



# Director of National Parks State of the Parks Report

Director of National Parks Annual Report 2009–10 Supplementary Information

Managing the Australian Government's protected areas

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#### Front cover

Banksia flower – June Anderson Ulu<u>r</u>u sunset – Parks Australia Talingu<u>r</u>u Nyakunytjaku opening ceremony – Grenville Turner Kakadu rangers doing survey work – Nick Rains Red hermit crab – Fusion films Maps – Environmental Resources Information Network Designer – Papercut Editor – Elizabeth Hutchings Editing Indexer – Barry Howarth

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#### Map data sources

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Geographic Coordinate System on the GDA94 Datum.

# Guide to the State of the Parks report

The State of the Parks report presents systematic and consistent background information on each Commonwealth reserve proclaimed under the EPBC Act and on Calperum and Taylorville Stations.

The following information is common to the reports on each place:

- Area and locational information is derived from the Collaborative Australian Protected Areas Database and from a departmental Marine Protected Areas dataset which includes data sourced from Geoscience Australia.
- The World Conservation Union (**IUCN**) protected area management category is identified for each reserve, and where parts of a reserve are assigned to different categories this is indicated. The IUCN categories are formally assigned under the EPBC Act, and schedule 8 of the EPBC Regulations defines the Australian IUCN reserve management principles applying to each category.
- Where possible, each reserve's **biogeographic context** is described by reference to the national biogeographic regionalisations: terrestrial (Interim Biogeographic Regionalisation for Australia or IBRA) or marine (Integrated Marine and Coastal Regionalisation for Australia or IMCRA).
- The report summarises the relevance of **international agreements** to each reserve, recognising both the international significance of the reserves and the Director's legal responsibility to take account of Australia's obligations under each agreement.
- The report summarises the occurrence in each reserve of **species listed under the EPBC Act** as threatened, migratory or marine, and the status of relevant recovery plans.
- Information on the **total number of different types of plant and animal species** recorded for each place is included, to the extent of available knowledge. Species numbers for marine reserves are likely to be underestimated.
- Monitoring is a key aspect of successful park management, and **major monitoring efforts** for the year are reported.
- Future planning is ongoing, and **future challenges** are reported for each area.
- Management arrangements (such as boards of management, committees and management agreements with state agencies) are described.
- The report provides information by **key result area** on major issues, actions and performance results for 2009–10.

Also included in this section are **case studies** that provide more detailed reporting on management of specific issues.

The Director of National Parks is included in the Portfolio Budget Statements for the Environment, Water, Heritage and the Arts portfolio and contributes to the achievement of Outcome 1 (Environment). The Director contributes to this outcome through the sub-outcome *Conservation and appreciation of Commonwealth reserves through the provision of safe visitor access, the control of invasive species and working with stakeholders and neighbours* and Program 1.1 Parks and Reserves. Detailed reporting against the Portfolio Budget Statements 2009–10 targets is provided at Appendix A.



The Australian National Botanic Gardens in Canberra had the honour of being the first garden to contain Canberra's centenary correa cultivar – Correa 'Canberra Bells'. First planted in 2010, the cultivar is going to be ready for the public to purchase in 2013, the year of Canberra's centenary celebrations.

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Every year Kakadu National Park conducts a burning program to manage country and prevent late season wildfires. Pictured are young traditional owners Isaac Pamkal, Quinten McMah and Richard Landr in Kakadu's remote Stone Country. Young traditional owners are walking on country to manage fire in this remote and now uninhabited part of the park. Photo Director of National Parks

## 1 Terrestrial reserves summaries for 2009–10

- Australian National Botanic Gardens
- Booderee National Park
- Christmas Island National Park
- Kakadu National Park
- Norfolk Island National Park and Botanic Garden
- Pulu Keeling National Park
- Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park
- Calperum and Taylorville Stations

# **Australian National Botanic Gardens**

www.anbg.gov.au



### **Special features**

The Australian National Botanic Gardens (ANBG) is a major scientific, educational and recreational resource. It was one of the first botanic gardens in the world to adopt the study and display of a nation's native species as a principal goal. Approximately one-third of the known flowering plant species that occur in Australia and about half the known eucalypt species are represented in its living collection. The ANBG is a national showcase for the horticultural use of Australia's native plants. It is a partner in the Australian National Herbarium which provides the scientific identification of plant species represented in the living collection and scientific information on Australian plants.

The ANBG contributes to meeting Australia's obligations under international environment conventions to which

Australia is a signatory. In particular, the Convention on Biological Diversity recognises the importance of botanic gardens in *ex situ* and *in situ* conservation, research, training, plant identification and monitoring, raising public awareness, providing access to genetic resources, and global cooperation in the sustainable use of plant biodiversity. The ANBG provides expert participation and contributes scientific data to the Global Biodiversity Information Facility and other international biodiversity projects.

| Location                                     | Latitude 35°16' South, Longitude 149°06' East  |
|--|--|
| Area   | 85 hectares  |
| Proclamation date                            | 17 September 1991  |
| IUCN category                                | Category IV  |
| Biogeographic context                        | Displays plants from a diverse range of climatic and biogeographic regions—alpine to tropical, coastal to central desert   |
| Management plan                              | Second management plan expired 9 January 2009. A draft third management plan is in preparation for release for public comment in 2010–11   |
| Other significant<br>management<br>documents | Risk Assessment and Management Schedule; ANBG Masterplan (National Capital Authority); ANBG Fire Procedures 2008; Agreement for the Establishment and Operation of the Centre for Plant Biodiversity Research (CPBR) between the Director of National Parks and the Commonwealth Scientific and Industrial Research Organisation |
|  | (CSIRO); CPBR Strategic Plan   |

| Financial               | Operating  | \$9.652 million   |  |
|-------------------------|--|---|--|
|                         | Capital  | \$1.336 million   |  |
|                         | Revenue  | \$10.448 million  |  |
| Visitors                | 429,109 to site  |   |  |
|                         | 107,498 to visitor centre  |   |  |
| Living plants           | Planted in 2009–10: 4,000  |   |  |
|                         | Total number of taxa in the living collection: 6,077   |   |  |
|                         | Total number of registered plants in the living collection:  | 80,441  |  |
| Herbarium specimens     | Specimen records added to database in 2009–10: 11,119  |   |  |
|                         | Specimen records in database: 857,279  |   |  |
|                         | Total number of specimens in collection approximately 1.2 million: 899,265 items databased, plus approximately |   |  |
|                         | 300,000 not databased  |   |  |
| Australian Plant Name   | Names added to APNI data base in 2009–10: 10,530   |   |  |
| Index                   | Total names in APNI database: 215,807  |   |  |
| Australian Plant Census | Names added to APC database in 2009–10: 2,299  |   |  |
|                         | Total names in APC database: 19,431  |   |  |
| Australian Plant Image  | Images added in 2009–10: 6,481   |   |  |
| Index                   | Total number of images in collection: 63,315   |   |  |
| Permits                 | 16 commercial activity permits; 39 wedding licences; 78 l<br>4 research permits                                | icences to publish 514 photographs from the collection; |  |

| International conventions and agreements |  |
|--|--|
| World Heritage Convention                | Supports Australia's World Heritage sites through botanical research, scientific plant collections, plant identification, botanical information management and horticultural and educational programs  |
| Wetlands (Ramsar) Convention             | Supports Australia's obligations under the Ramsar Convention through access to<br>plant identification services and data on aquatic plants in the Australian National<br>Herbarium, and by delivering information on Australia's aquatic plants through<br>its website   |
| Other agreements                         | <ul> <li>Collaborates with international organisations including:</li> <li>Botanic Gardens Conservation International</li> <li>International Association of Plant Taxonomists</li> <li>International Plant Propagators Society</li> <li>International Union of Biological Sciences Taxonomic Databases Working Group</li> <li>International Plant Name Index (Royal Botanic Gardens, Kew,<br/>and Harvard University)</li> <li>Global Biodiversity Information Facility</li> <li>International Organisation for Plant Information World Vascular Plant Checklist<br/>Project</li> <li>Species 2000</li> <li>Millennium Seed Bank Project</li> <li>American Public Gardens Association</li> <li>Global Strategy for Plant Conservation</li> </ul> |

 Environment Protection and Biodiversity Conservation Act 1999

 Heritage
 On Commonwealth Heritage List

### Management arrangements

The ANBG is managed by an Executive Director supported by a General Manager, both appointed by the Director of National Parks. Since 1993 the ANBG has been a partner in the Centre for Plant Biodiversity Research, a joint research venture with CSIRO Plant Industry which incorporates the Australian National Herbarium. The herbarium retains voucher specimens for research and environmental studies and for plants at the ANBG.

### Monitoring

ANBG staff stocktake the living collection and record information on plant locations, plant deaths and the overall health of the collection. This information is linked electronically to scientifically documented voucher specimens in the Australian National Herbarium. A team of botanists, including national and international collaborators, ensure that the correct botanical names are always applied to the ANBG's living specimens and used in public interpretation. New accessions help to document the occurrence and distribution of plants in Australia.

Kangaroo, wallaby and rabbit populations are monitored to alert management to threats to the living collection. A venomous snake management plan monitors snake interactions with people.

### Future challenges

Major challenges are:

- securing sufficient resources to achieve government and national priorities
- finalising the third management plan
- reviewing the living collection and proposing strategies for its future management
- integrating climate change considerations into management and research
- finalising a new agreement between the Director of National Parks and CSIRO for the continuation of the Centre for Plant Biodiversity Research.
- securing future expanded accommodation for the Australian National Herbarium collections
- acquiring the latest information technology to improve taxonomy and systematics research.

### Report on performance by key result areas

#### **KRA1: Natural heritage management**

#### **Major issues**

- Water management and associated infrastructure
- Ex situ conservation
- Enhancing the living collection
- Managing plant record information, including introducing **geographic information system** (GIS) technology to living collection management

#### **Actions**

- Increase water use efficiency and sustainability
- Position the ANBG as a leader in ex situ conservation including seed banking
- Review the scope and operations of the living collection
- Use GIS to accurately map the living collection

- Secured a more reliable and sustainable water supply for irrigating the living collection. The National Capital Authority granted authorisation for the ANBG to extract water from Lake Burley Griffin and a pipeline for the non-potable water supply was installed between the lake and the ANBG. Works were commenced to distribute this water through the ANBG's irrigation system (see case study on page 17)
- Continued a program for *ex situ* alpine plant conservation supported by a three-year partnership between the ANBG, Australian National University, University of Queensland and the Friends of the ANBG. The program studies how climate change will affect the reproductive ecology and demography of Australian alpine flora. Eight field trips to the Mount Kosciuszko area were undertaken and 94 seed samples were collected

- Conducted recruitment for a coordinator of the Australian Seed Bank Partnership which will be based at the ANBG
- Completed a review of the living collection with recommendations for the collection's future management and new opportunities for its development
- Engaged a temporary GIS officer to begin developing GIS capability and commenced digital mapping of the ANBG
- Rehabilitated the old nursery site to prepare for a new display of the living collection
- Continued to display approximately one-third of the plant species occurring naturally in Australia, in a managed horticultural setting

#### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Visitor services including signage, interpretation and education programs
- Education programs need to be aligned with the Australian science curriculum, focusing on Australia's natural and cultural heritage
- Visitor programs and outreach
- Monitoring and evaluating visitors' satisfaction and needs

#### **Actions**

- Progress development and installation of interpretive, information and directional signage
- Review and redevelop current education programs to incorporate 'hands on, minds on' learning for students
- Redevelop the online education program booking system
- Use social media platforms to engage with a wider audience
- Develop a calendar of public programs, events and temporary exhibitions targeting key audiences
- · Conduct visitor surveys to measure visitor satisfaction and determine future needs
- Encourage greater visitation through a range of programs and initiatives

- Received a total of 429,109 visitors. Visitation for February (46,865), March (57,260) and April 2010 (52,224) was the highest for these months on record. Visitors to the visitor information centre numbered 107,498, 25 per cent of the total visitation to the ANBG
- Installed 66 new directional signs in September 2009 to enhance visitor orientation
- Installed information signs along the main path
- Revised all ANBG education programs and tailored the programs to meet the needs of interstate and local school students. Continued to redevelop programs to incorporate the national curriculum and inquiry-based learning techniques
- Hosted 9,520 school and tertiary students from 191 schools in ANBG education programs (59 per cent of students participated in ANBG-run programs and 41 per cent in *Do It Yourself* programs run by their own teachers).
   Schools from every state and territory included the ANBG on their Canberra excursion itinerary
- Distributed education resource material to schools and teachers. This included copies of the floral emblems of Australia and Bush Foods posters and the *Canberra Times* education supplement
- Completed the ANBG Education Strategy and reviewed education policies and procedures. This included redeveloping the online education booking system

- Implemented a successful events program including:
  - NAIDOC Week (July 2009)
  - Wattle Day (1 September 2009)
  - Christmas Concert (5 December 2009)
  - Summer Concert Series (9–31 January 2010)
  - Music and Dances and Weddings (7 February 2010)
  - Footprint EnviroFest (14 March 2010)
  - International Biodiversity Day (22 May 2010)
  - World Environment Day (5 June 2010)
  - Bush Magic: Storytime in the Gardens (first Friday of every month)
- Promoted the cultural, artistic and scientific values of Australian native plants through exhibitions including 'Greening Silver City', 'Celebrate Our Wattle', 'Tree of Trees', 'Friends School Photographic Exhibition', 'Replant', 'Nature's Canvas', 'Friends Botanical Art Group Exhibition', Friends School Photographic Retrospective', National Parks Association Photographic Exhibition' and 'Australian Plants Bonsai Exhibition'
- Received departmental approval for the Social Media Policy in March 2010. The ANBG social media Twitter and Facebook sites were launched in April 2010 to facilitate engagement with a national and international audience and a wider demographic
- Installed six pedestrian counters in January 2010 to monitor visitor flow throughout the ANBG
- Produced a 2010 commemorative calendar to celebrate the 40<sup>th</sup> anniversary of the official opening of the ANBG on 20 October 1970. In total 2,000 calendars were distributed to key stakeholders and sold to the public through the Botanic Bookshop

#### **KRA5: Stakeholders and partnerships**

#### **Major issues**

- Supporting and participating in national and international botanical forums including the Council of Heads of Australasian Herbaria, Council of Heads of Australian Botanic Gardens, Global Biodiversity Information Facility, Taxonomy Research and Information Network, Atlas of Living Australia, Encyclopaedia of Life and Taxonomic Databases Working Group
- Servicing the department's and CSIRO's need for technical and scientific advice on Australian plants
- Developing new partnerships with government and non-government organisations
- Continuing a collaborative partnership with the Friends of the ANBG
- Supporting and engaging with the Australian Cultivar Registration Authority, the Australian Network for Plant Conservation and Greening Australia
- Ongoing support for the Centre for Plant Biodiversity Research
- Fostering opportunities and partnerships with new stakeholders

#### **Actions**

- Continue the ANBG's active leadership role with the Council of Heads of Australian Botanic Gardens
- Continue strategic partnerships and cooperative data management with the Taxonomic Databases Working Group, Global Biodiversity Information Facility, Taxonomy Research and Information Network and Atlas of Living Australia
- Continue the Australian National Herbarium's engagement in the Council of Heads of Australasian Herbaria
- Undertake and promote the services that the ANBG and Centre for Plant Biodiversity Research can provide to the department and CSIRO in the form of technical and expert advice
- Continue to develop the positive partnership between the ANBG and the Friends of the ANBG
- Continue hosting the Greening Australia Community Seed Bank, the Australian Cultivar Registration Authority and the Australian Network for Plant Conservation on the ANBG website
- Continue the joint ANBG–CSIRO partnership in the Centre for Plant Biodiversity Research

#### Performance results 2009–10

- Continued ANBG membership of technical working groups under the Global Biodiversity Information Facility
   and Taxonomic Databases Working Group
- Continued the close collaboration between the ANBG seedstore and Greening Australia, including joint field collecting, seed storage and management. The ANBG provided Greening Australia with space and irrigation for seedling production
- The Australian National Herbarium continued to play a driving and coordinating role on behalf of the department for projects undertaken by the Council of Heads of Australasian Herbaria. This included continued work with Australia's Virtual Herbarium, and the Australian Plant Census
- The Centre for Plant Biodiversity Research continued its close association with the Taxonomy Research and Information Network, housing the network's core staff and participating in projects such as systematic and diversity studies of weeds of national significance and biodiversity information management
- The ANBG and Centre for Plant Biodiversity Research entered into a partnership with the Australian Biological Resources Study and the Atlas of Living Australia to develop and manage a common taxonomic infrastructure for the Australian Faunal Directory, the Flora of Australia, the Australian Plant Census and the Australian Plant Name Index, and to develop web services including a species profile template for the Atlas of Living Australia
- The Centre for Plant Biodiversity Research participated in a 'Bush Blitz' collaborative biodiversity survey in Darkwood Nature Reserve near Dorrigo, NSW, coordinated by the Australian Biological Resources Study. The results of these surveys will contribute to such projects as Australia's Virtual Herbarium and the Atlas of Living Australia
- The Friends of the ANBG ran the annual students' photographic competition and the autumn and spring plant sales; published quarterly newsletters; provided volunteer guided walks each day and facilitators for the Botanical Resource Centre twice a week; and supported the ANBG's annual summer concerts in January 2010
- The Australian Cultivar Registration Authority, based at the ANBG, documents the nomenclature of cultivated plants in the Australian Plant Name Index database. Funding was secured from private donors and the horticulture industry to enhance the index's cultivar data and add scanned pdf documents of the original cultivar descriptions
- The Australian Network for Plant Conservation, based at the ANBG, continued to conduct workshops in plant conservation techniques throughout the country and continued to produce its quarterly newsletter
- The Centre for Plant Biodiversity Research partnership in the new Australian Tropical Herbarium in Cairns was continued. The ANBG and the Centre for Plant Biodiversity Research successfully provided database services to support the tropical herbarium's collections management

#### **KRA6: Business management**

#### **Major issues**

- Finalisation of the third management plan
- Effective budget management to meet increasing operational costs
- Ongoing development and retention of staff
- Minimisation of operational risks to staff and visitors

#### **Actions**

- Develop the third management plan
- Align the strategic risk assessment and business planning timelines to ensure that resources meet existing and emerging needs
- Investigate new revenue opportunities to offset operational costs
- Continue staff development through targeted training programs, regular communication and a team-based approach to projects
- Embed risk management principles in project planning and operational processes

#### Performance results 2009–10

- Developed the draft management plan for public consultation in early 2010–11
- Addressed the challenge posed by increases in the cost of water through the new project to extract water from Lake Burley Griffin
- Maintained and improved staff consultation, involvement and capacity building through training, staff working groups and planning sessions
- Ensured staff health and safety through regular occupational health and safety committee meetings and applying risk management principles in developing capital works projects and operational plans

#### KRA7: Biodiversity science, knowledge management and use

#### **Major issues**

- Nationally consistent names for Australian plant species
- Systematics and classification of Australian plant species
- Taxonomic botanical research and documentation
- Developing the horticultural knowledge base
- Integrating the living collection database, herbarium database and image database
- Improving access to botanical information and images to assist in responding to plant conservation, natural resource management and environmental change
- · Awareness of, and engagement with, national and international collaborative biodiversity projects

#### **Actions**

- Maintain and curate the Australian National Herbarium collections and associated data content, and links to related information
- Make botanical data, information and expertise available to the national and international botanical communities and to the public
- Develop and maintain the Australian Plant Name Index and the Australian Plant Census to provide an up-to-date listing of flowering plants in Australia as a consensus view of the Australian botanical community
- Undertake taxonomic and systematic research, publish and disseminate research findings, and make data available to the research community and the public
- Develop, maintain and promote authoritative scientific databases of Australian plant information and make this information accessible online using contemporary data standards
- Integrate the department's plant and animal name databases with ANBG databases to allow more consistent management and delivery of biodiversity data
- Expand the extensive plant image collection and improve electronic management and access to the digital collection
- Position the ANBG as a key agency for disseminating information on conservation and environmental change issues in botanic gardens
- Drive national collaborative biodiversity information accession, management and delivery projects

- Databased 11,060 herbarium specimens with a total of 856,972 collection specimens now recorded in the database and available to the public through the internet
- Kept data in the Australian Plant Name Index up to date
- Updated the Australian Plant Image Index to make 6,481 additional images accessible on the internet
- Made significant progress on an agreed list of scientific names for Australia's flowering plants, including higher level taxonomy, through management of the Australian Plant Name Index and the national collaborative Australian Plant Census project. The project is endorsed by the Australian Government and by state and territory herbaria

- Commenced data collation for an agreed list of scientific names for Australian liverworts and hornworts through
  the Australian Plant Census project
- Maintained the Census of Vascular Plants of the ACT, including adding the hornwort and liverwort groups
- Negotiated a contract for a partnership with the Atlas of Living Australia to redevelop the nomenclature and taxonomic infrastructure for Australian plant and animal species in association with the Australian Biological Resources Study. This will effectively combine Australian Government plant and animal names data through a common interface
- Collaborated with the Atlas of Living Australia and the Taxonomy Research and Information Network to develop specifications for species profiles for managing digital biodiversity data. The Atlas of Living Australia also provided additional computer hardware to support increased demand for biodiversity name services
- Redeveloped the living collection information system
- Appointed research and technical staff to the Centre for Plant Biodiversity Research to undertake spatial analyses and research into the occurrence and distribution of Australian plants
- Commenced redevelopment of the ANBG website to update content, enhance the site's presentation and improve site navigation
- Continued research on the ecological function, structure and small-scale dynamics of grassland communities in south-eastern Australia, using grasslands in the West Wyalong district as model systems. A paper on this work was accepted for publication in the journal *Global Change Biology*
- The ANBG and Centre for Plant Biodiversity Research participated in national and international biodiversity information management and technical infrastructure projects including the Atlas of Living Australia, the Australian Faunal Directory, the Taxonomy Research and Information Network, the Australian Plant Census, Australia's Virtual Herbarium, the Global Biodiversity Information Facility, the Encyclopedia of Life and the Taxonomic Databases Working Group
- Researchers completed 21 scientific papers or publications resulting from research undertaken at the Australian National Herbarium. Areas of study included Australian Orchidaceae, Amaranthaceae, Rutaceae, Myrtaceae, Malvaceae, Portulacaceae, Mimosaceae, Santalaceae, weeds and bryophytes
- The Australian Plant Image Index undertook a contract to collect, database and manage images of weeds for the department's Weeds Australia website
- The Centre for Plant Biodiversity Research was contracted by the NSW Roads and Traffic Authority to document and manage translocation and conservation of three species of orchids threatened by the Bulahdelah bypass highway realignment

# Case Study: Water for the future at the Australian National Botanic Gardens

Construction is well under way on an exciting new water project at the Australian National Botanic Gardens.

Since its inception, the Gardens has relied on a supply of Canberra's normal drinking water for all its supply requirements including irrigation—the vast majority of its water use.

The changing climate, the recent years of drought, a focus on sustainability and the rising cost of drinking water led the Director of National Parks to commission a report investigating alternative water sources for the Gardens.

The report recommended that, subject to appropriate licensing, the most cost-effective and reliable supply of water for the Gardens was Canberra's Lake Burley Griffin.

In 2007, the Gardens applied for a water allocation licence to extract 170 megalitres per year from the lake. The National Capital Authority granted a temporary licence to extract the water. In the future the ACT Government will look after the licensing agreement.

In 2009, the Australian Government provided \$1.5 million through the Water for the Future plan to fund the water extraction project, including a new pipeline to the Gardens. The Director of National Parks committed a further \$1.4 million to the project.

The Gardens engaged Engon Pty Ltd to develop specifications, engineering drawings and tender information for the construction phase. Gardens' staff carried out the tender documentation and project management for the construction phase.

Construction began in April 2010, after the Gardens secured approvals from many ACT and Australian Government agencies. Draincorp Pty Ltd was the successful tenderer for this work.

The project is on schedule to be watering the living collection from non-drinking water by this summer. Using water from Lake Burley Griffin ensures long-term sustainability by reducing the Gardens' operational costs and reliance on Canberra's drinking water supply. The project is expected to free up around 170 megalitres of drinking water per year for other uses in Canberra.



A new pipe network to water Gardens' plants with non-drinking water from Lake Burley Griffin will help provide a more sustainable future for the collections. Photos: ANBG

# **Booderee National Park**

www.environment.gov.au/parks/booderee



### **Special features**

Booderee National Park is of great significance to its traditional owners, the Wreck Bay Aboriginal community, who are increasingly involved through a unique and evolving joint management model in running and servicing the park, and providing Aboriginal cultural experiences to its many visitors. More than 100 prehistoric Aboriginal sites dating back thousands of years have been recorded on the Bherwerre Peninsula. The Booderee Botanic Gardens component of the park is the only Aboriginal-owned botanic garden in Australia.

Booderee National Park protects most of the southern peninsula of Jervis Bay, the Bherwerre Peninsula, Bowen Island, and the waters and seabed in the southern part of the bay. Staff work cooperatively with the adjoining NSW Jervis Bay National Park and

Jervis Bay Marine Park to protect much of the region's biodiversity. Intensive pest control, such as the fox control program, allows species such as the endangered eastern bristlebird (*Dasyornis brachypterus*) and shore nesting hooded plover (*Thinornis rubricollis*) to flourish in Booderee.

Jervis Bay is one of the major biogeographic nodes in Australia and contains a variety of relatively undisturbed marine and terrestrial habitats. The marine environment is one of the most diverse recorded in temperate Australia, with tropical and temperate species represented. The park is renowned for its exceptional water clarity, due to small intact catchments, and for its exceptionally white sands. The park has one of the largest seagrass meadows on the NSW coast, which provides habitat to a wide variety of marine species. Terrestrial vegetation communities include relic rainforest, littoral rainforest, eucalypt forest, woodland, wet and dry heath, salt marsh and coastal wetlands, and coastal scrub and grassland communities. The park is rich in flora and fauna.

| Location              | Latitude 35° 09' South, Longitude 150°39' East   |                 |
|-----------------------|--|-----------------|
| Area                  | 6,379 hectares (including a marine area of 875 hectares)   |                 |
| Proclamation date     | 4 March 1992   |                 |
| IUCN category         | Category II  |                 |
| Biogeographic context | Interim Biogeographic Regionalisation for Australia region   | n: Sydney Basin |
| Management plan       | First plan expired 3 April 2009, second plan in preparation  |                 |
| Other significant     | Risk Assessment and Management Schedule; fire and pest management strategies; Memorandum of                  |                 |
| management            | Understanding with NSW Rural Fire Service; Memorandum of Understanding with the Department of Defence;       |                 |
| documents             | Botanic Gardens' Collections Policy: Joint Training Strategy with the Wreck Bay Aboriginal Community Council |                 |
|                       | and Wreck Bay Enterprises Ltd  |                 |
| Financial             | Operating  | \$6.923 million |
|                       | Capital  | \$0.787 million |
|                       | Revenue \$6.839 million  |                 |
|                       | Paid to traditional owners \$0.558 million   |                 |
| Visitors              | 450,000 (estimated)  |                 |
| Permits               | 21 commercial tour operators, 22 research, 3 wedding celebrants  |                 |

| International conventions and agreements  |                                     |
|---|-------------------------------------|
| Migratory Species (Bonn) Convention       | 27 of 105 listed Australian species |
| China-Australia Migratory Birds Agreement | 20 of 81 listed species             |
| Japan–Australia Migratory Birds Agreement | 23 of 77 listed species             |
| Korea–Australia Migratory Birds Agreement | 15 of 59 listed species             |

| Environment Protection and Biodiversity Conservation Act 1999 |  |  |
|---|--|--|
| Listed fauna  | Species  | 1 critically endangered<br>6 endangered<br>14 vulnerable<br>25 migratory<br>59 marine  |
|   | Recovery plans   | 7 being implemented: humpback whale ( <i>Megaptera novaeangliae</i> );<br>southern right whale ( <i>Eubalaena australis</i> ); albatross ( <i>Diomeda</i> spp. and<br><i>Thalassarche</i> spp.); Gould's petrel ( <i>Pterodroma leucoptera</i> ); giant<br>petrels ( <i>Macronectes</i> spp.); marine turtles; grey nurse shark ( <i>Carcharias taurus</i> )<br>4 in preparation: grey-headed flying-fox ( <i>Pteropus poliocephalus</i> );<br>eastern bristlebird ( <i>Dasyornis brachypterus</i> ); green and golden bell frog<br>( <i>Litoria aurea</i> ); giant burrowing frog ( <i>Heleioporus australiacus</i> ) |
| Listed flora  | Species  | 1 vulnerable   |
|   | Recovery plans   | 1 in preparation: magenta lilly-pilly (Syzygium paniculatum)   |
| Heritage  | On Commonwealth Heritage List (part of several listings) |  |

| Numbers of native species recorded |       |          |            |               |      |        |
|------------------------------------|-------|----------|------------|---------------|------|--------|
| Mammals                            | Birds | Reptiles | Amphibians | Invertebrates | Fish | Plants |
| 26                                 | 200   | 17       | 14         | Unknown       | 308  | 625    |

### Management arrangements: Board of Management

The Booderee National Park Board of Management has 12 members, including seven representatives nominated by the Wreck Bay Aboriginal Community Council. A new board was appointed in 2009. With the expiry of the first management plan in 2009, the board is overseeing preparation of the park's second management plan. A draft plan is expected to be released for public comment around October 2010.

### Monitoring

A five-year study in partnership with the Australian National University (ANU), which documented the role of fire in determining species distribution and abundance, was completed in 2008 and results are progressively being published. A new partnership study commenced in 2009, building on the data collected over the previous five years and looking in greater depth at the impacts of weeds and fire on native species. The published results of these studies indicate several important points. The first is that the December 2003 wildfire had relatively little impact on populations of native mammals, in contrast to a number of other studies of the impact of wildfire. The second is that bird diversity decreased at individual sites with the increasing number of fires a site had suffered. Thirdly, eastern bristlebird numbers recovered much more quickly after fire than studies at other sites have shown. The ANU team believe this is due to the existence of small pockets of unburnt refuges and intensive fox control.

Monitoring continued, with a focus on birds including the eastern bristlebird, hooded plover, sooty oystercatcher (*Haematopus fuliginosus*), and little penguin (*Eudyptula minor*). Research into the ecology of the rare eastern chestnut mouse (*Pseudomys gracilicaudatus*) indicates that it is in relatively high abundance but whether this is due to suitable habitat becoming available following fire or to intensive fox control is not clear. Wildlife monitoring also continued to focus on the effectiveness of regular fox baiting and long-term impacts of the 2003 Windermere and 2007 Cave Beach fires, particularly on long-nosed bandicoots (*Perameles nasuta*) and eastern bristlebirds.

Another study is examining the combined effects of fire, bitou bush, and wallaby grazing on native plant regeneration. Results of monitoring over the last 12 months confirm that wallabies have a major suppressive effect on the number of plant species and the abundance of individual plant species, with bracken (*Pteridium esculentum*) tending to dominate the grazed blocks and bitou dominating the ungrazed blocks.

Monitoring compliance with the park's marine zoning scheme and catch limits continued.

### **Future challenges**

Major challenges are:

- continuing to improve control measures for key threats to biodiversity including bitou bush and foxes
- increasing understanding of fire management and its effect on biodiversity outcomes
- improving management of the park's marine estate and increasing marine research
- addressing the park's increasing isolation from adjacent natural areas due to development pressures in the region
- supporting the development of new Aboriginal business enterprises in the park
- identifying ways of replacing critical ageing assets
- completing and implementing the cultural heritage strategy
- developing the second management plan with clear identification of outcomes for the next ten years and effective ways to measure and report on their implementation
- implementing the training strategy to support joint management and staff development
- progressing phase 2 service level agreements and contracting opportunities with the Wreck Bay Aboriginal Community Council to an agreed timetable and with clear employment benefits
- implementing the Booderee National Park Climate Change Strategy 2010–2015.

### Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Foxes continue to be the most significant feral pest and bitou bush continues to be the most significant weed
- Monitoring indicates that increased macropod browsing is changing the post-fire vegetation structure
- Restoring biodiversity through introductions of native, locally extinct species
- Adopting an ecosystem-based approach to reserve management
- Protection of seabird nesting habitat for the little penguin, three species of shearwater and the sooty oystercatcher
- Protecting the marine environment from increasing visitation and use
- Preparing for the impacts of climate change and adapting management strategies accordingly
- Rapid residential development in surrounding areas that is isolating the park from other natural areas, possibly threatening a range of species

#### **Actions**

- Continue fox control with an emphasis on removing residual, bait-shy individual foxes and introducing alternative fox control methods
- Refine integrated control measures for bitou bush (fire, spraying) and monitor ecological impacts of these control measures
- Control the spread of kikuyu on Bowen Island, and improve penguin nesting habitat
- Continue to implement an ecologically appropriate and visitor-safe fire management program and upgrade monitoring to cope with larger, more intense fires
- Continue to consult with relevant agencies on the park's regional value, the importance of maintaining habitat corridors and links with other natural areas, and possible impacts of development
- Work with researchers to better understand potential impacts of key threats including fire, weeds and climate change on the park

#### Performance results 2009–10

- Sprayed approximately 500 hectares of bitou bush in June 2010. Between 2004 and 2009 Booderee's aerial spraying program has resulted in a 90 per cent reduction in the area of high density infestation and a 75 per cent reduction in the area of medium density infestation (see case study on page 26)
- Again detected no green and golden bell frogs (*Litoria aurea*). This endangered species has not been detected in the park for five years and is likely to be locally extinct, despite little change to its habitat or hydrology
- Fully integrated fauna surveillance cameras into Booderee's fox control program. Long-term monitoring shows that key indicator species are responding positively to low fox numbers
- Observed stable population trends for eastern bristlebirds and most shorebird populations
- Finalised and adopted the Booderee National Park Climate Change Strategy 2010–2015

#### KRA2: Cultural heritage management

#### **Major issues**

- Maintaining the park's cultural values
- Identifying Wreck Bay Aboriginal Community Council priorities for cultural heritage management through a cultural heritage strategy and the second management plan
- Developing and delivering a well-accepted cultural heritage education program in partnership with the Wreck Bay Aboriginal Community Council
- Supporting the Wreck Bay Aboriginal Community Council in developing business enterprises in cultural education

#### **Actions**

- Offer school holiday interpretation programs with an increased focus on cultural interpretation
- Develop Koori cultural themes to promote understanding of Aboriginal plant use
- Support the Wreck Bay Aboriginal Community Council to complete the cultural heritage strategy for the park
- Continue the Junior Ranger program with an integrated approach to education about natural and cultural park values

#### Performance results 2009–10

- Conducted over 140 cultural interpretation sessions for visiting school groups, special interest groups and as part of the spring, summer and autumn school holiday programs
- Completed the education shelter and made significant progress on the pond features in the Koori Gardens section of the Booderee Botanic Gardens
- Incorporated broad cultural heritage directions into the draft second management plan. The cultural heritage strategy was held over for further consideration
- Continued the Junior Ranger program at Jervis Bay School. The program continued to be very popular and well supported, and was recognised by a number of national awards

#### KRA3: Joint management and working with Indigenous communities

#### **Major issues**

- · Meeting the obligations of and re-negotiating the lease agreement
- Progressing the second phase of contracting arrangements between the park and Wreck Bay Aboriginal Community Council to an agreed timetable
- Developing relevant sections of the second management plan



Booderee National Park is famed for its crystal clear water and sparkling white beaches. The park took out the top award for Indigenous tourism in Australia at the National 2009 Qantas Australian Tourism Awards and received a highly commended in the best tourism attraction category. Photo June Andersen

#### Actions

- Continue to negotiate the second phase of service level agreements for provision of agreed park services under the terms of the services contract between the Wreck Bay Aboriginal Community Council and the Director
- Implement an integrated training strategy agreed by the Wreck Bay Aboriginal Community Council, the park and Wreck Bay Enterprises Ltd
- Prepare an annual management plan implementation schedule and report progress to the board
- Prepare the second management plan

#### Performance results 2009–10

- Completed the agreement on the second round of outsourcing, including management of the visitor centre, grounds maintenance and building services. Both parties agreed to delay final implementation until restructures were completed
- Continued to deliver a broad range of training to park staff, Wreck Bay Enterprises Ltd and Wreck Bay Aboriginal Community Council members in accordance with the training strategy
- Completed an audit on the implementation of the training strategy and agreed the recommendations for incorporation into a new strategy
- Paid record levels of revenue to Wreck Bay Aboriginal Community Council under the lease agreement
- Substantially completed a draft second management plan with only minor amendments required before it is released for public comment
- Wreck Bay Enterprises Ltd contractors undertook \$1.9 million of works in the park

#### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Increasing visitors' awareness of the park's natural and cultural values
- Providing infrastructure to facilitate appropriate and safe use of the park, while protecting conservation values
- Age and costly maintenance requirements of the visitor centre
- Maintaining visitor numbers and revenue base in an increasingly competitive domestic tourism market

#### **Actions**

- Include conservation and cultural themes in interpretation programs
- Maintain campgrounds and public facilities and infrastructure to a high standard
- Monitor visitor numbers and experiences
- Continue to educate visitors about recreational fishing catch limits and marine zone restrictions and to enforce legislation where appropriate
- Renovate the visitor centre and plan for its replacement
- Manage risk through the park risk watch list and ParkSafe

- Attracted more than 450,000 visitors, a 3 per cent increase
- Delivered 108 school holiday interpretation sessions, focusing on Aboriginal cultural values and conservation themes, with over 3,000 attendees. A further 60 interpretation sessions were delivered to primary schools, high schools, universities and special interest groups, with more than 2,500 attendees in total
- Won the 2009 'best Indigenous experience' category and was commended in the 'best tourist attraction' category at the National Tourism Awards. The park won the New South Wales Tourism Award for best tourist attraction and two awards in the 2009 Keep Australia Beautiful Clean Beach Awards (for youth action and resource protection), giving further recognition to recycling, energy and water efficiency initiatives

- Continued to upgrade the park's website with news events and public announcements. Monitoring showed that camping information was clearly the most popular feature. A new e-newsletter was launched for visitors to keep track of park happenings and three issues were published
- Completed planning for a comprehensive visitor survey to be carried out in October 2010 (the next busy visitation period)
- Continued to upgrade visitor facilities including the Green Patch water mains, Murray's boat ramp, the botanic
  gardens walking trails and bridges, visitor information signs and roads, management trails and walking tracks.
  Also continued to install water and electricity saving devices (including photovoltaic panels in the depot and
  instantaneous gas hot water heaters in some Green Patch amenity blocks), and completed work on a number
  of campground barbecue shelters
- Developed a new self-guided walking trail and education kits for schools with final implementation due in 2010–11
- Recorded generally high levels of compliance with marine zoning scheme and catch limits but there continues to be a problem with a small number of fishers allegedly taking commercial quantities of squid

#### KRA5: Stakeholders and partnerships

#### **Major issues**

- Continuing the cooperative arrangements between the park, the New South Wales National Parks and Wildlife Service, the Jervis Bay Marine Park and the Department of Defence
- Continuing strong cooperative arrangements with universities
- Monitoring biodiversity recovery after fire through research partnerships

#### **Actions**

- Continue integrated management programs in key areas
- Support research in conservation areas identified in the management plan
- Support cooperative undergraduate and postgraduate programs
- Support community involvement in park management through volunteer programs

- Continued cooperative arrangements with other agencies including the New South Wales National Parks and Wildlife Service, Jervis Bay Marine Park, New South Wales Fisheries and Department of Defence. The park continued to lead regional fox management
- Issued nine undergraduate and one postgraduate research permits for conservation studies in accordance with the management plan. Cooperative undergraduate and postgraduate programs continued with the University of Canberra and the ANU
- Continued Community Development Employment Projects at the botanic gardens involving Wreck Bay youth and supported Vincentia High School's Students at Risk program through work experience
- Conducted 20 Parkcare activities, including major plant propagation at the botanic gardens and plantings in
  restored sites around the park
- Continued membership of, and involvement with, regional tourism organisations

#### **KRA6: Business management**

#### **Major issues**

- Ensuring that staff have all the necessary skills to do their jobs
- Sustaining the level of revenue from park fees
- Implementing the management plan
- Managing the budget to accommodate increased salary and contracting costs
- Supporting outsourcing to the Wreck Bay Aboriginal Community Council

#### **Actions**

- Increase emphasis on individual learning identified in personal development plans
- Continue to monitor trends in revenue from park fees and develop off-peak park use
- Identify budget savings and efficiencies wherever possible
- Contract work to the Wreck Bay Aboriginal Community Council where possible

- Offered training in line with personal development plans, with emphasis on contract and project management, fire preparedness/fighting and supervisory and management skills
- Successfully completed a firefighter fitness program
- Achieved a record revenue result from park use fees with an 8.7 per cent increase in camp fee revenue and a 5.8 per cent increase in entry fee revenue. Targeted camping and seasonal promotions, good weather and better compliance contributed to this best-ever result
- Improved compliance systems in the collection of entry and camping fees, with particular emphasis on weekend compliance at the entry station
- Continued the roll-out of power and water conservation measures to reduce the park's carbon footprint

# **Case Study: Battling bitou at Booderee**

Booderee continues to make great strides in its fight against the invasive African weed bitou bush.

Bitou bush was planted in the 1960s to help stabilise the shifting dune behind Bherwerre Beach. It quickly spread from there to the dry sclerophyll forest next to the dune system, spreading to the point where this area had one of the worst infestations on the New South Wales south coast.

Bitou bush is a perennial evergreen shrub in the daisy family, a native of South Africa and a major environmental weed of dune and coastal forest in southern Australia. It is classed as a Weed of National Significance.

In the 1990s, with Booderee now a national park, two techniques were developed to revolutionise bitou control. The first of these was aerial spraying. This technique involves a helicopter spraying a high concentration of Glyphosate, a commonly used non-selective herbicide, over remote or large-scale bitou infestations. Despite Glyphosate being non-selective, it can be applied without harming native vegetation if sprayed during winter when bitou bush is still biologically active but most native plants are dormant.

The other major technique was the spray-burn-spray method. This involves first spraying bitou, then burning it once it has died and dried. As with many Australian plants, burning stimulates mass germination in bitou. After a couple of seasons the plants from this mass germination are also sprayed, largely clearing the infestation.

Over the last six years, these techniques have seen the park make great progress in controlling bitou bush, cutting infestations back dramatically. In 2004 the distribution of bitou was aerially surveyed (Figure 1). As a result, the park decided to attack the main infestations behind Bherwerre Beach using the aerial spray-burn-spray method. Since then the park has surveyed the area in 2010 and again targeted the main bitou infestation with spray-burn-spray.



Figure 1: Bitou bush density at Booderee National Park in 2004



Figure 2: Bitou bush density at Booderee National Park in 2010

From Figures 1 and 2 it can be seen that the aerially applied spray-burn-spray treatment has had a dramatic result on bitou. Between 2004 and 2010, the area of high density infestation declined by 90 per cent while the area of medium density infestation declined by 75 per cent. Over the same period the area of low density infestation increased by 84 per cent but this was largely due to medium and high density areas becoming low density areas thanks to the spray-burn-spray method.

Over the next three years the park aims to entirely eliminate the remaining high density and medium density infestations. However, it will be extremely difficult to decrease the area of low density infestations to zero, because as the density of bitou bush decreases it becomes much harder and more costly to find and destroy the remaining plants.



Bitou bush

# **Christmas Island National Park**

www.environment.gov.au/parks/christmas



### **Special features**

The Christmas Island landscape is a characteristic example of a relatively large oceanic island that has been tectonically uplifted, with a distinct series of stepped terraces (which few islands exhibit). There are few islands at similar latitudes with similar floral or faunal components or comparable landscape and marine ecological integrity although several of the island's species are threatened, particularly native reptiles. Christmas Island's remoteness, climate and the influence of land crabs have resulted in the development of distinct tropical rainforest ecosystems that support a number of endemic animal species and 20 endemic plant species. The island provides important habitat for seven endemic land bird species and eight species (and one endemic subspecies) of resident seabirds, including the last remaining nesting habitat

of the endangered Abbott's booby (*Papasula abbotti*). The island has an extraordinary diversity and abundance of land crabs, with notable species being robber crabs (*Birgus latro*) and red crabs (*Gecarcoidea natalis*). Red crabs are the island's 'keystone' species as they influence the structure and species composition of the island's rainforests. Red crabs are renowned for their annual wet season migration, when millions of crabs migrate to the sea to spawn.

The marine environments of Christmas Island and the park are relatively simple in structure and low in species diversity but relatively pristine and are less threatened than many other tropical marine areas around the world. The island's marine environments include coral reef systems, outer reef slopes and walls, and oceanic waters provide habitat for a number of species including over 600 fish species. Notable marine species include whale sharks (*Rhincodon typus*) which are found in waters around the island from November to May each year, hybrid fish species and green turtles (*Chelonia mydas*) which nest on some of the island's beaches.

| Location              | Latitude 10°29' South, Longitude 105°38' East   |                 |
|-----------------------|---|-----------------|
| Area                  | 8,719 hectares  |                 |
| Proclamation dates    | 21 February 1980, 31 January 1986 and 20 December 198   | 39              |
| IUCN category         | Category II   |                 |
| Biogeographic context | Christmas Island is the coral-encrusted, emergent summit of a basaltic, submarine mountain in the Indian Ocean.<br>Its plants and animals are most closely linked with those of South-East Asia |                 |
| Management plan       | Third plan expired 13 March 2009. The fourth plan is currently being prepared   |                 |
| Other significant     | Christmas Island Mine-site to Forest Rehabilitation Memorandum of Understanding   |                 |
| management            |   |                 |
| documents             |   |                 |
| Financial             | Operating   | \$5.204 million |
|                       | Capital \$0.957 million   |                 |
|                       | Revenue \$5.560 million   |                 |
| Visitors              | Reliable estimates are not available  |                 |
| Permits               | 2 photography; 6 research; 3 other activities   |                 |

| International conventions and agreements  |  |  |
|---|--|--|
| Wetlands (Ramsar) Convention              | The Dales and a small landlocked mangrove forest at Hosnies Spring are listed under the convention |  |
| Migratory Species (Bonn) Convention       | 31 of 105 listed species   |  |
| China-Australia Migratory Birds Agreement | 48 of 81 listed species  |  |
| Japan–Australia Migratory Birds Agreement | 45 of 77 listed species  |  |
| Korea–Australia Migratory Birds Agreement | 40 of 59 listed species  |  |

| Environment Protection a | Environment Protection and Biodiversity Conservation Act 1999 |   |  |
|--------------------------|---|---|--|
| Listed fauna             | Species   | 2 extinct<br>1 critically endangered<br>4 endangered<br>7 vulnerable<br>63 migratory<br>92 marine   |  |
|                          | Recovery plans  | 10 being partially implemented: Christmas Island shrew ( <i>Crocidura attenuata trichura</i> ); Christmas Island pipistrelle ( <i>Pipistrellus murrayi</i> ); Abbott's booby ( <i>Papasula abbotti</i> ); Christmas Island goshawk ( <i>Accipiter fasciatus natalis</i> ); Christmas Island frigatebird ( <i>Fregata andrewsi</i> ); Christmas Island hawk-owl ( <i>Ninox natalis</i> ); marine turtles; whale shark ( <i>Rhincodon typus</i> ); Christmas Island or Lister's gecko ( <i>Lepidodactylus listeri</i> ); pink blind snake ( <i>Ramphotyphlops exocoeti</i> ) A regional recovery plan is being prepared for Christmas Island which will incorporate ecosystem and species specific recovery actions |  |
| Listed flora             | Species   | 2 critically endangered<br>1 endangered   |  |
|                          | Recovery plans  | 2 being partially implemented: <i>Asplenium listeri; Tectaria devexa</i> var. <i>minor</i><br>1 in preparation: <i>Pneumatopteris truncata</i><br>A regional recovery plan is being prepared for Christmas Island which will<br>incorporate ecosystem and species specific recovery actions   |  |
| Heritage                 | On Commonwealth Heritage                                      | List (as part of a wider listing of the island's natural areas)   |  |

| Numbers of native species recorded |       |          |                              |               |        |  |  |
|------------------------------------|-------|----------|------------------------------|---------------|--------|--|--|
| Mammals                            | Birds | Reptiles | Fish                         | Invertebrates | Plants |  |  |
| 3                                  | 95    | 9        | 622 species from 80 families | Over 2,000    | 213    |  |  |

### Management arrangements: advisory and consultative groups

The Christmas Island Crazy Ant Scientific Advisory Panel provides scientific and technical advice to the Director to inform the management of invasive yellow crazy ants (*Anoplolepis gracilipes*) in Christmas Island and Pulu Keeling National Parks.

The Christmas Island Expert Working Group, established in early 2009, continued its investigations into the decline of biodiversity on the island. The Minister is currently considering a report by the Expert Working Group.

In 2010 the Director established an island-based working group, comprising major stakeholders and chaired by the island's Administrator, to assist with the preparation of the Christmas Island Regional Recovery Plan.

The Director is a member of the Christmas Island Tourism Association and Christmas Island Emergency Management Committee and participates in other island forums.

### Monitoring

An island-wide survey is undertaken every two years to assess the effectiveness of the crazy ant control program, identify areas for future control and estimate relative changes in red crab burrow densities. The survey also provides distributional data on other native and exotic species. The latest survey was completed in August 2009.

Ongoing monitoring of native reptile abundance and distribution showed that native reptiles continued to decline. The reasons for these declines are not known but may be linked to disease and to exotic species, including centipedes and cats. Long-term monitoring sites are being established to help monitor ecosystem and species changes and threats. The detection in 2009 of two species not seen for more than 20 years and believed extinct was a positive development.

Park staff and the Australasian Bat Society monitored the critically endangered pipistrelle bat as part of an attempted captive breeding program. Monitoring suggested that this endemic species is likely to now be extinct.

Biophysical monitoring associated with the Christmas Island Mine-site to Forest Rehabilitation Program continued. This monitoring assesses the program's effectiveness by measuring species growth, soil characteristics and fauna species abundance.

### **Future challenges**

Major challenges are:

- developing, funding, coordinating and implementing island-wide landscape and ecosystem conservation approaches through the regional recovery plan
- working with relevant stakeholders to improve quarantine measures to reduce the likelihood of new invasive species entering the island and rapidly eradicating invasive species that may enter
- determining the reasons for the decline in terrestrial biodiversity, particularly reptiles, and implementing appropriate and feasible threat mitigation actions
- assessing the risks to species and habitats (such as ground-nesting sea birds, land birds and marine habitats) that may currently be secure but could be vulnerable to threatening processes such as invasive species
- continuing to implement the Christmas Island Mine-site to Forest Rehabilitation Program, including maintaining and monitoring existing plantings
- establishing long-term control of major invasive weeds threatening high value conservation assets
- contributing to the island's long-term future and economy through the development of nature-based tourism and of educational and scientific research opportunities, including maintaining and upgrading existing infrastructure and developing new infrastructure
- research and monitoring to better understand the island's marine environments including their values, threats and interactions between marine and terrestrial ecosystems and species.

### Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Reducing the likelihood of new invasive species entering the island and park and rapidly eradicating invasive species that may enter
- Developing and implementing strategies to mitigate the impacts of known threatening processes, including yellow crazy ants and cats
- Identifying and mitigating the impacts of unknown threatening processes leading to the current decline of threatened native species, particularly reptiles
- Conserving threatened species that are or may be at risk of extinction
- Collaborative and island-wide conservation management through developing and implementing the regional recovery plan
- Management of high priority weed species, particularly species that are invading or may invade relatively undisturbed rainforests
- Reducing crab mortality from traffic impacts
- Marine conservation and management including assessing threats to marine ecosystems and species



#### Actions

- Yellow crazy ants:
  - conduct an island-wide survey
  - conduct an aerial baiting program and assess off-target impacts of baiting
  - convene Crazy Ant Scientific Advisory Panel meetings
  - commence research into the indirect biological control of crazy ants
- Rehabilitate former mine site areas
- Control invasive weed species
- Support the development and implementation of a collaborative island-wide cat and rat management plan
- Prepare a Christmas Island Regional Recovery Plan
- Implement actions from existing single species recovery plans
- Implement road management strategies (road underpasses and fencing, stakeholder engagement) to protect red crabs during their migration
- Conduct reptile surveys to better understand threatening processes and to inform recovery and reintroduction needs
- Establish a captive breeding program to secure populations of key threatened species
- Facilitate and support research projects, including seabird and robber crab research
- Assess the marine values of Christmas Island and the Cocos (Keeling) Islands

- Completed the island-wide survey in August 2009. A new scientifically rigorous sampling methodology for native skinks was used
- Detected populations of Lister's gecko (*Lepidodactylus listeri*) (last found in 1987) and an individual pink blind snake (*Ramphotyphlops exocoeti*) (last found in 1985). A captive breeding program for native reptiles was progressed
- Commenced work to identify and manage potential threats to address the decline in native reptiles including assessing the risks of disease (under a contract with Taronga Zoo), establishing threat monitoring sites and progressing island-wide cat and rat management
- Completed aerial baiting of 784 hectares of yellow crazy ant supercolonies and began a monitoring project to detect off-target impacts of baiting
- Commenced a three-year research project for the biological control of crazy ants (funded by the Director and conducted by LaTrobe University)
- Completed earthworks and propagation and planting of 23,500 trees on former mine sites. This work included 15 hectares of new primary plantings and secondary infill plantings on existing sites as well as maintaining 120 hectares of existing plantings
- Attempted to capture pipistrelle bats to establish a captive breeding colony. The Australasian Bat Society undertook the work with support from the Director. Despite considerable efforts the attempt was unsuccessful and the pipistrelle is now considered likely to be extinct
- Commenced preparing the Christmas Island Regional Recovery Plan (incorporating ecosystem and species recovery actions) under the guidance of an island-based working group
- Prepared Ramsar ecological character descriptions for The Dales and Hosnies Spring as part of a national program for all of Australia's Ramsar sites

#### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Developing island-wide approaches to tourism development in conjunction with key stakeholders, consistent with protecting park values while providing visitors with opportunities for safe and high quality nature-based experiences
- Maintaining, upgrading and developing visitor infrastructure
- Accreditation of tour operators

#### **Actions**

- Continue participation in the Christmas Island Tourism Association Executive
- Install new directional signs on park roads and walking tracks
- Maintain, and where possible improve, roads, trails and viewpoints and produce new interpretive materials
- Support film crews and journalists working in the park

#### Performance results 2009–10

- Contributed to Christmas Island Tourism Association meetings, particularly on issues related to nature-based tourism opportunities
- Installed new road and walking track directional signs
- Maintained unsurfaced roads and management tracks
- Continued to develop tour operator training resources
- Produced interpretive brochures on Christmas Island species and a reptile watch poster
- Assisted film crews (Australian and international) and journalists publicising the island's biodiversity and conservation values

#### **KRA5: Stakeholders and partnerships**

#### **Major issues**

- · Progressing collaborative conservation management programs with stakeholders
- Effectively engaging and collaborating with stakeholders in aspects of park management and other issues of mutual interest such as tourism and emergency management

#### **Actions**

- Provide in-kind and field support for visiting scientists
- Undertake consultation and planning sessions with stakeholders and technical experts for the preparation of the Christmas Island Regional Recovery Plan
- Liaise with stakeholders on conservation and park management issues including road maintenance, cat and red crab management
- Deliver educational and interpretive sessions for students, residents and tour groups
- Continue and progress cooperation with the Shire of Christmas Island and Christmas Island Phosphates Pty Ltd for cat control
- Liaise with the Department of Immigration and Citizenship on induction and education for staff and contractors working on Christmas Island
- Participate in island-wide forums including the Christmas Island Tourism Association Executive and the Christmas Island Emergency Management Committee

#### Performance results 2009–10

- Established an island-based stakeholder working group, which met three times, to assist with the preparation of the Christmas Island Regional Recovery Plan. Consulted with the community and other stakeholders
- Supported visiting scientists and state government officers undertaking research projects into seabirds and land crabs
- Held educational sessions on park and conservation management for students from the Christmas Island District High School, island residents and visiting tour groups including bird watching groups
- Continued cooperative approaches to cat control with stakeholders including working with the Shire and Christmas Island Phosphates on developing an island-wide cat and rat management plan. Supported a second cat bait efficacy trial using the toxin para-aminopropiophenone

#### KRA6: Business management

#### **Major issues**

- Delivering quality management services within a limited budget
- The third management plan has expired
- Ensuring up-to-date governance and management strategies are in place

#### Actions

- · Maintain park management services within budget
- Prepare the fourth management plan
- Manage Christmas Island and Pulu Keeling National Parks as one management entity

- Managed operational and capital budgets within approved parameters
- Largely completed preparation of the draft fourth management plan. The plan was not released for public comment because of the need to incorporate relevant findings of the final Expert Working Group report
- Increased Christmas Island National Park staff support for Pulu Keeling National Park including conducting an island-wide survey of weeds and crazy ant distribution, initiating the preparation of a new Pulu Keeling management plan and providing administrative support

# Case Study: Yellow crazy ant helicopter baiting program

Yellow crazy ants are one of the world's worst invasive species and they're a serious challenge in the management of Christmas Island National Park. Over recent years they have formed dense supercolonies on the island containing thousands of ants, causing significant damage to Christmas Island's unique ecosystems by killing large numbers of red crabs and other animals. Red crabs are the island's major keystone species shaping the structure and species composition of the island's rainforests.

To reduce the impacts of crazy ants on red crabs and the island's ecosystems the national park carried out a major aerial baiting program in 2009, to follow up the first aerial baiting conducted in 2002. The first step was conducting an extensive island-wide survey to work out exactly where the supercolonies were. For several months staff traversed the entire island surveying over 900 sites. The result was a map of crazy ant supercolonies and red crab burrow densities together with other biodiversity data.



Crazy ant baiting on Christmas Island

In September 2009, a helicopter was used to precisely bait crazy ant supercolonies, which covered 784 hectares of the island. A very low concentration of Fipronil bait (a tenth of 1 per cent) was used to control the ants. Monthly monitoring of these baited supercolony sites shows that crazy ant densities were reduced by 99 per cent.

Park staff placed a high emphasis on minimising any non-target impacts of baiting. Food lures were dropped from a helicopter to attract robber crabs away from areas that were about to be baited. This technique, combined with the low concentration Fipronil bait, proved to be highly successful with extremely low numbers of robber crabs and no red crabs known to be killed by the baiting.

Because of their rapid breeding cycle, crazy ants will steadily increase in numbers again over the next few years. An alternative control method is being investigated. In December 2009 a three-year \$1 million research project kicked off to investigate the feasibility of indirect biological control of crazy ants. The project is a partnership between the Director of National Parks and LaTrobe University. If this research proves successful, biological control is likely to become a key tool to help reduce the impacts of crazy ants on Christmas Island's ecosystems and species.

# Kakadu National Park

#### www.environment.gov.au/parks/kakadu



### **Special features**

Kakadu National Park is inscribed on the World Heritage List for both its natural and cultural values. It is one of the most ecologically and biologically diverse places in Australia.

Bininj (Kakadu's traditional owners and other relevant Aboriginal people) maintain strong links to their country, links that are demonstrated through their cultural practices, spiritual beliefs and traditional management and use of their country. An estimated 15,000 rock art sites and innumerable artefacts and sites of cultural, archaeological and historic significance in the Kakadu region contribute to archaeological evidence indicating that people have lived continuously in the region for at least 50,000 years.

The park contains almost an entire major tropical river catchment (the South Alligator River catchment) and large representative examples of the wet-dry tropical ecosystems of northern Australia. Major landforms in the park include the sandstone plateau and escarpment, extensive areas of savanna woodlands, monsoon forest, riverine and riparian environments, billabongs, floodplains, mangroves and mudflats.

| Location                                     | Latitude 13°29' South, Longitude 132°26' East   |                  |  |
|--|---|------------------|--|
| Area   | 1,979,767 hectares  |                  |  |
| Proclamation dates                           | 5 April 1979, 28 February 1984, 12 June 1987,<br>22 November 1989, 24 June 1991 and 26 May 2007   |                  |  |
| IUCN category                                | Category II   |                  |  |
| Biogeographic context                        | Located in the wet-dry tropics<br>Interim Biogeographic Regionalisation for Australia regions: Darwin Coastal; Arnhem Plateau; Pine Creek   |                  |  |
| Management plan                              | Fifth plan expires 31 December 2013   |                  |  |
| Other significant<br>management<br>documents | Tourism Master Plan; District and Stone Country fire management plans; Crocodile Management Strategy,<br>Feral Animal Management Strategy; Gunlom Mine Sites Rehabilitation Strategy            |                  |  |
| Financial                                    | Operating   | \$21.945 million |  |
|  | Capital   | \$2.748 million  |  |
|  | Revenue   | \$22.297 million |  |
|  | Paid to traditional owners  | \$1.655 million  |  |
| Visitors                                     | 180,480 visitors (estimated)  |                  |  |
| Permits                                      | 113 film and photography; 97 commercial tour operator (April 2009–March 2010 season) and 111 commercial tour operator (April 2010–March 2011 season); 20 research; 195 bushwalking; 514 camping |                  |  |

| International conventions and agreements  |   |  |  |  |
|---|---|--|--|--|
| World Heritage Convention                 | Listed under cultural criteria (i) and (vi) and natural criteria (ii), (iii) and (iv), recognising the park's outstanding natural and cultural values |  |  |  |
| Wetlands (Ramsar) Convention              | Entire park listed  |  |  |  |
| Migratory Species (Bonn) Convention       | 39 of 105 listed Australian species   |  |  |  |
| China-Australia Migratory Birds Agreement | 51 of 81 listed species   |  |  |  |
| Japan–Australia Migratory Birds Agreement | 49 of 77 listed species   |  |  |  |
| Korea-Australia Migratory Birds Agreement | 41 of 59 listed species   |  |  |  |
| Environment Protection a | nd Biodiversity Conservatio | n Act 1999   |
|--------------------------|-----------------------------|--|
| Listed fauna             | Species                     | 2 critically endangered  |
|                          |                             | 8 endangered   |
|                          |                             | 11 vulnerable  |
|                          |                             | 108 migratory  |
|                          |                             | 114 marine   |
|                          | Recovery plans              | 5 being implemented: bare-rumped sheathtail bat ( <i>Saccolaimus saccolaimus nudicluniatus</i> ); golden bandicoot ( <i>Isoodon auratus</i> ) and golden-backed tree rat ( <i>Mesembriomys macrurus</i> ); Gouldian finch ( <i>Erythrura gouldiae</i> ); eastern partridge pigeon ( <i>Geophaps smithii smithii</i> ), crested shrike tit ( <i>Falcunculus frontatus whitei</i> ) and northern masked owl ( <i>Tyto novaehollandiae kimberli</i> ); marine turtles 6 in preparation: water mouse ( <i>Xeromys myoides</i> ); red goshawk ( <i>Erythrotriorchis radiatus</i> ); yellow chat (Alligators River Region) ( <i>Epthianura crocea tunneyi</i> ); freshwater sawfish ( <i>Pristis microdon</i> ); speartooth shark ( <i>Glyphis</i> sp. A); northern rivers shark ( <i>Glyphis</i> sp. C) |
| Listed flora             | Species                     | 1 critically endangered<br>1 vulnerable  |
|                          | Recovery plans              | none   |
| Heritage                 | On National Heritage List   |  |

| Numbers of native species recorded |       |          |            |                            |        |
|------------------------------------|-------|----------|------------|----------------------------|--------|
| Mammals                            | Birds | Reptiles | Amphibians | Fish                       | Plants |
| 68                                 | 292   | 135      | 26         | 320                        | 2,022  |
|                                    |       |          |            | (276 marine and estuarine, |        |
|                                    |       |          |            | 44 freshwater)             |        |

## Management arrangements: Board of Management

The Minister appoints members to the Kakadu National Park Board of Management. The board has 15 members, ten of whom are appointed as representatives of the park's traditional owners, representing the geographic spread of Aboriginal people in the region and the major language groupings. The remaining members are the Director of National Parks, the Assistant Secretary Parks Operations and Tourism Branch, nominees with environmental and tourism expertise and a nominee of the Northern Territory Government. The term of the serving board expired in March 2010 and a list of nominees for the new board has been submitted for Ministerial approval.

## Monitoring

Monitoring and control continued for introduced plants including *Mimosa pigra*, mission grass (*Pennisetum polystachion*), olive hymenachne (*Hymenachne amplexicaulis*), salvinia (*Salvinia molesta*) at Yellow Water and gamba grass (*Andropogon gayanus*). Of these, salvinia and mission grass continue to be major challenges for the park. Two relatively new weed species were also targeted: snakeweed (*Stachytarphetta*) and knobweed (*Hyptis capitata*).

Park staff worked with Bininj to identify the park values that are threatened by feral animals. This work will be used in developing a three-year feral animal control program. Five days of aerial control focused on feral pigs.

A new infestation of introduced invasive ants was discovered in Jabiru. Control work began and some areas will be resurveyed to identify further infestations.

Studies of estuarine crocodile (*Crocodylus porosus*) populations and nesting flatback turtles (*Natator depressus*) in coastal areas of the park continued.

The second phase of a major program to monitor broadscale fauna trends was completed. This program involves fauna surveys at 134 fireplots in the park, which were initially set up to monitor the impacts of fire on different vegetation types. The program links fauna monitoring with fire and vegetation monitoring, and allowed investigation of trends in a regional context. Comparable monitoring also takes place at Litchfield and Nitmiluk National Parks. A paper was published analysing the results of the monitoring in the three parks.

A major three-year collaborative project with the Northern Territory Department of Natural Resources, Environment and the Arts was completed. This project involved targeted surveys of threatened species in recognised biodiversity hotspots in the park, largely in the Arnhem Land Plateau. All surveys involved park staff (including trainees and school-based apprentices), Northern Territory Government staff, neighbouring Indigenous ranger groups and traditional owners from Arnhem Land.

Both studies confirmed previous observed trends of significant ongoing decline in some mammal species within the park, declines which are occurring across northern Australia more widely. The good numbers of small mammal species recorded in the final two surveys of the biodiversity hotspot program was a positive finding which may help in identifying the causes for declines recorded elsewhere. It is intended to re-engage the consultants involved, extending the biodiversity hotspot program for a further three years.

Fire monitoring and management continued, based on a strategy of regular data collection and inter-district meetings. The Stone Country Burning Program was implemented for the fourth year, and continues to achieve positive results in preventing late dry season intense fires on the sensitive stone country. The program involves Bininj in bushwalking/burning activities and aims to establish an appropriate fire regime to protect sensitive biodiversity values and facilitate cultural activities on country.

Cultural heritage site monitoring and management continued, including visits to remote areas by Bininj and staff. Park staff also added to existing oral history recordings and development of a cultural heritage sites register, with the support and involvement of Bininj.

Consultants from the Australian National University worked with Bininj and park staff to produce a cultural resource management strategy, due for completion at the end of September 2010.

## **Future challenges**

Major challenges are:

- ongoing implementation of management plan actions that support Indigenous business ventures and employment including capacity building, address caring for country challenges, support Kakadu's living cultural values and support its World Heritage values
- improving the understanding of the impacts of fire, ferals and climate change, coordinating research in these areas and adapting management accordingly
- identifying the cause of small mammal decline and taking appropriate action
- controlling the spread of weeds and the impact of introduced animals
- developing systems and partnerships to make the best use of resources
- upgrading information management systems
- implementing the recommendations of the climate change strategy
- · developing staff through formal and informal training programs
- ensuring visitor and staff safety.

## Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- · Fire management, particularly in sandstone habitats
- Managing pest plant and animal species and their impacts
- Monitoring and protecting threatened species
- Decline of small-mammal populations
- Improving the recording, storage and display of species data
- Improving understanding and protection of the marine environments of the Kakadu coast
- The future impact of climate change on Kakadu, particularly on freshwater wetlands

#### Actions

- Review the Arnhem Land Plateau Landscape Unit Fire Strategy after three years of operation
- Develop and implement fire strategies for other landscape units in the park
- Continue to review and refine fire regimes for the variety of habitats within the park
- Continue to refine the feral animal management plan following population modelling with recent survey results
- Monitor threatened species in biodiversity hot spots
- Continue to control serious pest plant species, focusing on weeds of national significance
- Improve knowledge of landscape change processes
- Address identified gaps in knowledge about potential climate change impacts
- Continue monitoring native animals affected by cane toads
- Monitor the impact of visitor use on Kakadu's natural values
- Improve the use of geographic information system (GIS) technology in recording weed locations and weed data
- Continue to commission and support research that will improve management of the park's natural and cultural values

#### Performance results 2009–10

- Published proceedings from the 2008–09 symposia and workshop series with the assistance of the Environmental Research Institute of the Supervising Scientist
- Completed a three-year collaborative project with the Northern Territory Government monitoring threatened species in biodiversity hotspots. There were six surveys in total
- Control measures for Mimosa (Mimosa pigra) have virtually eliminated this weed from the park
- Completed resampling fauna at Kakadu fire plots
- Continued the successful bushwalking burning program in the Arnhem Land Plateau
- Supported an ongoing study on the impact of cane toads (*Rhinella marina*) on native frog populations
- Completed a collaborative project with the Northern Territory Government on two species of coastal dolphins, the Indo-Pacific humpback (*Sousa chinensis*) and Australian snubfin (*Orcaella heinsohni*), in the East and South Alligator rivers. It is proposed to extend the project for a further 12 months to survey the West Alligator and Wildman rivers
- Supported a Northern Territory Government project to relocate golden bandicoots (*Isoodon auratus*) to an offshore island
- Engaged consultants from CSIRO to work with Bininj and park staff to refine feral animal management in the park

#### KRA2: Cultural heritage management

#### Major issues

- Protection and appropriate presentation of World Heritage cultural values
- Managing the park as part of a living culture for Bininj
- Supporting Bininj participation in cultural activities and traditional practices
- Balancing the need to protect rock art and other significant Aboriginal heritage with facilitating its appreciation by visitors

- Commence development of an overall strategy to manage the park's cultural resources
- Develop strategic programs to conserve and monitor Kakadu's unique cultural values in consultation with Bininj
- Continue rock art protection and maintenance work
- Continue cataloguing and preserving cultural heritage materials
- Complete the development of a Cultural Information Management System
- Continue to increase awareness of the Cultural Information Management System, particularly amongst Bininj, and to add data to the system

- Continue to collect oral histories and ensure these are properly protected and archived
- Support Bininj leadership in natural and cultural resource management activities
- Establish two-way learning strategies and programs
- Facilitate visits on country for Bininj, particularly in remote locations, as a tool for re-establishing cultural links to country
- Seek opportunities to transfer knowledge between generations
- Ensure that Kakadu's living cultural status is recognised in tourism strategy development and decision-making
- Review the approach to protection and interpretation of historic heritage in the park

- Continued the review of recorded cultural material, storage of cultural objects, and cultural heritage databases in consultation with Bininj. The review will include development of protocols to ensure that these sensitive cultural resources can be accessed appropriately and in a user-friendly format
- Produced DVDs recording the views of Bininj on various management issues
- Continued to develop a register of oral history audio and video material and to record history from identified informants, in particular key traditional owners
- Transferred approved audio and video materials from the park for long-term storage and protection in accordance with the partnership agreement between the National Archives of Australia and the Director
- Completed the development of the Cultural Information Management System
- Continued rock art management with the involvement of relevant Bininj
- Continued discussions with the Aboriginal Areas Protection Authority and Northern Land Council about a register of sites of significance and access protocols
- Completed a review of historic (non-Aboriginal) cultural heritage sites
- Completed the following major oral history projects: the history of Mudginberri abattoir, particularly the role that Bininj played in the buffalo industry; recording landscape change from the records of Dave Lindner, a long-term resident of the Kakadu region; and traditional uses of the South Alligator floodplain. Similar work is planned for Anlarr (Nourlangie Camp), the old Jim Jim pub and Munmalary in 2010–11
- Commenced development of Sickness Country protocols for the southern part of the park

#### KRA3: Joint management and working with Indigenous communities

#### Major issues

- Meeting the commitments outlined in the lease and the fifth management plan
- Ensuring shared decision-making occurs at all levels within the park
- Monitoring and reporting on implementation of the fifth management plan

#### **Actions**

- Ensure decision-making is consistent with the consultation guidelines
- Encourage increased Aboriginal engagement in work plans through recruitment and skills development programs
- Support traditional land management projects
- Support the board
- Continue day-to-day consultations with traditional owners

- Bininj staff continued certificate level studies, numeracy and workplace English language and literacy training
- Engaged Bininj in delivering interpretive and environmental programs
- Continued programs to re-engage young Aboriginal people in education and continued the Junior Ranger program with Jabiru and Gunbalanya area schools

- Continued skill development and training for Bininj staff via internal and external courses
- Consulted on wide-ranging park management issues with Bininj through the Northern Land Council
- · Continued day-to-day joint decision-making by relevant Bininj and park staff
- Continued supporting a Northern Land Council Kakadu Officer position under contractual arrangements with the Northern Land Council
- Held regular meetings of the Kakadu National Park Board of Management
- Convened a meeting between the park and neighbouring Indigenous Protected Areas
- Engaged Bininj as part of the Kakadu Indigenous Ranger Program (see case study on page 43)

#### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Ongoing implementation of the new Kakadu brand to better position the park, nationally and internationally, as a major tourist destination in the Top End
- Improving the quality and range of visitor experiences
- Improving visitor safety
- Communicating with the tourism industry
- Implementing the park's Tourism Master Plan and strategic direction for increasing the benefits from tourism

#### **Actions**

- Continue to implement the new brand strategy focusing on experiencing Kakadu's World Heritage values and to develop and implement a Tourism Master Plan
- Monitor the tour operations permit system and tour guide accreditation
- Increase knowledge of visitation patterns and experiences through visitor surveys park wide and for specific sites
- Regularly review safety of visitor areas
- Regularly inspect and maintain visitor facilities

#### Performance results 2009–10

- Launched the Tourism Master Plan 2009–2014 in March 2010
- Refined the Kakadu visitors' website to better match visitor expectations to experiences in the park and convey essential information to travellers
- Reviewed tour operator permit conditions and implementation of the park's tour guide accreditation program established in 2007
- Delivered a range of seasonal interpretive programs incorporating natural and cultural content
- Continued to provide detailed visitor information for use in tourism planning and resource allocation
- Supported Aboriginal enterprise development and involvement in tourism ventures such as the Goymarr Tourist Information Centre through financial support for Bininj to attend tourism industry events and in-kind assistance to produce collective promotional material

#### **KRA5: Stakeholders and partnerships**

#### **Major issues**

- Continuing effective relationships with the tourism industry, Northern Territory Government, research institutions, and neighbours (particularly Indigenous ranger groups)
- Continuing to participate in local, regional, national and international initiatives associated with Kakadu's World
  Heritage values
- Building relationships with educational institutions to develop 'education to work' pathways for Bininj

#### Actions

- Build a cooperative relationship with tourism stakeholders such as Tourism Top End and the Northern Territory
  Government
- Develop an operational relationship with park neighbours, in particular Aboriginal associations and neighbouring Indigenous ranger groups
- Take an active role in community programs
- Establish and support links with managers of other World Heritage areas
- Build a strategic alliance with the West Arnhem College and Charles Darwin University to progress education to work programs
- Work with the Kakadu Research Advisory Committee to advise the board and the Director on research matters

#### Performance results 2009–10

- Continued the relationship between the Australian and Northern Territory governments, with joint funding and planning to advance tourism in the park
- Continued to work cooperatively with the Northern Territory Bushfires Council and other Northern Territory
   Government agencies, West Arnhem Shire and the Northern Land Council
- Continued the Junior Ranger program as part of the Year 6 curriculum and implemented a Junior Ranger program at West Arnhem College
- Supported community events including festivals celebrating Indigenous culture and community spirit, such as the Mahbilil Festival in Jabiru and the Stone Country Festival in Gunbalanya
- Appointed a new Kakadu Research Advisory Committee for a five-year term in line with the board term. The new members reviewed the committee's operations and began developing a strategic framework for research in the park for the next five years

#### **KRA6: Business management**

#### **Major issues**

- Recognising high levels of staff expertise and performance
- Securing resources to implement the fifth management plan and meet park lease obligations
- Complying with obligations under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Regulations for the management of Commonwealth reserves
- Maintaining and upgrading infrastructure

#### Actions

- Implement the department's performance development scheme
- Fulfil the department's financial management and reporting obligations
- Manage park assets and developments to relevant Australian Standards

- Continued ParkSafe, occupational health and safety training and incident reporting and assessment
- Continued to allocate and prioritise resources to meet the aims of the park lease and fifth management plan
- Continued to carry out the management plan implementation strategy
- Implemented the performance development scheme for all staff focusing on key result areas and staff development
- Prioritised asset management and the work program against risk considerations and maintenance schedules

# Case Study: Kakadu's Indigenous rangers—Closing the Gap

Samantha Deegan lives in the Kakadu area with her family and has been employed full-time on the Kakadu Indigenous Ranger Program since early 2009.

The program, funded through the Australian Government's Working on Country program, is helping to boost Indigenous job opportunities in the park. It contributes to the Closing the Gap target of halving the difference between Indigenous and non-Indigenous job outcomes within a decade.

'The Kakadu Indigenous Ranger Program is great—it's helped me get real experience across lots of different areas in Kakadu,'Samantha said.

'Since I started in the ranger program, I've worked in the Mary River District doing weed work and helping to open visitor sites like Gunlom and Koolpin Gorge after the wet season. I've helped coordinate staff training, and worked in the Bowali Visitor Centre giving tourists advice on great things to do at Kakadu. I've also completed a fair bit of training with the park, and at the moment I'm working on a project to record the oral histories of senior traditional owners in the park, which I'm really enjoying.

'I grew up at outstations in Kakadu and my kids are now growing up in the park and going to school here. I love working in the field, and in future my goal is to work as a full-time ranger in the Jim Jim District in Kakadu.'

In 2009–10, the Kakadu Indigenous Ranger Program provided salaried job opportunities for 11 Indigenous community rangers within the park. The success of the program is underpinned by the park's strong partnership with the Warnbi and Werenbun Aboriginal Corporations. Rangers in the program are employed through these two Indigenous corporations. They are then based at Kakadu where they receive training and mentoring, and work in many different park management roles.

To date, six people involved in the program have gone on to Australian Public Service roles within the park, with other participants building the experience and skills necessary to win such positions in the future.

There are many social and economic benefits to the Kakadu Indigenous community, as rangers develop networks and increase their social participation through employment while enhancing their own living standards and those of their families.

The Kakadu Indigenous Ranger Program is currently funded until June 2013, which will ensure Kakadu continues to contribute significantly to Closing the Gap for Indigenous communities through jobs in conservation and park management.



Sam at Kakadu

# Norfolk Island National Park and Botanic Garden

www.environment.gov.au/parks/norfolk



## **Special features**

Historically, Norfolk Island has been subject to extensive land clearing for agriculture and housing.

Today, the national park and botanic garden are the last refuge for many plants and animals including over 180 native plant species, 40 of which are endemic and 46 which are listed species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Seven bird species and subspecies are endemic to Norfolk Island with four of these listed as threatened species under the EPBC Act: the Norfolk Island boobook owl (*Ninox novaeseelandiae undulata*), the Norfolk Island green parrot (*Cyanoramphus cookii*), the Norfolk Island golden whistler (*Pachycephala pectoralis xanthoprocta*), and the Norfolk Island scarlet robin (*Petroica multicolor multicolor*). All these species are forest dependent,

and hence the national park and botanic garden have become critical habitats for the future survival of these species.

The national park, particularly the Phillip Island section, provides important habitat for many species of seabirds, including many migratory and marine species listed under the EPBC Act.

There are two native reptiles, the Lord Howe Island (Norfolk Island) skink (*Oligosoma lichenigera*) and the Lord Howe Island (Norfolk Island) gecko (*Christinus guentheri*), that are endemic to the Norfolk and Lord Howe Island groups. Neither is found on the main island but both species occur on Phillip Island. Both are listed threatened species under the EPBC Act.

| Location                               | Latitude 29°01' South, Longitude 167°56' East  |   |
|--|--|---|
| Area                                   | 695.5 hectares (includes Mount Pitt section 493 hectares; Phillip Island 197 hectares; and Norfolk Island Botanic Garden 5.5 hectares)   |   |
| Proclamation dates                     | National park 31 January 1986 (Mount Pitt section); 24 January 1996 (Phillip Island)<br>Botanic garden 31 January 1986   |   |
| IUCN category                          | Norfolk Island National Park: Category II (national park)<br>Norfolk Island National Park Forestry Zone: Category VI (managed resource protected area)<br>Norfolk Island Botanic Garden: Category IV (habitat/species management area) |   |
| Biogeographic context                  | Isolated small islands of volcanic origin (2 to 3 million years old) in the South Pacific Ocean.<br>Prior to European settlement, Norfolk Island was almost entirely covered by sub-tropical rainforest                                |   |
| Management plan                        | Current plan expires on 12 February 2018   |   |
| Other significant management documents | Norfolk Island Region Threatened Species Recovery Plan; Norfolk Island National Park Weed Control Strategy   |   |
| Financial                              | Operating  | \$1.090 million   |
|  | Capital  | \$0.202 million   |
|  | Revenue  | \$1.109 million   |
| Visitors                               | 23,700 (estimated). Visitor survey indicates 90 per cent of visitors to Norfolk Island visit the national park and/or botanic garden   |   |
| Permits                                | 11 commercial tour operator; 3 commercial photography  | y; 10 scientific research; 3 collection for traditional use |

| International conventions and agreements  |                                     |  |
|---|-------------------------------------|--|
| Migratory Species (Bonn) Convention       | 17 of 105 listed Australian species |  |
| China-Australia Migratory Birds Agreement | 24 of 81 listed species             |  |
| Japan–Australia Migratory Birds Agreement | 29 of 76 listed species             |  |
| Korea-Australia Migratory Birds Agreement | 22 of 59 listed species             |  |

| <b>Environment Protection a</b> | Environment Protection and Biodiversity Conservation Act 1999 |  |  |
|---------------------------------|---|--|--|
| Listed fauna                    | Species   | 5 extinct<br>5 critically endangered<br>2 endangered<br>5 vulnerable<br>37 migratory<br>57 marine  |  |
|                                 | Recovery plans  | A regional threatened species recovery plan for the island was completed in<br>June 2010 and is under consideration. This plan identifies priorities for management<br>actions to assist the recovery of all listed plant and animal species on Norfolk Island.<br>Existing plans for the Norfolk Island green parrot ( <i>Cyanoramphus cookii</i> ),<br>Norfolk Island golden whistler ( <i>Pachycephala pectoralis xanthoprocta</i> ) and<br>Norfolk Island scarlet robin ( <i>Petroica multicolor multicolor</i> ) remain in place until the<br>regional plan is approved |  |
| Listed flora                    | Species   | 15 critically endangered<br>16 endangered<br>15 vulnerable   |  |
|                                 | Recovery plans  | A regional threatened species recovery plan for the island was completed in<br>June 2010 and is under consideration. This plan identifies priorities for<br>management actions to assist the recovery of all listed plant and animal species<br>on Norfolk Island  |  |
| Heritage                        | Phillip Island is on the Commonwealth Heritage List           |  |  |

| Numbers of native species recorded |       |          |        |
|------------------------------------|-------|----------|--------|
| Mammals                            | Birds | Reptiles | Plants |
| 2                                  | 50    | 2        | 180    |

## **Management arrangements**

The Norfolk Island community provides guidance to the Director on national park and botanic garden management through the Norfolk Island National Park Advisory Committee, which meets formally twice a year and informally each month.

The Norfolk Island Administration currently manages forestry operations within the forestry zone of the national park. Any operations require approval from the Director of National Parks.

## Monitoring

Monitoring of Norfolk and Phillip Islands for new pest animals and plants continues. Isolated nests of the Asian paper wasp (*Polistes chinensis*) have been identified and destroyed to prevent their spread in the park.

Argentine ants (*Linepithema humile*) have been identified on Norfolk Island. Some control measures have been progressed, but the distribution of the ants across the island continues to increase. For this reason, monthly surveys for Argentine ants are conducted at all visitor areas and around the periphery of the park, particularly focusing on areas near known infestations. At 30 June 2010, Argentine ants had not been detected in the park or botanic garden.

Rat populations are monitored as part of a park-wide rodent management program. Records are kept of bait taken and animals trapped. In addition, eight rat monitoring stations are set three times per year to provide an indication of rat activity.

Recovery programs for the Norfolk Island green parrot and boobook owl include monitoring and recording nest sites and chicks. Results suggest the green parrot population continues to increase while the owl population appears to be stable and may have reached carrying capacity.

## Future challenges

Major challenges are:

- transitioning to a more effective feral animal control/eradication program, particularly for rodents, cats, chickens and crimson rosellas
- finding more efficient and practical ways to meet the requirements of endangered species programs including through implementing the regional threatened species recovery plan
- achieving a sustainable balance between protecting the natural values of the park and supporting visitor use of the park and botanic garden
- managing remnant endemic and important native species in the park's forestry zone.

## Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Managing pest animals and weeds
- Protecting and enhancing populations of endangered species
- Continuing the rehabilitation of Phillip Island
- Building an adequate knowledge base to underpin management decisions

#### Actions

- Continue implementing the conservation weeding program
- Implement identified recovery actions for endangered species
- Continue vertebrate pest species management programs
- Increase research and survey work within the park and botanic garden

#### Performance results 2009–10

- Completed weed control in six of the 19 coups identified in the weed control strategy for the park. Under the strategy, coups are treated on a two-yearly cycle, focusing on priority weed control to increase habitat opportunities for native species
- Continued weed management activities on Phillip Island, effectively keeping the east end of the island relatively weed free and making a significant difference in weed cover in Long Valley
- Continued management of morning glory (*Ipomea cairica* and *I. indica*) in the botanic garden (see case study on page 49)
- Trapped 17 cats within the park under the feral cat control program. Analysis of gut contents is providing valuable information about prey, particularly the role cats play in reducing the rodent population versus the impact they have on Norfolk Island's bird life
- Completed the upgrade of rat stations to modern bait/trap boxes. Rodents took approximately 1,100 kilograms of bait in the park and more than 420 rats were caught in traps
- Removed over 50 feral chickens from the park and botanic garden

#### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Growing visitor expectations in relation to tourism infrastructure
- Providing safe and well-presented walking tracks and visitor facilities
- Providing high quality interpretive signs and pamphlets
- A growing demand for a professional environmental information centre

#### Actions

- Resurface walking tracks to reduce slipping hazard and improve amenity
- Redevelop walking tracks in the botanic garden
- Redesign and replace interpretive signs and brochures
- Develop a professional and functional interpretation centre

#### Performance results 2009–10

- Completed the botanic garden boardwalk and track upgrade
- Resurfaced all walking tracks in the park and botanic garden
- Developed a style guide for new interpretive products
- Released new brochures on walking tracks, plants and birds
- Designed, produced and installed new welcome, walking track and road directional signs
- Conducted the annual visitor survey to gauge the views and satisfaction level of park visitors. Feedback was 97 per cent positive, especially in relation to visitor area presentation, contact with rangers, diversity of walks, and quality of walks. A few respondents noted concerns in relation to directional signs (new signs installed in 2009–10 are expected to address this issue)

#### **KRA5: Stakeholders and partnerships**

#### **Major issues**

- Working effectively with the Norfolk Island Government, local tourism operators, environmental groups, the community, and professional and amateur researchers
- Revitalising and redirecting operations of the Norfolk Island National Park Advisory Committee

#### Actions

- Meet regularly with tourism industry representatives
- Work with the teachers and students of Norfolk Island Central School as a way to engage the younger members of the community
- Coordinate, or participate in, at least one community activity each year which promotes the park and botanic garden, or promotes the values of these areas
- Coordinate twice-yearly meetings of the Norfolk Island National Park Advisory Committee as the formal mechanism for community input into park management

- Through networking and regular contact, maintained professional and cordial relationships with the following stakeholders and partners: other departmental staff; other Australian Government departments on Norfolk Island; the Norfolk Island Government and administration; Norfolk Island tourism operators and industry groups; and environment and conservation groups
- Worked with Norfolk Island Central School in rehabilitating areas of the park and botanic garden
- Successfully managed a permit system for commercial operators, researchers and local traditional use collectors
- Provided newspaper articles and radio interviews covering topical issues with an environmental focus
- Gave talks to local groups and organisations about park activities
- Held the 50<sup>th</sup> meeting of the Norfolk Island National Park Advisory Committee—a milestone of 25 years' participation by five of the community members
- Finalised a review of the advisory committee's operating procedures which will guide the committee's future direction

#### **KRA6: Business management**

#### **Major issues**

- Delivering quality management services within a limited budget
- Maintaining transparent and accountable processes of permit issuance, contract management and decision-making

#### **Actions**

- Maintain park management services within budget
- Transition from contractors to staff as a more cost-effective and productive way of operating
- Develop staff capacity to deliver legislative and administrative services
- Dispose of assets surplus to needs to increase revenue and reduce maintenance costs

- Managed operational and capital budgets within allowed parameters
- Reviewed permit applications and conditions to ensure compliance with legislation and policy
- Finalised five contracts for services and employed an additional four casual staff to fulfil the work requirements
- Sold a Director of National Parks owned residential dwelling and captive breeding cages through tender processes

# Case Study: The transformation of Norfolk Island's botanic garden

What a difference a year can make in a garden—especially when it has the help of local school children and some exceptionally enthusiastic rangers.

At the start of 2009, the Norfolk Island Botanic Garden was looking a little run down. The tracks were worn and the weeds were winning the battle.

Despite this, the botanic garden still attracted lots of visitors. The garden is one of the few remaining areas of subtropical vine forest on Norfolk Island, but it needed a major effort to restore its conservation value and make it safe and more enjoyable for visitors.

The Director of National Parks allocated \$60,000 capital works funding for repairing the walking tracks through the botanic garden as part of the renovations. The project aimed to raise the tracks in areas where there were exposed tree roots, to improve safety for walkers and to protect trees from further root damage. It was planned as a three-year project, but with the leadership of visitor facilities ranger lan McLeod was completed in just 16 months.

In addition to the repairs to the existing walking tracks, park staff designed and constructed a new boardwalk near the entrance to the botanic garden bordered by a variety of Norfolk Island's endemic plants and plants of conservation interest. The next step is to label each plant to help visitors recognise and learn about Norfolk's plant life.

The transformation of the vine forest has been astounding. In April 2009 most of the garden was choked with the weed morning glory. The native vegetation was struggling to survive. It was going to be a huge task to resurrect the native vine forest, so the park enlisted the support of its local school to help with the task.

Over four days, grades five and six students from the Norfolk Island Central School became rangers for the day, clearing out the morning glory from the botanic garden and replacing the bare areas with native plants, including some which are listed as endangered and vulnerable. The grade five class performed a rain dance which really helped get the plants established during what had been the driest six months on record.

Norfolk Island park rangers have also been busy in the garden, trialling techniques to manage the morning glory, installing directional signs and putting in many hours of weeding and replanting. Today the hard work of parks staff and school students has paid off with the final refreshed botanic garden receiving accolades from all who visit.



Morning glory infestation



Students planting

# **Pulu Keeling National Park**

www.environment.gov.au/parks/cocos



## **Special features**

Pulu Keeling National Park's most outstanding feature is its intact coral atoll ecosystem. With the widespread global decline of similar coral island habitats and their reefs due to human interactions, the conservation and protection of the park and its wildlife are of international importance.

The park, which makes up the whole of North Keeling Island, is an internationally significant seabird rookery. The breeding colony of the dominant bird species the red-footed booby (*Sula sula*)—is one of the largest in the world. The island is also the main habitat of the endangered Cocos buff-banded rail (*Gallirallus philippensis andrewsi*) found only on the Cocos (Keeling) Islands.

The critically endangered Round Island petrel

(*Pterodroma arminjoniana*) has been recorded on the island but has not been sighted in recent years, despite intensive searching. Green turtles (*Chelonia mydas*) nest on the island and hawksbill turtles (*Eretmochelys imbricata*) inhabit the waters of the park; both species are listed as vulnerable.

| Location                                     | Latitude 11°50' South, Longitude 96°49' East  |                                     |
|--|---|-------------------------------------|
| Area   | 2,602 hectares (including marine area extending 1.5 kilon   | netres around North Keeling Island) |
| Proclamation date                            | 12 December 1995  |                                     |
| IUCN category                                | Category II overall comprising:<br>Terrestrial Zone Category Ia (122 hectares)<br>Marine Zone Category II (2,480 hectares)                  |                                     |
| Biogeographic context                        | Isolated atoll in the Indian Ocean formed atop an old volcanic seamount   |                                     |
| Management plan                              | Second plan expires 27 April 2011   |                                     |
| Other significant<br>management<br>documents | Visitor access, boating, diving and fishing strategies; Management Plan Implementation Schedule;<br>Risk Assessment and Management Schedule |                                     |
| Financial                                    | Operating   | \$0.597 million                     |
|  | Capital   | not applicable                      |
|  | Revenue \$0.642 million   |                                     |
| Visitors                                     | 61 visitors to Home Island Office<br>75 visitors to Pulu Keeling National Park  |                                     |
| Permits                                      | 34 marine access  |                                     |

| International conventions and agreements  |                                    |  |
|---|------------------------------------|--|
| Wetlands (Ramsar) Convention              | Entire park listed                 |  |
| Migratory Species (Bonn) Convention       | 8 of 105 listed Australian species |  |
| China–Australia Migratory Birds Agreement | 15 of 81 listed species            |  |
| Japan–Australia Migratory Birds Agreement | 15 of 77 listed species            |  |
| Korea-Australia Migratory Birds Agreement | 8 of 59 listed species             |  |

| Environment Protection and Biodiversity Conservation Act 1999 |  |   |
|---|--|---|
| Listed fauna  | Species  | 1 critically endangered<br>4 endangered<br>5 vulnerable<br>24 migratory   |
|   | Recovery plans                                     | 36 marine<br>4 being implemented: blue whale ( <i>Balaenoptera musculus</i> ) and sei whale<br>( <i>Balaenoptera borealis</i> ); Round Island petrel ( <i>Pterodroma arminjoniana</i> );<br>Cocos buff-banded rail ( <i>Gallirallus philippensis andrewsi</i> ); marine turtles |
| Listed flora  | Species  | None  |
| Heritage  | North Keeling Island on Commonwealth Heritage List |   |

| Numbers of native species recorded |       |          |        |
|------------------------------------|-------|----------|--------|
| Mammals                            | Birds | Reptiles | Plants |
| 5                                  | 24    | 6        | 31     |

## Management arrangements: management committee

The Pulu Keeling National Park Community Management Committee comprises the Director of National Parks (or his nominee), three others nominated by the Director and six community representatives nominated by the Cocos (Keeling) Islands Shire Council.

## Monitoring

The red-footed booby population in the park has been monitored since 1985. Analysis of the data in 2009 again put the number at around 30,000 breeding pairs.

With a current estimate of 1,000 individuals, the buff-banded rail population remains stable in the park and staff continue to monitor the population. A project to establish a second viable population within the Cocos (Keeling) Islands group began in 2008 and continued through 2009–10. Systematic marine turtle monitoring has been maintained in the park over the last ten years.

Following an island-wide survey in June 2008, data continue to show that invasive yellow crazy ants (*Anoplolepis gracilipes*) are fairly widespread with some sites recorded at 'supercolony' density. The monitoring program follows the methodology used at Christmas Island National Park.

## **Future challenges**

Major challenges are:

- preventing the introduction of pests and diseases to the park
- preventing and containing the impact of exotic species. Island fauna is especially vulnerable to the introduction of exotic species; outbreaks of scale insects and weeds, especially Siam weed (*Chromolaena odorata*) and die-back (*Phytophthera* spp.) on nearby Christmas Island and in Western Australia, may pose a threat to the park
- managing the current threatening exotic species coral berry (Rivina humilis) and yellow crazy ants
- managing for global warming, which poses a particular challenge to the future management of low-lying atolls such as Pulu Keeling.

## Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Regular access to the park to perform routine tasks
- Illegal entry to the park
- Illegal wildlife harvesting
- Monitoring the red-footed booby population
- Monitoring and management of threatening exotic species

#### Actions

- Maintain a workable arrangement with the service provider to provide boats for access to the park
- Maintain surveillance and boat patrols
- Survey bird numbers regularly
- Undertake an island-wide survey targeting exotic weed and pest species

#### Performance results 2009–10

- Maintained sufficient access to the park by boat to undertake seabird monitoring and management duties
- Recorded the first confirmed sighting of the tropical shearwater (*Puffinus bailloni*) for Pulu Keeling and the eastern Indian Ocean in November 2009. Further surveys will verify whether this species is using the park to breed
- Continued working with the community and with other law enforcement agencies to detect incidents involving protected species
- Completed an island-wide survey to provide baseline data on the distribution and abundance of exotic species

#### KRA2: Cultural heritage management

#### **Major issues**

- The SMS Emden shipwreck is a popular diving site
- Visitors to Malay gravesites

#### Action

• Ensure access to sites is managed appropriately

#### Performance results 2009–10

- Managed access to cultural heritage sites effectively
- Conducted eight guided walking tours of the gravesites and the Emden memorial site
- Distributed cultural educational material on walking tours

#### KRA4: Use and appreciation of protected areas

#### Major issue

• Potential for park visitors to introduce exotic species

- Implement quarantine procedures
- Prevent introduction of exotic species

• Continued to inspect visitors' equipment, clothing and footwear prior to visitors swimming ashore and ensure that it is scrubbed. No evidence was found that new species have been introduced

#### **KRA5: Stakeholders and partnerships**

#### **Major issues**

- Continuing a positive working relationship with the community
- Dissatisfaction with park management with regard to the red-footed booby harvest proposal decision-making process

#### **Actions**

- Promote the benefits of the park (including employment, tourism and local expenditure)
- Continue the ongoing community relations and education programs

#### Performance results 2009–10

- Continued to use the Home Island office to build positive working relationship with stakeholders, locals and tourists. Attended community and school functions
- Continued to advertise local employment opportunities and engage community members where possible. Maintained a temporary employment register
- Maintained regular meetings and communication with stakeholders
- Continued educational activities with the Cocos (Keeling) Islands District School and community, specifically on invasive species but also incorporating other local conservation messages

#### **KRA6: Business management**

#### Major issue

• Isolation limits access to external support networks

#### Action

• Facilitate visits to the park by external support staff and facilitate off-island training

- · Managed operational and capital budgets within approved parameters
- Received regular support from Christmas Island National Park staff with field work, financial functions and geographic information system data management

# Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park

www.environment.gov.au/parks/uluru



## **Special features**

Uluru–Kata Tjura National Park is inscribed on the World Heritage List for both the cultural and natural values of its landscape. The park supports traditional owners to maintain their living culture and contains landscapes of exceptional scenic beauty. It also protects the iconic rock outcrops of Uluru and Kata Tjura and outstanding examples of arid zone flora and fauna.

Uluru–Kata Tjuta National Park is a place of great spiritual and cultural importance to Anangu (western desert Aboriginal people). For countless generations this ancient landscape has been influenced by the activities of Anangu and their ancestors. The land management techniques that are a feature of these activities are an intrinsic part of *Tjukurpa* (traditional law and culture) and a feature of the joint management of the park by Anangu and Parks Australia.

| Location                                     | Latitude 25°15' South, Longitude 130°43' East   |                       |
|--|---|-----------------------|
| Area   | 132,566 hectares  |                       |
| Proclamation dates                           | 24 May 1977, 28 October 1985  |                       |
| IUCN category                                | Category II   |                       |
| Biogeographic context                        | Interim Biogeographic Regionalisation for Australia region  | n: Great Sandy Desert |
| Management plan                              | Fifth plan came into effect 9 January 2010 and expires 8 January 2020   |                       |
| Other significant<br>management<br>documents | Lease between the Ulu <u>r</u> u–Kata Tju <u>t</u> a Aboriginal Land Trust and the Director of National Parks; Visitor Infrastructure<br>Master Plan; Ulu <u>r</u> u Climb Health and Safety Report; Cultural Heritage Action Plan; Women's Cultural Heritage Plan;<br>Fire Management Strategy and Operations Manual; Buffel Grass Management Strategy |                       |
| Financial                                    | Operating \$12.864 million  |                       |
|  | Capital \$5.475 million   |                       |
|  | Revenue \$11.545 million  |                       |
|  | Paid to traditional owners \$2.011 million  |                       |
| Visitors                                     | 334,240 visitors (16 years and above) based on park tickets sold  |                       |
| Permits                                      | 159 film/photography; 95 tour operators; 91 media; 4 rese   | earch                 |

| International conventions and agreements  |  |  |
|---|--|--|
| World Heritage Convention                 | Listed under cultural criteria (v) and (vi) and natural criteria (ii) and (iii), recognising the park's outstanding natural and cultural values and its significance as a cultural landscape |  |
| Migratory Species (Bonn) Convention       | 10 of 105 listed Australian species  |  |
| China-Australia Migratory Birds Agreement | 12 of 81 listed species  |  |
| Japan–Australia Migratory Birds Agreement | 14 of 77 listed species  |  |
| Korea–Australia Migratory Birds Agreement | 13 of 59 listed species  |  |
| Other agreements                          | Listed as a biosphere reserve under the UNESCO Man and the Biosphere Programme   |  |

| Environment Protection and Biodiversity Conservation Act 1999 |  |  |  |
|---|--|--|--|
| Listed fauna  | Species  | 6 extinct<br>2 endangered<br>3 vulnerable<br>16 migratory<br>36 marine (birds)   |  |
|   | Recovery plans   | 3 being implemented: mala or rufous hare wallaby ( <i>Lagorchestes hirsutus</i> );<br>tjaku <u>r</u> a or great desert skink ( <i>Egernia kintorei</i> ); itjari-itjari or southern marsupial<br>mole ( <i>Notorcytes typhlops</i> ) |  |
|   |  | 2 in preparation: murjta or mulgara ( <i>Dasycercus cristicauda</i> ); waru or black-flanked rock-wallaby ( <i>Petrogale lateralis</i> )   |  |
| Listed flora  | None   |  |  |
| Heritage  | On National Heritage List and Commonwealth Heritage List |  |  |

| Numbers of native species recorded |       |          |      |            |          |
|------------------------------------|-------|----------|------|------------|----------|
| Mammals                            | Birds | Reptiles | Fish | Amphibians | Plants   |
| 21                                 | 170   | 73       | None | 4          | Over 400 |

## **Management arrangements: Board of Management**

The current traditional owner representatives on the Ulu<u>r</u>u–Kata Tju<u>t</u>a Board of Management were appointed by the Minister for the Environment, Water, Heritage and the Arts in November 2008 for a period of five years. A new tourism representative was appointed to the board in May 2010.

The majority of board members must be Indigenous persons nominated by the park's traditional Aboriginal owners. The board comprises 12 members: four male and four female traditional owner representatives; the Director of National Parks; and one nominee each from the Northern Territory Government, the Minister for Tourism and the Minister for the Environment.

The board has a responsibility to prepare and implement the management plan and advise the Minister on the park's future development. Through joint management, Anangu and *Piranpa* (non-Aboriginal people) work together to manage the park's cultural and natural heritage.

## Monitoring

The thirteenth annual tjaku<u>ra</u> or great desert skink (*Egernia kintorei*) survey took place in February–March 2010. Another record number of breeding burrows (234) were documented during the monitoring, with an unprecedented 95 burrows containing juveniles and 65 containing sub-adults. This number of breeding burrows exceeds by far the previous highest number recorded since monitoring began.

The methodology for the murtja or mulgara (*Dasycercus cristicauda*) survey altered this year to combine trapping and spoor searches to improve understanding of the species' population dynamics and distribution. Ten individuals were trapped during two trapping sessions and mulgara signs (burrows and food digging holes) were found on all 20 survey sites. These data will be further analysed to improve understanding of the species' habitat preferences.

The first year of regular itjari-itjari or southern marsupial mole (*Notoryctes typhlops*) monitoring was completed in April 2010 and involved monthly searches in a range of habitat types including various spinifex (*Triodia* spp.) age classes and topography such as dune tops and inter-dune swales. Signs of itjari-itjari (tracks and exit/entry holes) were found at all sites monitored and it appears that the species is widespread throughout the spinifex habitats of the park. The species' surfacing behaviour was positively correlated with rainfall between three and ten days before surveying, confirming traditional owner knowledge of the species' habits.

The park's rare flora survey continued with most of the 17 priority species now found within the park, including two species found this year after not being located in initial surveys—sterile lovegrass (*Eragrostis sterilis*) and Kata Tjuta early nancy (*Wurmbea centralis*). The presence of a third species, Sturt's hibiscus (*Hibiscus sturtii* var. *sturtii*), awaits confirmation. These small populations will now become the target of appropriate management activities to ensure they are not lost from the park.

The seventh survey of the captive breeding population of mala or rufous hare wallaby (*Lagorchestes hirsutus*) took place in April 2010. Twenty-three new animals were tagged from a total of 51 animals captured. The population continues to be healthy with the majority of animals gaining weight and many of the population's founding members still thriving.

The first monitoring for the striated grass wren (*Amytornis striatus*) since 1992 was completed, together with the first monitoring of macroinvertebrates on the summit of Ulu<u>r</u>u since the 1980s.

A waterhole monitoring program began, using remote photography. This program will assess the abundance and distribution of the park's rarest macropod, the euro (*Macropus robustus*), and will also assess feral animal and tourist impacts on these fragile freshwater ecosystems.

Monitoring the effectiveness of introduced buffel grass (*Cenchrus ciliaris*) removal and ecosystem recovery has found that biodiversity levels and native plant abundance are increasing following buffel grass removal from habitats at the base of Ulu<u>r</u>u.

Activity and abundance surveys for introduced predators continued. Feral cat monitoring is using satellite tracking collars to better focus control efforts and to quantify which species are most at risk from feral cats.

Visitor monitoring used vehicle counters and visitor surveys. Vehicle counters looked at traffic movement across the park on the main roads and counted 176,840 vehicle movements. Visitor surveys were conducted in July 2009, October 2009 and April 2010. The surveys showed consistently high visitor satisfaction, the average being 96 per cent.

## Future challenges

Major challenges are:

- controlling the impact of vertebrate pests on waterholes and on native fauna and flora species
- managing the impact of visitors on cultural sites particularly those with high visitation around Uluru
- managing visitor safety in the harsh environment, in particular for visitors who choose to climb Uluru
- working with the NT Government and the Department of Families, Housing, Community Services and Indigenous Affairs to find alternative arrangements for delivering essential services (power, water and sewerage) to the Mutitjulu Community
- retaining and developing staff in a remote area
- increasing Anangu engagement in park management
- managing the budgetary impact of decreasing visitor numbers.

## Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Restricting the spread of introduced buffel grass and reducing its abundance throughout the park
- Reducing the impacts of vertebrate pests (fox, cat, camel, rabbit, feral dogs)
- Monitoring the status of threatened species and managing threatening processes
- Reintroducing locally extinct species
- Controlling erosion and repairing existing damage
- Using fire effectively as a habitat management tool
- Quantifying the impact of climate change on semi-arid ecosystems
- Ensuring that monitoring activities provide effective data on ecosystem health



Uluru–Kata Tjuta National Park completed Talinguru Nyakunyatjaku, its new viewing area in 2009–10. The award-winning facility offers visitors a chance to see Australia's most iconic landmark while providing information on its cultural and environmental importance. Pictured is an Anangu dancer at the official opening of the viewing area. Photo Grenville Turner

#### Actions

- Complete the fire and vegetation management strategy to guide fire planning and activity within the park
- Complete a Buffel Grass Management Strategy to improve the effectiveness and efficiency of resource use to achieve improved conservation and recreational outcomes over the next five years
- Adapt and continue the buffel grass control program
- Release rabbit calicivirus into larger sections of the park to control resilient rabbit populations
- Extend the annual fire planning workshop to two days to enhance the contribution by the park's traditional owners to planning the seasonal burn program
- Continue to monitor the park's threatened species to improve understanding of these species and ensure management is effective and adaptive
- Trial innovative programs aimed at improved feral species management including cat home range studies and targeted trapping, and developing a camel management program
- Maintain the pest-free enclosure
- Continue to develop a species reintroduction program
- Continue revegetation programs in construction areas and locations where buffel grass has been
   successfully removed
- Continue the erosion control program
- Improve data and geographic information system (GIS) management

#### Performance results 2009–10

- Completed the Fire Management Strategy and Operations Manual which is now being used to plan all burns within the park. Several burns were conducted
- Completed the Buffel Grass Management Strategy which is now being used to prioritise buffel grass control activities. These include continuing the Conservation Volunteers Australia program around the base of Ulu<u>r</u>u and removing buffel grass from roads and tracks throughout the rest of the park to reduce spread
- Continued preparation of the Vertebrate Pest Management Strategy with completion expected in September 2010
- Used GIS technology to map burns and the distribution of invasive weeds, feral animals and threatened species. This resulted in efficiencies in planning and implementing management programs
- Mapped and assessed several rare flora species
- Conducted monthly vertebrate pest monitoring for cats, foxes and dogs in the bore fields area of the park. Pest numbers continue to be low
- Released rabbit calicivirus in areas of resilient rabbit burrows following the success of release trials in the mala paddock last year
- Conducted mulgara, great desert skink, marsupial mole and mala surveys. More accurate mulgara population data have been generated, together with baseline data for monitoring marsupial mole populations
- Conducted sampling for invertebrates and water quality testing at Uluru waterholes
- Conducted a feral cat trapping program including checking and baiting the traps every day

#### **KRA2: Cultural heritage management**

#### **Major issues**

- Supporting the continuation of Anangu living culture and knowledge
- Protecting historic and Anangu cultural information, sites and objects

- Revise the Cultural Heritage Action Plan (2002) and continue to implement the Women's Cultural Heritage Plan (2005)
- Continue the rock art conservation, oral history and repatriation programs
- Identify, catalogue and conserve cultural, historical and archaeological sites and objects

- Protect cultural sites around Uluru
- Maintain the Cultural Sites Management System database as an information repository, planning and reporting tool
- Maintain the A<u>ra Irititja</u> (Stories from the Past) database, promote community access, and continue data entry. A<u>ra Irititja</u> is a multimedia database and associated project that enables A<u>n</u>angu to access archival material (film, photographs, sound recordings, documents, artefacts)
- Support staff and Anangu participation in the annual Women's Law and Culture meeting
- Support and promote the use of traditional knowledge and skills in all areas of park management and especially in fire management
- Facilitate and support the transfer of knowledge between Anangu generations

- Held three Cultural Heritage and Scientific Consultative Committee meetings to provide advice to the board on natural and cultural heritage issues
- Held a cultural heritage workshop involving traditional owners from the Mutitjulu Community and other communities to revise the Cultural Heritage Action Plan
- Continued the rock art protection program with field visits from rock art conservators to men's, women's and public rock art sites at the base of Ulu<u>r</u>u
- Conducted a rock art protection training workshop for Indigenous Protected Area ranger groups based at
   Docker River, Sandy Bore and lands in WA
- Repaired significant graffiti on public rock art sites
- Completed construction of the new viewing platform and walking path for the Wave Cave to prevent visitor impact on the site
- Formed a partnership with archaeologists at the University of Queensland to begin archaeological survey work throughout the park
- Continued cultural site patrols and added the resulting data to the Cultural Site Management System
- Provided logistical support for Anangu attending Women's Law and Culture meetings

#### KRA3: Joint management and working with Indigenous communities

#### **Major issues**

- Managing the park in accordance with the lease obligations, joint management principles and the new management plan
- Providing opportunities for Indigenous economic development in the park
- Maintaining relationships and partnerships with relevant Anangu organisations
- Ensuring traditional owners are appropriately consulted about park projects and park management activities
- Supporting Anangu employment, education and training
- Supporting ongoing transfer of traditional knowledge between generations of Anangu

- · Maintain productive working relationships with joint management partners
- Work with the Central Land Council to ensure effective traditional owner consultation about significant park projects
- Support Anangu enterprise development in the park
- Develop and implement an intergenerational training and employment strategy and continue to provide opportunities for Anangu to develop park management skills and experience
- Continue to develop the Junior Ranger program

- Held one regular and four special meetings of the board and seven meetings of the board's consultative committees
- Through the Central Land Council involved traditional owners in finalisation of the fifth management plan and other significant projects
- Continued to support the agreement between the Mutitjulu Community and the park in employing Anangu, including acknowledging and recompensing senior Anangu for their traditional knowledge and skills
- Significantly increased Anangu participation in the Mutitjulu Community Ranger Program. Twelve Anangu from
  the Mutitjulu Community participated regularly in park employment
- Undertook Junior Ranger activities, including night viewing of mala at the mala paddock and producing batik banners for public display at the cultural centre
- Engaged Pitjantjatjara interpreters for board, consultative committee and other meetings to improve communication with traditional owners and community members
- Established a new committee to provide guidance to the board and park management on event development in the park
- New tourism representative appointed to the board by the Minister
- Board members and traditional owners participated in the opening of the Talinguru Nyakunytjaku visitor facility
- Developed a draft intergenerational training and employment strategy, consistent with actions from the new management plan
- Appointed two workforce development coordinators in early 2010
- Developed work readiness and life skills training programs for Anangu
- Engaged tourism experts to identify potential new tourism opportunities and provide support to Anangu in developing new tourism businesses (see case study on page 63)

#### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Completion and official opening of Talinguru Nyakunytjaku, the new visitor facility
- Implementation of an online ticket system for the park
- Managing the demands of international and Australian film crews and professional photographers
- Managing ageing infrastructure
- Maintaining a high level of visitor safety in the park
- Managing the Uluru climb to reduce the risks to the health and safety of visitors, and to respect cultural traditions
- Interpreting key park messages to visitors
- Development of high quality tourism opportunities to facilitate closure of the climb

- Monitor visitor satisfaction
- Continue media briefings (using face to face briefings and electronic communications)
- Develop new interpretive signage, including visitor safety messages
- Maintain visitor infrastructure including walking tracks and pathways
- Continue tour operator workshops and orientation programs
- Implement compulsory tour guide certification
- Develop guidelines and processes to facilitate and support potential new tourism opportunities to benefit traditional owners and the park

- Conducted visitor surveys in April 2010. An average 98 per cent of domestic respondents and 94 per cent of international respondents were satisfied overall with their visit
- Undertook four rescues of visitors on Uluru and responded to a further eight emergency situations
- Issued 91 media permits for filming or photography in the park
- Issued 95 tour operator permits
- Progressed consultation and planning for upgrading the cultural centre
- Maintained the park's rock rescue, emergency response, first aid and fire suppression capabilities
- The Minister officially opened the new Uluru viewing facility, Talinguru Nyakunytjaku, in October 2009
- Delivered free interpretive events to visitors including the daily ranger-guided Mala Walk at Uluru
- Facilitated two VIP visits by New Zealand delegates
- Maintained effective liaison with Charles Darwin University which provides the online guide accreditation course. A new handbook was produced as an accompaniment to the online course and to facilitate access to information about the park remotely
- Continued to work with regional partners on the Red Centre National Landscape and Red Centre Way tourist drive
- Consulted tourism stakeholders about developing an online ticket system for the park
- Let contracts for designing and constructing new interpretive signage
- Continued a significant road maintenance program
- Developed draft event guidelines

#### **KRA5: Stakeholders and partnerships**

#### **Major issues**

- Providing opportunities for new Indigenous business enterprises
- Maintaining an effective working relationship with the Mutitjulu Community
- Maintaining an ongoing partnership with Ayers Rock Resort
- Maintaining an ongoing partnership with the tourism industry
- Maintaining good relationships with other key stakeholders
- Engaging with new local government, Northern Territory and Australian Government agencies working with the Mutitjulu Community

#### Actions

- Hold meetings of the board's consultative committees
- Participate in Resort Business Partners meetings
- Communicate clearly with all parties about park developments
- Meet regularly with local stakeholder groups
- Continue supporting volunteer and community groups in protecting park values

- Held several meetings of the Tourism Consultative Committee, the Film and Photography Consultative Committee and the Cultural Heritage and Scientific Consultative Committee
- Attended meetings of the Resort Business Partners
- Attended MacDonald Shire Council meetings
- Supported teams from Conservation Volunteers Australia working on weed control in the park
- Participated in Yulara Counter Disaster Committee meetings

- Held tourism stakeholder meetings to seek feedback on online ticketing and other issues
- Formed the Ulu<u>r</u>u Regional Employment Group to ensure a regional approach to training and employment of
  Indigenous job seekers
- Produced quarterly e-newsletters to communicate park news and activities to stakeholders

#### KRA6: Business management

#### **Major issues**

- Implementing the organisational review to ensure the most effective and efficient staffing structure
- Finalising and implementing the new management plan
- Providing suitable staff housing and an improved office environment
- Rising fuel prices affecting diesel power generation and the vehicle fleet
- Maintaining park infrastructure and road networks
- Providing essential services to the Mutitjulu Community
- Developing lease agreements for business enterprises at the cultural centre
- Improving corporate governance procedures
- Reduced revenue due to a shortfall in expected visitor numbers
- Staff training and development
- Maintaining staff health and safety at work

#### **Actions**

- Continue to implement the organisational review
- Ensure that the Housing, Training, and Occupational Health and Safety committees are functional and meet regularly
- Finalise the fifth management plan
- Continue to implement the staff training plan and update the training calendar
- Continue to develop new deeds of standing offer
- Continue to implement safe working procedures, including job safety analyses and standard operating procedures

- Finalised the fifth management plan with the board. The plan was approved by the Minister and came into effect in January 2010
- Improved the staff orientation package
- Staff, Anangu and Mutitjulu Community members attended numerous training events, ranging from informal information sessions to accredited training
- Two staff members received assistance under the department's Study Support Scheme
- Held regular Occupational Health and Safety Committee and Housing Committee meetings
- Appointed a new Training Committee, with new membership and terms of reference adopted to ensure consistency with requirements under the current management plan
- Continued deeds of standing offer or contracts for sewerage and septic systems, cleaning, air conditioner maintenance, fleet servicing and fire detection
- Completed the office refit and moved visitor services staff to park headquarters
- Senior park staff attended science and park managers forums in Canberra
- Administration staff attended the Remote Area Administration Forum in Canberra and several staff attended leadership training in Darwin

# Case Study: Developing new experiences at Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park

A new management plan has led to a renewed engagement in tourism development at Uluru-Kata Tjura National Park.

The new plan sets out an intention to eventually replace the Ulu<u>r</u>u climb with new visitor experiences, once clear preconditions have been met.

This push for new experiences, particularly ones that help visitors connect with local Aboriginal culture, is being driven by the majority-Aboriginal board that manages the park. The board is working together with the Director of National Parks, Tourism NT, the tourism industry and other traditional owners to identify new tourism opportunities for the park.

Harry Wilson, who is the board chair, said the new plan and its focus on cultural tourism will be good for A<u>n</u>angu, the park's traditional owners, and great for visitors.

'We think this plan will be good for our culture and we hope it'll mean jobs for us,' Mr Wilson said.

'We want visitors to come and see our country and share our culture. We read the submissions saying that's what visitors want too. That's why this plan opens up many more opportunities for the tourism industry.

'We're hoping the industry will work with us to create new Indigenous experiences—maybe activities at night when the park is cool and the stars are so bright. Maybe cultural performances like dance at the new viewing area. Some senior people are thinking about special walks to their own country.

'The most important thing is to create new experiences—without new activities some visitors will still think the most important thing about Ulu<u>r</u>u is the climb.'

Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park is a site of significant cultural importance to A<u>n</u>angu and an iconic travel destination, as part of the Red Centre National Landscape.

In support of the board's plan, the Director of National Parks has engaged two tourism advisors to identify new tourism opportunities, support new Anangu tourism ventures, help people form partnerships and engage with key stakeholders to develop a common way forward for tourism.

Park visitors have a clear desire and an increasing expectation that they will have the opportunity to meet Anangu and experience their culture. Park managers are committed to supporting Anangu to develop new tourism opportunities that fill this gap while setting realistic expectations for visitors. Already, significant time has been spent with Anangu talking about their ideas for tourism and business development in the park and surrounding region. Anangu are excited about the prospect of building businesses that will promote employment for their children and enable them to share their home with visitors.

The new tourism directions for Uluru–Kata Tjura National Park will be a long-term process and will need to be taken one step at a time. The most important part will be the journey with Anangu, helping them to find ways to showcase their spectacular country and their living culture.

In an exciting first step, the Mutitjulu Foundation sponsored a group of 20 dancers from Uluru to attend this year's Garma Festival in Arnhem Land. They will perform the *Bunggul (Inma* or dance), visit the Yirrkala School, learn about tourism from the local Yolgnu traditional owners, and interact with visitors from around the world. On their return they will report to the whole community and establish their own professional performance company.



Talinguru Nyakunyatjaku – the new Uluru viewing area

# **Calperum and Taylorville Stations**

www.environment.gov.au/parks/biosphere/riverland



## **Special features**

Calperum and Taylorville Stations are adjoining pastoral leases in the Riverland area of South Australia approximately 250 kilometres east of Adelaide, near the Victorian border.

Calperum and Taylorville are important locally, nationally and internationally because of their intact mallee vegetation, the presence of several threatened bird species, and their wetlands and related species. The properties form critical habitat for the endangered black-eared miner (*Manorina melanotis*). They are also important for the conservation of the nationally vulnerable malleefowl (*Leipoa ocellata*), the regionally vulnerable bush stone-curlew (*Burhinus grallarius*) and the nationally vulnerable southern bell frog (*Litoria ramiformis*).

The properties are key components of the Riverland (formerly Bookmark) Biosphere Reserve. While biodiversity conservation guides the management of both properties and both actively rely on community participation in management activities, there are differences in the management objectives of the two properties. Taylorville is managed as an IUCN Category IV reserve, for habitat and species conservation. Calperum is managed for a broader, additional set of objectives, including environmentally sustainable development such as tourism.

| Location              | Latitude 33°49' South, Longitude 140°34' East (Calperum)   |                 |  |  |
|-----------------------|--|-----------------|--|--|
|                       | Latitude 33°56' South, Longitude 140°11' East (Taylorville)  |                 |  |  |
| Area                  | 331,238 hectares combined area:  |                 |  |  |
|                       | Calperum 238,638 hectares; Taylorville 92,600 hectares   |                 |  |  |
| Status                | Pastoral leases in South Australia, held by the Australian Government through the Director of National Parks (Calperum acquired in 1993, Taylorville acquired in 2000)   |                 |  |  |
| IUCN category         | Calperum: not assigned<br>Taylorville: Category IV   |                 |  |  |
| Biogeographic context | Interim Biogeographic Regionalisation for Australia region: Murray–Darling Depression  |                 |  |  |
| Management plan       | Non-statutory management plan covering both properties finalised in February 2005 (expired with previous management contract in 2008, but still in effect until the next plan is finalised, expected March 2011) |                 |  |  |
| Other significant     | Management contract with Austland Services Pty Ltd; Biosphere Reserves Seville Strategy  |                 |  |  |
| management documents  | and statutory framework  |                 |  |  |
| Financial             | Operating *  | \$0.643 million |  |  |
|                       | Capital  | \$0.047 million |  |  |
|                       | Revenue  | \$0.602 million |  |  |
| Visitors              | Over 2,900 bed-nights in camping grounds, dormitories and other accommodation  |                 |  |  |

\* This funding is provided by the Director of National Parks. Austland Services provides at least matching resources

| International conventions and agreements  |   |  |  |
|---|---|--|--|
| Wetlands (Ramsar) Convention              | Part of Calperum included in Riverland Ramsar site                          |  |  |
| Migratory Species (Bonn) Convention       | 8 of 105 listed Australian species  |  |  |
| China–Australia Migratory Birds Agreement | 16 of 81 listed species   |  |  |
| Japan–Australia Migratory Birds Agreement | 14 of 77 listed species   |  |  |
| Korea–Australia Migratory Birds Agreement | 12 of 59 listed species   |  |  |
| Other international agreements            | Major component of the Riverland Biosphere Reserve under the UNESCO Man and |  |  |
|   | the Biosphere Programme   |  |  |

| Environment Protection and Biodiversity Conservation Act 1999 |   |  |  |  |
|---|---|--|--|--|
| Listed fauna  | Species   | 1 endangered   |  |  |
|   |   | 6 vulnerable   |  |  |
|   | 12 migratory  |  |  |  |
|   | 45 marine (birds)   |  |  |  |
|   | Recovery plans  | 2 being implemented: malleefowl (Leipoa ocellata); black-eared miner |  |  |
|   |   | (Manorina melanotis)   |  |  |
| Listed flora  | Species   | None   |  |  |
| Heritage  | On Commonwealth Heritage List   |  |  |  |
| Other   | Taylorville and most of Calperum listed as critical habitat for black-eared miner |  |  |  |

| Numbers of native species recorded |       |          |            |      |          |
|------------------------------------|-------|----------|------------|------|----------|
| Mammals                            | Birds | Reptiles | Amphibians | Fish | Plants   |
| 25                                 | 188   | 68       | 10         | 12   | Over 350 |

### Management arrangements

Calperum and Taylorville Stations are managed by Austland Services Pty Ltd (a company established by the Australian Landscape Trust) under contract to the Director of National Parks. The current management contract runs from 3 July 2008 to 30 June 2013. Austland Services provides additional support for management activities and community-based programs.

## Monitoring

Significant monitoring programs track the physical and biological attributes of both properties. The ongoing, routine monitoring program included surveys of small vertebrates (mammals and reptiles), malleefowl and black-eared miner populations, floodplain grazing pressure, floodplain tree health, groundwater salinity, surface water quality and rainfall. Special purpose monitoring activities during the year included intensive rabbit monitoring in restoration areas, bush stone-curlew surveys and vegetation surveys.

Rainfall on both properties was close to the long-term average in 2009–10, leading to a generally strong response from vegetation in mallee and semi-arid woodland areas and from black box (*Eucalyptus largiflorens*) on the floodplain. The situation for river red gum (*Eucalyptus camaldulensis*) is less encouraging. While there has been increased vigour in stands of river red gums adjacent to wetlands that have received environmental watering there is a general, ongoing decline in the condition of river red gums in other areas.

Along with an increase in overall vigour of the mallee woodlands, there have been mixed trends in mallee bird populations. Encouraging levels of breeding activity were observed in black-eared miner colonies, including in areas that were impacted by the 2006 bushfires. Similar recovery has not been evident in some other mallee species such as the striated grasswren (*Amytornis striatus*). The annual small vertebrate (mammals and reptiles) surveys were conducted under unusually hot conditions, but still yielded above average catch levels as well as some unusual species observations. This supports the view that, overall, woodland biodiversity is on an improving trajectory.

Monitoring also revealed positive impacts of the filling of Lake Merreti and Lake Woolpolool. In November 2009 surveying around Lake Merreti recorded more than 3,000 waterbirds from 29 species. On Lake Woolpolool, which was watered after Lake Merreti, the numbers were lower, but this may have been at least partly due to widespread, major falls in other areas within the Murray–Darling Basin providing alternative habitat. Frog populations also responded well to the input of environmental water, the threatened southern bell frog (*Litoria raniformis*) being recorded in high numbers.

## Future challenges

Major challenges are:

- supporting and promoting the development of sustainable economic activities based on the region's natural resources, particularly ecotourism
- optimising the management regime for Calperum Station's wetlands to make most effective and efficient use of available water resources
- protecting the critical threatened species habitat provided by mature mallee on Taylorville and Calperum from fire and other potential threats
- developing cross-tenure approaches to managing the broader landscape for shared goals
- landscape-scale restoration of ecological communities and functions
- understanding and managing the effects of salinity on the Calperum floodplain
- understanding and managing the potential impacts of climate change.

#### **KRA1: Natural heritage management**

#### **Major issues**

- Rehabilitating and conserving native vegetation and endemic fauna
- Controlling feral animals and weeds
- Conserving fauna
- Managing wetland watering regimes
- Managing fire, salinity and climate change impacts

#### **Actions**

- Continue feral animal control programs
- Monitor native animal populations and vegetation condition
- Implement fire management strategies
- Support recovery programs for threatened birds
- Actively restore and revegetate wetlands and semi-arid woodlands
- Rationalise watering points
- Encourage and support research into key issues

- Continued regular feral animal control programs, including laying approximately 3,600 fox baits and 60 kilometres of rabbit control bait trail, and ripping 500 rabbit warrens. Feral goat and feral pig control programs continued to maintain populations at low to moderate levels
- Collaborated in a regional pig control research and enhancement project being managed through the SA Murray–Darling Basin Natural Resources Management Board. Project activities included trialling new pig trapping, monitoring and baiting techniques, and hosting a community pig control forum
- Continued to support detailed surveys of vegetation health and weed status at Calperum and Taylorville. Surveys of the Oak Bore (30,000 hectares), Yubalia (28,000 hectares) and Calperum Islands (4,000 hectares) 'blocks' were undertaken
- Continued and enhanced a diverse program of biological monitoring including broadscale small vertebrate surveys, threatened species monitoring, floodplain tree health surveys, vegetation photopoint surveys, and aquatic and terrestrial wetland/floodplain species assessments
- Continued to develop data collection and management techniques, especially use of hand-held computers with global positioning system (GPS) capabilities for collecting and mapping data and transferring the data into Calperum's geographic information system

- Established a new set of small vertebrate monitoring sites to help evaluate the impact of vegetation restoration projects around the Calperum floodplain
- Developed better methods of assessing floodplain grazing pressure
- Supported research by University of Adelaide undergraduate students into rabbit monitoring techniques and parasite loads in floodplain kangaroo populations
- Commenced installation of an atmospheric gas flux monitoring tower on Calperum Station to provide a representative mallee woodland site for the OzFlux network. The facility will be managed by CSIRO and the University of Adelaide and will monitor the flow of carbon, energy and water vapour between the mallee and the atmosphere
- Continued to implement the Bookmark Mallee Fire Management Plan, including fuel reduction burning, fire track maintenance and enhancement, maintenance and upgrading of fire-fighting water storage and participation in cooperative, regional fire management processes
- Hosted training exercises by local Country Fire Service units
- Actively supported threatened species recovery programs for the black-eared miner and malleefowl through biological surveys, predator control and fire management
- Took custody of survey data on behalf of the black-eared miner recovery team
- Successfully sought funding for a research program to undertake surveys to update black-eared miner population data and mitigate threats from fire and habitat 'invasion' by a related species
- Continued to maintain a series of enclosures to serve as reference points for vegetation restoration projects
- Commenced two major vegetation restoration projects. The first project will restore areas of semi-arid woodland connecting the Calperum floodplain and mallee woodlands. The second project will restore degraded areas within the Riverland Ramsar sites, including areas affected by salinity and severe habitat modification
- Commissioned a paper outlining ecological factors and practical management issues affecting restoration of the semi-arid woodland
- Completed preliminary analyses of airborne electromagnetic survey data for floodplain salinity, and installed 20 piezometers to monitor groundwater salinity at locations of interest indentified in the survey
- Supplemented regular monitoring of the existing network of over 50 groundwater test wells installed under the GridWell program with additional monitoring to track the impacts of wetting/drying actions
- Partnered in the development of the Riverland Ramsar Site Management Plan 2010–2015
- Participated in South Australian Government forums on the conservation status of grasses, chenopods and birds within the South Australian Murray–Darling Basin
- Began development of a photographic collection to record long-term trends in the ecological health of the Riverland region, based on photographs held by members of the local community
- Supported the development by volunteers of two local species guidebooks. The first guidebook is designed for use by biological survey volunteers in identifying locally occurring mammals and reptiles, and the second is intended primarily for use by volunteer land managers in identifying weed species that occur on Calperum or Taylorville
- Supported ongoing PhD research projects into the impact of floodplain salinity on invertebrates, and on climatic refugia and the ecological genetics of the southern scrub-robin (*Drymodes brunneopygia*)
- Supported a new PhD research project investigating carbon sequestration in Calperum's mallee woodlands
- Supported a new MSc research project on the ecology of the black-eared miner
- Secured environmental water allocations for filling Lake Merreti and Lake Woolpolool, and conducted enhanced monitoring activities to document the impact of the lakes' filling

#### KRA2: Cultural heritage management

#### **Major issue**

• Protecting and conserving Indigenous and non-Indigenous heritage

#### Action

• Protect, conserve and encourage awareness and recognition of heritage

#### Performance results 2009–10

- Continued to monitor, protect and revegetate identified Indigenous and non-Indigenous heritage sites
- Continued to protect and maintain iconic structures that recall the early pastoral industry, including the Yubalia Outstation ruins, Coopers Camp fishers' hut and various items of pastoral-era infrastructure
- Graduated the first group of four full-time trainees under the Aboriginal Learning on Country project at Calperum in December 2009. This major project develops natural resource and cultural heritage management skills in the region's Aboriginal population, and is run in collaboration with state, Australian Government and private partners. In 2010 the program was expanded, with a new intake of five trainees and a team leader (see case study on page 71)
- Established an Aboriginal ranger training project in collaboration with the SA Murray–Darling Basin Natural Resources Management Board, with funding from the Australian Government's Working on Country program. The project employs five full-time trainees and a team leader, working on natural and cultural heritage management at several sites across the South Australian Riverland
- Hosted and encouraged visits by regional Aboriginal elders to promote engagement in cultural heritage
   management
- Conducted occasional guided tours through more remote areas of Calperum Station, including cultural heritage sites, for members of the general public

#### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Providing quality visitor services that are compatible with conservation objectives, visitor safety and management requirements
- Communicating the values of Calperum and Taylorville
- Conducting relevant research to support management objectives
- Conducting commercial activities that achieve ecologically sustainable use of natural resources, provide financial benefits that support the protection and/or rehabilitation of natural and cultural assets, and serve as models for the region

#### **Actions**

- Manage and monitor day-to-day recreational use
- Develop, maintain and promote education programs for a range of audiences, using the resources at Calperum and Taylorville and the McCormick Centre for the Environment in Renmark
- Continue current research programs, develop further research programs as needed and manage research data
- Develop suitable ecologically sustainable activities
- Review how efficiently available water resources are used

- Continued to redevelop and enhance floodplain camping areas and develop a mallee interpretive garden
- Provided more than 2,900 bed-nights of accommodation to volunteers, students and visitors to Calperum Station
- Continued to upgrade interpretive signs and materials
- Continued occasional 'tag-along' tours to provide the public with safe access to the remote mallee woodland areas of Calperum Station

- Continued to support the development of sustainable ecotourism in the region through the Riverland Ecotourism Association and Riverland Tourism
- Supported the development of a proposal to establish a regionally significant ecotourism venture, 'The Great Riverland Trail', under the auspices of the Riverland Development Corporation (now Regional Development Australia Murraylands and Riverland). The proposed 150 kilometre walking/boating trail would commence at the McCormick Centre for the Environment in Renmark and pass through Calperum and Chowilla Stations before returning to Renmark via the Murray River
- Conducted education programs for students from pre-primary to tertiary, using Calperum Station and the McCormick Centre for the Environment as key activity sites
- Calperum Station and the McCormick Centre for the Environment supported or delivered over 3,200 person-days of education and training to students from all levels of the formal education sector and the general community
- Continued field trips for Year 8 and Year 9 Renmark High School Science and Society and Environment courses
- Supported professional development days for teachers of environment-related subjects
- Continued to provide a Vocational Education and Training program for senior secondary students studying for Certificate 1 and 2 units in Conservation and Land Management
- Four full-time Aboriginal trainees completed Certificate 2 courses in Conservation and Land Management and other accredited training under the SA Murray–Darling Basin Natural Resources Management Board's Aboriginal Learning on Country project
- Hosted three groups of North American tertiary students under the International Student Volunteers program
- Provided a field site, operational support and exhibition facilities for the Australian National University's Engaging Visions project
- Hosted numerous field trips and camps for TAFE SA (Technical and Further Education), university and non-government groups studying biology, ecology and environmental management. Sessions were held on floodplain management, communities' capacity to understand and respond to environmental issues involving the river, conducting biological surveys, collecting and classifying native plants, and the aims and methods of community-based management of Calperum and Taylorville Stations
- Hosted and/or supported activities for community environmental management and education programs and organisations, including Waterwatch, Frogwatch, Community Stream Sampling, the River Murray Youth Council, Rotary's Preserve Planet Earth project, Riverland Youth Theatre and GrowSmart Careers in Science
- Supported the delivery of a regional youth diversion program (Calperum on the Land) in conjunction with South Australian education and legal/law-enforcement agencies, and provided nature-based training activities for participants in the program
- Hosted three PhD students using Calperum Station as a field research site, and numerous undergraduate field trips

#### **KRA5: Stakeholders and partnerships**

#### **Major issues**

- Promoting the UNESCO Man and the Biosphere Programme
- Involving the community in land management
- Supporting and recognising volunteers
- Fostering long-term capacity for sustainable development in the community

- Promote and disseminate information that assists in achieving the goals of the Man and the Biosphere Programme
- Promote, support and oversee extensive volunteer involvement
- Develop a system for consistently recording volunteer hours
- Participate in the Riverland Biosphere Community Committee

- Continued to promote Calperum and the McCormick Centre as places available for research and monitoring, education, skill-sharing and public recreation. Encouraged volunteers to foster these objectives at all suitable opportunities
- Continued to provide various forms of support and to encourage existing and potential volunteers, and maintained a database to record and analyse volunteer contributions to management of the properties. More than 200 individual volunteers engaged in a wide range of management activities on Calperum and Taylorville, with more than 220 volunteers together logging over 8,000 hours of hands-on activity
- Two long-standing volunteers each passed the 2,800 hours mark for accumulated activity
- The McCormick Centre continued to disseminate information on the Man and the Biosphere Programme
- Continued participation in management of the Riverland Biosphere through its community committee
- Continued the Paddock Adoption Scheme, under which teams of community members take direct responsibility for the day-to-day management of particular sections of Calperum and Taylorville
- Supported the delivery of Calperum on the Land, a diversionary program for at-risk Riverland youth, using Calperum Station as a site for environmental training activities
- Continued to engage with Adelaide-based Rotary clubs to promote Calperum and Taylorville as a focus for activity under Rotary's Preserve Planet Earth program

#### **KRA6: Business management**

#### **Major issues**

- Property maintenance
- Business management
- Environmentally sustainable management

#### Actions

- Maintain infrastructure
- Manage the two properties professionally and accountably

- Continued producing seed and tube-stock for use in revegetation projects
- · Maintained existing equipment, buildings, fencing, tracks and other infrastructure
- Continued to develop an outstation at Casuarina Dam on Taylorville Station to support field work and to act as a forward fire-fighting facility
- Continued to maintain and develop visitor accommodation and related infrastructure
- Further upgraded computing and communications infrastructure
- Maintained a recycling program

# **Case Study: Aboriginal training at Calperum Station**

Over recent years Calperum has become the base for two highly successful Indigenous training projects which have started more than a dozen Aboriginal students on the path to careers in conservation. They are the Aboriginal Learning on Country project and a Working on Country project.

The Aboriginal Learning on Country project has become a model for Indigenous training in the region. It grew from a partnership between the community, governments and local businesses to harness the enthusiasm of the local Aboriginal community. The training project was launched in January 2009 with four trainees, who developed their land management skills by taking part in the regular operations of Calperum Station. They learnt how to survey and monitor wildlife, control pests such as goats and rabbits, rehabilitate degraded areas and use machinery and equipment. Over the next 12 months, all the trainees completed a Certificate 2 in Conservation and Land Management along with extra training in areas of their choice.

In 2010 the project was expanded with the recruitment of five new trainees and a dedicated team leader. The crew extended the scope of its operations outside Calperum's borders, maintaining the wetlands and grounds of the McCormick Centre for the Environment in nearby Renmark and assisting with projects at the Kungun Community Development Centre, a cultural centre run by the regional Aboriginal community.

The Calperum project was such a success that two more Aboriginal Learning on Country projects are now under way at Gerard and Monarto Zoo, using the same model of 'learning by doing'.

With local desire for training continuing to grow, a Working on Country training project was launched at Calperum in December 2009 with funding from the Australian Government. The Riverland Aboriginal Ranger project was set up by the South Australian Murray–Darling Basin Natural Resources Management Board, bringing on board another five trainee rangers and a team leader.

These trainees are working on two major vegetation rehabilitation projects in and around Calperum's Ramsar-listed wetlands. They regularly survey grazing pressures, control rabbits and collect and propagate local seeds. They have been busy upgrading the plant nursery facilities, installing irrigation and watering infrastructure, and making and maintaining specialised planting and seeding equipment. After plants go into the ground the team monitors and cares for them, ensuring maximum benefit flows from their efforts. The team is also involved in caring for cultural sites, developing visitor facilities and ecotourism potential, and landscape monitoring and research programs.

Ranger team leader John Williams, an Aboriginal man from the Western Arnhem Land region of the Northern Territory, sees the benefits of the training flowing through the whole community:

'The team is working to preserve and strengthen past, present and future connections between the peoples of the region and their landscape—not just through its own work every day, but also by engaging with the wider community and visitors to the region.'



Trainees learn equipment maintenance as part of their study program. Photo G Whiteman



The Pink Anemone fish typically inhabit coral reefs where they live symbiotically with anemones. Photo Cathy Zwick DEWHA
## 2 Marine reserves summaries for 2009–10

Marine bioregional planning

South-east Commonwealth Marine Reserve Network Apollo Commonwealth Marine Reserve Beagle Commonwealth Marine Reserve Boags Commonwealth Marine Reserve East Gippsland Commonwealth Marine Reserve Flinders Commonwealth Marine Reserve Franklin Commonwealth Marine Reserve Freycinet Commonwealth Marine Reserve Huon Commonwealth Marine Reserve Macquarie Island Commonwealth Marine Reserve Murray Commonwealth Marine Reserve Nelson Commonwealth Marine Reserve South Tasman Rise Commonwealth Marine Reserve Tasman Fracture Commonwealth Marine Reserve Zeehan Commonwealth Marine Reserve

#### South-west Marine Region

Great Australian Bight Marine Park (Commonwealth Waters)

#### North-west Marine Region

Ashmore Reef National Nature Reserve Cartier Island Marine Reserve Mermaid Reef Marine National Nature Reserve Ningaloo Marine Park (Commonwealth Waters)

#### **East Marine Region**

Cod Grounds Commonwealth Marine Reserve Coringa–Herald National Nature Reserve Elizabeth and Middleton Reefs Marine National Nature Reserve Lihou Reef National Nature Reserve Lord Howe Island Marine Park (Commonwealth Waters) Solitary Islands Marine Reserve (Commonwealth Waters)

Heard Island and McDonald Islands Marine Reserve

# Marine bioregional planning

#### www.environment.gov.au/coasts/mbp

Marine bioregional planning is the Australian Government's approach to protecting the conservation values of the marine environments found in Commonwealth waters. The marine bioregional planning process began in 2006 and is due to be completed in 2011. Five marine regions—South-east, South-west, North-west, East and North—have been identified and are shown below.

## Marine planning regions



Marine bioregional plans are being prepared under the EPBC Act and will guide the Minister, sectoral managers and industry in making decisions about conservation issues and priorities in Australia's 14 million square kilometre ocean jurisdiction. The marine bioregional planning process will also meet Australia's national and international commitment to establish a national representative system of marine protected areas in Commonwealth waters by 2012.

Marine bioregional plans are developed in three stages: firstly a profile of the region's characteristics; secondly a draft plan; and finally a marine bioregional plan which includes a proposed network of representative marine protected areas. Marine protected areas must be declared under the EPBC Act before coming into effect. Once they are declared, activities within marine protected areas are regulated through a management plan prepared by the Director of National Parks.

The Director of National Parks is responsible for Commonwealth marine reserves which already exist in four of the five marine regions and are managed under delegation from the Director by the department's Marine Division. To date one network, the South-east Commonwealth Marine Reserve Network, has been established.

In May 2009 the last bioregional profile, covering the East marine region, was released. The bioregional profiles can be accessed at http://www.environment.gov.au/coasts/mbp/index.html.

In 2009–10, areas for further assessment were released for the South-west, North, North-west and East marine regions. These encompass representative examples of the range of biodiversity and ecosystems, and are the first step in identifying marine reserves. Areas for further assessment do not define the proposed boundaries for new marine reserves. They are intended to aid analysis of information at a detailed scale and thus help narrow the areas of focus for locating new marine reserves. They provide detailed information about social and economic interests that can be used to minimise and/or avoid impacts on industry when designing marine reserves.

The following sections report on the management of reserves in the South-east, South-west, North-west and East marine regions. The North Marine Region, which covers an area of more than 715,000 square kilometres in the Gulf of Carpentaria, Arafura Sea and Timor Sea as far west as the Northern Territory–Western Australian border, does not yet contain any marine protected areas.





The deep sea stalked crinoid, Pentacrinitidae spA. Its arms are joined together to form a feeding basket where food is captured. Stalked crinoids resemble feather stars but have a stalk that allows them to elevate the feeding basket into the water column to catch food drifting past. Photo Courtesy of CSIRO

# South-east Commonwealth Marine Reserve Network

www.environment.gov.au/coasts/mpa/southeast



## **Special features**

The South-east Commonwealth Marine Reserve Network is the first temperate, deep-sea marine reserve network in the world. This large network comprises 14 reserves that are representative examples of the diverse sea floor features and associated habitats found in the South-east Marine Region. The South-east Marine Region stretches from the far south coast of New South Wales, around Tasmania and Victoria and west to Kangaroo Island off South Australia out to 200 nautical miles, and includes Macquarie Island and its surrounding waters.

The Reserve Network includes significant underwater features such as canyons, seamounts, and diverse marine life associated with them, some of which is new to science and found nowhere else in the world. The Reserve Network provides habitat and feeding grounds for a variety of birds and sea life including large iconic species such as the great white shark (*Carcharodon carcharias*), southern bluefin tuna (*Thunnus maccoyii*) and migrating whales. The deeper parts of the Reserve Network are home to a diverse range of fish and other creatures such as crabs, coral, sea urchins and sponges.

The 14 reserves in the South-east Commonwealth Marine Reserve Network are:

- Apollo Commonwealth Marine Reserve
- Beagle Commonwealth Marine Reserve
- Boags Commonwealth Marine Reserve
- East Gippsland Commonwealth Marine Reserve
- Flinders Commonwealth Marine Reserve
- Franklin Commonwealth Marine Reserve
- Freycinet Commonwealth Marine Reserve
- Huon Commonwealth Marine Reserve
- Macquarie Island Commonwealth Marine Reserve
- Murray Commonwealth Marine Reserve
- Nelson Commonwealth Marine
- South Tasman Rise Commonwealth Marine Reserve
- Tasman Fracture Commonwealth Marine Reserve
- Zeehan Commonwealth Marine Reserve.

The reserves are managed by the department's Marine Division under delegation from the Director of National Parks.

## South-east Commonwealth Marine Reserve Network overview

| Area                                      | 388,458 square kilometres  |                |
|---|--|----------------|
| Proclamation date                         | 28 June 2007 (effective 3 September 2007)  |                |
| IUCN category                             | Includes Categories Ia, II, IV and VI. See individual reserves   | 5              |
| Biogeographic context                     | Includes various Integrated Marine and Coastal Regionalisation for Australia (IMCRA) 4.0 provincial bioregions.<br>See individual reserves   |                |
| Management plan                           | A management plan (to include the Macquarie Island Commonwealth Marine Reserve) is currently being developed   |                |
| Other significant<br>management documents | Australian Government annual business agreements with the Victorian and South Australian governments,<br>Tasmania Police and Tasmanian Parks and Wildlife Service; memorandum of understanding between the<br>Department of the Environment, Water, Heritage and the Arts and Australian Fisheries Management Authority;<br>a departmental memorandum of understanding between Parks Australia and the Marine Division |                |
| Financial                                 | Operating  | \$814,084*     |
|   | Capital  | Not applicable |
|   | Revenue  | Not applicable |
| Permits/approvals                         | Operating under interim management arrangements with:<br>370 commercial fishing approvals  |                |
|   |  |                |
|   | 17 commercial tourism approvals  |                |
|   | 2 scientific approvals   |                |

\* In addition to the operating costs for each reserve, \$903,090 was spent across the 25 marine reserves managed by the Marine Division on professional services, permits and performance assessment systems, training, communications, workshops and conference attendance, surveillance and enforcement activities

| International conventions and agreements  |   |  |
|---|---|--|
| World Heritage Convention                 | Macquarie Island and waters within a 12 nautical mile radius were listed as a<br>World Heritage Area in 1997  |  |
| Migratory Species (Bonn) Convention       | 25 of 105 listed Australian species   |  |
| China-Australia Migratory Birds Agreement | 4 of 81 listed species  |  |
| Japan–Australia Migratory Birds Agreement | 5 of 77 listed species  |  |
| Korea-Australia Migratory Birds Agreement | 3 of 59 listed species  |  |
| Other agreements                          | Agreement on the Conservation of Albatrosses and Petrels; International<br>Convention for the Regulation of Whaling;<br>Convention on the Conservation of Antarctic Marine Living Resources |  |

| Environment Protection and Biodiversity Conservation Act 1999 |  |   |  |
|---|--|---|--|
| Listed fauna  | Species  | 21 endangered<br>44 vulnerable<br>30 migratory<br>72 marine   |  |
|   | Recovery plans   | 11 being implemented: albatross ( <i>Diomeda</i> spp. and <i>Thalassarche</i> spp.) and giant petrels ( <i>Macronectes</i> spp.); marine turtles; 10 seabird species; southern right whale ( <i>Eubalaena australis</i> ); blue whale ( <i>Balaenoptera musculus</i> ), fin whale ( <i>B. physalus</i> ) and sei whale ( <i>B. borealis</i> ); white shark ( <i>Carcharodon carcharias</i> ); grey nurse shark ( <i>Carcharias taurus</i> ); humpback whale ( <i>Megaptera novaeangliae</i> ); 4 handfish species; and sub-Antarctic fur seal ( <i>Arctocephalus tropicalis</i> ) and southern fur seal ( <i>Mirounga leonina</i> ) |  |
| Listed flora  | None   |   |  |
| Heritage  | Part of Macquarie Island Com<br>National Heritage List | monwealth Marine Reserve and part of Huon Commonwealth Marine Reserve on  |  |

| Numbers of native species recorded <sup>(a)</sup> |             |            |              |           |
|---|-------------|------------|--------------|-----------|
| Mammals   | Birds       | Reptiles   | Fish         | Plants    |
| At least 44                                       | At least 61 | At least 4 | At least 158 | Not known |

(a) Species numbers are from a 2006 species inventory based on documented sightings taken in the Reserve Network and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

## **Management arrangements**

A management plan for all 14 Commonwealth marine reserves in the Reserve Network is currently being developed. The draft management plan is expected to be released for public consultation in the second half of 2010.

A first round of public consultation on the Director's intention to draft a management plan was undertaken in early 2008. Submissions were received from individuals, businesses, conservation organisations, recreational associations, industry groups and government agencies.

Some delays have been experienced in developing a draft plan for further consultation because it will form a template for future network plans. Interim arrangements are in place to manage use of the Reserve Network until a management plan is in operation.

## Monitoring

Relatively little is known about the plants and animals of the South-east Marine Region's deep-water habitats. As part of the management plan, the department intends to develop a research and monitoring strategy to identify and address the main knowledge gaps for the Reserve Network.

In the meantime, the Director will continue to undertake and approve research projects that clearly address management needs for the Reserve Network. The findings of two major projects conducted in 2008–09 which studied aspects of the South-east Marine Region's ecology in both continental shelf and deep-water habitats will be considered in developing the management plan.

## Future challenges

Major challenges are:

- understanding the full extent of the social, economic and environmental values associated with the Reserve Network and implementing a management program that sustains these values
- managing a large area of marine reserves which are isolated, remote and costly to visit
- improving knowledge and management of the key threats impacting on the values of the Reserve Network
- liaising with key stakeholders and other community interest groups about reserve and network management
- maintaining productive management partnerships with relevant state and Australian Government agencies
- developing and implementing an awareness program for key stakeholder groups and the community generally
- encouraging appropriate use of the Reserve Network, compliance with its rules and active stakeholder involvement in its day-to-day management
- establishing a research and monitoring program to guide management over the longer term.

## Report on performance by key result areas

#### **KRA1: Natural heritage management**

#### **Major issues**

- · Limited information on the ecological communities and processes within the Reserve Network
- Degradation of feeding and breeding areas within state jurisdiction on Macquarie Island that affects reserve values offshore

#### Actions

- Develop an integrated and focused research and monitoring strategy to underpin management of the Reserve Network
- Continue to work in partnership with the relevant state governments to protect and develop understanding of species, habitats and marine systems and their interaction with Commonwealth marine reserves

#### Performance results 2009–10

- Began the Macquarie Island pest (rodent and rabbit) eradication program. On successful completion this will provide many seabird species that forage within the adjacent marine reserves with a restored habitat, free of predatory rodents, in which to recolonise the island
- Funded research projects by the Tasmanian Aquaculture and Fisheries Institute and CSIRO. The studies commenced in late 2009 and will provide baseline biological information for several of the reserves
- Inventoried scientific literature relevant to the Reserve Network
- The Tasmanian Department of Primary Industries, Parks, Water and Environment monitored key seabird and pinniped species on Macquarie Island, and collected and removed marine debris. This work provided valuable data on populations of key species and minimised risk to island-based species that use Macquarie Island Commonwealth Marine Reserve as a foraging area

### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Reserve use under the interim management arrangements
- · Lack of Australian Government compliance and enforcement capacity for the South-east Marine Region
- Monitoring and detection of illegal activities
- Potential non-compliance with Reserve Network interim management arrangements by some recreational and commercial fishing operators and commercial tourism operators

### Actions

- Develop strategies to detect and monitor illegal activities including entering into information sharing arrangements and contracting compliance services with relevant parties
- Develop educational material, including posters, brochures and DVDs, to raise community awareness and understanding of the Reserve Network values and the management arrangements

### Performance results 2009–10

- Continued interim management arrangements providing for use of the Reserve Network consistent with the zoning of the individual reserves, pending development of the Reserve Network management plan
- Continued annual arrangements with state and Australian Government agencies to deliver compliance and enforcement in the South-east Marine Region
- Conducted compliance monitoring at Macquarie Island Commonwealth Marine Reserve as a result of an investigation initiated by the Australian Fisheries Management Authority
- Distributed the Warden's Field Manual for the South-east Marine Region to Australian and state government agencies to assist appointed wardens in administering the EPBC Act
- Received monthly reports from the Australian Fisheries Management Authority to assist compliance monitoring
- · Continued to distribute educational products to stakeholders and the community
- Developed, in partnership with the Tasmanian Parks and Wildlife Service, a communication/education concept plan for the Reserve Network with emphasis on promoting the values and appropriate use of Freycinet Commonwealth Marine Reserve

### KRA5: Stakeholders and partnerships

### **Major issues**

- Ensuring ongoing and constructive engagement with the community, key stakeholders and interest groups and government agencies
- Establishing complementary management arrangements with state and Australian Government agencies

#### Actions

- Develop formal partnerships with state and Australian Government agencies to maintain an active compliance and enforcement capacity for the South-east Marine Region
- · Consult with key stakeholders and interest groups on management arrangements and planning

#### Performance results 2009–10

- Signed annual business agreements with Tasmanian and South Australian government departments to undertake vessel patrols and air surveillance within the Reserve Network consistent with risk management
- Continued consultation with the South East Region Fishing Industry Working Group and fishing industry representatives. Provided support for a fishing industry liaison officer
- Continued to consult with stakeholders and the community on developing a draft management plan for the Reserve Network
- Continued the service level agreement with the Tasmanian Government on the cooperative management of marine protected areas, including Macquarie Island Commonwealth Marine Reserve

# **Apollo Commonwealth Marine Reserve**

VICTORIA Apollo Bay King Island Melbourne Apollo Bay King Island APOLLO COMMONWEALTH MARINE RESERVE

www.environment.gov.au/coasts/mpa/southeast/apollo

### Special features

Apollo Commonwealth Marine Reserve is located off Apollo Bay on Victoria's west coast. It lies in the shallow waters of the continental shelf at depths of 80 to 120 metres. The reserve complements the Victorian Government's marine protected area network.

The reserve contains representative samples of the Bass Strait Province bioregion that extends from South Australia to the west of Tasmania. The area includes the Otway Depression, an undersea valley that joins the Bass Basin to the open ocean. This valley was an outlet channel from the old Bass Lake and mainland river systems during the last ice age.

The reserve encompasses an area of the continental shelf which is a high-energy environment, exposed to large swell waves from the south-west and strong tidal flows. These rough seas are home to such species as fur seals and the school shark (*Galeorhinus galeus*).

| Location              | Latitude 39°16'South, Longitude 143°35'East          |
|-----------------------|--|
| Area                  | 118,360 hectares                                     |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)            |
| IUCN category         | Category VI  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Bass Strait Province |

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# **Beagle Commonwealth Marine Reserve**

Melbourne VICTORIA BEAGLE COMMONWEALTH MARINE RESERVE Units Group Flinders Island

www.environment.gov.au/coasts/mpa/southeast/beagle

## **Special features**

Beagle Commonwealth Marine Reserve is situated entirely within the shallow Bass Strait. It lies mostly between depths of 50 to 70 metres with its north-western edge abutting Victorian waters to the south-east of Wilsons Promontory.

Beagle Reserve is representative of an area of shallow continental shelf ecosystems that extends around south-eastern Australia to the east of Tasmania. It covers an area of the sea floor that is thought to have formed a land bridge with Tasmania as recently as 10,000 years ago during the last ice age.

The reserve encompasses the fauna of central Bass Strait which is expected to be especially rich based on studies of several sea floor dwelling animal groups. Its boundary encloses the Tasmanian Kent Group Marine Reserve and the Hogan and Curtis Island groups. Its ecosystems are similar to those documented for the

deeper sections of the Kent Group Marine Reserve, especially those based around rocky reefs. They support beds of encrusting, erect and branching sponges, and sediment composed of shell grit with patches of large sponges and sparse sponge habitats.

The reserve's deep rocky reefs support a rich array of life, and the area provides homes and feeding grounds for seabirds, little penguins (*Eudyptula minor*) and Australian fur seals (*Arctocephalus pusillus doriferus*). The reserve is located near the Hunter group of islands, which is an important breeding area for the fairy prion (*Pachyptila turtur*), shy albatross (*Thalassarche cauta cauta*), silver gull (*Chroicocephalus novaehollandiae*), short-tailed shearwater (*Ardenna tenuirostris*), black-faced cormorant (*Phalacrocorax fuscescens*), Australian gannet (*Morus serrator*), common diving petrel (*Pelecanoides urinatrix*) and little penguin.

| Location              | Latitude 39°21'South, Longitude 146°58'East          |
|-----------------------|--|
| Area                  | 292,758 hectares                                     |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)            |
| IUCN category         | Category VI  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Southeast Transition |

## **Boags Commonwealth Marine Reserve**

www.environment.gov.au/coasts/mpa/southeast/boags



## **Special features**

Boags Commonwealth Marine Reserve is situated off the north-western tip of Tasmania, north of Three Hummock Island. The reserve is wholly contained within western Bass Strait with a depth range mostly between 50 and 80 metres.

The reserve represents an area of shallow continental shelf ecosystems that extends through central Bass Strait. It encompasses the fauna of central Bass Strait, which is expected to be especially rich based on studies of several sea floor dwelling animal groups.

The reserve contains a rich array of life, particularly bottom dwelling animals, as is common for the central Bass Strait area. It is also a foraging area for a variety of seabirds, including the fairy prion (*Pachyptila turtur*), shy albatross (*Thalassarche cauta cauta*), silver gull (*Chroicocephalus novaehollandiae*), short-tailed shearwater (*Ardenna tenuirostris*), black-faced cormorant

(*Phalacrocorax fuscescens*), Australian gannet (*Morus serrator*), common diving petrel (*Pelecanoides urinatrix*) and little penguin (*Eudyptula minor*). It lies adjacent to an important breeding area in Tasmania's north-west, particularly the Hunter group of islands.

| Location              | Latitude 40°14' South, Longitude 144°59' East        |
|-----------------------|--|
| Area                  | 53,748 hectares                                      |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)            |
| IUCN category         | Category VI  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Bass Strait Province |

# **East Gippsland Commonwealth Marine Reserve**

www.environment.gov.au/coasts/mpa/southeast/east-gippsland



### **Special features**

East Gippsland Commonwealth Marine Reserve is located off the coast near the NSW–Victoria border. The reserve contains representative samples and impressive geomorphic features such as rocky substrate habitat, an extensive network of submarine canyons, an escarpment in depths from 600 metres to deeper than 4,000 metres and a knoll which juts out from the base of the continental slope.

The reserve includes both warm and temperate waters and supports free-floating aquatic plants and microscopic plant (phytoplankton) communities. The area's complex seasonality in oceanographic patterns influences biodiversity and local productivity. There are summertime incursions of the warm East Australian Current and a wintertime cascade of cold water from Bass Strait that sinks along the upper slope and forms a temperature front. This cold front helps nutrients come to the surface

and in turn this supports a diverse phytoplankton community and other sea life. It is thought that the area provides foraging habitat for seabirds including the wandering albatross (*Diomedea exulans*).

| Location              | Latitude 38°04′ South, Longitude 150°20′ East        |
|-----------------------|--|
| Area                  | 413,664 hectares                                     |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)            |
| IUCN category         | Category VI  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Southeast Transition |

# **Flinders Commonwealth Marine Reserve**

www.environment.gov.au/coasts/mpa/southeast/flinders



## **Special features**

Flinders Commonwealth Marine Reserve is named after the adjacent Flinders Island in the Furneaux group of islands to the north-east of Tasmania. The reserve covers a depth range from about 40 metres on the shallow continental shelf to depths of approximately 3,000 metres at the edge of Australia's Exclusive Economic Zone.

The reserve spans continental shelf, slope and deeper water ecosystems of the major biological zone that extends around south-eastern Australia to the east of Tasmania. Key features of this area are the continental shelf and a long portion of steep continental slope escarpment incised by a series of submarine canyons. Sea bottom habitats include sheer rocky walls and large rocky outcrops that support a rich diversity of small seabed animals such as lace corals and sponges. These and the large expanses of sandy and muddy

sediments are habitats for a wide variety of fishes and invertebrates.

Biodiversity is influenced by summertime incursions of the warm East Australian Current and associated large-scale, anti-clockwise whirlpools. Another prominent feature is a large offshore seamount. Seamounts are generally considered to be important centres of deep ocean biodiversity.

The shallower part of the reserve includes habitat important to the white-fronted tern (*Sterna striata*), Australian gannet (*Morus serrator*), black-faced cormorant (*Phalacrocorax fuscescens*), common diving petrel (*Pelecanoides urinatrix*), fairy prion (*Pachyptila turtur*), little penguin (*Eudyptula minor*), shy albatross (*Thalassarche cauta cauta*), silver gull (*Chroicocephalus novaehollandiae*), crested tern (*Thalasseus bergii*), short-tailed shearwater (*Ardenna tenuirostris*) and white-faced storm-petrel (*Pelagodroma marina*). Importantly, the reserve includes the habitat of a suite of continental shelf and slope shark species, including school shark (*Galeorhinus galeus*) and, between 400 and 600 metre depths, gulper sharks—Harrison's dogfish (*Centrophorus harrissoni*) and southern dogfish (*C. zeehaani*). Among the fishes, sponges and deep-water corals of this reserve is the giant crab (*Pseudocarcinus gigas*). This is one of the biggest crabs in the world, weighing up to 15 kilograms.

| Location              | Latitude 40°00' South, Longitude 151°17' East                             |  |
|-----------------------|---|--|
| Area                  | 2,704,306 hectares  |  |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)                                 |  |
| IUCN category         | Category la overall comprising:   |  |
|                       | Sanctuary Zone Category la (2,581,195 hectares)                           |  |
|                       | Multiple Use Zone Category VI (123,111 hectares)                          |  |
| Biogeographic context | IMCRA 4.0 provincial bioregions: Tasmanian Province, Southeast Transition |  |

# Franklin Commonwealth Marine Reserve

www.environment.gov.au/coasts/mpa/southeast/franklin



## **Special features**

Franklin Commonwealth Marine Reserve is situated off the north-western tip of Tasmania, south of King Island. The reserve covers an area of continental shelf waters in a depth range of 50 to 150 metres.

The reserve represents an area of shallow continental shelf ecosystems. It incorporates two major biological zones: the Franklin Zone, which runs down the west coast of Tasmania (from which the reserve takes its name) and the biological zone that extends from South Australia and western Victoria.

This reserve provides a feeding ground for a variety of seabirds, including the fairy prion (*Pachyptila turtur*), shy albatross (*Thalassarche cauta cauta*), silver gull (*Chroicocephalus novaehollandiae*), short-tailed shearwater (*Ardenna tenuirostris*), black-faced cormorant (*Phalacrocorax fuscescens*), common diving petrel

(*Pelecanoides urinatrix*) and, in particular, the Australian gannet (*Morus serrator*) that breeds at the nearby Black Pyramid Rock—one of only eight breeding sites in Australia.

| Location              | Latitude 40°46' South, Longitude 144°16' East   |
|-----------------------|---|
| Area                  | 67,077 hectares   |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)   |
| IUCN category         | Category VI   |
| Biogeographic context | IMCRA 4.0 provincial bioregions: Western Bass Strait Transition, Tasmanian Transition |

# **Freycinet Commonwealth Marine Reserve**



www.environment.gov.au/coasts/mpa/southeast/freycinet

### **Special features**

Freycinet Commonwealth Marine Reserve is named after the adjacent Freycinet National Park on the east coast of Tasmania. It covers a depth range from about 40 metres on the continental shelf to depths of approximately 3,000 metres at the edge of Australia's Exclusive Economic Zone.

The reserve spans the continental shelf, slope and deeper water ecosystems of the major biological zone that extends around south-eastern Australia to the east of Tasmania. Key features of this area are the continental shelf and a long portion of steep continental slope escarpment that joins a large offshore saddle.

Other prominent features include large offshore seamounts which are believed to be individually important, providing habitat to species that may be unique to each seamount and to a range of more widely occurring species.

The shallower part of the reserve includes habitat important to the white-fronted tern (*Sterna striata*), Australian gannet (*Morus serrator*), black-faced cormorant (*Phalacrocorax fuscescens*), common diving petrel (*Pelecanoides urinatrix*), fairy prion (*Pachyptila turtur*), little penguin (*Eudyptula minor*), shy albatross (*Thalassarche cauta cauta*), silver gull (*Chroicocephalus novaehollandiae*), crested tern (*Thalasseus bergii*), short-tailed shearwater (*Ardenna tenuirostris*) and white-faced storm-petrel (*Pelagodroma marina*).

Additionally, the reserve includes the habitat of a group of continental shelf and slope shark species, including school shark (*Galeorhinus galeus*) and, between 400 and 600 metres, two gulper sharks—Harrison's dogfish (*Centrophorus harrissoni*) and southern dogfish (*C. zeehaani*).

| Location              | Latitude 42°12' South, Longitude 151°07' East  |  |
|-----------------------|--|--|
| Area                  | 5,794,248 hectares   |  |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)  |  |
| IUCN category         | Category la overall comprising:  |  |
|                       | Sanctuary Zone Category la (5,679,269 hectares)  |  |
|                       | Recreational Use Zone Category II (32,330 hectares)  |  |
|                       | Multiple Use Zone Category VI (82,649 hectares)  |  |
| Biogeographic context | IMCRA 4.0 provincial bioregions: Tasmania Province, Southeast Transition, Tasmanian IMCRA Province |  |

# **Huon Commonwealth Marine Reserve**

www.environment.gov.au/coasts/mpa/southeast/huon



## **Special features**

Huon Commonwealth Marine Reserve is situated to the south-east of Tasmania. It covers a broad depth range from the inner continental shelf at about 70 metres to the abyss at over 3,000 metres. The majority of the reserve's area is in deep water.

The reserve spans the continental shelf, continental slope and deeper water ecosystems of a primary biological zone to the south of Tasmania. Close to the shore seabirds and school shark (*Galeorhinus galeus*) can be found, while further into the open ocean the seabed is made up of deep plains which are broken up by submerged mountains. A diverse range of fish, coral, squid, crabs and other animals make these seamounts their home.

The reserve's most remarkable feature is a cluster of cone-shaped submerged seamounts. The natural values of these seamounts include a rich seabed fauna

characterised by high numbers of endemic species and the presence of large, erect seabed animals, including habitat-forming corals and sponges. Some of these are extremely long-lived—hundreds and possibly thousands of years old—making them some of the longest-lived animals on earth. The reserve's seamounts provide an important connection between seamounts of the Indian Ocean and the Tasman Sea. In 2006 the Tasmanian Seamounts area was added to the Commonwealth Heritage List to recognise its unique natural values.

The reserve also includes an area of continental shelf and slope known to be important foraging habitat for the Australian gannet (*Morus serrator*), shy albatross (*Thalassarche cauta cauta*) and silver gull (*Chroicocephalus novaehollandiae*) from adjacent nesting areas. Based on the distribution of larvae, this area is also known to provide spawning or nursery areas for important commercial fishes including the ocean perch (*Helicolenus barathri* and *H. percoides*) and blue warehou (*Seriolella brama*). Other offshore geological features include terraces, rotated continental blocks, saddles, pinnacles and canyons, which are believed to provide habitat for unique fauna.

| Location              | Latitude 44°19' South, Longitude 147°40' East                                |  |
|-----------------------|--|--|
| Area                  | 999,074 hectares   |  |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)                                    |  |
| IUCN category         | Category VI overall comprising:  |  |
|                       | Benthic Sanctuary Zone Category la (38,897 hectares)                         |  |
|                       | Multiple Use Zone Category VI (960,177 hectares)                             |  |
| Biogeographic context | IMCRA 4.0 provincial bioregions: Tasmanian IMCRA Province, Tasmania Province |  |

# Macquarie Island Commonwealth Marine Reserve

www.environment.gov.au/coasts/mpa/macquarie



### **Special features**

Macquarie Island Commonwealth Marine Reserve protects the unique and vulnerable marine ecosystems of the south-eastern portion of Commonwealth waters around Macquarie Island. The reserve includes significant feeding and migratory areas for a number of threatened marine mammals and seabirds. It contains a variety of large-scale benthic (seabed) habitats, each exposed to different depths, currents, nutrient levels, wave activity and temperatures.

The Macquarie Island region has unique geological characteristics. It is the only known location where oceanic crust from a normal mid-ocean ridge has been lifted above sea level in a major oceanic basin.

In 1997 Macquarie Island and waters within a 12 nautical mile radius were inscribed on the World Heritage List.

Several species found in the region are under threat, including albatross, penguin and seal species.

Macquarie Island is also listed as a critical habitat under the EPBC Act for the grey-headed albatross (*Thalassarche chrysostoma*) and wandering albatross (*Diomedea exulans*).

| Location              | Latitude 55°54' South, Longitude 161°38' East             |  |
|-----------------------|---|--|
| Area                  | 16,189,466 hectares                                       |  |
| Proclamation date     | 27 October 1999   |  |
| IUCN category         | Category IV overall comprising:                           |  |
|                       | Sanctuary Zone Category Ia (5,713,710 hectares)           |  |
|                       | Habitat Species Zone Category IV (10,475,756 hectares)    |  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Macquarie Island Province |  |

# **Murray Commonwealth Marine Reserve**



www.environment.gov.au/coasts/mpa/southeast/murray

### **Special features**

Murray Commonwealth Marine Reserve stretches south of the River Murray mouth off the South Australian coast for a distance of more than 400 kilometres. It runs from the inshore state waters to the edge of Australia's Exclusive Economic Zone.

The reserve protects samples of the region's key features, including continental shelf and slope, abyssal (ocean floor) plain and canyons. It includes areas of Australian sea lion (*Neophoca cinerea*) and New Zealand fur seal (*Arctocephalus forsteri*) habitat, a residence area for school shark (*Galeorhinus galeus*) and, at depths of 400 to 600 metres, habitat for the southern dogfish (*Centrophorus zeehaani*), a species of gulper shark.

The reserve spans an extensive area across the Lacapede shelf, continental slope and deeper water ecosystems that extends from South Australia to the west of Tasmania. It contains one of the most spectacular

geological formations on the Australian continental block, the Murray Canyons. The canyons are situated south of Kangaroo Island off the South Australian coast and stretch for more than 150 kilometres. Deeper than America's Grand Canyon and more than twice the height of Mount Kosciuszko, the Murray Canyons descend to 4,600 metres below sea level.

The marine life that inhabits the Murray Canyons is supported by nutrient-rich sediments that have been deposited over thousands of years by the River Murray. Occasional seasonal upwelling occurs in this area, when nutrient-rich deeper waters are brought to the surface. This upwelling stimulates the food chain by encouraging the growth of phytoplankton which in turn become food for larger predators, resulting in a profusion of life.

| Location              | Latitude 37°26' South, Longitude 137°12' East   |  |
|-----------------------|---|--|
| Area                  | 2,580,312 hectares  |  |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)   |  |
| IUCN category         | Category la overall comprising:   |  |
|                       | Sanctuary Zone Category la (1,274,916 hectares)   |  |
|                       | Multiple Use Zone Category VI (590,687 hectares)  |  |
|                       | Special Purpose Zone Category VI (714,709 hectares)   |  |
| Biogeographic context | IMCRA 4.0 provincial bioregions: Spencer Gulf IMCRA Province, Southern Province, West Tasmania Transition |  |

# **Nelson Commonwealth Marine Reserve**



www.environment.gov.au/coasts/mpa/southeast/nelson

### **Special features**

Nelson Commonwealth Marine Reserve lies off the far south-east corner of South Australia and spans the deep water ecosystems (below 3,000 metres) extending from South Australia to the west of Tasmania. It encompasses geological features including plateaus, knolls, canyons and the abyssal plain (a large area of extremely flat or gently sloping ocean floor just offshore from a continent).

Scientists believe these areas are home to unique fauna, but little is known about what lives on the seabed of this reserve. The reserve is known to be an important area for a number of whale species including the southern right (*Eubalaena australis*), sperm (*Physeter macrocephalus*), minke (*Balaenoptera acutorostrata*), killer (*Orcinus orca*), long-finned pilot (*Globicephala melas*), short-finned pilot (*Globicephala macrorhynchus*) and blue (*Balaenoptera musculus*).

| Location              | Latitude 39°18' South, Longitude 139°52' East            |  |
|-----------------------|--|--|
| Area                  | 612,311 hectares   |  |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)                |  |
| IUCN category         | Category VI  |  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: West Tasmania Transition |  |

# South Tasman Rise Commonwealth Marine Reserve

 TASMANIA
 Image: Comparison of the second second

www.environment.gov.au/coasts/mpa/southeast/south-tasman-rise

### **Special features**

South Tasman Rise Commonwealth Marine Reserve covers an area of deep ocean to the south-east of Tasmania. It includes a section of the mid-continental slope of the South Tasman Rise at depths of 1,200 to 3,000 metres. The reserve's southern edge follows the boundary of Australia's Exclusive Economic Zone, 200 nautical miles from land. It encloses a submerged ridge of continental rock that stands as the last remnant of the link between Australia and Antarctica.

Deformed by the massive rifting process when the Australian continental block moved north, the South Tasman Rise supports unique environments for marine life and is an area of significant scientific interest.

The reserve contains several seamounts, some of which have flat summits, which indicates a period of exposure above the surface at some time.

| Location              | Latitude 46°17' South, Longitude 149°04' East       |  |
|-----------------------|---|--|
| Area                  | 2,770,437 hectares                                  |  |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)           |  |
| IUCN category         | Category VI   |  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Tasmania Transition |  |

# **Tasman Fracture Commonwealth Marine Reserve**

www.environment.gov.au/coasts/mpa/southeast/tasman-fracture



### **Special features**

Tasman Fracture Commonwealth Marine Reserve extends south-west of Tasmania from the continental shelf to the Exclusive Economic Zone boundary, 200 nautical miles from land. It complements the Port Davey Marine Reserve declared by the Tasmanian Government.

The reserve spans the continental shelf, continental slope and deeper water ecosystems to the south of Tasmania. It is scored by steep canyons and encloses other geological features which are believed to be characterised by unique fauna. These features include steep escarpments and troughs, saddles, canyons, basins and part of a plateau that is over 400 kilometres long and rises up to three kilometres above the sea floor.

The northernmost section of the reserve includes a drowned river valley. The natural values of this reserve include important habitat for the fairy prion

(Pachyptila turtur), little penguin (Eudyptula minor), common diving petrel (Pelecanoides urinatrix), short-tailed shearwater (Ardenna tenuirostris), silver gull (Chroicocephalus novaehollandiae), school shark (Galeorhinus galeus) and blue warehou (Seriolella brama).

Due to its location, extending south of the subtropical convergence zone and into the sub-Antarctic front, the reserve's fauna includes sub-Antarctic fishes and seabed invertebrates in at least the continental shelf and continental slope areas. Biodiversity in the reserve is also influenced by the Zeehan Current, which is the most easterly extent of flow from the Indian Ocean around southern Australia.

| Location              | Latitude 44°49' South, Longitude 144°49' East  |  |
|-----------------------|--|--|
| Area                  | 4,250,056 hectares   |  |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)  |  |
| IUCN category         | Category VI overall comprising:  |  |
|                       | Sanctuary Zone Category 1a (69,212 hectares)   |  |
|                       | Multiple Use Zone Category VI (2,049,572 hectares)   |  |
|                       | Special Purpose Zone Category VI (2,131,272 hectares)  |  |
| Biogeographic context | IMCRA 4.0 provincial bioregions: Tasmania Province, West Tasmania Province, Tasmanian IMCRA Province |  |

# Zeehan Commonwealth Marine Reserve



www.environment.gov.au/coasts/mpa/southeast/zeehan

### **Special features**

Zeehan Commonwealth Marine Reserve lies to the west and south-west of King Island off north-west Tasmania. It covers a broad depth range from the shallow continental shelf of approximately 50 metres to the abyssal (ocean floor) plain that is over 3,000 metres deep.

The reserve spans the continental shelf, continental slope and deeper water ecosystems of the major biological zone that extends from South Australia to the west of Tasmania. A significant feature of the reserve is a series of four submarine canyons that incise the continental slope, extending from the shelf edge to the abyssal plains. Biodiversity and productivity on the outer shelf and upper slope in the reserve are influenced by the Zeehan Current and its interactions with the canyons.

The reserve includes a variety of seabed habitats including rocky limestone banks. These support rich animal communities made up of large sponges and

other permanently attached or fixed invertebrates on the continental shelf. There are also extensive 'thickets' of low invertebrate animals—mostly lace corals and sponges—on the continental slope. These communities are exceptionally diverse and include species new to science. The rocky limestone banks provide important seabed habitats for a variety of commercial marine species, including the giant crab (*Pseudocarcinus gigas*). Concentrations of larval blue warehou (*Seriolella brama*) and ocean perch (*Helicolenus barathri* and *H. percoides*) indicate the area's role as a nursery ground.

The reserve is also a foraging area for a variety of seabirds, including the fairy prion (*Pachyptila turtur*), shy albatross (*Thalassarche cauta cauta*), silver gull (*Chroicocephalus novaehollandiae*) and short-tailed shearwater (*Ardenna tenuirostris*).

| Location              | Latitude 41°10' South, Longitude 142°18' East   |  |
|-----------------------|---|--|
| Area                  | 1,989,697 hectares  |  |
| Proclamation date     | 28 June 2007 (effective 3 September 2007)   |  |
| IUCN category         | Category VI overall comprising:   |  |
|                       | Multiple Use Zone Category VI (93,298 hectares)   |  |
|                       | Special Purpose Zone Category VI (1,896,399 hectares)   |  |
| Biogeographic context | IMCRA 4.0 provincial bioregions: West Tasmania Transition, Western Bass Strait IMCRA Transition, Tasmania |  |
|                       | Transition  |  |



The swallowtail nannygai are a distinctive fish species found in warm water reefs and are often caught as bycatch. They are pictured here in a temperate reef close to Rottnest Island about 18 kilometres from Perth, Western Australia. Photo Glen Cowans glencowans.com

# **South-west Marine Region**

www.environment.gov.au/coasts/mbp/south-west



## **Special features**

The South-west Marine Region covers more than 1.3 million square kilometres of ocean waters from the eastern tip of Kangaroo Island off the South Australian coast to waters off Shark Bay, Western Australia. The region features high biological diversity and a large number of species found nowhere else in the world.

The flora and fauna include a blend of tropical, subtropical and temperate species. Temperate species dominate the southern and eastern parts of the region while tropical species become more common moving north.

The Leeuwin Current has a significant impact on the productivity, ecosystems and biodiversity in the region. It is a shallow current that transports warm tropical water and tropical species southward along the continental shelf and east to Cape Grim, the north-west point of Tasmania. However, this warm shallow current suppresses predictable large-scale upwellings of nutrient-rich cold water on the west coast, thus maintaining low levels of productivity on the west coast. The Flinders Current and seasonal currents also have strong influences on the region's environment.

Australia's deepest waters are found in the South-west Marine Region, reaching a maximum depth of 5,900 metres in the Diamantina Fracture Zone south of Cape Leeuwin. The region is distinguished by a continental shelf with high wave exposure, punctuated by island groups, fringing reefs and sheltered habitats for marine communities. The continental slope is one of the most canyon-rich areas on the Australian margin and the region contains vast areas of abyssal (ocean floor) plain.

The region is acknowledged as an area of global significance as breeding or feeding grounds for a number of rare and endangered marine animals, including Australian sea lions (*Neophoca cinerea*), southern right whales (*Eubalaena australis*) and white sharks (*Carcharodon carcharias*). It was recently identified as a key area for beaked whales, a group of whales that is very rarely seen and of which little is known. The region also provides habitat for a large number of seabird species; some, like the Australian lesser noddy (*Anous tenuirostris melanops*), are found nowhere else in the world.

The South-west Marine Region is adjacent to the Western Australian and South Australian coasts, where a range of industries rely on the ocean. The industries and activities of most significance include aquaculture, commercial and recreational fishing, defence training activities, marine tourism and recreation, petroleum exploration and production, and ports and shipping.

## Marine bioregional planning

The South-west Bioregional Profile was released in October 2007 (see www.environment.gov.au/coasts/mbp/ publications/south-west/sw-region-profile.html). The profile identifies the conservation values of the region: 105 protected species, 17 key ecological features, five historic shipwrecks including the HMAS *Sydney* and HSK *Kormoran*, and one large marine reserve, the Great Australian Bight Marine Park.

The department has identified areas for further assessment across the region and is consulting widely about the design of reserve boundaries and zonings in these areas.

The draft South-west Marine Bioregional Plan is due to be completed in the latter half of 2010. The draft plan will include a proposal for a South-west Commonwealth Marine Reserve Network.

## **Existing Commonwealth marine reserves**

The South-west Marine Region includes one existing Commonwealth marine reserve, the Great Australian Bight Marine Park (Commonwealth Waters).



The hawksbill turtle is a large marine turtle with a distinctive parrot-like beak. It lives in coral and rocky reefs in Australia's tropical waters and breeds in the northern areas of the Great Barrier Reef and on beaches in the north-west of Western Australia. It is listed as a vulnerable species and can take up to 30 years to reach adulthood. Photo Glen Cowans glencowans.com

# **Great Australian Bight Marine Park (Commonwealth Waters)**

www.environment.gov.au/coasts/mpa/gab



### **Special features**

The Great Australian Bight Marine Park (Commonwealth Waters) protects marine mammal habitat and the ecological communities and sediments of the seabed in Commonwealth waters adjacent to the South Australian Great Australian Bight Marine Park (State Waters). Notable EPBC Act listed species are the endangered southern right whale (*Eubalaena australis*) and the vulnerable Australian sea lion (*Neophoca cinerea*).

The park is adjacent to Head of Bight, one of the most important calving and nursing locations for southern right whales in Australian waters and one of the most important, discrete breeding locations for the species in the world. The area also offers a unique opportunity to observe the species in a pristine environment.

The park protects a transection of the wide continental shelf of the Great Australian Bight, which is remarkable for its high levels of invertebrate endemism and diversity.

The park is also the largest representative sample of the southern continental margin of Australia in a reserve.

The park provides for the sustainable use of its natural resources, including commercial fishing and mineral exploration, while ensuring these activities do not impact on the park's values.

| Location                               | Latitude 21º42' Courth Lanaitude 120º22' Fact   |            |
|--|---|------------|
| Location                               | Latitude 31 43 South, Longitude 130 23 East   |            |
| Area                                   | 1,937,162 hectares  |            |
| Proclamation date                      | 22 April 1998   |            |
| IUCN category                          | Category VI overall comprising:<br>Marine Mammal Protection Zone Category VI (385,380 hectares)<br>Benthic Protection Zone Category VI (1,608,463 hectares)<br>(Overlap of these two zones = 56,681 hectares) |            |
| Biogeographic context                  | IMCRA 4.0 provincial bioregions: Great Australian Bight Shelf, Southern Province  |            |
| Management plan                        | Second plan expires 16 May 2012   |            |
| Other significant management documents | Service level agreement and subsidiary annual business agreements between the Australian and South Australian governments   |            |
| Financial                              | Operating   | \$150,605* |
|  | Capital Not applicable  |            |
|  | Revenue Not applicable  |            |
| Visitors                               | None recorded in Commonwealth waters. (Approximately 22,000 visitors to the Head of Bight, Nullarbor, SA, whale viewing area last whale watching season May–October 2009)                                     |            |
| Permits                                | 59 commercial fishing   |            |

\* In addition to the operating costs for each reserve, \$903,090 was spent across the 25 marine reserves managed by the Marine Division on professional services, permits and performance assessment systems, training, communications, workshops and conference attendance, surveillance and enforcement activities

| International conventions and agreements                 |                                     |
|--|-------------------------------------|
| Migratory Species (Bonn) Convention                      | 28 of 105 listed Australian species |
| China-Australia Migratory Birds Agreement                | 2 of 81 listed species              |
| Japan–Australia Migratory Birds Agreement                | 3 of 77 listed species              |
| Korea–Australia Migratory Birds Agreement                | 2 of 59 listed species              |
| Agreement on the Conservation of Albatrosses and Petrels | 15 of 26 listed species             |

| Environment Protection and Biodiversity Conservation Act 1999 |                |  |
|---|----------------|--|
| Listed fauna  | Species        | 6 endangered<br>17 vulnerable<br>31 migratory<br>57 marine   |
|   | Recovery plans | 4 implemented: southern right whale ( <i>Eubalaena australis</i> );<br>great white shark ( <i>Carcharodon carcharias</i> ); marine turtles;<br>albatross ( <i>Diomeda</i> spp. and <i>Thalassarche</i> spp.) and giant petrels ( <i>Macronectes</i> spp.)<br>1 in preparation: Australian sea lion ( <i>Neophoca cinerea</i> ) |
| Listed flora  | None           |  |

| Numbers of native species recorded <sup>(a)</sup> |       |          |      |                         |
|---|-------|----------|------|-------------------------|
| Mammals   | Birds | Reptiles | Fish | Invertebrates           |
| 38  | 29    | 1        | 185  | Over 800 <sup>(b)</sup> |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the park and adjacent areas. The inventory is continuing to be updated and refined; it is likely to underestimate current species numbers.

(b) Based on the following research:

Ward, T.M., Sorokin, S.J., Rogers, P.J., McLeay, L.J. and Turner, D.J. (December 2003). *Benthic Protection Zone of the Great Australian Bight Marine Park: 3. Pilot Study for Performance Assessment (Volume 1)*. South Australian Research and Development Institute (Aquatic Sciences), Final Report to National Parks and Wildlife South Australia and the Commonwealth Department for Environment and Heritage.

Currie, D.R., Sorokin, S.J. and Ward, T.M. (2007). Infaunal Assemblages of the Eastern Great Australian Bight: Effectiveness of a Benthic Protection Zone in Representing Regional Biodiversity. South Australian Research and Development Institute (Aquatic Sciences), Adelaide.

Currie, D.R., Sorokin, S.J. and Ward, T.M. (2008). Performance Assessment of the Benthic Protection Zone of the Great Australian Bight Marine Park: Epifauna. South Australian Research and Development Institute (Aquatic Sciences), Adelaide.

## **Management arrangements**

The park is managed by the department's Marine Division under delegation from the Director of National Parks. On-site management and surveillance are provided through formal arrangements with a number of South Australian and Australian government agencies.

The cross-jurisdictional Great Australian Bight Marine Park Steering Committee represents the agencies involved. A park manager is employed jointly by the department and the South Australian Department for Environment and Heritage. The Great Australian Bight Consultative Committee, with community representatives, advises the steering committee on management issues.

## Monitoring

A survey of the seabed communities of the Benthic Protection Zone was conducted in October 2006. The data collected from this survey and one in 2002 are contributing to a 20-year performance assessment program for the Benthic Protection Zone. The zone's deep-water seabed communities will be surveyed in August 2010.

In May 2010 results were published of a study into the foraging range and behaviour of the Australian sea lion, its interactions with commercial fishing vessels, and how the risks of injury resulting from those interactions can be minimised (see **http://www.environment.gov.au/coasts/mpa/gab/sea-lion.html**).

## Future challenges

Major challenges are:

- consolidating past and ongoing research into a cohesive program to assess the park's performance
- increasing the effectiveness of compliance strategies, including improving the fishing industry's compliance reporting
- increasing the park's effectiveness in fulfilling one of its primary functions: to protect the Australian sea lion from the impacts of fishing activity in the park.

## Report on performance by key result areas

#### **KRA1: Natural heritage management**

#### **Major issues**

- Lack of baseline information on species that live on and below the seabed including their biology
- Further information required from scientific studies on the foraging behaviour and abundance of Australian sea lions and from observations on the effects of human interactions with Australian sea lion populations

#### Action

• Continue to establish baseline data

### Performance results 2009-10 (in cooperation with the South Australian Government)

- Provided in-kind assistance for the southern right whale population census and photo-identification studies at the Head of Bight
- Updated the database to assist with continuing population studies on regional southern right whales
- Completed the Australian sea lion pup census for the Bunda Cliffs population for the 2009–10 breeding season
- Released in May 2010 a study into Australian sea lion foraging behaviour and interactions with fishing vessels and the park's effectiveness in protecting Australian sea lions

#### KRA4: Use and appreciation of protected areas

#### **Major issues**

- Establishing effective management arrangements to prevent illegal fishing
- Encouraging community participation in management activities
- Community understanding and appreciation of the park's values

#### Actions

- Review surveillance plans
- Continue aerial surveillance by Border Protection Command, on-ground surveillance by Yalata Land Management, and sea patrols by the SA Department of Primary Industries and Resources
- Investigate suspected illegal activity
- Continue to support the Yalata Community's participation in park management activities
- Review and implement a communications plan
- Disseminate the management plan and interpretive material

### Performance results 2009–10 (in cooperation with the South Australian Government)

- Advertised annual Marine Mammal Protection Zone closures
- Agencies undertook land, sea and aerial surveillance and operational patrols. One fishing activity is under investigation
- Monitored permits for commercial fishers
- The Yalata Community provided surveillance and beach clean-ups
- Reviewed and implemented the communications plan
- Informed the media about park activities
- Informed the public about park values and uses, including via state and Australian Government websites and the Department of the Environment, Water, Heritage and the Arts information booth at the annual Australian Petroleum Production and Exploration Association Conference
- Delivered professional development sessions for teachers on the park's values

#### **KRA5: Stakeholders and partnerships**

#### **Major issue**

• Maintain productive relationships with partners

#### Actions

- Negotiate and implement the annual business agreement with South Australia
- Develop compliance monitoring arrangements with the Australian Fisheries Management Authority
- · Keep stakeholders informed of, and involved in, management activities

### Performance results 2009–10 (in cooperation with the South Australian Government)

- Renewed the annual business agreement covering research, operations, visitor management, education, and compliance and enforcement
- Continued to raise compliance issues with the Australian Fisheries Management Authority and industry sectors
- Liaised with stakeholders from all sectors through the steering and consultative committees
- Provided advice to the mining and energy sector on requirements for carrying out mining operations in the park
- Liaised with other areas of the department on conservation of the Australian sea lion



Mermaid Reef Marine Park contains abundant marine life including many species of echinoderms such as feather stars. Feather stars get their name from their long branched arms, which have a feathery appearance. They attach themselves to coral, rocks or sponges using sticky appendages underneath known as 'cirri'. To feed, feather stars wave their many feathery arms to trap and eat plankton. Photo Cathy Zwick DEWHA

# **North-west Marine Region**

www.environment.gov.au/coasts/mbp/north-west



## **Special features**

The North-west Marine Region covers Commonwealth waters from Kalbarri, south of Shark Bay, to the Western Australian–Northern Territory border. It includes approximately 1.07 million square kilometres of ocean.

A unique combination of biophysical features and ecological processes differentiates the North-west Marine Region from other marine regions around Australia. The region comprises relatively shallow waters with more than 50 per cent of its waters less than 500 metres deep. Its oceanography is complex: the Indonesian Throughflow is a dominant influence in the majority of the region, with the Leeuwin Current dominant in the south. Both these currents are significant drivers of the region's ecosystems.

The region's waters are predominantly warm tropical waters with low salinity and are generally nutrient poor, so the region is considered to have a generally low level of productivity. However, there are sporadic bursts of higher productivity in parts of the region which are thought to be associated with specific events.

Despite overall low levels of productivity, the region supports a high biodiversity of tropical marine species, predominantly of Indo-Pacific origin and distribution, due to the influence of the Indonesian Throughflow. However, the region has a low level of endemicity when compared to most other Australian waters, particularly those of the south.

There are 149 EPBC Act listed species that occur within the region. The region contains internationally significant breeding and feeding grounds for a number of threatened and migratory marine animal species.

## Marine bioregional planning

The North-West Marine Bioregional Profile was released in November 2008 (see **www.environment.gov.au/coasts/mbp/north-west**).

## **Existing Commonwealth marine reserves**

The North-west Marine Region includes four existing Commonwealth marine reserves: Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve north-west of Darwin; Mermaid Reef Marine National Nature Reserve north-west of Broome, Western Australia; and Ningaloo Marine Park (Commonwealth Waters) off the coast of Western Australia.

The reserves are managed by the department's Marine Division under delegation from the Director of National Parks.

# **Ashmore Reef National Nature Reserve**

www.environment.gov.au/coasts/mpa/ashmore



## **Special features**

Ashmore Reef National Nature Reserve, located approximately 830 kilometres west of Darwin, is renowned for its high biological diversity and unique marine ecosystems. It contains a variety of marine habitats including a coral reef system, lagoons, abundant seagrass beds and extensive tidal sand flats, as well as vegetated sand islands.

Ashmore Reef is home to a variety of fish, coral, mollusc and other invertebrate species. Seventeen species of sea snakes have been recorded at Ashmore Reef, which is the highest known diversity and density of sea snakes in the world. Research since 2003, however, has identified a steep decline in the abundance and diversity of sea snakes at Ashmore Reef. The reserve is also an important breeding and feeding habitat for a number of threatened species, including dugong (*Dugong dugon*), green turtles (*Chelonia mydas*), loggerhead turtles (*Caretta caretta*) and hawksbill turtles (*Eretmochelys imbricata*).

The reserve's three islands have a combined area of 112 hectares and support some of the most important seabird rookeries on the North-west Shelf. The reserve is an important staging point for migratory wetland birds, especially waders. More than 93 species of seabirds have been recorded at Ashmore Reef, of which 45 are listed in international agreements for the conservation of birds and their habitats.

| Location              | Latitude 12°15' South, Longitude 123°05' East  |                |
|-----------------------|--|----------------|
| Area                  | 58,337 hectares  |                |
| Proclamation date     | 28 July 1983   |                |
| IUCN category         | Category la overall comprising:  |                |
|                       | Category la: 54,991 hectares   |                |
|                       | Category II: 3,346 hectares  |                |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Timor Province   |                |
| Management plan       | Second plan expired 25 June 2009; a new plan will be developed as part of management arrangements for<br>a proposed regional network of marine reserves being identified through the marine bioregional planning<br>process for the North-west Marine Region |                |
| Other significant     | Australian Government Memorandum of Understanding with Indonesia; Marine and Terrestrial Introduced  |                |
| management            | Species Prevention and Management Strategy   |                |
| documents             |  |                |
| Financial             | Operating  | \$75,272*      |
|                       | Capital  | Not applicable |
|                       | Revenue  | Not applicable |
| Visitors/users        | 76 Indonesian vessels; departmental officers (2 patrols); recreational vessels (yachts, catamarans)  |                |
| Permits/approvals     | 4 commercial journalism; 5 scientific: 2 commercial tourism  |                |

\* In addition to the operating costs for each reserve, \$903,090 was spent across the 25 marine reserves managed by the Marine Division on professional services, permits and performance assessment systems, training, communications, workshops and conference attendance, surveillance and enforcement activities

| International conventions and agreements  |   |  |
|---|---|--|
| Wetlands (Ramsar) Convention              | The entire reserve is listed  |  |
| Migratory Species (Bonn) Convention       | 28 of the 105 Australian listed species   |  |
| China-Australia Migratory Birds Agreement | 44 of 81 listed species   |  |
| Japan–Australia Migratory Birds Agreement | 45 of 77 listed species   |  |
| Korea–Australia Migratory Birds Agreement | 35 of 59 listed species   |  |
| Other agreements                          | Under a Memorandum of Understanding with Indonesia, traditional Indonesian fishers are allowed access to an area known as the MoU Box that includes the reserve |  |

| Environment Protection and Biodiversity Conservation Act 1999 |                               |  |  |  |  |
|---|-------------------------------|--|--|--|--|
| Listed fauna  | Species                       | 2 vulnerable<br>51 migratory<br>104 marine |  |  |  |
|   | Recovery plans                | 1 being implemented: marine turtles        |  |  |  |
| Listed flora  | None                          |  |  |  |  |
| Heritage  | On Commonwealth Heritage List |  |  |  |  |

| Numbers of native species recorded <sup>(a)</sup> |       |          |      |               |        |  |  |
|---|-------|----------|------|---------------|--------|--|--|
| Mammals   | Birds | Reptiles | Fish | Invertebrates | Plants |  |  |
| 1   | 93    | 19       | 810  | 1,371         | 44     |  |  |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the reserve and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

## Management arrangements

The reserve is managed by the department's Marine Division under delegation from the Director of National Parks. On-site management and surveillance are provided through formal arrangements with a number of other government agencies.

The reserve's management plan expired on 25 June 2009. Since then the reserve has been managed under interim arrangements which are consistent with the expired management plan. These arrangements will continue until a new management plan is developed at the conclusion of the marine bioregional planning process for the North-west Marine Region.

The Australian Customs and Border Protection Service carried out on-site management of the reserve and has maintained a permanent enforcement presence since April 2008. Regular surveillance flights over Ashmore were conducted and departmental staff visited the reserve in October 2009 and February 2010 to implement and assess reserve management activities.

## Monitoring

On 21 August 2009 an accident on the seabed resulted in an uncontrolled discharge of oil and gas from the Montara wellhead platform which continued until 3 November 2009. Monitoring during the Australian Government's response to the incident included daily aerial observations of the region including Ashmore Reef and Cartier Island marine reserves. Aerial observers reported sheen in the vicinity of the reserves on several occasions and wax was recorded in the lagoon at Ashmore Reef between 26 and 30 October 2009. A wildlife response triage facility was established at Ashmore Reef to provide initial treatment to wildlife affected by oil. In total 29 birds were treated at the facility; six were successfully released and 23 died (see case study on page 109).

To identify and assess any short- or long-term environmental impacts of the spill an environmental monitoring plan is being implemented. The plan was agreed between the department and the company responsible for the platform, PTTEP Australasia. It includes several studies to identify and assess impacts on Ashmore Reef and Cartier Island marine reserves. These studies are continuing and, when available, results will be released on the department's website. As part of the monitoring plan three surveys were conducted. The first, a mega-fauna survey commissioned by the department aimed at identifying species, species behavior and physical/behavioural impacts was conducted between 27 and 29 September 2009. The report associated with this survey is now publicly available. The second and third surveys were conducted by departmental staff on 22 October 2009 and 13 and 14 February 2010. These surveys aimed to describe the shorelines and identifying potential impacts resulting from the oil spill.

During the February 2010 field trip department officers recorded a newly identified, permanently exposed vegetated sand cay to the east of East Island. The cay is triangular in shape, approximately 150 metres long, about 25 metres wide and covers approximately one-third of a hectare.

## **Future challenges**

Major challenges are:

- identifying the reasons for the decline in sea snake abundance and diversity
- managing potential introduced species
- maintaining a permanent compliance presence at the reserve
- managing for the potential impact of climate change, including coral bleaching events and loss of niche habitats and associated species
- identifying and appropriately addressing any impacts resulting from the Montara oil spill.

## Report on performance by key result areas

### KRA1: Natural heritage management

### Major issues

- Illegal fishing
- Coral bleaching and species loss
- · Introduction of pest species
- Montara oil spill

### Actions

- Enforce access and fishing restrictions
- Collaborate with other Australian Government agencies in working with Indonesian officials and fishers to improve
  management of the MoU Box fishery
- Encourage and facilitate research and monitoring of the reef and island environments
- Manage threats identified in the Marine and Terrestrial Introduced Species Prevention and Management Strategy (2004)
- Monitor and remove weeds and marine debris from the reserve
- Implement quarantine, bilge and ballast water protocols
- Implement environmental monitoring to identify and assess impacts resulting from the Montara oil spill

### Performance results 2009–10

- The Australian Customs and Border Protection Service vessel *Ashmore Guardian* continued its permanent compliance and management presence at the reserve
- Customs officers enforced access and fishing restrictions. Officers provided information to fishing vessels in the area and advised crews of restrictions. Suspected illegal activities were investigated and warnings issued
- Continued collection and analysis of marine debris
- Established a wildlife response triage facility to provide initial treatment to wildlife affected by the Montara oil spill. In total 29 birds were treated at the facility; six were successfully released and 23 died
- Developed and implemented an environmental monitoring plan to identify and assess any short- or long-term environmental impacts of the Montara oil spill which included three field surveys
# KRA4: Use and appreciation of protected areas

#### **Major issue**

• Damage to the reef from anchoring vessels

#### Actions

- Maintain three moorings and decommission ten
- Monitor visitation

## Performance results 2009–10

- Conducted maintenance on three moorings and decommissioned ten moorings installed at Ashmore Reef to ensure the reef is protected while visitor safety is maintained
- Customs officers monitored visitors' use of moorings
- Distributed information about appropriate mooring use via a brochure and the department's website

# **KRA5: Stakeholders and partnerships**

#### **Major issues**

- Illegal foreign fishing
- Effective working and liaison arrangements with the management service provider, the Australian Customs and Border Protection Service

#### Actions

- Collaborate with Australian Government agencies involved in revising and implementing an integrated
  management approach for Indonesian fishing in the MoU Box
- Maintain the close working relationship with the Australian Customs and Border Protection Service

- Consulted with the Department of Agriculture, Fisheries and Forestry to address overfishing issues in the MoU Box on a regional and cooperative basis
- Held regular meetings and consultation with the Australian Customs and Border Protection Service
- Provided warden training for Customs officers

# Case Study: Montara oil spill

Between 21 August and 3 November 2009, an accident at the seabed resulted in an uncontrolled discharge of oil and gas from the Montara wellhead platform, 140 kilometres from the north Western Australian coast.

The leak prompted an unprecedented response from the Department of the Environment, Water, Heritage and the Arts, with an immediate wildlife response plan enacted to treat affected wildlife and a long-term environmental monitoring plan negotiated.

The department stationed wildlife response officers at Ashmore Reef between 8 September and 5 December 2009 to provide round-the-clock monitoring and triage for injured wildlife found to be affected by the oil spill.

These officers undertook regular surveys of the Ashmore islands which support large breeding populations of seabirds and are important staging points for migratory shorebirds.

Oiled animals were given a full assessment, a 'quick wash' to remove the worst of the oil contamination, treatment of any infections or wounds, temperature control, hydration and feeding. Following consultation with a veterinarian animals were then released or transported to the mainland for veterinary care.

A total of 29 birds were treated at Ashmore; 23 of the treated birds died but six were successfully released following treatment. Two sea snakes were found dead in the region.

The department also established a wildlife response centre at Broome, in collaboration with the Western Australian environment department. This centre would have provided further capacity to rehabilitate affected wildlife found in state and Commonwealth waters but fortunately was not needed.

To ensure that the environmental impacts of the spill are identified and addressed, the department has worked with the company responsible for the oil spill, PTTEP Australasia, and with the Australian Maritime Safety Authority on comprehensive long-term scientific monitoring of the spill's effects.

The monitoring plan will ensure the detection of any long-term impacts that may not be immediately observable, such as impacts on fish numbers and changes in populations of birds, sea snakes and turtles. If particular specified changes are observed, PTTEP will be required to provide detailed remediation proposals to the department for approval. These proposals will be peer-reviewed by experts from the Australian Institute for Marine Science, CSIRO and relevant state and territory agencies.

The monitoring program will continue for years to come and includes marine life surveys, wildlife and habitat studies, water quality tests and shoreline assessments. More information on the environmental monitoring plan, including results as they become available, is at **www.environment.gov.au/coasts/oilspill**.

A Commission of Inquiry into all aspects of the incident concluded on 18 June 2010. More information on the inquiry and its outcomes is at **www.montarainquiry.gov.au**.



Montara oil well

# **Cartier Island Marine Reserve**

www.environment.gov.au/coasts/mpa/cartier



# **Special features**

Cartier Island Marine Reserve is located in the Indian Ocean, approximately 790 kilometres west of Darwin and approximately 45 kilometres south-east from Ashmore Reef. The reserve contains a variety of marine habitats including a coral reef system, a sand island and extensive tidal sand flats.

The reserve is home to a variety of fish, coral, sponge, echinoderm, mollusc and other invertebrate species. Its varied habitats support an unusually high diversity and density of sea snakes, some of which are endemic to the region. The reserve supports populations of feeding, breeding and nesting sea turtles and may also support dugongs (*Dugong dugon*).

| Location                                     | Latitude 12°32' South, Longitude 123°33' East   |   |  |
|--|---|---|--|
| Area   | 17,238 hectares   |   |  |
| Proclamation date                            | 7 June 2000   |   |  |
| IUCN category                                | Category la   |   |  |
| Biogeographic context                        | IMCRA 4.0 provincial bioregion: Timor Province  |   |  |
| Management plan                              | First plan expired 25 June 2009; a new plan will be developed as part of management arrangements for a proposed regional network of marine reserves being identified through the marine bioregional planning process for the North-west Marine Region |   |  |
| Other significant<br>management<br>documents | Australian Government Memorandum of Understanding with Indonesia; Standard Operating Procedures<br>(included in an operations manual) for Australian Customs and Border Protection Service officers operating<br>at the reserve                       |   |  |
| Financial                                    | Operating Not applicable*   |   |  |
|  | Capital Not applicable  |   |  |
|  | Revenue Not applicable  |   |  |
| Visitors/users                               | Departmental officers (2 patrols), commercial tourists, Customs officers (routine patrols)  |   |  |
| Permits/approvals                            | 4 commercial journalism; 5 scientific; 2 commercial touris  | m |  |

| International conventions and agreements |   |  |  |
|--|---|--|--|
| Migratory Species (Bonn) Convention      | 1 of 105 listed Australian species  |  |  |
| Other international agreements           | Under a Memorandum of Understanding with Indonesia, traditional Indonesian fishers are allowed access to an area known as the MoU Box that includes the |  |  |
|  | reserve   |  |  |

| Environment Protection and Biodiversity Conservation Act 1999 |                |                                     |  |  |
|---|----------------|-------------------------------------|--|--|
| Listed fauna  | Species        | 8 marine                            |  |  |
|   | Recovery plans | 1 being implemented: marine turtles |  |  |
| Listed flora  | None           |                                     |  |  |

| Numbers of native species recorded <sup>(a)</sup> |         |    |     |       |   |  |
|---|---------|----|-----|-------|---|--|
| Mammals Birds Reptiles Fish Invertebrates Plants  |         |    |     |       |   |  |
| 1   | Unknown | 17 | 810 | 1,371 | 0 |  |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the reserve and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

# **Management arrangements**

The reserve is managed by the department's Marine Division under delegation from the Director of National Parks. On-site management and surveillance are provided through formal arrangements with a number of other government agencies.

The reserve's management plan expired on 25 June 2009. Since then the reserve has been managed under interim arrangements which are consistent with the expired management plan. These arrangements will continue until a new management plan is developed at the conclusion of the marine bioregional planning process for the North-west Marine Region.

Cartier Island and Ashmore Reef reserves are managed together, being approximately 45 kilometres apart. The Australian Customs and Border Protection Service has a permanently stationed enforcement vessel at Ashmore Reef that assists with on-site management. Compliance and enforcement activities were supported by regular surveillance flights over the Cartier Island Marine Reserve during 2009–10 and departmental staff visited the reserve in February 2010 as part of foreshore assessment monitoring associated with the Montara oil spill.

# Monitoring

On 21 August 2009 an accident on the seabed resulted in an uncontrolled discharge of oil and gas from the Montara wellhead platform which continued until 3 November 2009. Monitoring during the Australian Government's response to the incident included daily aerial observations of the region including Ashmore Reef and Cartier Island marine reserves.

To identify and assess any short- or long-term environmental impacts of the spill an environmental monitoring plan is being implemented. The plan was agreed between the department and the company responsible for the platform, PTTEP Australasia, and includes several studies to identify and assess impacts to Ashmore Reef and Cartier Island marine reserves. These studies are continuing and, when available, results will be released on the department's website.

Long-term monitoring since before the Montara incident had shown that the major threats to the reserve were from illegal foreign fishing and climatic disturbances such as cyclones and coral bleaching.

# Future challenges

Major challenges are:

- compliance and enforcement in this remote location
- managing for the potential impacts of climate change.

# Report on performance by key result areas

# KRA1: Natural heritage management

# **Major issues**

- Illegal access
- Overfishing
- Montara oil spill

# Actions

- Enforce access and fishing restrictions
- Liaise with the Department of Agriculture, Fisheries and Forestry and Indonesian officials to improve management of the MoU Box fishery
- Encourage and facilitate reef research and monitoring
- Implement environmental monitoring to identify and assess impacts resulting from the Montara oil spill

# Performance results 2009–10

- The Australian Customs and Border Protection Service vessel *Ashmore Guardian* continued to protect the reserve by implementing compliance and enforcement measures and on-site management
- Customs officers enforced access and fishing restrictions. Officers approached all fishing vessels in the area and advised crews of restrictions. Suspected illegal activities were investigated and warnings issued
- Continued to collect and analyse marine debris
- Developed and implemented an environmental monitoring plan to identify and assess any short- or long-term environmental impacts of the Montara oil spill

# KRA5: Stakeholders and partnerships

## **Major issues**

- Illegal foreign fishing
- Effective working and liaison arrangements with the management service provider, the Australian Customs and Border Protection Service

## Actions

- Collaborate with Australian Government agencies involved in revising and implementing an integrated
  management approach for Indonesian fishing in the MoU Box
- Maintain the close working relationship with the Australian Customs and Border Protection Service

- Consulted with the Department of Agriculture, Fisheries and Forestry to address overfishing issues in the MoU Box on a regional and cooperative basis
- Held regular meetings and consultation with the Australian Customs and Border Protection Service
- Provided warden training for Customs officers

# **Mermaid Reef Marine National Nature Reserve**

www.environment.gov.au/coasts/mpa/mermaid



# **Special features**

Mermaid Reef is the most north-easterly of three shelf-edge reefs in the Rowley Shoals, located approximately 300 kilometres north-west of Broome, Western Australia. No land is exposed above the high water mark at Mermaid Reef, which places it under Australian Government jurisdiction.

Clerke Reef and Imperieuse Reef, the two southerly reefs of the Rowley Shoals, have permanent land above the high water mark and form part of the Rowley Shoals Marine Park, declared under Western Australian legislation.

The three reefs of the Rowley Shoals are the most perfect geological examples of shelf-edge reefs in Australian waters. Each reef includes spectacular and unusual underwater topography and life forms that attract divers from around the world.

Many coral and fish species that inhabit the shoals are at the limit of their distribution. The coral and fish communities of the Rowley Shoals are unique in their relative abundance of species.

| Latitude 17°06' South, Longitude 119°38' East  |  |  |
|--|--|--|
| 53,987 hectares  |  |  |
| 21 March 1991  |  |  |
| Category la  |  |  |
| IMCRA 4.0 provincial bioregion: Northwest Transition   |  |  |
| First plan expired 16 May 2007; a new plan will be developed as part of management arrangements for a proposed regional network of marine reserves being identified through the marine bioregional planning process for the North-west Marine Region |  |  |
| Service level agreement and annual business agreements with the Western Australian Department of Fisheries and Western Australian Department of Environment and Conservation   |  |  |
| Operating \$93,021*  |  |  |
| Capital Not applicable   |  |  |
| Revenue Not applicable   |  |  |
| 250–350  |  |  |
| 3 commercial tour operators, 1 scientific research   |  |  |
|  | Latitude 17°06' South, Longitude 119°38' East<br>53,987 hectares<br>21 March 1991<br>Category la<br>IMCRA 4.0 provincial bioregion: Northwest Transition<br>First plan expired 16 May 2007; a new plan will be develor<br>proposed regional network of marine reserves being iden<br>process for the North-west Marine Region<br>Service level agreement and annual business agreement<br>and Western Australian Department of Environment and<br>Operating<br>Capital<br>Revenue<br>250–350<br>3 commercial tour operators, 1 scientific research |  |

| International conventions and agreements  |                                     |  |  |
|---|-------------------------------------|--|--|
| Migratory Species (Bonn) Convention       | 17 of 105 Australian listed species |  |  |
| China–Australia Migratory Birds Agreement | 13 of 81 listed species             |  |  |
| Japan–Australia Migratory Birds Agreement | 11 of 77 listed species             |  |  |
| Korea-Australia Migratory Birds Agreement | 11 of 59 listed species             |  |  |

| Environment Protection and Biodiversity Conservation Act 1999 |  |  |  |  |
|---|--|--|--|--|
| Listed fauna  | Species     2 endangered       7 vulnerable       13 migratory       48 marine |  |  |  |
|   | Recovery plans   | 3 being implemented: great white shark ( <i>Carcharodon carcharias</i> ); marine turtles; humpback whale ( <i>Megaptera novaeangliae</i> ) |  |  |
| Listed flora  | None   |  |  |  |
| Heritage  | On Commonwealth Heritage List (part of reserve only)                           |  |  |  |

| Numbers of native species recorded <sup>(a)</sup> |    |    |          |          |                |  |
|---|----|----|----------|----------|----------------|--|
| Mammals Birds Reptiles Fish Invertebrates Plants  |    |    |          |          |                |  |
| 13  | 19 | 18 | Over 390 | Over 633 | No land plants |  |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the reserve and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

# Management arrangements

The Mermaid Reef Marine National Nature Reserve is managed under a service level agreement and annual business agreements between the Director of National Parks, the WA Department of Environment and Conservation and the WA Department of Fisheries. The WA agencies implement management actions on behalf of the Director of National Parks. The Australian Customs and Border Protection Service provides regular aerial surveillance of the reserve.

The first management plan expired on 16 May 2007 and since then the reserve has been managed under interim arrangements which are consistent with the expired management plan. These arrangements will continue until a new management plan is developed at the conclusion of the marine bioregional planning process for the North-west Marine Region.

# Monitoring

Monitoring to date has shown that the major threats to Mermaid Reef are from climatic disturbances such as cyclones and coral bleaching, and human impacts such as anchoring and pollution. Fishing has also been identified as a potential pressure on Mermaid Reef. Regular surveillance is conducted to monitor such activities.

Further promotion of the ReserveWatch volunteer monitoring program was undertaken by providing stakeholders with relevant information including report forms and guides for filling out the reports. This program aims to strengthen partnerships between industry and communities and reserve managers while providing managers with valuable information on the condition of reserves.

# **Future challenges**

Major challenges are:

- reviewing the need for navigation aids for shipping and near the Mermaid Reef visitor moorings
- improving visitors' understanding of the reserve's conservation values and management requirements
- managing for the potential impacts of climate change.

# Report on performance by key result areas

## KRA 1: Natural heritage management

## **Major issues**

- Preventing anchor damage
- Monitoring the reserve's condition
- Monitoring and compliance issues related to illegal fishing

# Actions

- Maintain moorings
- Maintain surveillance
- Encourage and facilitate research and monitoring at the reserve
- Assess the need for specific moorings for dive sites
- Monitor and remove marine debris from the reserve

# Performance results 2009–10

 Assessed the unapproved mooring device known as the Cod Hole Strop. The assessment included analysing feedback from commercial tourism operators about the need for a mooring at the site, a physical assessment of the Cod Hole Strop, advice from the Australian Maritime Safety Authority and legal counsel and a cost-benefit analysis of the risks associated with mooring options at the Cod Hole dive site. The assessment did not establish that the Cod Hole Strop adequately provides a safe mooring for the range of vessels that visit the reserve and recommended that it be removed

# KRA4: Use and appreciation of protected areas

# **Major issues**

- Need for visitors to understand and comply with reserve values and uses
- Unapproved moorings
- Need for improved reporting by commercial users

# Action

• Progress work related to visitor access to the reserve

# Performance results 2009–10

- Finalised assessment of the need for dive site moorings at the reserve
- Informed reserve users that they are not permitted to use the unapproved Cod Hole Strop, which will be removed in 2010–11 in line with recommendations of the assessment of the mooring device
- Invited reserve users to submit proposals to bear the costs of installing a private mooring at the Cod Hole dive site. The department has not received any mooring installation proposals

# KRA5: Stakeholders and partnerships

## **Major issues**

- Effective management of the reserve by the management service providers (WA Department of Environment and Conservation and WA Department of Fisheries)
- Industry stewardship of the reserve to support management

## Action

Manage and maintain an effective relationship with the WA Department of Environment and Conservation and
WA Department of Fisheries

# Performance results 2009–10

• Implemented annual business agreements with WA partner agencies

# Ningaloo Marine Park (Commonwealth Waters)

www.environment.gov.au/coasts/mpa/ningaloo



# **Special features**

The Ningaloo Reef is a tropical reef system adjacent to an arid part of the continental land mass of Western Australia. In places it is as close as 20 metres to the coastline. These and other characteristics make Ningaloo unique among the tropical reefs off the northern coast of Australia.

Ningaloo Marine Park (Commonwealth Waters) protects the deep-water environment fringing the reef, including the open waters and seabeds of the continental slope and shelf. The reef supports a wide variety of biological communities, with the range of coral cover and species changing within short distances.

Ningaloo Marine Park is made up of state waters, extending from the Western Australian coastline out to three nautical miles, and Commonwealth waters from the limit of the state jurisdiction out to the seaward boundary of Ningaloo Marine Park.

The reef is an important area for marine mammals, particularly whales. Green turtles (*Chelonia mydas*) are very common all along the coast, with several breeding rookeries. Of particular interest is the presence of the whale shark (*Rhincodon typus*), the world's biggest fish species. Ningaloo Marine Park is one of the few places around the world where whale sharks regularly occur. They aggregate in the park around March–April each year and feed on plankton, small fish or squid until June–July.

| Location                                     | Latitude 21°51' South, Longitude 113°52' East  |     |  |
|--|--|-----|--|
| Area   | 243,513 hectares   |     |  |
| Proclamation dates                           | 7 May 1987, 21 July 1992, 14 August 2003   |     |  |
| IUCN category                                | Category II  |     |  |
| Biogeographic context                        | IMCRA 4.0 provincial bioregions: Northwest Province, Central Western Transition, Central Western Shelf and Northwest Shelf Province  |     |  |
| Management plan                              | Second plan expired on 2 July 2009; a new plan will be developed as part of management arrangements for a proposed regional network of marine reserves being identified through the marine bioregional planning process for the North-west Marine Region |     |  |
| Other significant<br>management<br>documents | Service level agreement and annual business agreements with the Western Australian Department of Fisheries and Western Australian Department of Environment and Conservation   |     |  |
| Financial                                    | Operating \$130,281*   |     |  |
|  | Capital Not applicable   |     |  |
|  | Revenue Not applicable   |     |  |
| Visitors/users                               | Not available  |     |  |
| Permits/approvals                            | 2 commercial tourism, 2 non-commercial fishing approva   | als |  |

| International conventions and agreements  |                                    |  |  |
|---|------------------------------------|--|--|
| Migratory Species (Bonn) Convention       | 3 of 105 listed Australian species |  |  |
| China–Australia Migratory Birds Agreement | 4 of 81 listed species             |  |  |
| Japan–Australia Migratory Birds Agreement | 4 of 77 listed species             |  |  |
| Korea-Australia Migratory Birds Agreement | 1 of 59 listed species             |  |  |

| Environment Protection and Biodiversity Conservation Act 1999 |                               |  |  |  |
|---|-------------------------------|--|--|--|
| Listed fauna  | Species                       | 1 endangered<br>9 migratory<br>19 marine   |  |  |
|   | Recovery plans                | 3 being implemented: great white shark ( <i>Carcharodon carcharias</i> ); marine turtles; whale shark ( <i>Rhincodon typus</i> ) |  |  |
| Listed flora  | None                          |  |  |  |
| Heritage  | On Commonwealth Heritage List |  |  |  |

| Numbers of native species recorded <sup>(a)</sup> |    |         |    |   |  |
|---|----|---------|----|---|--|
| Mammals Birds Reptiles Fish Plants                |    |         |    |   |  |
| Unknown   | 22 | Unknown | 54 | 0 |  |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the park and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers

# **Management arrangements**

Ningaloo Marine Park (Commonwealth Waters) is managed under a service level agreement and annual business agreements between the Director of National Parks, the WA Department of Environment and Conservation and the WA Department of Fisheries. The WA agencies implement management actions on behalf of the Director of National Parks. The Australian Customs and Border Protection Service provides regular aerial surveillance of the park.

The second management plan expired on 2 July 2009 and since then the reserve has been managed under interim management arrangements which are consistent with the expired management plan. These arrangements will continue until a new management plan is developed as part of management arrangements for a proposed regional network of marine reserves being identified through the marine bioregional planning process for the North-west Marine Region.

On 3 July 2009, following expiration of the management plan, the delegate of the Director of National Parks issued an approval for non-commercial fishing in the reserve. The approval was renewed for a further six months from 1 February 2010. Conditions of approval are consistent with the WA Department of Fisheries management arrangements for recreational fishing in the Gascoyne Region with the added exclusion of the compressed air breathing equipment.

# Monitoring

The WA Marine Science Institution is conducting a number of research projects in Ningaloo Marine Park. Most projects to date have been undertaken in the state waters of the park, but sampling for one project has extended into Commonwealth waters and is expected to provide information on the deep-water sponge communities in Commonwealth waters in 2009–10.

The Australian Institute of Marine Science, in a consortium with Australian and United States research organisations, extended a project begun in 2004–05. The project uses satellite tracking to collate data on the range and behaviour of whale shark individuals from the Commonwealth and state waters of Ningaloo Marine Park.

# Future challenges

Major challenges are:

- mapping habitats adequately
- maintaining consistency between Australian Government and state government planning and, where possible, management processes
- managing for the potential impacts of climate change.

# Report on performance by key result areas

# KRA1: Natural heritage management

# **Major issues**

- Limited information about the Commonwealth waters of the park
- Lack of information on the distribution, migration, behaviour and abundance of key species including whale sharks
- Lack of information on the effects of human and commercial interactions on the park's key attributes
- Potential listing of Ningaloo Marine Park on the National Heritage and World Heritage lists

# Actions

- Engage in the National Heritage and World Heritage listing processes
- Monitor and remove marine debris from the park

# Performance results 2009–10

- Continued a study of the behaviour and migration habits of whale sharks travelling to Ningaloo Marine Park
- Continued a volunteer monitoring program that monitors marine turtles in the park
- Continued to collect and analyse marine debris

## KRA4: Use and appreciation of protected areas

## **Major issues**

- Reports of commercial fishers entering Commonwealth waters and fishing illegally
- Effective management of commercial tours
- Communication and enforcement of the Regulations under the EPBC Act

## **Actions**

- Monitor illegal entry to Commonwealth waters via aerial and sea surveillance
- Ensure commercial tour operators comply with permits and conditions

- Continued engagement with state partners (WA Department of Environment and Conservation and WA Department of Fisheries) with regard to roles and cooperative arrangements for compliance and enforcement activities
- Issued approvals for commercial tour operators
- Renewed an approval for non-commercial fishing in the reserve. Conditions of approval are consistent with the WA Department of Fisheries management arrangements for recreational fishing in the Gascoyne Region with the added exclusion of compressed air breathing equipment
- Conducted regular surveillance by air and sea

# **KRA5: Stakeholders and partnerships**

#### **Major issues**

- Maintaining productive relationships with partners
- Negotiating complementary management regimes with partner agencies to best manage the adjoining Commonwealth and state marine parks

### **Actions**

- Develop and implement a work plan under the annual business agreement to manage the Ningaloo Marine Park
- Keep stakeholders informed of and involved in management activities

# Performance results 2009–10

- Negotiated and implemented workplans under service level agreements
- Maintained productive working arrangements with state agencies

# **KRA6: Business management**

#### Major issue

• Need to effectively manage contracts with service providers

#### Actions

- Negotiate and implement annual business agreements
- Manage contracts with service providers

- Negotiated and implemented the annual business agreement with the WA Department of Environment and Conservation covering compliance and enforcement, management intervention and visitor infrastructure, research and monitoring, public participation, and education
- Negotiated and implemented the annual business agreement with the WA Department of Fisheries covering education, compliance and enforcement, visitor management, and training



Influenced by the tropical waters of the East Australian Current and the icy Tasman Sea, the waters of Lord Howe Island Marine Park encompass a climatic transition zone that supports an unusual mix of tropical, sub-tropical and temperate marine fauna and flora. In addition to this rich biodiversity, the region also supports a high level of endemism and provides a refuge for otherwise rare species such as the Black Cod. Photo Ian Hutton DEWHA

# **East Marine Region**

www.environment.gov.au/coasts/mbp/east



# **Special features**

The East Marine Region covers 2.4 million square kilometres of the Coral and Tasman seas. It includes all Commonwealth waters on the eastern side of Australia from the tip of Cape York to Bermagui, just north of the New South Wales–Victoria border, as well as the waters around Norfolk Island and Lord Howe Island. The region excludes the state waters of Queensland and New South Wales and the Great Barrier Reef Marine Park. Offshore it is bounded by the outer limit of Australia's Exclusive Economic Zone (200 nautical miles).

The region is characterised by deep-water pelagic tropical and subtropical marine ecosystems. It is home to globally significant populations of internationally threatened species. The region is dominated by the East Australian Current, the largest ocean current close to the coast of Australia. The variability of the East Australian Current both season-to-season and year-to-year has a significant influence on biological productivity. Phytoplankton and fish distributions are linked to the current. Generally waters of the region are low in nutrients; upwellings created by currents and gyres interact with islands and seamounts and are significant for biological productivity.

# Marine bioregional planning

The first stage of the marine bioregional planning process was completed on 19 May 2009 with the Minister's release of the East Bioregional Profile. The bioregional profile includes detailed information about the region's key habitats, species, natural processes, conservation and heritage values, and human uses (see www.environment.gov.au/coasts/mbp/publications/east/bioregional-profile.html).

The department has identified areas for further assessment across the region and is consulting widely about the design of reserve boundaries and zoning in these areas.

The draft East Marine Bioregional Plan is due to be completed early in 2011. The draft plan will include a proposal for an East Commonwealth Marine Reserve Network that builds on the existing network of Commonwealth marine reserves in the East Marine Region.

# **Existing Commonwealth marine reserves**

The East Marine Region includes six existing Commonwealth marine reserves. Coringa–Herald National Nature Reserve and Lihou Reef National Nature Reserve lie off the Queensland coast; Elizabeth and Middleton Reefs Marine National Nature Reserve, the Solitary Islands Marine Reserve (Commonwealth Waters), Lord Howe Island Marine Park (Commonwealth Waters) and the Cod Grounds Commonwealth Marine Reserve lie off the coast of New South Wales. The reserves are managed by the department's Marine Division under delegation from the Director of National Parks.

Four existing Commonwealth marine reserves in the region are currently managed under interim management arrangements that allow activities to be conducted that otherwise would be prohibited under the EPBC Act: the Solitary Islands Marine Reserve (Commonwealth Waters) Management Plan expired on 4 April 2008; the Lord Howe Island Marine Park (Commonwealth Waters) Management Plan expired on 24 September 2009, the Coringa–Herald National Nature Reserve and Lihou Reef National Nature Reserve Management Plan expired on 4 September 2008. The first management plan for the Cod Grounds Commonwealth Marine Reserve is under development. These parks will be managed under interim arrangements until new management plans are developed, following the completion of the marine bioregional planning process.

# **Coral Sea Conservation Zone**

The Coral Sea Conservation Zone lies within the East Marine Region and covers approximately 972,000 square kilometres of Australian waters and seabed east of the Great Barrier Reef Marine Park, out to the edge of Australia's Exclusive Economic Zone.

The existing Coral Sea National Nature Reserves—Coringa–Herald and Lihou Reef reserves—and the Great Barrier Reef Marine Park are not included in the conservation zone.

The Coral Sea Conservation Zone is an interim measure to protect this environmentally significant area while it is assessed for more permanent protection through the marine bioregional planning process. The East Bioregional Profile shows that the environmental significance of the Coral Sea lies in its diverse array of coral reefs, atolls, deep sea plains and canyons, and the extent to which the region's natural and heritage values have remained relatively undisturbed by direct human impact.

For more information on the Coral Sea Conservation Zone, see **www.environment.gov.au/coasts/coral-sea.html**.

# **Cod Grounds Commonwealth Marine Reserve**

www.environment.gov.au/coasts/mpa/cod-grounds



# **Special features**

The Cod Grounds Commonwealth Marine Reserve was declared to protect important habitat of the critically endangered grey nurse shark (*Carcharias taurus*). The east coast population of the grey nurse shark is listed as critically endangered under the EPBC Act and is at high risk of extinction due to its low reproduction rate and fishing-related mortality.

The Cod Grounds reef is the most northerly of a series of reefs extending south and south-west located off Laurieton in northern New South Wales. The Cod Grounds is the shallowest reef in the series and has steep slopes. The reef provides prime habitat for grey nurse sharks, which are observed in aggregations just above the seabed in or near the deep sandy-bottomed gutters between the pinnacles. Sharks are observed at the Cod Grounds throughout the year in varying numbers, with over 80 sharks sighted at any one time.

The Cod Grounds supports several prey species of the grey nurse shark, including jewfish, tailor, yellowtail kingfish, small sharks and squid.

The Cod Grounds Commonwealth Marine Reserve was declared a Sanctuary Zone as recommended by the Recovery Plan for the Grey Nurse Shark, as it provides critical feeding and reproduction habitat for grey nurse sharks. Under the Cod Grounds management arrangements all fishing is prohibited.

| Location              | Latitude 31°40'52" South, Longitude 152°54'37" East. The reserve comprises a 1,000 metre radius from this point |                |
|-----------------------|---|----------------|
| Area                  | 314 hectares  |                |
| Proclamation date     | 10 May 2007   |                |
| IUCN category         | Category la   |                |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Central Eastern Shelf Tran  | isition        |
| Management plan       | Interim management arrangements are in place until a management plan is developed                               |                |
| Other significant     | Annual business agreement between the Australian and New South Wales governments (Industry and                  |                |
| management            | Investment NSW) to deliver compliance and enforcement   |                |
| documents             |   |                |
| Financial             | Operating   | \$168,216*     |
|                       | Capital   | Not applicable |
|                       | Revenue   | Not applicable |
| Visitors              | 20 commercial recreational dive trips and 4 research trips recorded   |                |
| Permits/approvals     | 1 commercial dive operator approval; 1 research approval; 1 research permit                                     |                |

| Environment Protection and Biodiversity Conservation Act 1999 |                |  |  |
|---|----------------|--|--|
| Listed fauna  | Species        | A full species list has not yet been compiled although the critically endangered grey<br>nurse shark ( <i>Carcharias taurus</i> ) and vulnerable white shark ( <i>Carcharodon carcharias</i> )<br>are known to occur. The vulnerable humpback whale ( <i>Megaptera novaeangliae</i> )<br>is likely to pass through the reserve on its annual migration |  |
|   | Recovery plans | 3 being implemented: grey nurse shark ( <i>Carcharias taurus</i> ); white shark<br>( <i>Carcharodon carcharias</i> ); humpback whale ( <i>Megaptera novaeangliae</i> )   |  |
| Listed flora  | None           |  |  |

# Management arrangements

The reserve is managed by the department's Marine Division under delegation from the Director of National Parks. On-site management and surveillance are provided through formal arrangements with a number of other government agencies.

The Cod Grounds Commonwealth Marine Reserve has been assigned to IUCN Category Ia, which means that the Cod Grounds are to be managed primarily for scientific research and environmental monitoring.

Industry and Investment NSW undertakes compliance and enforcement under an annual business agreement between the Australian and New South Wales governments.

Interim management arrangements will remain in force until the management plan for the reserve is approved. The draft plan is expected to be finalised in the second half of 2010.

# Monitoring

Grey nurse shark numbers are being monitored at the Cod Grounds as part of a broader study into the numbers and distribution of the species along Australia's east coast. The reserve's only approved commercial dive operator is required to report the number of grey nurse sharks sighted on each dive in the reserve. Numbers vary from zero to over 80 sharks sighted on any one dive.

The Tasmanian Aquaculture and Fisheries Institute undertook a baseline biodiversity survey in the Cod Grounds in May 2009 and the results were published in May 2010. The survey concluded that the reserve encloses an area of high conservation value, not only because it contains a significant grey nurse shark aggregation site but also because it is a productive area that supports a large biomass of fishes including many exploited species. Illegal fishing is considered to be the greatest threat to these communities at present.

The Port Macquarie Underwater Research Group continued to monitor and photograph species with the aim of identifying major species occurring in the region of the reserve. The group has produced a website, posters and signs to publicise its findings (see **www.purg.com.au**).

Fieldwork was completed for the 2009–10 component of an ongoing project collecting data on sea temperatures and grey nurse sharks via a listening station and temperature data loggers.

# Future challenges

Major challenges are:

- managing public access to the reserve
- educating the public on the reserve's values and why these particular management arrangements have been implemented
- developing and implementing an effective compliance and enforcement strategy
- developing the management plan.

# Report on performance by key result areas

# KRA1: Natural heritage management

# **Major issues**

- Monitoring grey nurse shark habitats and populations
- Obtaining baseline information on the reserve's habitats

# Actions

- Implement interim management arrangements to manage user impact on conservation values
- Retrieve and replace equipment collecting data on sea temperatures and grey nurse sharks

# Performance results 2009–10

- Published results of the baseline biodiversity survey
- Completed the 2009–10 component of the ongoing project collecting data on sea temperatures and grey nurse sharks via temperature data loggers and a shark listening station
- Undertook regular grey nurse shark counts
- Managed user impact on the reserve's environment via interim management arrangements

# KRA4: Use and appreciation of protected areas

## **Major issues**

- Managing visitor access and activities
- Keeping visitors informed of management arrangements
- Possible illegal fishing
- Pollution and marine debris

## **Actions**

- Enforce the fishing prohibition
- Assess applications for access for commercial operations and research
- Implement interim management arrangements
- Undertake regular compliance and monitoring patrols
- Distribute brochures and information on the reserve

- Industry and Investment NSW conducted 30 surface compliance and enforcement patrols under the annual business agreement
- NSW officers gave information and advice to fishers operating close to and within the reserve
- NSW officers detected three recreational fishing vessels fishing inside the reserve and the department undertook follow-up enforcement action
- Received reports on activities undertaken in the reserve (required under the approval) from the reserve's only approved commercial dive operator

# KRA5: Stakeholders and partnerships

#### **Major issues**

- Ensuring ongoing engagement with the community, key groups and government agencies
- Establishing complementary management arrangements between NSW and Australian Government agencies
- Developing the management plan
- Informing the community about interim management arrangements including a total ban on fishing in the reserve

## **Actions**

- Develop the annual business agreement with the NSW state government to undertake compliance activities in the reserve
- Consult with key stakeholders and industry bodies
- Initiate development of the management plan
- Inform the community on the interim management arrangements

- Entered into the annual business agreement with Industry and Investment NSW to undertake sea patrols within the reserve
- Consulted with NSW and Australian government stakeholders about the development of the management plan
- Advised the local dive operator, researchers and NSW state agencies on the status of reserve values under the interim management arrangements

# **Coringa–Herald National Nature Reserve**

www.environment.gov.au/coasts/mpa/coringa



# **Special features**

Coringa–Herald National Nature Reserve has six islets and cays of which all except one are vegetated. The vegetation is mainly tropical shoreline plants of the Indo-Pacific region. However the reserve also includes the only forested cays in the Coral Sea Islands Territory. The *Pisonia grandis* forest ecosystem, which occurs on two islets in the reserve, has significant conservation value. The forested islets are important habitat for species of resident birds and also migratory seabirds that gather there from an extensive oceanic area to breed.

The terrestrial beach habitat throughout the reserve is important breeding habitat for the green turtle (*Chelonia mydas*). The reef habitats support benthic (bottom-dwelling) flora and fauna that are distinct from those of the Great Barrier Reef. Dolphins and whales occur in the area.

The Coringa Islets were named after the Coringa Packet,

a sailing ship wrecked off Chilcott Islet in 1945. The remains of the Coringa Packet have been declared an historic shipwreck.

| Location              | Latitude 16°59' South, Longitude 149°45' East                  | Latitude 16°59' South, Longitude 149°45' East |  |
|-----------------------|--|---|--|
| Area                  | 885,249 hectares   | 885,249 hectares                              |  |
| Proclamation date     | 16 August 1982   |   |  |
| IUCN category         | Category la  |   |  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Northeast Province             |   |  |
| Management plan       | Second plan expired 4 September 2008                           |   |  |
| Financial             | Operating     Not applicable*       Capital     Not applicable |   |  |
|                       |  |   |  |
|                       | Revenue Not applicable   |   |  |
| Visitors/users        | 3 research and monitoring trips                                |   |  |
| Permits               | 1 research   |   |  |

| International conventions and agreements  |                                    |  |
|---|------------------------------------|--|
| Wetlands (Ramsar) Convention              | Entire reserve is listed           |  |
| Migratory Species (Bonn) Convention       | 8 of 105 listed Australian species |  |
| China–Australia Migratory Birds Agreement | 14 of 81 listed species            |  |
| Japan–Australia Migratory Birds Agreement | 15 of 77 listed species            |  |
| Korea–Australia Migratory Birds Agreement | 8 of 59 listed species             |  |

| Environment Protection and Biodiversity Conservation Act 1999 |                |   |  |
|---|----------------|---|--|
| Listed fauna  | Species        | 2 endangered  |  |
|   |                | 8 vulnerable  |  |
|   |                | 16 migratory  |  |
|   |                | 51 marine   |  |
|   | Recovery plans | 2 being implemented: marine turtles; great white shark (Carcharodon carcharias) |  |
| Listed flora  | None           |   |  |

| Numbers of native species recorded <sup>(a)</sup> |       |          |          |               |        |
|---|-------|----------|----------|---------------|--------|
| Mammals   | Birds | Reptiles | Fish     | Invertebrates | Plants |
| 30  | 27    | 5        | Over 342 | Over 1,000    | 16     |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the reserve and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

# **Management arrangements**

The reserve is managed by the department's Marine Division under delegation from the Director of National Parks. On-site management and surveillance are provided through formal arrangements with a number of other government agencies.

The Bureau of Meteorology provides weather forecasting services and storage facilities for an emergency helicopter fuel cache to cover possible emergency evacuation from the reserve. Coastwatch provides aerial surveillance. Customs provides surface compliance and enforcement, and support for research and monitoring activities in the reserve.

The second management plan for the reserve expired on 4 September 2008. The next management plan will be developed following the conclusion of the bioregional planning process for the East Marine Region. In the meantime, the reserve will be managed through interim arrangements under the EPBC Act.

# Monitoring

Seabird monitoring continued with the assistance of a volunteer program that has run continuously since 1991. The long-term and now regionally significant dataset provides valuable information about these species.

Subsurface sea temperature loggers continued to operate as part of a large ongoing temperature monitoring program.

# Future challenges

Major challenges are:

- logistics, costs and occupational health and safety issues associated with managing such an isolated reserve
- maintaining the health of the Pisonia forest ecosystem including controlling pest insects
- understanding and managing the impacts of climate change, including coral bleaching events and loss of niche habitats and associated species.

# Report on performance by key result areas

# KRA1: Natural heritage management

# **Major issues**

- Impacts associated with human use including possible illegal fishing and the introduction of pest species
- Measuring reef health including the effects of coral bleaching
- Impacts of existing pest insects and climate change on the Pisonia forest ecosystem

## **Actions**

- Enforce the fishing prohibition
- Continue the strategic reef monitoring program
- Continue to monitor insect pests and respond as necessary
- Acquire aerial images to monitor vegetation

# Performance results 2009–10

Annual seabird monitoring program continued

### KRA4: Use and appreciation of protected areas

### Major issues

- Introduction of pest species by visitors to the reserve
- Managing visitor access and activities

#### Actions

- Distribute the information brochure
- Maintain the website
- Maintain information signs on the cays and islets in the reserve
- Issue permits for visitor access

## Performance results 2009–10

- Distributed the information brochure to reserve users including researchers and commercial tour operators. The brochure details effective quarantine measures to be undertaken by visitors to the reserve and why these practices are so important. The brochure is also available on the department's website
- Issued one permit for scientific research
- No illegal activity was reported by the Australian Customs and Border Protection Service

## **KRA5: Stakeholders and partnerships**

#### **Major issues**

- · Lack of awareness among stakeholders of reserve management prescriptions
- Maintaining effective operational relationships with partners

#### **Actions**

- Consult stakeholders and partner agencies and provide regular information on important issues
- Distribute the reserve information brochure
- Distribute information to stakeholders regarding reserve management arrangements

## Performance results 2009–10

• Liaised with the Australian Customs and Border Protection Service, the Bureau of Meteorology, Department of Defence, Department of Infrastructure, Transport, Regional Development and Local Government, researchers and tour operators and distributed up-to-date information on management issues as required

#### **KRA6: Business management**

#### **Major issue**

• Occupational health and safety risk to personnel associated with working in an isolated reserve

#### Action

· Continue to refine and implement measures identified through the activity safety analysis

## Performance results 2009–10

• No work was undertaken in the reserve by departmental staff in 2009–10

# **Elizabeth and Middleton Reefs Marine National Nature Reserve**

www.environment.gov.au/coasts/mpa/elizabeth



# **Special features**

Elizabeth and Middleton Reefs Marine National Nature Reserve is located 160 kilometres north of Lord Howe Island in a transition area between tropical and temperate climates. Both reefs rise independently from deep oceanic water and are the southernmost open-ocean platform reefs in the world.

Isolation and exposure to convergent tropical and temperate ocean currents and climates have given the reefs a distinct and diverse assemblage of marine species including a number of endemic species. Many species are near the northern or southern limit of their distribution.

The reserve supports two of the few known populations of the black cod (*Epinephelus daemelii*), once common along the New South Wales coast but now considered rare. The reserve also has high numbers of Galapagos reef sharks (*Carcharhinus galapagensis*) which suggests

the reefs are an important nursery area for this species. Apart from at Lord Howe Island, the Galapagos reef shark has not been recorded in any other Australian reef system.

The reserve is a feeding ground for green turtles (*Chelonia mydas*) and marine mammals such as bottlenose dolphins (*Tursiops truncatus*) and short-finned pilot whales (*Globicephala macrochynchus*).

The reserve has a rich maritime history with over 30 vessels being wrecked on the reefs over the past 200 years. The most prominent of these is the *Runic*, a 13,500 tonne meat freighter that ran aground on Middleton Reef in 1961. Although it is rapidly breaking up, the wreck is still visible for several nautical miles.

| Location              | Latitude 29°42' South, Longitude 159°05' East         |                 |
|-----------------------|---|-----------------|
| Area                  | 187,726 hectares                                      |                 |
| Proclamation date     | 23 December 1987                                      |                 |
| IUCN category         | Category la overall comprising:                       |                 |
|                       | Sanctuary Zone Category la (143,146 hectares)         |                 |
|                       | Habitat Protection Zone Category II (44,580 hectares) |                 |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Lord Howe Province    |                 |
| Management plan       | Second plan expires 22 March 2013                     |                 |
| Financial             | Operating   | Not applicable* |
|                       | Capital   | Not applicable  |
|                       | Revenue Not applicable                                |                 |
| Visitors              | Not recorded, numbers low                             |                 |
| Permits               | 17 recreational access, 1 commercial journalism       |                 |

| International conventions and agreements  |                                    |  |
|---|------------------------------------|--|
| Wetlands (Ramsar) Convention              | Entire reserve is listed           |  |
| Migratory Species (Bonn) Convention       | 2 of 105 listed Australian species |  |
| China–Australia Migratory Birds Agreement | 3 of 81 listed species             |  |
| Japan–Australia Migratory Birds Agreement | 6 of 77 listed species             |  |
| Korea–Australia Migratory Birds Agreement | 3 of 59 species                    |  |

| Environment Protection and Biodiversity Conservation Act 1999 |                |  |  |
|---|----------------|--|--|
| Listed fauna  | Species        | 1 vulnerable<br>8 migratory<br>13 marine |  |
|   | Recovery plans | 1 being implemented: marine turtles      |  |
| Listed flora  | None           |  |  |

| Numbers of native species recorded (a) |       |          |      |               |       |
|--|-------|----------|------|---------------|-------|
| Mammals                                | Birds | Reptiles | Fish | Invertebrates | Flora |
| 2                                      | 10    | 2        | 407  | 586           | 19    |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the reserve and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

# Management arrangements

The reserve is managed by the department's Marine Division under delegation from the Director of National Parks. On-site management and surveillance are provided through formal arrangements with a number of other government agencies.

# Monitoring

The reef systems at the reserve have been surveyed regularly since 1987. The reserve is generally in good health with little coral bleaching and very little evidence of crown-of-thorns starfish (*Acanthaster planci*) activity. The number of black cod appears to be stable and high numbers of Galapagos sharks were observed during recent surveys.

# **Future challenges**

Major challenges are:

- developing and implementing a regular biological monitoring program with standard methodology
- monitoring for possible illegal activities in the area.

# Report on performance by key result areas

## **KRA1: Natural heritage management**

## **Major issue**

• Monitoring reef health and populations of large vertebrates (black cod, Galapagos shark)

## Actions

- Enforce fishing restrictions
- Implement management plan prescriptions
- Undertake biological monitoring

# Performance results 2009–10

• No formal monitoring of the reserve was undertaken in 2009–10

## KRA2: Cultural heritage management

#### **Major issue**

• Possible interference with shipwrecks

#### Actions

- Enforce shipwreck protection strategies
- Implement management plan prescriptions
- Inspect the condition of shipwrecks

### Performance results 2009–10

Coastwatch flights detected no interference with shipwrecks

#### KRA4: Use and appreciation of protected areas

## **Major issues**

- Managing visitor access and activities
- Keeping visitors informed of management arrangements
- Possible illegal fishing
- Pollution and marine debris

#### **Actions**

- Enforce fishing restrictions
- Issue permits for visitor access and recreational fishing
- Implement management plan prescriptions
- Undertake regular compliance and monitoring patrols
- Distribute brochures and information on the reserve

## Performance results 2009–10

- · Coastwatch flights detected one commercial fishing vessel apparently fishing illegally
- · Issued permits for visitor access and recreational fishing, and for commercial journalism

#### **KRA5: Stakeholders and partnerships**

## Major issue

• Maintaining good relationships with the Australian Customs and Border Protection Service, researchers, the Lord Howe Island community who visit the reserve, and New South Wales Government agencies who implement day-to-day management under the annual business agreement

## Action

• Ensure relationships with partners are productive

## Performance results 2009–10

• Liaised with the Australian Customs and Border Protection Service, scientists, tour operators, the Lord Howe Island community and New South Wales Government agencies

# Lihou Reef National Nature Reserve

www.environment.gov.au/coasts/mpa/lihou



# **Special features**

Lihou Reef National Nature Reserve and its associated sandy coral cays and islets comprise the largest reef structure in the Coral Sea. The reef habitats support benthic (bottom-dwelling) flora and fauna that are distinct from those of the Great Barrier Reef. A diverse range of marine organisms has been recorded in the reserve. The green turtle (*Chelonia mydas*) breeds in the reserve and a number of cetacean species (whales and dolphins) use the area.

Seven cays and islets in the reserve are vegetated, mainly by widespread tropical shoreline plants of the Indo-Pacific region. The reserve also contains extensive and regionally significant seabird colonies. The buff-banded rail (*Gallirallus philippensis*) is the only landbird species that breeds in the reserve.

Several well-documented shipwrecks, and a number of wrecks whose origins are not yet known, are located on Lihou Reef.

| Location              | Latitude 17°21'South, Longitude 151°44'East        |  |
|-----------------------|--|--|
| Area                  | 843,670 hectares                                   |  |
| Proclamation date     | 16 August 1982                                     |  |
| IUCN category         | Category la  |  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Northeast Province |  |
| Management plan       | Second plan expired 4 September 2008               |  |
| Financial             | Operating\$104,045*CapitalNot applicable           |  |
|                       |  |  |
|                       | Revenue Not applicable                             |  |
| Visitors/users        | Bureau of Meteorology; recreational yachts         |  |
| Permits/approvals     | 1 research, 1 media, 2 commercial tourism          |  |

| International conventions and agreements  |                                    |  |
|---|------------------------------------|--|
| Wetlands (Ramsar) Convention              | Entire reserve is listed           |  |
| Migratory Species (Bonn) Convention)      | 6 of 105 listed Australian species |  |
| China–Australia Migratory Birds Agreement | 13 of 81 listed species            |  |
| Japan–Australia Migratory Birds Agreement | 15 of 77 listed species            |  |
| Korea–Australia Migratory Birds Agreement | 9 of 59 species                    |  |

| Environment Protection and Biodiversity Conservation Act 1999 |                |   |  |
|---|----------------|---|--|
| Listed fauna  | Species        | 2 endangered<br>8 vulnerable<br>17 migratory<br>51 marine                       |  |
|   | Recovery plans | 2 being implemented: marine turtles; great white shark (Carcharodon carcharias) |  |
| Listed flora  | None           |   |  |

| Numbers of native species recorded <sup>(a)</sup> |       |          |          |               |        |
|---|-------|----------|----------|---------------|--------|
| Mammals   | Birds | Reptiles | Fish     | Invertebrates | Plants |
| 30  | 24    | 5        | Over 342 | Over 1,000    | 7      |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the reserve and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

# **Management arrangements**

The reserve is managed by the department's Marine Division under delegation from the Director of National Parks. On-site management and surveillance are provided through formal arrangements with a number of other government agencies.

Coastwatch provides regular aerial surveillance of the reserve. The Bureau of Meteorology collects and replaces temperature data loggers during their annual visits. The bureau also provides storage for an emergency helicopter fuel cache to cover emergency evacuation from the reserve.

The second management plan for the reserve expired on 4 September 2008. The next management plan will be developed following the conclusion of the bioregional planning process for the East Marine Region. In the meantime, the reserve will be managed through interim arrangements under the EPBC Act.

# Monitoring

No monitoring activities were undertaken.

# **Future challenges**

Major challenges are:

- logistics, costs and occupational health and safety issues associated with managing such an isolated reserve
- understanding and managing the impacts of climate change, including coral bleaching events and loss of niche habitats and associated species.

# Report on performance by key result areas

## **KRA1: Natural heritage management**

## **Major issues**

- Impacts associated with human use including possible illegal fishing and the introduction of pest species
- Measuring reef health including the effects of coral bleaching
- The reserve's isolation means ongoing, on-ground monitoring remains logistically difficult

## **Actions**

- Enforce the fishing prohibition
- Continue the strategic reef monitoring program
- Establish terrestrial monitoring of vegetation and insects on the cays and islets

# Performance results 2009–10

• The reserve was surveyed in 2008. The next survey is due in 2011–12

#### KRA4: Use and appreciation of protected areas

### Major issues

- Managing visitor access and activities
- · Lack of awareness among stakeholders of reserve management prescriptions
- Maintaining relationships with key partners on an effective operational basis
- Introduction of pest species by visitors to the reserve

## **Actions**

- Distribute the information brochure
- Maintain website information
- · Continue to promote and maintain partnerships with other agencies to assist with activity monitoring
- Issue permits for visitor access

#### Performance results 2009–10

- Distributed the reserve information brochure to stakeholders. The brochure details effective quarantine measures to be undertaken by visitors to the reserve and the importance of these practices. The brochure is also available on the department's website
- No illegal activity was reported by the Australian Customs and Border Protection Service
- Issued four permits

## **KRA5: Stakeholders and partnerships**

## **Major issues**

- · Lack of awareness among stakeholders of reserve management prescriptions
- · Maintaining effective operational relationships with partners

#### Actions

- · Consult key stakeholders and partners and provide regular information on important issues
- Distribute the reserve information brochure
- Continue to promote and maintain partnerships with other agencies to assist with monitoring

## Performance results 2009–10

- Liaised with the Australian Customs and Border Protection Service, the Bureau of Meteorology and the Department of Infrastructure, Transport, Regional Development and Local Government
- Distributed the reserve information brochure to stakeholders

# **KRA6: Business management**

## Major issue

Occupational health and safety risk to personnel from working in an isolated reserve

## Action

• Continue to refine and implement measures identified through the activity safety analysis

## Performance results 2009–10

• No fieldwork was undertaken

# Lord Howe Island Marine Park (Commonwealth Waters)

www.environment.gov.au/coasts/mpa/lordhowe



# **Special features**

Lord Howe Island Marine Park (Commonwealth Waters) protects and conserves the complex, vulnerable and regionally unique set of deep-sea structures, benthic habitats and flora and fauna associated with the Lord Howe Island seamount system.

The marine park ensures that natural resources important for food, income and recreation for the Lord Howe Island community are protected and used in an ecologically sustainable manner.

| Location              | Latitude 31°47' South, Longitude 159°09' East   |            |  |
|-----------------------|---|------------|--|
| Area                  | 300,287 hectares  |            |  |
| Proclamation date     | 21 June 2000  |            |  |
| IUCN category         | Category IV overall comprising:   |            |  |
|                       | Category la 96,166 hectares   |            |  |
|                       | Category IV 204,121 hectares  |            |  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Lord Howe Province  |            |  |
| Management plan       | The first plan expired on 24 September 2009   |            |  |
| Other significant     | Service level agreement and subsidiary annual business agreement between Australian and New South Wales |            |  |
| management            | governments   |            |  |
| documents             |   |            |  |
| Financial             | Operating   | \$118,124* |  |
|                       | Capital Not applicable  |            |  |
|                       | Revenue Not applicable  |            |  |
| Visitors/users        | Not known   |            |  |
| Permits/approvals     | 9 commercial approvals  |            |  |

| International conventions and agreements  |  |  |  |
|---|--|--|--|
| World Heritage Convention                 | The Lord Howe Island group was World Heritage listed in 1982 in recognition of its outstanding natural beauty and its exceptional biodiversity |  |  |
| China–Australia Migratory Birds Agreement | 1 of 81 listed species   |  |  |
| Japan–Australia Migratory Birds Agreement | 4 of 77 species  |  |  |
| Korea-Australia Migratory Birds Agreement | 4 of 59 species  |  |  |

| Environment Protection and Biodiversity Conservation Act 1999 |                           |   |  |
|---|---------------------------|---|--|
| Listed fauna  | Species                   | 3 endangered<br>10 vulnerable<br>15 migratory<br>20 marine  |  |
|   | Recovery plans            | 2 being implemented: albatross ( <i>Diomeda</i> spp. and <i>Thalassarche</i> spp.) and giant petrels ( <i>Macronectes</i> spp.); marine turtles |  |
| Listed flora  | None                      |   |  |
| Heritage  | On National Heritage List |   |  |

| Numbers of native species recorded <sup>(a)</sup> |       |          |      |         |
|---|-------|----------|------|---------|
| Mammals   | Birds | Reptiles | Fish | Plants  |
| Unknown   | 11    | Unknown  | 42   | Unknown |

(a) Species numbers are from a 2006 species inventory based on documented sightings in the reserve and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

# **Management arrangements**

The NSW Marine Parks Authority manages the Commonwealth marine park under a service level agreement.

The Lord Howe Island Steering Committee provides a forum for cooperative planning and management of the adjacent state and Commonwealth parks. The Lord Howe Island Marine Park Advisory Committee enables stakeholder groups to provide advice on the management of both parks to the managing agencies.

The Australian Customs and Border Protection Service periodically conducts Coastwatch flights over the Lord Howe Island area and reports on vessel activity, including possible breaches of zoning regulations. Surface surveillance is undertaken by the New South Wales Marine Parks Authority.

The first management plan for the reserve expired on 24 September 2009. The next management plan will be developed following the conclusion of the bioregional planning process for the East Marine Region. In the meantime, the reserve will be managed through interim arrangements under the EPBC Act.

# Monitoring

Data on fish catch effort by charter fishing vessels operating under permit in the marine park continue to be logged and collated on an annual basis.

A baited remote underwater video survey was completed and builds on information about benthic fish assemblages in deep-water habitats collected in 2004.

# **Future challenges**

Major challenges are:

- minimising the negative impacts of climate change
- implementing a strategic monitoring program, following baseline and fish catch data collection
- monitoring the area for possible illegal activities.

# Report on performance by key result areas

## KRA1: Natural heritage management

## **Major issues**

- Ensuring compliance with the interim management arrangements
- Developing the second management plan

# Actions

- Enforce fishing restrictions
- Train and authorise enforcement staff
- Review the first management plan in preparation for developing the second management plan at the conclusion of the bioregional planning process for the East Marine Region

# Performance results 2009–10

- Shore-based and vessel-based surveillance revealed no illegal fishing activity in the park
- The NSW marine park manager and ranger continued as wardens under the EPBC Act
- Completed a baited underwater video survey of benthic fish assemblages in deep-water habitats

# **KRA5: Stakeholders and partnerships**

# **Major issues**

- Maintaining cooperation with the Lord Howe Island community and NSW Marine Parks Authority for effective day-to-day management of the park
- Community support for interim management arrangements
- Participating in a community consultation program for reviewing the first management plan and developing the second plan

#### Action

• Take an active role on the advisory and steering committees for the state and Commonwealth marine parks. The department is now represented on the Lord Howe Island Marine Park Advisory Committee

## Performance results 2009–10

Attended two steering committee and advisory committee meetings

## **KRA6: Business management**

## **Major issues**

- Continuing assistance from the NSW Marine Parks Authority and NSW Department of Environment, Climate Change
   and Water
- Implementing cooperative arrangements for joint community consultation on NSW and Australian government reviews of zoning and management plans with the NSW Department of Environment, Climate Change and Water

## Action

• Negotiate and implement the annual business agreement with the NSW Marine Parks Authority

- Negotiated and implemented the annual business agreement
- Commenced a joint community consultation program with the NSW Department of Environment, Climate Change and Water for zoning and management plan reviews

# **Solitary Islands Marine Reserve (Commonwealth Waters)**

www.environment.gov.au/coasts/mpa/solitary



# **Special features**

The Solitary Islands Marine Reserve (Commonwealth Waters) and the adjacent Solitary Islands Marine Park (State Waters) are located in a mixing zone between tropical and temperate environments. Many species in the reserve are at, or close to, the northern or southern extent of their geographic range.

The reserve is home to a number of species that are listed as endangered or vulnerable under state or Commonwealth legislation or international agreements. These include several dolphin species, humpback whales (*Megaptera novaeangliae*), grey nurse sharks (*Carcharias taurus*), black cod (*Epinephelus daemelii*), Bleekers devil fish (*Paraplesiops bleekeri*), and numerous seabird species. An area known as Pimpernel Rock forms part of the critical habitat for the grey nurse shark which aggregates there.

| Location              | Latitude 29°48' South, Longitude 153°22' East   |  |  |
|-----------------------|---|--|--|
| Area                  | 15,233 hectares   |  |  |
| Proclamation date     | 3 March 1993  |  |  |
| IUCN category         | Category VI overall comprising:   |  |  |
|                       | Category la 79 hectares   |  |  |
|                       | Category IV 3,746 hectares  |  |  |
|                       | Category VI 11,408 hectares   |  |  |
| Biogeographic context | IMCRA 4.0 provincial bioregion: Central Eastern Shelf Transition  |  |  |
| Management plan       | The first plan expired 3 April 2008. Interim management arrangements are in place                           |  |  |
| Other significant     | Service level agreement and subsidiary annual business agreement between the Australian and New South Wales |  |  |
| management            | governments   |  |  |
| documents             |   |  |  |
| Financial             | Operating \$239,656*  |  |  |
|                       | Capital Not applicable  |  |  |
|                       | Revenue Not applicable  |  |  |
| Visitors              | Not known   |  |  |
| Permits               | 5 recreational diving, 1 research   |  |  |
| Approvals             | 69 commercial fishing, 6 commercial tour operator   |  |  |

| International conventions and agreements  |                                     |  |  |
|---|-------------------------------------|--|--|
| Migratory Species (Bonn) Convention       | 12 of 105 listed Australian species |  |  |
| China–Australia Migratory Birds Agreement | 9 of 81 listed species              |  |  |
| Japan–Australia Migratory Birds Agreement | 12 of 77 listed species             |  |  |
| Korea-Australia Migratory Birds Agreement | 5 of 59 listed species              |  |  |

| Environment Protection and Biodiversity Conservation Act 1999 |                |   |  |
|---|----------------|---|--|
| Listed fauna  | Species        | 4 endangered<br>7 vulnerable<br>24 migratory<br>38 marine                 |  |
|   | Recovery plans | 2 being implemented: marine turtles; grey nurse shark (Carcharias taurus) |  |
| Listed flora  | None           |   |  |

| Numbers of native species recorded <sup>(a)</sup> |       |          |                         |               |
|---|-------|----------|-------------------------|---------------|
| Mammals   | Birds | Reptiles | Fish                    | Invertebrates |
| 25  | 37    | 6        | Over 263 <sup>(b)</sup> | 90            |

(a) Species numbers except fish are from a 2006 species inventory based on documented sightings in the reserve and adjacent areas. The inventory is continuing to be updated and refined; it is likely to currently underestimate species numbers.

(b) Fish species number is from a 2009 list of species identified in the Solitary Islands Marine Park (State Waters) by the Solitary Islands Underwater Research Group.

# **Management arrangements**

The NSW Marine Parks Authority conducts on-site day-to-day management of the reserve for the Australian Government under an annual business agreement. NSW Fisheries provides additional compliance and enforcement support.

The Solitary Islands Marine Park Advisory Committee oversees management and planning arrangements, and enables stakeholders to contribute to planning for both the adjacent state park and the Commonwealth reserve.

The management plan review was finalised in 2010. Results from the review will be released in late 2010 and include recommendations for the next management plan that will come into effect when the bioregional planning process is completed. Interim management arrangements are now in force to allow activities permitted under the expired management plan to continue.

# Monitoring

The NSW Marine Parks Authority and CSIRO continued to monitor grey nurse shark movements between aggregation sites in the reserve including Pimpernel Rock.

Ongoing research was conducted to identify fish biodiversity patterns in deep reef habitats and to explore the representation of fish assemblages.

The NSW Marine Parks Authority continued to remove and monitor debris at Pimpernel Rock.

# **Future challenges**

Major challenges are:

- managing the reserve under the interim management arrangements
- consulting with stakeholders and the NSW Marine Parks Authority on future management arrangements, including the bioregional planning process for the East Marine Region.

# Report on performance by key result areas

## KRA1: Natural heritage management

## Major issue

· Potential illegal activities threatening conservation values

# Actions

- Enforce fishing restrictions
- Monitor anchor sites at Pimpernel Rock

# Performance results 2009–10 (in cooperation with New South Wales Government)

- The NSW Marine Parks Authority conducted 26 surface compliance and enforcement patrols
- NSW Fisheries conducted four surface compliance and enforcement patrols
- NSW officers conducted targeted operations in response to intelligence received, particularly for the Pimpernel Rock Sanctuary Zone. Four fishing vessels were detected inside the reserve and enforcement action was taken

#### KRA4: Use and appreciation of protected areas

## **Major issues**

- Managing impacts from visitor activities in the Sanctuary Zone
- Managing impacts from commercial fishing under approvals in the Habitat Protection Zone

#### Actions

- Conduct surface patrols and manage commercial fishing approvals
- Communicate reserve values and provide information to users
- Communicate with user groups to discuss the implementation of the approvals regime
- · Issue permits and approvals for recreational and commercial activities

## Performance results 2009–10 (in cooperation with New South Wales Government)

- The NSW Marine Parks Authority provided surveillance support through regular surface patrols
- Issued one additional commercial fishing approval bringing the total to 69 commercial fishing approvals and six commercial tourism approvals, indicating a high response rate from users to the new approvals regime
- Issued five permits for recreational access to Pimpernel Rock

## **KRA5: Stakeholders and partnerships**

## **Major issue**

• Ongoing engagement with the community and with NSW and Australian government representatives

## Actions

- Develop an annual business agreement with the NSW Department of Environment, Climate Change and Water to provide management, communication, compliance and research services in the reserve
- Participate in Solitary Islands Marine Park Advisory Committee meetings
- Conduct community consultation and stakeholder meetings as part of the planning process for the East Marine Region

## Performance results 2009–10 (in cooperation with New South Wales Government)

- Signed and implemented the annual business agreement
- Conducted management, communication, compliance and research activities
- Participated in advisory committee meetings
- Gave presentations and met with all identified stakeholder groups at various locations and times to update them on the bioregional planning process



King penguins (Aptenodytes patagonicus) roam the glacial moraine along the edge of Winston Lagoon, Heard Island. Photo Kate Kiefer

# Heard Island and McDonald Islands Marine Reserve

www.heardisland.aq



# **Special features**

The Heard Island and McDonald Islands Marine Reserve includes the Territory of Heard Island and McDonald Islands, which extends to 12 nautical miles from shore, plus an additional marine area which extends in parts to the 200 nautical mile boundary of Australia's Exclusive Economic Zone. The reserve is approximately 4,099 kilometres south-west of Perth.

Heard Island and McDonald Islands is the only major subantarctic island group believed to contain no species directly introduced by humans. Its terrestrial and marine ecology and oceanographic conditions are quite distinct from other Southern Ocean islands, including Australia's Macquarie Island.

The islands and surrounding waters provide crucial breeding habitat for many birds and marine mammals. Eleven of the species breeding or foraging in the marine reserve are listed as threatened under the Agreement

on the Conservation of Albatrosses and Petrels; and three species are listed as endangered and 14 species as vulnerable under the EPBC Act. Two species, the Heard Island sheathbill (*Chionis minor nasicornis*) and the Heard Island cormorant (*Phalacrocorax atriceps*), are endemic to the reserve.

The terrestrial environment contains permanent glaciers, Australia's only active volcanoes, and Australia's highest mountain (Mawson Peak 2,750 metres) outside the Australian Antarctic Territory. Heard Island contains significant cultural relics and heritage sites from 19th and early 20th century sealing activities and from the first Australian Antarctic research expeditions.

The marine environment surrounding the islands features diverse and distinctive benthic habitats that support a range of slow growing and vulnerable species including corals, sponges, barnacles and echinoderms. The waters of the reserve also include prime foraging areas for a number of land-based marine predators, and provide nursery areas for fish, including commercially harvested species. Areas of highly productive nutrient-rich waters in the reserve, created by the confluence of key oceanographic fronts such as the Antarctic Polar Front, are believed to provide feeding grounds for cetaceans.

| Location              | 53°05′ South, 73°30′ East  |          |  |
|-----------------------|--|----------|--|
| Area                  | 6,465,845 hectares   |          |  |
| Proclamation date     | 16 October 2002  |          |  |
| IUCN category         | Category la  |          |  |
| Biogeographic context | Subantarctic area  |          |  |
|                       | IMCRA 4.0 provincial bioregion: Kerguelen Province                         |          |  |
| Management plan       | First plan expires 10 August 2012  |          |  |
| Other significant     | Australia's Antarctic Science Program: Science Strategy 2004–05 to 2008–09 |          |  |
| management            |  |          |  |
| documents             |  |          |  |
| Financial             | Operating  | \$83,535 |  |
|                       | Capital Not applicable   |          |  |
|                       | Revenue Not applicable   |          |  |
| Visitors              | O <sup>(a)</sup>   |          |  |
| Permits               | 2  |          |  |

(a) Excludes landings from fisheries surveillance patrols, the details of which are protected
| International conventions and agreements   |  |
|--|--|
| World Heritage Convention  | The Territory of Heard Island and McDonald Islands is listed under natural criteria<br>(i) and (ii), recognising its outstanding natural values  |
| Migratory Species (Bonn) Convention  | 12 of the 105 listed Australian species  |
| China–Australia Migratory Birds Agreement  | 1 of the 81 listed species   |
| Japan–Australia Migratory Birds Agreement  | 4 of the 77 listed species   |
| Korea–Australia Migratory Birds Agreement  | 1 of the 59 listed species   |
| Convention on the Conservation of Antarctic Marine<br>Living Resources   | The territorial sea and Exclusive Economic Zone lie within the convention area   |
| Agreement on the Conservation of Albatrosses and Petrels   | 11 of the 26 listed species  |
| Treaty between the Government of Australia<br>and the Government of the French Republic on<br>Cooperation in the Maritime Areas adjacent to<br>the French Southern and Antarctic Territories,<br>Heard Island and the McDonald Islands | The treaty provides for cooperation between Australia and France to combat illegal fishing and conduct scientific research in the adjacent territorial seas and Exclusive Economic Zones |

| Environment Protection and Biodiversity Conservation Act 1999 |                               |   |  |  |
|---|-------------------------------|---|--|--|
| Listed fauna  | Species <sup>(a)</sup>        | 1 endangered<br>10 vulnerable<br>14 migratory<br>51 marine  |  |  |
|   | Recovery plan                 | 1 being implemented: albatross ( <i>Diomeda</i> spp. and <i>Thalassarche</i> spp.) and giant petrels ( <i>Macronectes</i> spp.) |  |  |
| Listed flora  | None                          |   |  |  |
| Heritage  | On National Heritage List and | d World Heritage List   |  |  |

(a) Breeding and non-breeding species other than cetaceans.

| Numbers of native species recorded |                   |          |                   |                    |                    |
|------------------------------------|-------------------|----------|-------------------|--------------------|--------------------|
| Mammals                            | Birds             | Reptiles | Fish              | Invertebrates      | Plants             |
| 7 <sup>(a)</sup>                   | 47 <sup>(b)</sup> | 0        | 34 <sup>(c)</sup> | 169 <sup>(d)</sup> | 262 <sup>(e)</sup> |

(a) 3 breeding, 4 non-breeding seal species

(b) 19 breeding, 28 non-breeding

(c) Recorded from nearshore waters (less than 12 nautical miles)

(d) Terrestrial and freshwater

(e) 12 vascular plants, 62 bryophytes, 71 lichens, 100 terrestrial algae, 17 marine macro-algae

### **Management arrangements**

The reserve is managed by the department's Australian Antarctic Division under delegation from the Director of National Parks.

# Monitoring

Research and monitoring priorities are:

- research that increases understanding of the reserve's values and provides for ongoing reporting on the condition of the reserve's values, as required under legislation and national and international agreements
- research to determine whether the current reserve area sufficiently represents the region's marine habitats and is effective in achieving the purposes for which the reserve was declared
- research and monitoring to further understanding of the impacts of human activities in and around the reserve on the reserve's values, and to contribute to developing management strategies
- research and monitoring that will help address emerging management issues consistent with the provisions of the management plan.

# **Future challenges**

The major challenge continues to be funding and mounting expeditions to the reserve for research and monitoring, maintaining field huts and removing waste.

## Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Monitoring changes to the landscape and the status of populations of species breeding in the reserve
- Preventing introductions and controlling or eradicating non-native species
- Ensuring the reserve provides sufficient protection for the region's biodiversity

#### Actions

- Use remotely sensed data to assess environmental change
- Verify visitors' compliance with quarantine requirements
- Obtain specialist assistance in quarantine management, and the potential control or eradication of species of concern

#### Performance results 2009–10

• Consulted with the Southern Ocean fishing industry and conservation groups on the outcomes of the Conservation Zone scientific assessment completed in 2008-09. The assessment will help inform decisions on future reserve boundaries

#### KRA2: Cultural heritage management

#### **Major issue**

• The potential degradation or loss of cultural heritage on Heard Island

#### Actions

- Monitor the extent of the degradation or loss of cultural heritage
- Ensure visitors understand the nature of offences under the *Environment Protection and Management Ordinance 1987* and Regulations under the EPBC Act

#### Performance results 2009–10

• Briefed permit holders in accordance with management plan requirements

#### KRA4: Use and appreciation of protected areas

#### **Major issue**

• Facilitating environmentally appropriate visitor access

#### Action

• Ensure permits are issued in a timely fashion and visitors are briefed in accordance with management plan requirements

#### Performance results 2009–10

• Briefed permit holders in accordance with management plan requirements

#### KRA5: Stakeholders and partnerships

#### **Major issues**

- Engaging the community in the management of the reserve
- Communicating the reserve's values to the Australian and global public

#### Action

• Progress strategies for communicating information on reserve management issues

#### Performance results 2009–2010

• Consulted government agencies, industry and conservation groups on the management of the fishery adjacent to the reserve

#### **KRA6: Business management**

#### **Major issue**

• Implementing the management plan

#### **Actions**

- Encourage compliance through education and self-regulation
- Identify management plan implementation priorities and allocate resources accordingly

#### Performance results 2009–10

- Completed investigation of a compliance incident involving an incursion into the reserve
- Registered the revised Environment Protection and Management Ordinance 1987

# 3 Appendices

Appendix A – Portfolio Budget Statements reporting – 2009–10 Appendix B – Glossary and shortened forms

# Appendix A: Portfolio Budget Statement Reporting – 2009–10

#### Key Result Area 1 – Natural Heritage Management

#### PBS Target – Viable populations of selected significant species maintained

Park managers have nominated 35 species across the six terrestrial reserves to determine whether viable populations of selected significant species have been maintained in those reserves. Of the selected species, the populations of 5 species are increasing; 13 species are remaining steady; 8 species are decreasing; 1 species may be extinct; and for 8 species population data are deficient.

#### **Booderee National Park**

| Species  | EPBC Act status | Monitoring   | Actions   | Trend  | Flag              |
|--|-----------------|--|---|--|-------------------|
| Eastern bristlebird<br>Dasyornis<br>brachypterus       | Endangered      | Monitoring program<br>for distribution and<br>abundance in place<br>since 2004.  | Controlling fox<br>populations and<br>preserving suitable<br>bristlebird habitat.   | Numbers have been<br>steadily increasing<br>since the last major<br>wildfire in 2003.  | ↑ Numbers rising  |
| Sooty<br>oystercatcher<br>Haematopus<br>fuliginosus    | Νο              | Monitoring program<br>for distribution and<br>abundance in place<br>since 2004.  | Controlling fox<br>populations and<br>protecting Bowen Island<br>nesting sites. Public<br>education programs.   | Numbers have been<br>stable for the life of the<br>monitoring program.<br>Ongoing nesting activity<br>has been observed.   | → Numbers steady  |
| Pied oystercatcher<br>Haematopus<br>longirostris       | No              | Monitoring program<br>for distribution and<br>abundance in place<br>since 2004.  | Controlling fox<br>populations. Working<br>with other land<br>management agencies<br>to control threats posed<br>by vehicles. Public<br>education programs. | Numbers have been<br>stable for the life of the<br>monitoring program.   | → Numbers steady  |
| Little penguin<br>Eudyptula minor                      | Marine          | Irregular counts of beach<br>landings. Irregular<br>monitoring of chick<br>mortality.  | Maintained native<br>plantings to re-establish<br>penguin nesting habitat<br>on Bowen Island.   | This is a stable and very<br>healthy population<br>displaying exceptionally<br>high breeding success.  | → Numbers steady  |
| Long-nosed<br>bandicoot<br>Perameles nasuta            | No              | Monitoring program for<br>bandicoots and primary<br>food source<br>(invertebrates) in place<br>since 2003.                     | Controlling fox<br>populations.   | Populations peaked in<br>2005–2006 before declining<br>in 2008–2009. Numbers<br>have increased in 2010.<br>This is considered to be<br>representative of trends in<br>recovering bandicoot<br>populations. | → Numbers steady  |
| Green and golden<br>bell frog<br><i>Litoria aurea</i>  | Vulnerable      | Call back monitoring of<br>breeding sites since 1996.<br>PhD research project of<br>all frogs has been<br>underway since 2007. | Fire management to<br>minimise impact of<br>frog habitat  | Not detected in the Park<br>for five years and is likely<br>to be locally extinct,<br>despite little change to<br>habitat or hydrology.  | ↓ Numbers falling |
| Giant burrowing<br>frog<br>Heleioporus<br>australiacus | Vulnerable      | Call back monitoring of<br>breeding sites since 1996.<br>PhD research project of<br>all frogs has been<br>underway since 2007. | Fire management to<br>minimise impact of<br>frog habitat  | Numbers have been<br>stable for the life of the<br>monitoring program.   | → Numbers steady  |

| Species  | EPBC Act status | Monitoring   | Actions   | Trend   | Flag             |
|--|-----------------|--|---|---|------------------|
| Common brushtail<br>possum<br>Trichosurus<br>vulpecula | No              | Monitoring programs<br>for distribution and<br>abundance in place<br>since 2003, | Controlling fox<br>populations  | Populations have increase<br>slowly since intensive fox<br>baiting started, | 1 Numbers rising |
| Hooded plover<br>Thinornis rubricollis                 | Marine          | Monitoring program in<br>place since 2004  | Controlling fox<br>populations. Working<br>with other land<br>management agencies<br>to control threats posed<br>by vehicles. Public<br>education programs. | Numbers have been<br>stable for the life of the<br>monitoring program.      | → Numbers steady |

### **Christmas Island National Park**

| Species   | EPBC Act status   | Monitoring   | Actions  | Trend  | Flag              |
|---|---|--|--|--|-------------------|
| Christmas Island<br>pipistrelle<br><i>Pipistrellus murrayi</i>  | Critically<br>Endangered  | Monitoring of<br>Pipistrelle call activity.<br>Monitoring of roost<br>trees to determine<br>potential predators.   | Expert Working Group<br>assessment of threats to<br>the Island's biodiversity,<br>including the pipistrelle.<br>Captive breeding<br>program attempted in<br>2009 but no bats were<br>caught.   | The pipistrelle may now be extinct.  | ↓ May be extinct  |
| Native reptiles<br>(blue-tailed skink<br><i>Cryptoblepharus</i><br><i>egeriae</i> ,<br>Lister's gecko<br>Lepidodactylus<br>listeri, and<br>forest skink<br><i>Emoia nativitatis</i> ) | No (except for<br>Lister's Gecko<br>which is listed<br>as Vulnerable) | Ongoing survey of<br>native reptile fauna<br>conducted as well as<br>commencement of<br>threatening species<br>monitoring.   | Captive breeding<br>program for native<br>reptiles commenced.<br>Assessment of<br>threatening processes,<br>including disease factors<br>commenced.  | Reptile species appear to<br>be undergoing a rapid<br>population decline. Lister's<br>gecko ( <i>Lepidodactylus</i><br><i>listeri</i> ) was rediscovered<br>during the year. | ↓ Numbers falling |
| Red crab<br>Gecarcoidea natalis   | No  | Biennial biodiversity<br>survey of burrow counts<br>to determine density.<br>Survey has used<br>consistent methodology<br>since 2001. Last survey<br>occurred in 2009.                 | Continued crazy ant<br>management program,<br>including aerial baiting<br>and commencement of<br>an indirect biological<br>control research project.<br>Continued red crab<br>management program<br>including traffic<br>management, road<br>infrastructure<br>development and<br>education. | Population numbers<br>appear to have remained<br>steady from 2001 to 2007.   | → Numbers steady  |
| Abbott's booby<br>Papasula abbotti  | Endangered;<br>Marine;<br>Migratory                                   | Aerial nest count survey<br>last conducted in 2009<br>but the results are<br>inconclusive.<br>External researcher<br>currently investigating<br>some aspects of<br>population ecology. | Continuation of the<br>Christmas Island<br>Mine-site to Forest<br>Rehabilitation<br>Programme (CIMFR)<br>which focuses on the<br>rehabilitation of Abbott's<br>booby nesting habitat.  | Trend is currently<br>unknown.   | Data deficient    |

### Kakadu National Park

| Species   | EPBC Act status                     | Monitoring  | Actions  | Trend  | Flag              |
|---|-------------------------------------|---|--|--|-------------------|
| Northern quoll<br>Dasyurus<br>hallucatus                              | Endangered                          | Biodiversity Hotspot<br>Surveys and targeted<br>monitoring at the East<br>Alligator Ranger Station.<br>Incidental sighting<br>database records any<br>sightings or road kills.<br>Intermittent records are<br>being received<br>indicating there are a<br>few areas where this<br>species is persisting<br>albeit in low numbers. | Landscape unit-based<br>fire management to<br>improve habitat quality.<br>Off-shore species<br>relocation program<br>conducted in conjunction<br>with NT Govt. | Population decline was<br>evident following arrival<br>of cane toad. Population<br>levels are at low levels<br>and stable.   | → Numbers steady  |
| Northern brown<br>bandicoot<br>Isoodon macrourus                      | No                                  | Biodiversity Hotspot<br>Surveys.<br>Incidental sighting<br>database records any<br>sightings or road kills.   | Landscape unit-based<br>fire management to<br>improve habitat quality.   | Population declining<br>consistent with pattern of<br>small mammal decline<br>across Northern Australia.   | ↓ Numbers falling |
| Northern brush<br>tail possum<br><i>Trichosurus</i><br>arnhemensis    | No                                  | Biodiversity Hotspot<br>Surveys.<br>Incidental sighting<br>database records any<br>sightings or road kills.   | Landscape unit-based<br>fire management to<br>improve habitat quality.   | Population declining<br>consistent with pattern of<br>small mammal decline<br>across Northern Australia.   | ↓ Numbers falling |
| Brush-tailed<br>rabbit-rat<br><i>Conilurus</i><br><i>penicillatus</i> | Vulnerable                          | Biodiversity Hotspot<br>Surveys and targeted<br>monitoring at the<br>Mardugal Campground.<br>Incidental sighting<br>database records any<br>sightings or road kills.  | Landscape unit-based<br>fire management to<br>improve habitat quality.   | Population declining<br>consistent with pattern of<br>small mammal decline<br>across Northern Australia.   | ↓ Numbers falling |
| Black-footed<br>tree-rat<br><i>Mesembriomys</i><br>gouldii            | No                                  | Biodiversity Hotspot<br>Surveys.<br>Incidental sighting<br>database records any<br>sightings or road kills.   | Landscape unit-based<br>fire management to<br>improve habitat quality.   | Population declining<br>consistent with pattern of<br>small mammal decline<br>across Northern Australia.   | ↓ Numbers falling |
| Pale field rat<br>Rattus tunnneyi                                     | No                                  | Biodiversity Hotspot<br>Surveys.<br>Incidental sighting<br>database records any<br>sightings or road kills.   | Landscape unit-based<br>fire management to<br>improve habitat quality.   | Population declining<br>consistent with pattern of<br>small mammal decline<br>across Northern Australia.   | ↓ Numbers falling |
| Flatback turtle<br>Natator depressus                                  | Vulnerable;<br>Marine;<br>Migratory | Continuation of 15 year<br>survey and capture<br>program (annual survey).   | -  | Monitoring shows population is steady.   | → Numbers steady  |
| Estuarine<br>crocodile<br><i>Crocodylus porosus</i>                   | Marine;<br>Migratory                | Continuation of 15 year<br>survey and capture<br>program.<br>Satellite tracking project<br>has underway for 5 years.  | _  | Crocodile populations in<br>East Alligator River and<br>South Alligator River are<br>healthy and beginning<br>to plateau. Crocodile<br>population in West Alligator<br>River is still increasing.<br>Further information is<br>required to determine<br>population dynamics in<br>the Wildman River. | → Numbers steady  |

### Norfolk Island National Park

| Species  | EPBC Act status          | Monitoring   | Actions   | Trend   | Flag  |
|--|--------------------------|--|---|---|---|
| Green parrot<br>Cyanoramphus<br>cookii   | Endangered;<br>Migratory | Annual monitoring of<br>assisted breeding nesting<br>sites throughout<br>breeding season (October<br>to June). Monitoring<br>commenced in the 198's<br>and birthrate data<br>collected since 1986. | Active management of<br>50 green parrot nesting<br>sites. Active feral animal<br>control (rats, cats,<br>crimson rosellas). | Current population<br>estimate of<br>200 individuals.<br>300% increase over the<br>past decade (approx).  | 1 Numbers rising  |
| Norfolk Island<br>morepork<br>(boobook) owl<br><i>Ninox</i><br><i>novaeseelandiae</i><br><i>undulata</i> | Endangered;<br>Migratory | Artificial nesting<br>boxes are monitored<br>annually to record<br>breeding activity<br>(October to January).  | Installation of 4 new owl<br>nesting boxes bringing<br>total available nesting<br>boxes to 32.                              | Current population<br>estimate of 40 individuals.<br>No change over past year.<br>Although not well<br>documented, there has<br>been an increase over<br>the past decade.<br>First introduced from<br>NZ in mid 1980s.<br>Steady population<br>numbers may indicate<br>that carrying capacity<br>of existing habitat has<br>been reached. | → Numbers steady  |
| Golden whistler<br>Pachycephala<br>pectoralis<br>xanthoprocta  | Vulnerable               | No monitoring program<br>at present. 2010 estimate<br>of 2,200 birds.  | Weed and feral animal control.  | Unable to determine.<br>No trends at present.   | Data deficient<br>(Numbers may<br>rising but difficult<br>to compare<br>previous survey<br>numbers) |
| Pacific robin<br>Petroica multicolor<br>multicolor   | Vulnerable               | No monitoring program at present.  | Weed and feral animal control.  | Unable to determine.<br>No trends at present.   | Data deficient  |
| Wedge-tailed<br>shearwater<br>Puffinus pacificus   | Marine;<br>Migratory     | No monitoring program at present.  | Weed and feral animal control.  | Unable to determine.<br>No trends at present.   | Data deficient  |

### Pulu Keeling National Park

| Species   | EPBC Act status      | Monitoring   | Actions   | Trend   | Flag             |
|---|----------------------|--|---|---|------------------|
| Red-footed booby<br>Sula sula   | Marine;<br>Migratory | Annual fauna survey<br>conducted on<br>North Keeling Island<br>since 1985.                                       | Continued monitoring<br>program. Community<br>education and<br>compliance activities  | Analysis of data indicates<br>population remain<br>steady at around 30,000<br>breeding pairs.                           | → Numbers steady |
| Cocos buff-<br>banded rail<br>Gallirallus<br>philippensis<br>andrewsi | Endangered           | Monitoring commenced<br>in late 1999. Monitoring<br>continued<br>opportunistically when<br>staff visit the park. | Undertook feasibility to<br>re-introduce and<br>establish a second viable<br>population outside the<br>park (southern atoll).<br>Collaborative work with<br>the Cocos Islands Shire<br>and scientists | In 2005, monitoring data<br>was analysed and found<br>that the current<br>population is stable at<br>1,000 individuals. | Data deficient   |

### Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park

| Species  | EPBC Act status | Monitoring   | Actions   | Trend  | Flag              |
|--|-----------------|--|---|--|-------------------|
| <i>Tjaku<u>r</u>a –</i> great<br>desert skink<br><i>Egernia kintorei</i> | Vulnerable      | 13th annual <i>Tjaku<u>r</u>a</i><br>survey (Feb–Mar 2010)<br>identified 234 active<br>burrows (95 containing<br>juveniles and<br>65 containing sub adults).   | Continued fire<br>management to<br>improve habitat quality.<br>Continue predator<br>monitoring.<br>Finalise feral strategy<br>concentrating on the<br>borefields area of habitat.   | Highest number of active<br>burrows since inception<br>of monitoring (13 years).   | 1 Numbers rising  |
| Mala – rufous<br>hare wallaby<br><i>Lagorchestes</i><br>hirsutus         | Endangered      | 6th annual mala survey<br>(April 2009) captured 47<br>individuals (14 tagged).   | Continued active<br>management within<br>predator proof enclosure<br>such as mosaic burning<br>(20% regeneration to<br>80% mature spinifex) and<br>supplementary feeding<br>within enclosure.   | 24 individuals were<br>released in September<br>2005. In latest survey<br>(June 2010) 52 individuals<br>were caught including<br>23 new animals.   | 1 Numbers rising  |
| Murtja – mulgara<br>Dasycercus<br>cristicauda                            | Vulnerable      | Trapping for mulgara<br>captured eight animals<br>over two trapping<br>sessions.<br>New methodology<br>introduced this year<br>found widespread<br>mulgara signs<br>throughout the<br>20 survey areas. | Continued fire<br>management to<br>improve habitat quality.<br>Collared feral cats to<br>determine whether they<br>are main predator.   | Activity level is higher this<br>year due to trapping<br>across a wider area<br>however still unable to<br>determine trends. Further<br>surveys to be conducted<br>in 2010–11 will help to<br>estimate population trend.<br>Habitat still recovering<br>from 2002 wildfires that<br>burnt 50% of the park. | Data deficient    |
| Southern<br>marsupial mole<br><i>Notoryctes</i><br><i>typhlops</i>       | Endangered      | Monthly monitoring<br>across 8 different areas<br>of Spinifex habitat.   | Currently determining<br>habitat preferences<br>and distribution across<br>the park.  | Marsupial mole sign<br>(tracks/pop holes) found<br>in all 8 spinifex habitat<br>types- surface habitat<br>preferences apparent.<br>No baseline data so unable<br>yet to establish trends.  | Data deficient    |
| Striated grasswren<br>Amytornis striatus                                 | No              | Initial survey occurred<br>in 1992. Monitoring<br>recommenced<br>recommence in<br>August 2009 and<br>1 individual was found.   | Repeat survey<br>September 2010 to<br>establish size of<br>populations still living<br>within the park and<br>habitat preferences to<br>inform fire strategy.<br>Continue active fire<br>management to reduce<br>large scale habitat loss<br>from wildfire. | Decreased between 1992<br>and 2009 with birds only<br>found in 1 location<br>compared to several<br>locations in 1992.   | ↓ Numbers falling |
| Common wallaroo<br>or euro<br><i>Macropus robustus</i>                   | No              | Initial survey began<br>in May 2010.   | Currently determining<br>habitat preferences and<br>visitor influences on<br>existing populations.  | No baseline data or trends to date.  | Data deficient    |
| Rare plant survey  | No              | Annual monitoring of 15 priority species.  | Individual management<br>actions for each<br>species- include fire<br>management regimes,<br>erosion control and<br>camel control.  | Numbers stable.  | → Numbers steady  |

### PBS Target – No net increase in distribution/abundance of significant invasive species

• Park managers have nominated 20 significant invasive species across the six terrestrial reserves to identify changes in overall distribution and abundance. Of the selected species, the populations of 5 species are increasing; 3 species are remaining steady; 4 species are decreasing; and for 8 species population data are deficient.

#### **Booderee National Park**

| Species                                      | Monitoring   | Actions   | Trend  | Flag              |
|--|--|---|--|-------------------|
| European red fox<br><i>Vulpes vulpes</i>     | Utilising fauna surveillance<br>cameras, fox bait take and sand<br>plot monitoring to monitor<br>residual fox populations.   | Continue to undertake fox<br>control activities with an<br>emphasis on removing residual,<br>bait-shy individual foxes and<br>introducing alternative fox<br>control methods. | Fox numbers very low and<br>alternative fox control<br>techniques are proving effective<br>for controlling residual foxes.   | → Numbers steady  |
| Bitou bush<br>Chrysanthemoides<br>monilifera | Aerial survey undertaken.<br>Density and distribution<br>mapped and recorded on GIS.<br>Annual aerial spray efficacy<br>mapped and recorded on GIS.<br>Post treatment exclosure trials<br>to assess vegetation recovery. | 500ha of bitou bush sprayed<br>in June 2010.  | 90% reduction in the area of<br>high density infestation and 75%<br>reduction in the area of medium<br>density infestation since 2004.<br>Post treatment recovery slow<br>due to high levels of preferential<br>grazing by native species. | ↓ Numbers falling |

### **Christmas Island National Park**

| Species                                       | Monitoring  | Actions   | Trend  | Flag              |
|---|---|---|--|-------------------|
| Yellow crazy ant<br>Anoplolepis<br>gracilipes | Biennial biodiversity survey to<br>determine supercolony density.<br>Survey has used consistent<br>methodology since 2001. Last<br>survey occurred in 2007. | 90 hectares of yellow crazy ant supercolonies treated.  | Significant decline in<br>supercolony numbers occurred<br>in 2002 after successful aerial<br>baiting program. Since 2002<br>supercolonies have slowly<br>increased.<br>Aerial baiting program<br>conducted in 2009, 784 ha<br>supercolonies baited. Ongoing<br>monitoring indicates aerial<br>baiting has been successful in<br>reducing ant numbers in former<br>supercolonies. | ↓ Numbers falling |
| False curry bush<br><i>Clausena excavata</i>  | Initial survey to be conducted<br>as part of 2009 island wide<br>survey.  | Weed eradication project<br>undertaken.   | No baseline data to date so no<br>trend can be detected.<br>Increasing numbers and<br>distribution under intact<br>rainforest canopy is of<br>significant concern.   | Data deficient    |
| Feral cat<br>Felis catus                      | Determining feral cat numbers<br>is extremely difficult. Still<br>investigating approaches to<br>monitor effectively.                                       | Island wide cat management<br>plan developed to undertake<br>collaborative approach to cat<br>and rat management. Shire of<br>Christmas Island has proposed<br>new by-laws to control cats in<br>settled areas and conducts a<br>de-sexing program in<br>collaboration with Director of<br>National Parks and Christmas<br>Island Phosphates.<br>Trial conducted to test<br>effectiveness of a new cat bait<br>and toxin with delivery system<br>appropriate to Christmas Island<br>was successful. | No baseline data to date so<br>no trend can be detected.<br>Anecdotal evidence suggests<br>that numbers appear to be<br>rising.  | Data deficient    |

### Kakadu National Park

| Species                          | Monitoring   | Actions   | Trend  | Flag             |
|----------------------------------|--|---|--|------------------|
| Mimosa<br><i>Mimosa pigra</i>    | Mimosa stands have been<br>mapped and there is an annual<br>monitoring program.  | Integrated eradication program conducted.   | Under control, virtually absent from the park                          | → Numbers steady |
| Para grass<br>Brachiaria mutica  | Ongoing monitoring as part<br>of integrated weed program.<br>Species is subject to several<br>current research projects. | Opportunistic control.  | The range of this species is increasing.                               | 1 Numbers rising |
| Salvinia<br>Salvinia molesta     | Ongoing monitoring as part of integrated weed program.   | Introduction of biological<br>control agent and minor<br>mechanical and chemical<br>control in key sites.             | Extent of infestations varies greatly between locations and over time. | → Numbers steady |
| Water buffalo<br>Bubalus bubalus | Major survey conducted in 2008–09.   | A major control exercise was<br>conducted in 2008–09<br>-opportunistic control measures<br>were conducted in 2009–10. | Buffalo numbers increasing.  | 1 Numbers rising |
| Feral pig<br>Sus scrofa          | Major survey conducted in 2008–09.   | A major control exercise was<br>conducted in 2008-09<br>-opportunistic control measures<br>were conducted in 2009–10. | Feral pig numbers are increasing.                                      | 1 Numbers rising |

### Norfolk Island National Park

| Species                                    | Monitoring   | Actions   | Trend   | Flag           |
|--|--|---|---|----------------|
| Black rat<br>Rattus rattus                 | Monthly survey of presence/<br>absence of rats. Trapping and<br>baiting program provides an<br>indication of presence/absence.                     | Commenced upgrade of rat<br>stations to modern bait/trap<br>boxes. 1,100kg of bait taken<br>by rodents. Over 250 rats<br>caught in traps. | Numbers of rodents trapped<br>and bait take similar over many<br>years indicating stable<br>population despite program.                         | Data deficient |
| Feral cat<br>Felis catus                   | Trapping program provides a<br>presence/absence indication.<br>Continued gut analysis to<br>determine prey composition<br>(eg native birds, rats). | 17 wild cats controlled in the park.  | Unable to quantify population<br>size. Uncertain whether rodent<br>control program on park is<br>impacting on feral cat numbers<br>in the park. | Data deficient |
| Red guava<br>Psidium<br>cattleianum        | No monitoring program<br>at present.   | Completed weed control in<br>6 of the 19 coups identified<br>in the rehabilitation strategy.<br>6 ha weeds controlled.                    | Unable to determine.<br>No trends at present.   | Data deficient |
| African olive<br>Olea europaea<br>africana | No monitoring program<br>at present.   | Completed weed control in<br>6 of the 19 coups identified<br>in the rehabilitation strategy.<br>6 ha weeds controlled.                    | Unable to determine.<br>No trends at present.   | Data deficient |

### Pulu Keeling National Park

| Species                                       | Monitoring  | Actions  | Trend  | Flag             |
|---|---|--|--|------------------|
| Yellow crazy ant<br>Anoplolepis<br>gracilipes | Island wide survey<br>conducted in June 2008.<br>Survey methodology will be<br>updated to include detection<br>of 'scale insects' | Continued monitoring program.<br>Planning for control programs<br>using chemical.<br>Successful funding application<br>to undertake major invasive<br>species management programs<br>from 2009–11. | Colonies fairly widespread, with<br>some sites recorded at<br>'supercolony' density. | 1 Numbers rising |
| Coral berry<br>Rivina humilis                 | Ongoing mapping activities since 2008.  | Successful funding application<br>to undertake major invasive<br>species management programs<br>from 2009–11.  | Increased distribution and density observed in western part of the park.             | ↑ Numbers rising |

### Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park

| Species   | Monitoring   | Actions   | Trend  | Flag              |
|---|--|---|--|-------------------|
| Buffel grass<br>Cenchrus ciliaris                   | Monitoring of native<br>biodiversity following buffel<br>removal around Ulu <u>r</u> u.  | Prioritised buffel grass control<br>activities including the Ulu <u>r</u> u<br>base and areas of high<br>conservation value.                    | Distribution throughout the<br>park decreased due to an<br>increase in control activities.                   | ↓ Numbers falling |
| Feral cat<br>Felis catus                            | 10 satellite tracking collars<br>(lasting 8 months) have been<br>fitted to determine range,<br>microhabitat use and potential<br>prey risk. Currently trialling<br>roadside monitoring of feral<br>cat tracks. | Continued feral cat trapping program.   | Unable to establish trend with current monitoring approach.  | Data deficient    |
| European wild<br>rabbit<br>Oryctolagus<br>cuniculus | Annual monitoring of active<br>burrows has been undertaken<br>since 1989.  | Calicivirus released around resilient burrows.  | Active burrows have reduced<br>significantly since 1989. 93%<br>decrease in active burrows over<br>18 years. | ↓ Numbers falling |
| European red fox<br><i>Vulpes vulpes</i>            | Monthly vertebrate pest<br>monitoring in borefields area of<br>Park commenced Sept 2008  | Completing vertebrate pest<br>strategy for the park which<br>documents new control<br>techniques for foxes. Trials will<br>begin early in 2011. | Baseline data only.<br>No trends at present.   | Data deficient.   |

#### Key Result Area 2 – Cultural Heritage Management

PBS Target – 100 per cent of key sites, as agreed with traditional owners, inspected and treated as required (Jointly managed parks only)

• All key sites at Kakadu and Ulu<u>r</u>u–Kata Tju<u>t</u>a National Parks were inspected as agreed with traditional owners with various treatments undertaken as required. An inspection and treatment program is not yet in place at Booderee National Park.

#### Key Result Area 3 – Joint Management And Working With Indigenous Communities

PBS Target – Five per cent increase in numbers of Indigenous staff and/or contractors directly or indirectly providing park services (Jointly managed parks only)

- Overall the number of directly employed Indigenous staff throughout the year remained steady in the jointly managed parks.
- The number of Indigenous staff (including intermittent and irregular employees) and contractors indirectly
  engaged to provide services at Kakadu and Uluru–Kata Tjura National Parks increased by 33 per cent.
  The increase at Uluru–Kata Tjura was partly due to the engagement of two workforce development
  coordinators (funded by the Department of Education, Employment and Workplace Relations). Ninety-seven
  Indigenous workers were employed under a memorandum of understanding with the Muritjulu Community
  Aboriginal Corporation.
- Wreck Bay Enterprises Ltd (the enterprise arm of the Wreck Bay Aboriginal Community Council) provided \$1.9 million of cleaning, road maintenance and entry station services to Booderee National Park.
- The Director and Wreck Bay Enterprises Ltd completed the agreement on the second round of outsourcing at Booderee, including management of the visitor centre, grounds maintenance and building services. Both parties agreed to delay final implementation until restructures were completed.

#### Key Result Area 4 - Use And Appreciation Of Protected Areas

PBS Target – Greater than 80% of comments received from park users about their visit are positive

Visitor surveys were undertaken in Kakadu, Ulu<u>r</u>u–Kata Tju<u>t</u>a and Norfolk Island National Parks. All reserves
recorded satisfaction from greater than 80% of park users (Ulu<u>r</u>u – 96%, Kakadu – 94%; Norfolk Island – 97%).

#### Key Result Area 5 – Stakeholders And Partnerships

#### PBS Target – Stakeholders and partners are actively involved during the year

- Stakeholders and partners were actively involved and contributed effectively to park management activities. Key stakeholder included national and regional tourism organisations (including the Transport and Tourism Forum and Tourism Australia), industry groups, universities, non-government organisations and community groups.
- Research partnerships continued with a range of organisations such as the Northern Territory Parks and Wildlife Service, CSIRO, Australian Institute of Marine Science, James Cook University, Australian National University, University of Canberra, Charles Darwin University and the Tasmanian Aquaculture and Fisheries Institute.
- Constructive partnerships in managing Commonwealth reserves continued with: local government including Councils, state government parks agencies and other relevant agencies including schools and educational institutions and conservation and land management agencies, and Commonwealth agencies including the Department of Defence, the Attorney-General's Department, the Department of Agriculture, Fisheries and Forestry, and the Australian Customs and Border Protection Service.
- The ANBG and the Centre for Plant Biodiversity Research continued their support for, and involvement, with the Council of Heads of Australian Botanic Gardens and the Council of Heads of Australian Herbaria.

#### Key Result Area 6 – Business Management

#### PBS Target – Reduction in number of risks identified in Risk Watch Lists as 'extreme', 'very high' or 'high'

• There has been a net reduction in the number of extreme and high risks in risk watch lists of 1% over 2009–10.

#### PBS Target – Eight management plans and four implementation schedules in place

- Four terrestrial reserve management plans are in place (Norfolk Island National Park and Norfolk Island Botanic Gardens are two reserves covered by one management plan). Draft management plans are being finalised for Booderee and Christmas Island National Parks and the Australian National Botanic Gardens.
- Four terrestrial reserve implementation schedules are in place. Implementation schedules are not in place for the reserves with expired management plans.

# PBS Target – Number of major injuries to staff, contractors, volunteers and visitors relating to an undertaking of the Director of National Parks

• Five major injuries sustained by parks staff (lacerations and fractures). Two park visitors died (one in Kakadu National Park and one undertaking the Uluru climb) and there were 15 major injuries to visitors (caused by road accidents, heat stress, dehydration and fractures).

PBS Target – 80 per cent of management prescriptions in management plans subject to technical audits are completed (applies ONLY to those plans that have received a technical audit)

• A technical audit conducted on the implementation of the Australian National Botanic Gardens Management Plan found that 65% of management prescriptions were fully completed during the life of the plan, 23% were partially completed and 12% were not commenced.

#### PBS Target – Six parks with climate change strategies in place

- Climate change strategies were completed for Kakadu and Booderee National Parks and the Australian National Botanic Gardens. Draft strategies were also prepared during the year for Ulu<u>r</u>u–Kata Tju<u>t</u>a and Norfolk Island National Parks. Policies and related to climate change monitoring, mitigation and adaptation are also being incorporated into management plans as they are being drafted.
- Climate change strategies for each park identify actions to address five key objectives:
  - Understanding the implications of climate change
  - Implementing adaptation measures to maximise the resilience of our reserves
  - Reducing our carbon footprint
  - Working with communities, industries and stakeholders to mitigate and adapt to climate change
  - Communicating the implications of climate change and our management response.

#### PBS Target – Three actions implemented which reduce greenhouse gas emissions

- Greenhouse gas emissions associated with stationary and transport energy use over the year were estimated to be 5,150 tonnes of carbon dioxide. This is a reduction of around 12% compared with the average emissions over the past three years. Improvements in energy efficiency were largely related to stationary sources, including the installation of solar panels at Kakadu, Norfolk Island and Booderee National Parks. The solar panels at Booderee National Park have generated 4,088 kilowatt hours since November 2009. The closure of a glasshouse at the Australian National Botanic Gardens for renovations also impacted on energy use.
- Developing accurate measurements of greenhouse emissions related to waste remains challenging and estimates were not available for all reserves. Both the Australian National Botanic Gardens and Booderee National Parks have improved their recycling capacity through measures to minimise contamination of recyclable waste.

#### Key Result Area 7 – Biodiversity Knowledge Management

#### PBS Target – Five per cent increase in website unique users and publications accessed

- The Parks Australia websites (environment.gov.au/parks and kakadu.com.au) received an increase in visitation by 25% from the previous year with 540,877 'unique' visits for the year (an average of 1,481 'unique' visitors per day). There was also an increase in the number of online publications accessed with 105,181 'unique' views (an average of 288 'unique' views per day).
- Estimates of hits to the Australian National Botanic Gardens website (**www.anbg.gov.au**) indicate an increase in the use of the site of around 20% over 2009–10.

# **Appendix B: Glossary and shortened forms**

| A <u>n</u> angu  | Western Desert Aboriginal person or people (generally those Aboriginal people with traditional affiliations to the Ulu <u>r</u> u–Kata Tju <u>t</u> a National Park   |
|--|---|
| ANAO   | Australian National Audit Office  |
| ANBG   | Australian National Botanic Gardens   |
| Benthic  | Marine organisms that live on, in or near the ocean floor   |
| Bininj   | Traditional owners of Aboriginal land and traditional owners of other land in Kakadu National Park,<br>and other Aboriginals entitled to enter upon or use or occupy the park in accordance with Aboriginal<br>tradition governing the rights of that Aboriginal or group of Aboriginals with respect to the Park |
| CAC Act  | Commonwealth Authorities and Companies Act 1997   |
| Cetaceans  | Whales, porpoises and dolphins  |
| China–Australia Migratory<br>Birds Agreement (CAMBA)   | Agreement between the Government of Australia and the Government of the People's Republic of<br>China for the Protection of Migratory Birds and their Environment   |
| CSIRO  | Commonwealth Scientific and Industrial Research Organisation  |
| EEZ  | Exclusive Economic Zone   |
| Endemic  | (Of a taxonomic group) confined to a given region   |
| EPBC Act   | Environment Protection and Biodiversity Conservation Act 1999   |
| FOI Act  | Freedom of Information Act 1982   |
| GIS  | Geographic information system   |
| GPS  | Global positioning system   |
| IBRA   | Interim Biogeographic Regionalisation for Australia   |
| IMCRA  | Integrated Marine and Coastal Regionalisation for Australia   |
| IUCN   | International Union for the Conservation of Nature  |
| Japan–Australia Migratory<br>Birds Agreement (JAMBA)   | Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment   |
| KRA  | Key result area   |
| Migratory Species (Bonn)<br>Convention                 | Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)  |
| MoU Box area   | An area within Australian waters covered by a Memorandum of Understanding with Indonesia that includes Ashmore Reef and Cartier Island and is open to traditional Indonesian fishers  |
| Pelagic  | Species or activities that normally live or occur near the ocean surface or the water column  |
| Korea–Australia Migratory<br>Birds Agreement (ROKAMBA) | Agreement between the Government of Australia and the Government of the Republic of Korea for the Protection of Migratory Birds   |
| Seamounts  | Large cone-shaped remnants of extinct volcanoes rising from the ocean floor   |
| Terrestrial  | Relating to the land or land-dwelling   |
| UNESCO   | United Nations Educational, Scientific and Cultural Organization  |
| Wetlands (Ramsar) Convention                           | Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar, 1971)   |
| World Heritage Convention                              | Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)   |

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