

FEATURE

Heard Island in focus

Rising majestically out of nowhere, Heard Island, wild and wind-battered and surrounded by the tumultuous waters of the Southern Ocean, recently became the centre of an ambitious and successful scientific research program to find out how Antarctic ecosystems tick. This issue of *Australian Antarctic Magazine* celebrates the efforts and achievements of the scientists, expeditioners and crew, who combined their talents to uncover the secrets of one of the world's wildest and most undisturbed places.

After its discovery in 1853, Heard Island attracted sealers who rapidly set about exploiting the abundant wildlife on the island. Sealing finished around the 1890s and the island was infrequently visited by seafarers, adventurers and eventually by scientists. In 1947 Australia mounted the first ANARE (Australian National Antarctic Research Expedition) to Heard Island and established a station in 1948, which was abandoned in 1955. Australian scientists continued to visit Heard Island irregularly through the late 20th century. In spite of, or because of the sporadic nature of these activities, Heard Island is as close to pristine as anywhere on Earth.

In 1997 Heard Island and the McDonald Islands were inscribed on the World Heritage List for their outstanding natural values, beautiful landforms, geology and geomorphology, and their importance in demonstrating significant ongoing ecological and biological processes. In 2003 the 65 000 square kilometre Heard Island and McDonald Islands (HIMI) marine reserve was declared, encompassing the islands and an area of ocean stretching to the edge of Australia's Exclusive Economic Zone.

With its unmodified, interrelated terrestrial, freshwater, coastal and marine ecosystems – in which the evolution of plants and animals has occurred in a natural state – and its location south of the Antarctic Polar Front, Heard Island provides a unique laboratory. There are opportunities for scientists to study the effects of geographic isolation and climate change on the evolution of species; the effects of climate change on glacial retreat, biodiversity and the functioning of subantarctic terrestrial and lake ecosystems; and the interrelationships between the terrestrial and marine environments. Understanding these interactions will help us to conserve this remarkable place and provide us with advance warning of impending changes in Antarctica.

The waters around Heard Island also support two important fisheries for Patagonian toothfish and mackerel icefish. Understanding how the ecosystem works and the relationships between the fish and the species that depend on them, is important for the ecologically sustainable management of the fishery. To ensure these fisheries are sustainable, we must understand the effects of fishing on the target species, their predators and their prey. Heard Island is the breeding ground for large colonies of seals, penguins and albatrosses and it is therefore an ideal place on which to study these complex food webs.

In the summer of 2003–04, the Australian Antarctic Division (AAD) mounted a ground-breaking research program with 28 expeditioners journeying to Heard Island. Another team of scientists and crew aboard the *Aurora Australis*, remained in the Southern Ocean to study the prey and foraging patterns of Heard Island predators and support various land-based activities.

One project, led by AAD marine mammal scientist Nick Gales, involved satellite tracking penguins, seals and albatrosses as they foraged out to sea; logging thousands of individual dives by fur seals, macaroni and king penguins; and collecting samples for dietary analysis. Despite advances in satellite technology that enable us to see things from a great distance, there is still no substitute for the human hand or eye when it

comes to collecting samples or – as Barbara Wienecke discovered – spotting an elusive penguin in a crowd.

Heard Island's geology is dominated by the active volcano Big Ben and, as Doug Thost and his colleagues discovered, fast-flowing glaciers that have retreated dramatically in recent decades as a result of climate change. This glacial retreat has opened up new ice-free areas on the island for colonisation by plants and animals.

Long-term monitoring of such changes will now be easier thanks to the success of terrestrial ecologists in mapping the vegetation on Heard Island. These maps will provide a starting point upon which to map future vegetation change.

Protecting the natural values of Heard Island is an important part of the AAD's responsibilities, as was evident in the precautions expeditioners took in maintaining strict quarantine measures and in ongoing efforts to clean up pollutants at the old Atlas Cove Station. A new management plan for the HIMI region is currently being developed and reflects our obligations to ensure best practice management of this nationally and internationally significant area.

While Heard Island was a focus of 2003–04, Antarctica-related activities continued apace. This issue of the magazine features highlights from the Antarctic Treaty Consultative Meeting, and meetings of the Committee for Environmental Protection and the International Whaling Commission.

Heard Island expeditioners 2003–04 aboard the *Southern Supporter*.

FRONT ROW L-R: Karen Evans, Robb Clifton, Shavawn Donoghue, Justine Shaw, Perpetua Turner. SECOND ROW (kneeling): Graeme Denny, Heather Kirkpatrick, Jenny Scott. MIDDLE ROW: Denna Kingdom, Kate Kiefer, Simon Goldsworthy, Ruth Casper, Kieran Lawton, Barbara Wienecke, Iain Staniland, Karl Rollings, Rowan Trabilco, Johanna Turnbull, Bruce Deagle. BACK ROW: Simon Jarman (far left), Nick Gales, Chris Stevenson, Roger Kirkwood, Martin Truffer, Marcus Schortemeyer, Peter Dann, Doug Thost. ABSENT: Eric Woehler.



Through these meetings Australia plays a vital role in ensuring Antarctica and its flora and fauna are 'valued, protected and understood'.

As I write, we are entering an exciting new era in Australia's Antarctic air transport history. Our new CASA 212-400 aircraft will shortly touch down for the first time on one of the world's most remote runways – the new ice runway about 60 km from Casey station. The new aircraft will bring increased flexibility and responsiveness to our Antarctic program and open up exciting new opportunities for science and international collaboration on the frozen continent.

In another exciting initiative we have set a course for a new direction in Antarctic science. Better prediction of future global climate change and protecting the Antarctic environment is the focus of the Science Strategy for Australia's Antarctic Science Program 2004/05 – 2008/09.

As this magazine goes to press, teams of expeditioners – a mixture of new faces and some more experienced hands – are heading south for the summer, continuing our tradition of undertaking world class science. Regular readers will also notice that this magazine is a mix of the old and the new. As we continually strive for excellence in all that we do, we've made some changes to the format which I hope you enjoy.

Tony Press
 —TONY PRESS
 Director, AAD

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SIMON GOLDSWORTHY

Heard Island research sites 2003-04

