guide from the station.

**Route B.** — A longer and more strenuous walk, starting from the visitor centre, visiting the geophysics building, climbing a traverse up steep slopes between the cliffs behind the station, eventually reaching the meteorological installation on the highest point of Point Thomas (173 m), providing a panoramic view of Admiraity Bay: time approximately 90 minutes. This route requires an experienced guide from the ship or station, though parties taking the route are within sight of the station all the time. It is suitable only for fit walkers.

**Route C.** — A longer but non-strenuous walk alongshore from the greenhouse to the base of Point Thomas, then along Ezcurra Inlet to Italian Valley: approximate time 2–3 hours. This route is capable of several variations. Passengers may walk back to the station along the same route. Alternatively, they may be picked up by Zodiac at Italian Valley, or, if accompanied by guides from the station, return by more adventurous and scenic inland routes.

Route A was completed and brought into use in late summer 1996–97 (Ciaputa and Salwicka 1997). This is the easiest walk, that anyone who is able to land should manage. The most difficult aspect for infirm visitors may be walking over cobbles close to the landing point itself. The path, about 2 m wide, is identified by stick markers and cairns (important in early season when parts are snow-covered), removal of stones, laying gravel, providing edging, and other non-intrusive techniques, which serve mainly to ensure that a single track, and not several parallel tracks, will be used. Creation of the path has encouraged station personnel to use it, rather than make independent tracks across the vegetation.
Between the SSSI boundary and the station the path crosses a wide expanse of varying vegetation, including hairgrass *Deschampsia antarctica*, mosses, and nitrophilous algae. This affords opportunities to examine the precise nature of damage caused by walking in areas of different soil moisture and vegetation cover. Different parts of the path are being monitored in specific ways, including soil impaction, ecological surveys and photographic studies: experimental procedures include removal and relocation of vegetation, and use of natural fertilizers. Numbers of visitors using the path are carefully monitored, and the whole route is visible from the platform of the lighthouse, from which movements of parties can be surveyed and plotted.

Building operations at the station restricted the number of visitors during 1997–98, but Route A is currently in its third season of use. Routes B and C are available on request, though their use is permitted only when authorized by the station commander, whose decision is based on weather conditions and other safety factors. Tourists are not allowed to attempt them unaccompanied; parties must be accompanied by at least one guide from the ship who has previously followed the route, and who is equipped with VHF radio for contacting the ship and station. Responsibility for the safety of those taking part will rest entirely with the tour operators.

**Zodiac cruises**

Admiralty Bay as a whole is one of the more interesting and scenically-attractive areas of the South Shetland Islands, with several anchorages from which can be operated a number of Zodiac cruises. Operators are advised particularly of the beauty and interest of Ezcurra Inlet, a sheltered deep-water inlet close to *Arctowski* Station, which is usually ice-free from mid-November to March, and includes a recommended deep-water anchorage. Lined with steep scree slopes, cliffs and glaciers and dotted with islands, it offers relatively safe small-boat cruising, with two or three possible landings and many points of scenic, geological, glaciological, biological and historic interest. Illustrated guides to Ezcurra Inlet are being prepared.

**Visitor centre**

The three-year plan provides for an information centre at which visitors may learn something of the history and natural history of Admiralty Bay, and the immediate environs of *Arctowski* Station. Though shipborne tourism began over thirty years ago, and the Maritime Antarctic currently receives approximately 10,000 visitors per year, there has so far been very little effort by tour operators, national expeditions or the Antarctic Treaty System to provide information ashore for tourists on points of natural and scientific interest of the area.

There are strong arguments for not setting up special educational facilities in what many visitors regard as “wilderness” areas, for example at landing sites that are relatively free from human buildings and activities. Conversely, there are strong arguments for providing, at a well-established research station, interpretive
material that helps visitors toward (a) a better understanding of the area in which they find themselves, and (b) appreciating why Antarctica is of continuing importance to the scientific community.

An interpretive centre is particularly appropriate for Arctowski Station, which is situated in an area of outstanding beauty and historical interest, and for more than two decades has been the focal point of much scientific research (*e.g.* Dalziel 1989). Local geology, geomorphology, botany, climatology, history and oceanography, already well mapped and documented, will be presented in ways that are readily assimilable by short-term visitors. A building for the centre was constructed during the 1997–98 rebuilding programme (Fig. 2), below the lighthouse, and close to the main landing point and starting point of Routes A and B, replacing a weather-worn storage container. Material is currently being prepared for display and sale.

**Tourism-related research**

Objectives of this part of the programme were (a) to measure and monitor both seasonal impacts of tourists and year-round activities of station personnel, in the station area and border zone, (b) to recommend and initiate tourism-related studies
of botany and wildlife local to Arctowski Station, and (c) to monitor wildlife and tourist impacts at neighbouring landing sites, and designate a control area, relatively free from human influences, for baseline monitoring.

Monitoring

Responsibilities imposed by the Protocol on Conservation to the Antarctic Treaty include monitoring the effects of visitors. Though this does not apply to activities around research stations, Arctowski Station is well situated to undertake research on monitoring procedures and on other tourism-related studies that are not currently being investigated elsewhere in Antarctica. Records are being maintained of numbers of visiting ships, passengers coming ashore, timing of visits, nationalities of visitors, and other basic data that can readily be collated. Use of trails and other facilities, behaviour of passengers in relation to weather, distribution of wildlife and other factors, infringements of guidelines, environmental damage and other consequences, environmentally both positive and negative, will be monitored closely.

Local botanical and wildlife studies

The area surrounding the station is well provided with fine soils of glacial and aeolian origin, in a range of ecological settings from dry mountain slopes to wet coastal plains. Many studies have already been made of local flora, including the prominent moss and grass beds immediately behind the station. The station buildings include plant laboratories and a greenhouse. Flora and facilities combine to provide possibilities for programmes of studies of plant growth and regeneration in relation to soil compaction, mechanical damage and other factors associated with impacts both of human visitors and of resident seals, penguins and other wildlife.

Baseline studies of birds and seals in the station and boundary areas have already provided wildlife inventories, which are being maintained by Ciaputa and Salwicka. Salwicka and Stonehouse (in press) have developed studies of southern elephant seals Mirounga leonina, Weddell seals Leptonychotes weddelli and Antarctic fur seals Arctocephalus gazella, including diurnal and seasonal movements, responses to visitors, and physiological monitoring of respiration and heartbeat using non-invasive methods. In the course of this research, all three species have been found to make frequent use of resting apnoea, with dramatic reduction of heartrate and significant consequences both for energy budgeting and for interactions with human visitors.

Research at neighbouring sites

Though Arctowski Station offers opportunities for research on many aspects of visitor impacts, neither the station area, nor neighbouring SSSI No. 8, nor other sites within Admiralty Bay offer undisturbed populations with the combination of species (for example Adélie penguins, chinstrap penguins Pygoscelis antarctica, skuas, giant petrels Macronectes giganteus) that we require for continuation of
particular research projects initiated by Project Antarctic Conservation. These include heartbeat monitoring of incubating birds in the presence of visitors, under controlled conditions, using non-intrusive techniques (Nimon et al. 1994, 1995; Nimon and Stonehouse 1995). Nor does Admiralty Bay provide a site, rich in vegetation and wildlife but subject to little or no human visitation or interference, that can be monitored as a control for comparison with visited sites. However, these facilities are available in King George Bay, within easy reach by sea, making possible extensions of tourism-related research from Arctowski Station. Preliminary studies have been completed, and a five-year programme of field-based research is currently in preparation.

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References


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Streszczenie

Polska Stacja Naukowa PAN im. Henryka Arctowskiego jest jednym z najczęściej odwiedzanych przez turystów miejsc w Antarktyce. Artykuł przedstawia główne założenia i wstępne wyniki trzyletniego programu badań, prowadzonego we współpracy z Scott Polar Research Institute, Cambridge University i Zakładu Biologii Antarktyki PAN, nad ruchem turystycznym w rejonie stacji.

Główne kierunki prowadzonych prac to:
- dokładne wyznaczenie w terenie i na mapie granic SSSI nr 8 oraz topograficzny i ekologiczny opis strefy buforowej pomiędzy stacją i SSSI nr 8;
- wyznaczenie trzech różnych ścieżek turystycznych w okolicy stacji oraz jednej trasy wycieczkowej dla małych jednostek pływających typu „Zodiac”, które odciągają stację i skierują uwagę gości na lokalne atrakcje przyrodnicze;
- rozpoznanie ewentualnych zagrożeń dla lokalnej flory i fauny wynikających ze wzmożonej aktywności turystycznej oraz wyznaczenie poletek badawczych poddanych stałemu monitoringu.