

MANAGING WILDLIFE TOURISM ON AUSTRALIA'S SUB-ANTARCTIC MACQUARIE ISLAND

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Abstract

Macquarie Island's unique and hostile sub-Antarctic environment is home to an abundance of spectacular wildlife such as the elephant seal and the endemic royal penguin. This Tasmanian sub-Antarctic island is becoming increasingly attractive to tourists seeking a nature based experience. The way in which tourists are managed has implications for resource management and conservation objectives. This paper begins with a summary of the international significance of Macquarie Island, including its listing as a World Heritage Area along with the legal and administrative framework for managing tourism. The existing level of wildlife tourism on Macquarie Island is examined by assessing the number of tourists visiting the island, the reasons tourists visit and the type of product tourism operators provide. The types of impacts associated with wildlife tourism are discussed and the ability of the environment to cope with an increase in tourist numbers assessed. The existing application of entry fees and quota restrictions is presented. The paper concludes by discussing the potential for a sustainable increase in tourist numbers on Macquarie Island and requirements for long term monitoring to assess those impacts.

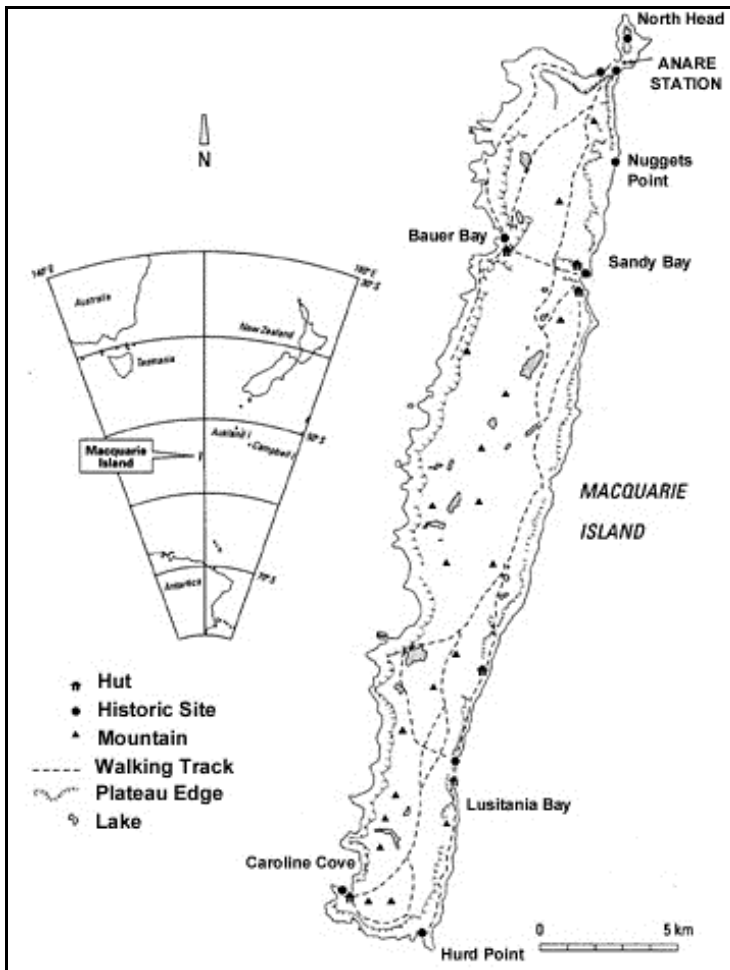
Introduction

Macquarie Island is a 34 km long and up to 5 km wide sub-Antarctic island situated in the Southern Ocean (Figure 1). Its area includes Judge and Clerk Islets 11 km to the north, Bishop and Clerk Islets 37 km to the south, and all offshore islands, rocks and reefs to the low water mark. The Island is located approximately 1,500 km south-south-east of Tasmania, roughly half-way between the Antarctic continent and Australia.

Macquarie Island was declared a Wildlife Sanctuary in 1933, became a State Reserve in 1972 and was recognised internationally in 1977 as a Biosphere Reserve under the

United Nations Educational, Scientific and Cultural Organisation's (UNESCO) Man and the Biosphere Program (UNESCO 2001). The Island was declared a restricted area in 1979 thereby requiring visitors to the Island to acquire permits from the managing authority.

Figure 1. Macquarie Island.



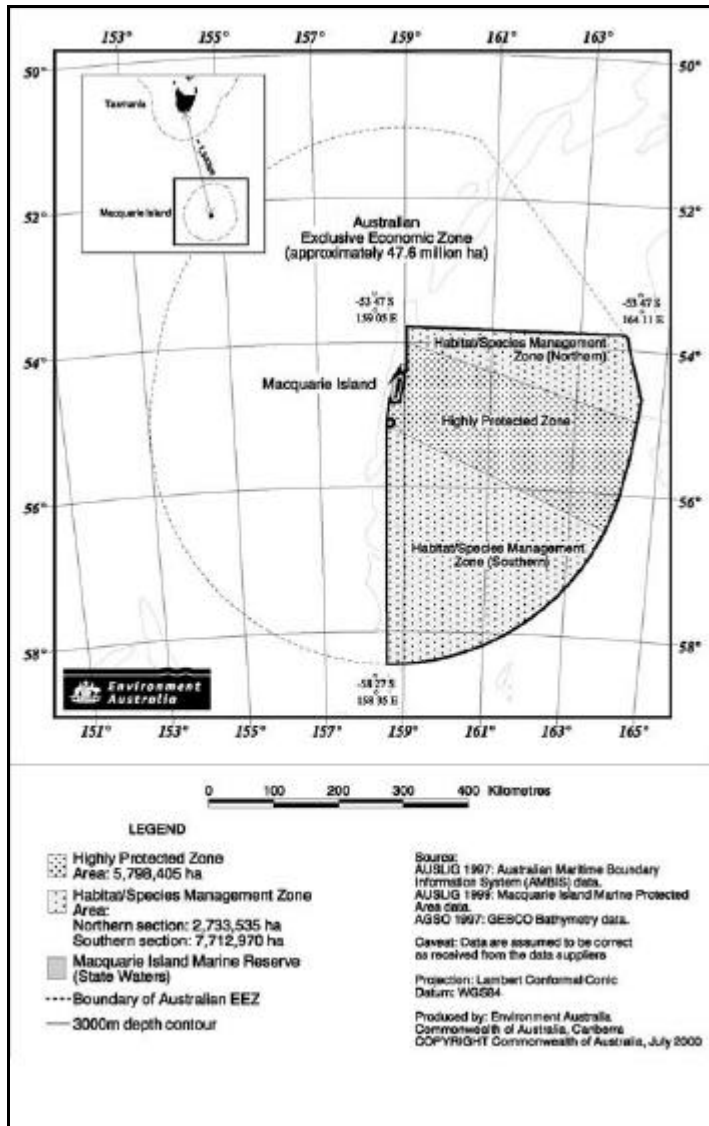
Source: PWS website (<http://www.parks.tas.gov.au/homemi/macqis.html>).

In 1997, the World Heritage Committee (WHC) inscribed Macquarie Island and waters out to 12 nautical miles on the World Heritage List for its outstanding geoconservation significance, satisfying natural criteria i and iii. Macquarie Island is the only island in the world composed entirely of oceanic crust and rocks from the earth's mantle where rocks from the mantle are being actively exposed above sea level (PWS 1998; World Conservation Monitoring Centre 2001). Interestingly, Macquarie Island was not

inscribed on the World Heritage List for its biological values. At the time of inscription, the WHC (1997, p.36) 'encouraged the Australian authorities to consider for the future a renomination with the Subantarctic Islands of New Zealand and to consider adding biological criteria in a future renomination.'

In October 1999 the Macquarie Island Marine Park (Figure 2), an area encompassing 16.2 million hectares of the 47.6 million hectare Exclusive Economic Zone (EEZ) surrounding Macquarie Island, was declared to 'protect the unique and vulnerable marine ecosystems of the south-eastern portion of the Macquarie Island Region (Environment Australia 2001, p.6). The Marine Park is divided into three zones: a Highly Protected Zone (assigned to IUCN category Ia) and two Habitat/Species Management Zones (IUCN category IV) either side of the Highly Protected Zone.

Figure 2. Macquarie Island Marine Park.



Source: Environment Australia 2001.

The State Government of Tasmania, through the Tasmanian Parks and Wildlife Service (PWS), a division of the Department of Primary Industries, Water and Environment (DPIWE), is responsible for the management of Macquarie Island and the surrounding waters out to 3 nautical miles. The Commonwealth Government is responsible for the management of the area from 3 nautical miles to the EEZ around Australia (Environment Australia 2001).

Legislation providing for the conservation of Macquarie Island is present at both the federal and state levels and includes the *Environment Protection and Biodiversity*

Conservation Act 1999 (Cwlth) and the *National Parks and Wildlife Act 1970* (Tas.) An objective of the *Environment Protection and Biodiversity Conservation Act 1999* is to provide for the protection of the environment, in particular those aspects of the environment that are matters of national environmental significance. World Heritage is one of six environmental aspects to be considered of national environmental significance (Padgett & Kriwoken 2001). Section 23(1) of the *National Parks and Wildlife Act 1970* requires managing authorities to manage reserved land in accordance with the provisions of a management plan. In satisfying this requirement, Macquarie Island is managed in accordance with the Macquarie Island Nature Reserve Management Plan 1991 (Department of Parks, Wildlife and Heritage 1991). A management objective of the Plan is to permit tourist visits under strictly controlled conditions which allow visitors to experience the natural values of the Island without compromising them.

Wildlife tourism on Macquarie Island

A series of New Zealand Government expeditions to the Auckland Islands, Campbell Island and Macquarie Island over the period 1882 to 1927 provides the earliest evidence of the carriage of tourists to Macquarie Island (Headland 1994). According to Headland (1994), these expeditions were made at least annually with some of the passengers described as tourists. Early tourism continued up to the mid 1950s with a number of tourists travelling aboard ships on voyages to Antarctica for a variety of purposes, including the relief of scientific staff, the provision of supplies, castaway searches and the provision of mail services.

Modern commercial shipborne Antarctic tourism commenced in 1958, when an Argentinian ship took approximately 200 passengers on two trips to the Antarctic Peninsula (Reich 1980; Headland 1994). Commercially operated cruise ships have taken tourists to Antarctica every year since, with the exception of 1960 to 1965 when no commercial cruises took place. Regular tourist visits to Macquarie Island by commercial shipborne tour operators did not commence until the 1990/91 season when 559 tourists visited the Island aboard four ship visits (Table 1).

Table 1. Ship visits, tourist landings and annual quotas for Macquarie Island.

Season	Ship visits	Tourists landings	Quota
1990/91	4	559	500
1991/92	0	0	500
1992/93	4	416	500
1993/94	3	128	500
1994/95	5	342	500
1995/96	8	351	500
1996/97	6	490	500
1997/98	6	313	500
1998/99	6	374	500
1999/00	4	329	500
2000/01	7	556	750
Totals	53	3858	N/A

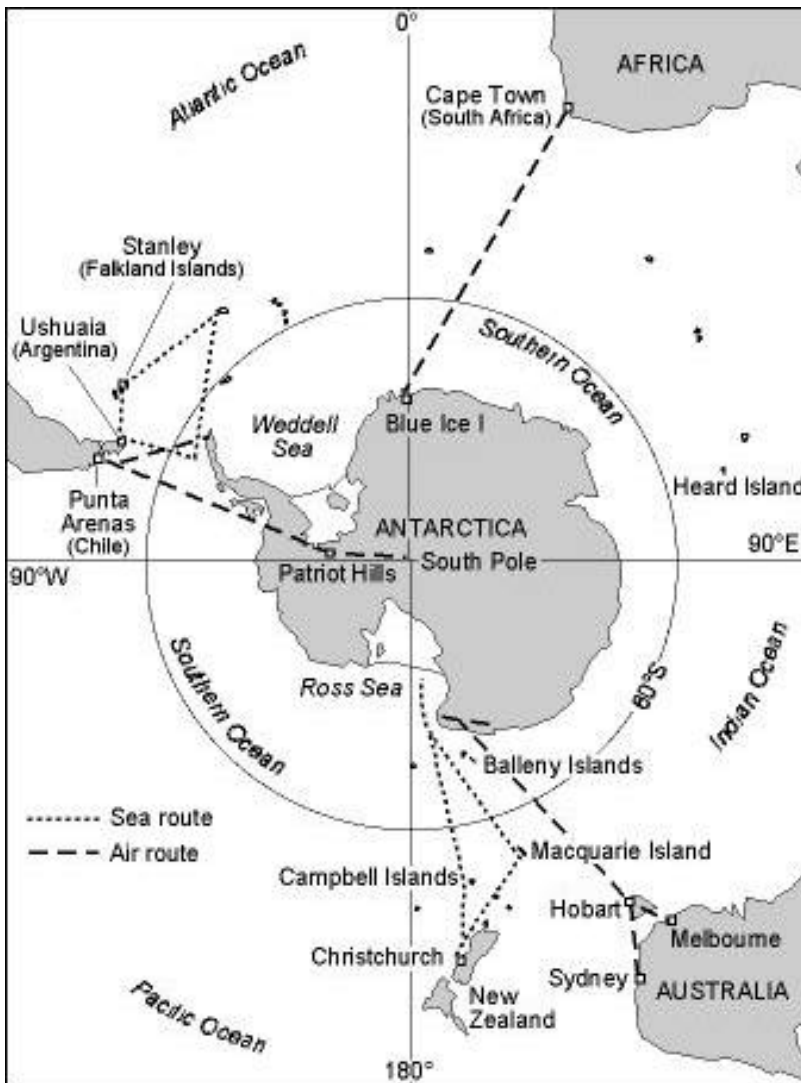
Source: Data supplied by Noel Carmichael, PWS.

The number of tourists that have visited Macquarie Island since the 1990/91 season has fluctuated between years with an average visitation rate of 350 visitors per annum (Table 1). For the 2001/02 season, it is projected that 642 tourists will visit Macquarie Island aboard 10 ship visits (Nagel 2001, pers. comm.).

The only tourism product currently available for tourist visits to Macquarie Island is expedition style shipborne tourism. This form of tourism requires that tourists travel aboard ships with the majority of time spent at sea. A number of shore landings are included in the itinerary for visits to sites, such as research stations, cultural attractions and wildlife viewing. Tourists may also participate in zodiac cruising throughout their expedition, and on some trips may participate in adventure type activities, such as kayaking, diving and camping. Such adventure activities are currently not permitted on Macquarie Island.

Most tourist operators that visit Macquarie Island include the visit as part of a longer expedition to the Antarctic continent or as part of an expedition that includes other destinations, such as the sub-Antarctic islands of New Zealand (Figure 3). A significant reason for including Macquarie Island in the itinerary of longer voyages to Antarctica is to accommodate a break in lengthy periods of sea travel. Other significant reasons for tourist visits to Macquarie Island include its wildlife, flora, cultural attractions and visits to the Australian National Antarctic Research Expedition (ANARE) research station. This paper concentrates on wildlife tourism, therefore the vegetation, cultural and research attractions are not discussed.

Figure 3. Major seaborne and airborne tourist routes to Antarctica.



Source: Kriwoken & Rootes 2000.

The abundant, diverse and often unique wildlife of Macquarie Island, in particular the large number of penguins, is a significant reason for tourist visits. Approximately 3.5 million seabirds arrive annually on Macquarie Island to breed and moult. Most of these visiting seabirds are penguins and include approximately 850,000 endemic royal penguins; over 100,000 breeding pairs of king penguins; less than 5,000 breeding pairs of gentoo penguins; and rockhopper penguins for which population estimates range from 10,000 to 500,000 breeding pairs (PWS 1998). Other seabirds that visit Macquarie Island include the endemic king cormorant, skuas and four albatross species, including up to ten breeding pairs of wandering albatross and approximately 2,000 breeding pairs of light-mantled sooty albatross.

Four species of seal breed on Macquarie Island, including Antarctic fur seals, sub-Antarctic fur seals, New Zealand fur seals and one seventh of the world's population of elephant seals. The New Zealand fur seal is the most populous seal on the Island with over 2,000 individuals (PWS 1998).

Impacts of wildlife tourism on Macquarie Island

In addition to the Management Plan, the PWS has a set of guidelines for tourist operations at Macquarie Island (c. 1999). These complementary documents include prescriptions for the management of tourist visits to the Island, such as the restriction of visits to the Island between the times of 0700 and 1900 hours as pre-arranged with the PWS with no overnight stays permitted. Ships that carry more than 200 passengers are not allowed to land visitors on the Island.

Tourist landings are restricted to two areas: the beach at Sandy Bay and the ANARE research station on the isthmus (Figure 1). Tourists are not permitted to land at any other place on the Island, however zodiac cruising is allowed. A popular zodiac cruising destination is Lusitania Bay as it is home to a king penguin colony (Carmichael 2001, pers. comm.). The guidelines allow a maximum of 60 people ashore at any one time at

Sandy Bay and a maximum of 100 people ashore at any one time at the isthmus area. The PWS does not permit concurrent landings at each of the sites, therefore there will be a maximum of 100 tourists ashore on the Island at any one time.

Tourists visiting the Sandy Bay area are restricted to the beach and two boardwalks. The first boardwalk takes tourists to the periphery of a royal penguin colony and the second to a king penguin colony. Elephant seals, fur seals and a number of non-breeding penguin species are seen on the beach. Visitors to the isthmus are restricted to the beach, boardwalks, the network of roads at the ANARE station and the station if a visit has been arranged. Boardwalks in the isthmus area take tourists to a cultural site containing digesters from the sealing era that were used for rendering down elephant seal blubber and to a look-out over the research station and isthmus area. Gentoo penguins are encountered on the beach.

Any level of recreational or tourist use of a natural area inevitably results in some level of environmental impact. According to Cole (1994), the total impact to a natural area depends on a number of principal factors that are unique to each individual site. These factors comprise frequency of use, type and behaviour of use, season of use, environmental conditions and spatial distribution of use.

Tourist visits to Macquarie Island are strictly managed by PWS staff to minimise impact in accordance with the Management Plan and guidelines, with restrictions imposed on the principal factors of impact, with the exception of environmental conditions, such as the weather which can not be altered. The number of tourists visiting the Island, or frequency of use, is managed by a quota system. This quota system allowed up to 500 tourist landings per annum over the 1990s and was increased for the 2000/01 season by 50% from 500 to 750 (Table 1).

The spatial distribution and type and behaviour of tourist use of Macquarie Island are restricted and managed by PWS staff with shore visits only permitted in the Sandy Bay

and isthmus areas. Macquarie Island's tourist season is restricted to November to March due to the inhospitable climate of the Island and Antarctica. Most tourist operators include Macquarie Island in their itineraries either on the way to or from Antarctica, therefore the season is restricted to these months to enable ships to reach the Antarctic continent when sea ice is at its minimum.

The strict control of tourist visits to Macquarie Island and their restriction to hardened sites and beach areas suggest that tourists have a negligible impact on the Island's environment. Tourist visits to wildlife colonies via the boardwalks do not venture beyond the periphery of the colonies, therefore it is expected that the impact on the wildlife is negligible. Tourists encounter a variety of wildlife on the beach in the Sandy Bay area, therefore there is the potential for disturbances to wildlife if tourists approach too closely. The PWS does not have minimum distances to which tourists may approach wildlife similar to the International Association of Antarctica Tour Operators, however tourist visits to the Island are strictly controlled by PWS staff to ensure that tourists do not approach wildlife too closely and that any disturbances are kept to a minimum (Carmichael 2001, pers. comm.).

Entry fees

The PWS levies a fee of \$A165 for each paying passenger aboard a commercial tourist ship that makes a shore visit to Macquarie Island. The guidelines for tourist operations on Macquarie Island (PWS c. 1999) state that the revenue will be used for the management and promotion of the Island, which may include the provision of staff, facilities to protect the environment and visitor impact monitoring programs. This levy raised over \$91,000 for the 2000/01 season and on projected figures will raise over \$105,000 during 2001/02.

Potential for increase in tourist numbers

Due to the nature and strict control of tourist visits to Macquarie Island, it is expected that the environment could cope with an increase in tourist numbers, provided that

tourist visits continue to be restricted to the two landing areas at Sandy Bay and the isthmus area and any visits are strictly controlled. Both areas currently visited by tourists are either beach or hardened areas, therefore an increase in tourist numbers should result in only a minimal increase in impact on the environment. This suggestion is supported by recreational impact research which typically finds a curvilinear relationship between frequency of use and environmental impact, with most impacts occurring under low levels of recreational use and additional use causing relatively little additional impact (Stankey & Manning 1986; Cole 1993, 1994).

Conclusion

During the 1999/00 and 2000/01 seasons there was an increase in tourist visits to Macquarie Island from 329 to 556, an increase of 69%. The PWS managed this increase in demand by increasing the quota in 2000/01 by 50% from 500 to 750. The quota of 750 will remain for the upcoming 2001/02 summer, where it is projected that 642 tourist landings will be made on Macquarie Island, an increase of 15% from the previous year. If tourist visits to Macquarie Island were to continue to increase by 15% each year, over 1,000 tourists would visit Macquarie Island over the 2005/06 summer and almost 2,000 tourists during 2009/10.

The PWS is currently conducting research on the impacts of tourist visits to the Island. It is essential that these studies continue into the future and include long-term impact monitoring as the results will assist in determining whether the increase in tourist visits is sustainable. The research will also be essential to management and policy-makers in deciding whether the quota should be increased in future years or whether a ceiling should be imposed.

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