

# The Prince Edward Islands Millennium Expedition

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**A**N EXPEDITION TO SURVEY BIRD AND SEAL populations on the Prince Edward Islands took place from 11 to 31 December 2001. The first priority was to undertake a count of the breeding birds during the peak of the summer breeding season. An additional objective was to obtain estimates of the numbers of fur seals (*Arctocephalus* species) breeding at Prince Edward Island.

The Prince Edward Islands lie in the Southern Ocean, 2180 km southeast of Cape Town. There are two islands in the group, Marion Island (46°54'S, 37°45'E, area 290 km<sup>2</sup>) and Prince Edward Island (46°38'S, 37°57'E, area 44 km<sup>2</sup>). They were physically annexed by South Africa on 29 December 1947 and 4 January 1948, respectively, and legally incorporated into the then Union of South Africa by the Prince Edward Islands Act (Act 43 of 1948). The islands have the status of a Special Nature Reserve, proclaimed on 3 November 1995 in terms of Section 18 of the Environment Conservation Act (Act 73 of 1989). They form a unique ecosystem, and Prince Edward Island in particular has experienced limited human interference, making it one of the least modified islands in the Southern Ocean.<sup>1,2</sup> South Africa intends to nominate them as a natural site to the 1972 convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention).

Activities on the islands are governed by a management plan, implemented by the Prince Edward Islands Management Committee (PEIMC), the main objective

of which is to protect the fragile ecosystems of the islands. One of the key ways of achieving this is to prevent the landing of alien plants or animals.<sup>3</sup> Access to the islands is thus tightly restricted.

In terms of the management plan there is a need to survey the breeding seabirds and seals of the island group. The islands have been designated an Important Bird Area, and 15 of the 29 bird species which breed there fall into unfavourable conservation status categories, as determined by IUCN criteria.<sup>4,5</sup> A further motivation for the survey was the newly negotiated Agreement on the Conservation of Albatrosses and Petrels (ACAP), to which South Africa will become a contracting party in 2003. Again, knowledge of the islands' seabird populations is necessary for South Africa to contribute to this agreement.<sup>6</sup> ACAP is an agreement in terms of the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), to which South Africa is also a contracting party.<sup>7</sup>

There has never been a comprehensive survey of the seabird populations that breed at Prince Edward Island in summer, nor a comprehensive synoptic survey of the bird fauna of the two islands. For most species at Prince Edward Island and for several at Marion Island, there were no recent estimates of population sizes. For example, the last published estimates of Indian yellow-nosed albatrosses (*Thalassarche carteri*) and grey-headed albatrosses (*T. chrysostoma*) at Prince Edward Island were based on counts conducted in 1979. A survey of the surface-breeding seabirds became a priority, given intensive long-line fishing around the islands and its potential impact on some bird species<sup>7</sup> and global decreases in others, such as the rockhopper penguin (*Eudyptes chrysocome*), often as a result of climatic change.<sup>9</sup>

The islands are accessible only by sea. The team for the Prince Edward Islands Millennium Expedition, undertaken with South African expertise and backing,

sailed from Cape Town on 12 December 2001 on board the research ship *Africana*. The members consisted of 23 scientists and technicians, two media personnel and a medical doctor. Twelve scientists were drawn from Marine & Coastal Management (Department of Environmental Affairs and Tourism), six from the University of Cape Town (Avian Demography Unit and Percy FitzPatrick Institute of African Ornithology), two from the University of Pretoria (Mammal Research Institute), and one each from the University of the Witwatersrand, Western Cape Nature Conservation Board and the Robben Island Museum. In addition, two members of the Marion Island M58 team assisted with the scientific fieldwork. John Cooper was appointed the expedition's conservation officer by the PEIMC. Ten of the 25 scientists were women.

The islands are five days' sailing from Cape Town. On arrival on 17 December, the six scientists of the survey team for Prince Edward Island were landed at Cave Bay. Strict quarantine measures were enforced to minimize the risk of introducing alien biota to this near-pristine island.<sup>3</sup> Three immediately set out for the western coastal plain, and spent two days surveying birds and seals in this area before returning to Cave Bay. Most accessible parts of the island were covered within the six-day period approved by the management committee. The team was collected by the *Africana* on 22 December, and then transferred to Marion Island.

The remainder of the team landed at the meteorological station at Transvaal Cove on Marion Island on 17 December. Two teams of four undertook the major part of the bird counting. One group, under Michelle Greyling, set out directly across the island and counted birds from Grey-headed Albatross Ridge, along the west coast of the island back to Transvaal Cove. The other team, under Wilna Wilkinson, conservation officer on Marion Island for the year, was responsible for counting birds along the eastern perimeter of the island. A 'night bird' team, led by Leshia Upfold, was responsible for catching, identifying and gathering mensural data for burrow-nesting birds that arrive at their nest sites only at night to avoid predation by Subantarctic skuas (*Catharacta antarctica*). This group also assisted with bird counts within a day's walk of Transvaal Cove. A team, under Michael Meÿer, was responsible for attaching satellite-tracking devices to seals and birds [king penguin (*Aptenodytes patagonicus*), macaroni penguin (*Eudyptes*

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**Table 1.** Papers containing the scientific results of the Prince Edward Islands Millennium Expedition.**A.** In press with the *African Journal of Marine Science* 25 (2003)

1. Bester M.N., Ryan P.G. and Dyer B.M. Population numbers of fur seals at Prince Edward Island, Southern Ocean.
2. Cooper J., Battam H., Loves C., Milburn P.J. and Smith L.E. The oldest known banded wandering albatross *Diomedea exulans* at the Prince Edward Islands.
3. Cooper J. and Weimerskirch H. Exchange of wandering albatross *Diomedea exulans* between the Prince Edward and Crozet islands: implications for conservation.
4. Crawford R.J.M. and Cooper J. Conserving surface-nesting seabirds at the Prince Edward Islands: the roles of research, monitoring and legislation.
5. Crawford R.J.M., Cooper J., du Toit M., Greyling M.D., Hanise B., Holness C.L., Keith D.G., Nel J.L., Petersen S.L., Spencer K., Tshingana D. and Wolfaardt A.C. Population and breeding of the gentoo penguin *Pygoscelis papua* at Marion Island, 1994/95–2002/03.
6. Crawford R.J.M., Cooper J. and Dyer B.M. Population of the macaroni penguin *Eudyptes chrysolophus* at Marion Island, 1994/95–2002/03, with information on breeding and diet.
7. Crawford R.J.M., Cooper J., Dyer B.M., Greyling M.D., Klages N.T.W., Nel D.C., Nel J.L., Petersen S.L. and Wolfaardt A.C. Decrease in numbers of the eastern rockhopper penguin *Eudyptes chrysolome filholi* at Marion Island, 1994/95–2002/03.
8. Crawford R.J.M., Cooper J., Dyer B.M., Greyling M.D., Klages N.T.W., Ryan P.G., Petersen S.L., Underhill L.G., Upfold L., Wilkinson W., de Villiers M.S., du Plessis S., Du Toit M., Leshoro T.M., Makhado A.B., Mason M., Merkle D., Tshingana D., Ward V.L. and Whittington P.A. Populations of surface-nesting seabirds at Marion Island, 1994/95–2002/03.
9. Crawford R.J.M., Duncombe Rae C.M., Nel D.C. and Cooper J. Unusual breeding by seabirds at Marion Island during 1997/98.
10. Crawford R.J.M., Cooper J., Dyer B.M., Wolfaardt A.C., Tshingana D., Spencer K., Petersen S.L., Nel J.L., Keith D.G., Holness C.L., Hanise B., Greyling M.D. and du Toit M. Population, breeding, diet and conservation of the Crozet shag *Phalacrocorax [atriceps] melanogenis* at Marion Island, 1994/95–2002/03.
11. Nel D.C., Taylor F., Ryan P.G. and Cooper J. Population dynamics of the wandering albatross *Diomedea exulans* at Marion Island: longline fishing and environmental influences.
12. Ryan P.G., Cooper J., Dyer B.M., Underhill L.G., Crawford R.J.M. and Bester M.N. Counts of surface-nesting seabirds breeding at Prince Edward Island, summer 2001/02.
13. Ryan P.G., Smith V.R. and Gremmen N.J.M. The distribution and spread of alien vascular plants on Prince Edward Island.
14. Schultz A. and Petersen S.L. Absence of haematozoa in breeding macaroni *Eudyptes chrysolophus* and eastern rockhopper *E. chrysolome* penguins at Marion Island.
15. Underhill L.G., Petersen S.L. and Cooper J. Nest densities of the wandering albatross *Diomedea exulans* at the Prince Edward Islands, estimated using GPS.

**B.** Papers published in other scientific and popular journals

- Akkers T. (2002). Research in the Southern Oceans. *Research Highlights 2001–2002* 11, 78–82.
- Anon. (2002). Prince Edward Islands Millennium Expedition. *Africa Birds & Birding* 7(2), 74.
- Cooper J. and Crawford R.J.M. (2003). Conserving South Africa's Prince Edward Islands and their seabirds in the 21st century. *African Wildlife* 57(3), 54–57.
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- Ryan P. G. (2002). More than an island fling? Attempted rapes by Wandering Albatrosses. *Africa Birds & Birding* 7(2), 15.
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*chrysolophus*), northern giant petrel (*Macronectes halli*), light-mantled sooty albatross (*Phoebastria palpebrata*), Crozet cormorant (*Phalacrocorax [atriceps] melanogenis*), Subantarctic fur seal (*Arctocephalus tropicalis*) and Antarctic fur seal (*A. gazella*). This team was assisted by Samantha Petersen, a veterinary nurse and one of the Marion Island M58 team.

Fieldwork was completed on 24 December, thanks to favourable weather conditions. The following day was marked by the passage of a strong cold front, with accompanying heavy seas. Fortunately, the winds and seas abated overnight, and the team was able to transfer to the *Africana* on schedule on 26 December. The ship returned to Cape Town early on 31 December.

The main scientific results of the expedition are being published as a suite of 15 papers in the inaugural volume of the *African Journal of Marine Science*, formerly known as the *South African Journal of Marine Science* (Table 1).

Based on the expedition's findings, as well as on ornithological research and monitoring conducted at Marion Island over the previous decade, the populations of most of the surface-nesting seabirds

have decreased at the Prince Edward Islands since the 1980s (Table 2). Twelve of the 15 seabird species that are regarded as Threatened or Near-threatened are surface-nesters.<sup>5</sup> The two main causes of these declines in population are thought to be by-catch mortality of the predominantly offshore-feeding albatrosses in long-line fisheries, and changes in oceanographic conditions, such as a rise in sea-surface temperature at Marion Island, influencing availability of prey to the penguin and the cormorant species, which are primarily inshore foragers.<sup>10</sup>

The overview paper on the expedition<sup>10</sup> proposes that the extent of the Prince Edward Islands Special Nature Reserve be expanded to include its surrounding territorial waters, so as to afford additional legal protection to the seabirds breeding there, especially those species that feed near the islands. It also argues that consideration should be given to listing species as threatened or protected in terms of planned new environmental legislation in South Africa and then developing management plans for them, linked closely with the international Agreement on the Conservation of Albatrosses and Petrels. Lastly, it argues that

the islands should be nominated as a Ramsar Wetland of International Importance in recognition of their importance to seabirds, with 13 of the 16 species exceeding the Ramsar Convention's



A macaroni penguin and its chick at Swartkops, Marion Island. Photograph: Samantha Petersen.

**Table 2.** Estimates of the annual breeding populations (pairs) of surface-nesting seabirds at Marion Island and Prince Edward Island in 2001/02.<sup>9</sup>

	Marion Island	Prince Edward Island	Combined annual breeding population	Status in South Africa	Trend 1992/93–2002/03*
King penguin <i>Aptenodytes patagonicus</i>	218 000	3000	221 000		S/I
Gentoo penguin <i>Pygoscelis papua</i>	844	475	1319	Near-threatened	D
Macaroni penguin <i>Eudyptes chrysolophus</i>	363 000	9000	372 000	Near-threatened	D
Eastern rockhopper penguin <i>E. chrysocome filholi</i>	67 000	45 000	112 000	Near-threatened	D
Wandering albatross <i>Diomedea exulans</i>	1869	1850	3719	Vulnerable	S
Grey-headed albatross <i>Thalassarche chrysostoma</i>	6229	3000	9229	Vulnerable	S
Indian yellow-nosed albatross <i>T. carteri</i>	0	7500	7500	Vulnerable	S
Dark-mantled sooty albatross <i>Phoebastria fusca</i>	564	1000	1564	Near-threatened	D
Light-mantled sooty albatross <i>P. palpebrata</i>	179	150	329	Near-threatened	D
Northern giant petrel <i>Macronectes halli</i>	295	300	595	Near-threatened	S/D
Southern giant petrel <i>M. giganteus</i>	1430	1400	2830	Near-threatened	D
Crozet shag <i>Phalacrocorax [atriceps] melanogenis</i>	344	50	394	Vulnerable	D
Subantarctic skua <i>Catharacta antarctica</i>	546	250	796		D
Kelp gull <i>Larus dominicanus</i>	24	30	54		D
Antarctic tern <i>Sterna vittata</i>	6	<5	<15		S/D
Kerguelen tern <i>S. virgata</i>	19	<5	c. 60	Endangered	S

\*The status of the species in South Africa<sup>4</sup> and the trends in populations at the Prince Edward Islands during the most recent decade (1992/93–2002/03) are indicated: D, decreasing; I, increasing; S, stable.

criterion that a wetland should be considered to be of international importance if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

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## The Working for Water Programme: scientific challenges in the field of invasive alien plant management

The first issue of the 2004 volume of the *South African Journal of Science* contains papers devoted to the many facets of this remarkable initiative, now in its eighth year. The programme's focus is job creation while protecting water supplies threatened by invasive alien plants, at which South Africa has proved to be a world leader.

Invasion of ecosystems by alien species is a problem of global significance. These invasions can alter the composition, structure and functioning of ecosystems and affect their capacity to deliver a range of benefits to human society. The South African experience of tackling this problem is therefore of more than local relevance.