

Australian Government Director of National Parks



# Director of National Parks State of the Parks Report Director of National Parks Annual Report 2011–12 Supplementary Information



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#### Map data sources

Indigenous Protected Areas (Declared), Collaborative Australian Protected Area Database, (CAPAD 2010): © Commonwealth of Australia, Department of Sustainability, Environment, Water, Population and Communities, 2012

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# 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 International Union of Conservation of Nature (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 2011–12.

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 Sustainability, Environment, Water, Population and Communities portfolio and contributes to the achievement of Outcome 1. 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 on the Portfolio Budget Statements 2011–12 targets is provided at Appendix A.

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## 1 Terrestrial reserves summaries for 2011–12



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, the Atlas of Living Australia 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 biog central desert	geographic regions—alpine to tropical, coastal to
Management plan	Third management plan came into effect on 29 May 201	2 with a life of 10 years
Other significant	Risk Assessment and Management Schedule; ANBG Mas	terplan (National Capital Authority); ANBG Emergency
management documents	Management Plan; Agreement for the Operation of the Centre for Australian National Biodiversity Research (CANBR) between the Director of National Parks and the CSIRO; CANBR Strategic Plan	
Financial	Operating	\$10.334 million
	Capital	\$1.056 million
	Revenue	\$10.164 million
Visitors	449,733 to ANBG	
	100,466 to Visitor Centre	
Living plants	Planted in 2011–12: 7,247	
	Total number of taxa in the living collection: 6,271	
	Total number of plants in the living collection: 74,022	
Herbarium specimens	Specimen records added to database in 2011–12: 15,326	
	Specimen records in database: 889,804	
	Total number of specimens in collection approximately 1.2 million: 935,093 items databased plus approximately 300,000 not databased	
Australian Plant Name	Names added to APNI database in 2011–12: 48,169	
Index	Total names in APNI database: 263,976	
Seed Bank	Number of wild collections added to Seed Bank in 2011–12: 231	
	Total number of collections in Seed Bank: 5,482	

Australian Plant Census	Names added to APC database in 2011–12: 8,234 Total names in APC database: 43,708	
Australian Plant Image Index	Images added in 2011–12: plant images 3,610; other 519 Total number of images in collection: 80.056	
Permits	5 commercial activity permits; 25 wedding licences; 4 research permits	

#### 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 horticulture and education programs		
Wetlands (Ramsar) Convention	Supports Australia's obligations under the Ramsar Convention through access to plant identification services and data on aquatic plants in the Australian National Herbarium, and by delivering information on Australia's aquatic plants through its website		
Other agreements	<ul> <li>International collaborations and partnerships include:</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, and Harvard University)</li> <li>Global Biodiversity Information Facility</li> <li>International Organisation for Plant Information World Vascular Plant Checklist Project</li> <li>Species 2000</li> <li>Millennium Seed Bank Partnership</li> <li>American Public Gardens Association</li> <li>Global Strategy for Plant Conservation</li> </ul>		
<b>Environment Protection and</b>	d 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 Australian National Biodiversity Research (CANBR) (formerly 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 seed collections and 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.

The ANBG collaborates with the University of South Australia to conduct general visitor satisfaction research. Visitor surveys were conducted in late 2011 for the *Visitors Perceptions of Service* report providing a benchmark across participating botanic gardens in Australia and New Zealand. The ANBG uses an automated online survey company to collect and report visitor satisfaction at public programs, education programs and events.

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:

- generation of new revenue opportunities to offset increasing operational costs
- strengthening scientific research through the acquisition of new resources and partnerships
- integrating climate change considerations into conservation programs and research
- increasing the reach and impact of the national environmental education program
- undertaking a new site development plan to guide the strategic development of the living collection and major infrastructure requirements
- developing and implementing contingency plans for major risks such as bushfires, drought, pests and resourcing issues
- redeveloping the ANBG website to reach compliance with new government accessibility standards
- uncertainty surrounding the transition of the Atlas of Living Australia from current funding to the next phase including continuity of projects established under Atlas of Living Australia funding
- transition to a new thematic structure involving all the national biological collections.

## Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Potential new threats to the living collection
- Ex situ conservation
- Completing the next living collection monitoring stocktake
- Enhancing the living collection and visitor experience through new developments

#### Actions

- Developing contingency plans for potential pests and diseases such as myrtle rust
- Position the ANBG as a leader in ex situ conservation including seed banking
- · Identify strategy to resource plant monitoring stocktake
- Planning for new developments to expand the range of species represented within the living collection

- The ANBG continued to display approximately one-third of the plant species occurring naturally in Australia, in a managed horticultural setting
- Major drainage and earthworks for the Red Centre Garden were completed by May 2012. This followed 18 months of research, design and sourcing of authentic materials and plants for the site, as well as hydrological engineering and development design work. Placement of the rock is nearing completion and the installation of the soil profile and subsurface drainage works has commenced
- Continued a program for *ex situ* alpine plant conservation supported by a three-year partnership between the ANBG, Australian National University, Australian Research Council, University of Queensland and the Friends of the ANBG. The program studies the effect climate change will have on the reproductive ecology and demography of Australian alpine flora. Five weeks fieldwork in Kosciuszko National Park resulted in collection of 71 seed lots
- Made 99 seed collections to secure ACT grassland species in the ANBG Conservation Seed Bank. Experiments being performed on these seed collections help build understanding and knowledge of the germination requirements of these Australian flora species, thus informing conservation and restoration practices
- Established a new volunteer program, called the 'Seedy Volunteers', to support the seed collecting program. Fourteen volunteers were recruited and trained and undertook a total of 17 local collecting trips with botanic gardens staff

- Recruited a Seed Conservation Biologist to enhance the ANBG's seed related research on germination and storage for *ex situ* conservation
- The ANBG conservation program focused on grassy woodland communities and sub-alpine flora. Specific conservation projects were undertaken associated with the following threatened species—*Zieria obcordata, Z. baeuerlenii, Swainsona recta, Eucalyptus imlayensis, Lepidium ginninderense* and *Hakea pulvinifera*
- A myrtle rust response plan was developed together with upgraded horticultural practices to reduce the risk of myrtle rust occurring in the ANBG
- Under the ANBG Pest Animal Management Strategy, surveys were completed for rabbits, foxes and kangaroos. The ANBG worked in collaboration with the ACT Parks and Conservation Service to reduce rabbit, cat, and fox numbers within the ANBG through improvements to the fence line and control programs. Management procedures for grey-headed flying-fox (*Pteropus poliocephalus*) were prepared and approved for the site
- Collaborated with the ACT Parks and Conservation Service to plan a hazard reduction burn on the southern annex to reduce the bushfire hazard to the ANBG. This provided opportunity for identification, survey and protection of several vulnerable or endangered species. The hazard reduction burn will occur during 2012–13
- Entrances to the Sydney Region Garden were upgraded with extensive use of sandstone landscape materials; the works were completed in October 2011. The Garden has been enhanced with more than 100 new vouchered field collections, including 20 listed threatened species collected during a series of field trips undertaken in partnership with NSW Office of Environment and Heritage, Eurobodalla Regional Botanic Gardens and Booderee Botanic Gardens
- New plant based staff working groups were established to develop, promote and enhance the living collection including: the Living Collection and Horticulture; the Eucalyptus; and the Asteraceae working groups

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

#### **Major issues**

- Raising the profile of the ANBG as a national institution and tourism destination
- Education programs to be expanded and promoted to students throughout Australia
- Visitor programs and outreach
- Monitoring and evaluating visitor satisfaction and needs

#### Actions

- Review existing education programs and develop new targeted programs that meet Australian curriculum requirements
- 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 449,733 visitors of which 22 per cent were recorded at the Visitor Centre
- A visitor survey conducted by the University of South Australia in October and November 2011 indicated:
  - overall visitor satisfaction was rated at 93 per cent
  - 52 per cent of visitors were from outside the ACT
  - most visitors intended to return (94 per cent) and most would recommend the gardens to others (91 per cent)
- An automated online survey commenced in January 2012 to collect and report visitor satisfaction at public programs and events which simplifies the distribution and collation process of surveying, whilst capturing more direct and accurate post visit perceptions and experiences, showed that:
  - the ANBG has achieved an overall high level of satisfaction with visitors attending public programs and special events

- the current pricing structure for ticketed events has been well received and rated either 'excellent' or 'good' value with the majority of visitors
- 35 per cent of visitors attending night tours had visited the ANBG for the first time
- 34 per cent of visitors to the Summer Concert series attended the event for the first time
- A new brand for the ANBG was implemented, including the development of a new logo, ranger uniforms, marketing materials and style guide. The new brand was developed to raise the profile of the ANBG as a national institution and a tourism destination
- In May 2012 established a ClimateWatch Trail in association with Earthwatch Australia. The Trail is part of a citizen-science based climate change monitoring program that allows Australians to make observations and record timing of phenological events (ie events such as flowering and animal migration which indicate the influence of climate on the recurrence of natural phenomena)
- In May 2012 launched the Flora Explorer bus tour. The 12-seater electric minibus was purchased with support from the Friends of the ANBG and provides visitors with a one-hour guided tour, increasing access to the ANBG for visitors with limited ability and expanding the range of visitor products
- The Summer Sounds concert series, held in January 2012 in partnership with the Friends of the ANBG, attracted 10,900 people over four weekends. Visitor survey results showed high audience satisfaction levels
- Hosted a short film festival 'Flix in the Stix' in February 2012, attended by 700 people. The ANBG is actively seeking new events that complement the values of the site and enhance visitor experiences
- Following on from the popular Enlighten Festival 'Twilight Tours' in March 2012, the ANBG launched a premium night tour in early June called 'afterDARK'. This new product has received strong bookings for its first three winter events from June to August 2012
- The ANBG participated in Floriade 2011 with an award-winning showcase garden on the theme of 'Food and Flavours of the Australian Bush'—the showcase garden won the gold award for the best garden display
- Bush Magic Storytime in the Gardens attracted a strong following of repeat family visitors. The program is aimed at preschool children and their families and 11 sessions were run through the year with an average of 33 children at each session
- Implemented a successful range of public programs including:
  - Monthly Botanical Art Workshops
  - Science Week (August 2011): Twilight: A Family Adventure tours, Science Week Children's Trail, What's in a Flower: plant identification
  - Waterwatch School Holiday program (October 2011)
  - Ikebana school holiday workshop and exhibition (October 2011)
  - Snakes Alive reptile exhibition in association with ACT Herpetological Association (January 2012)
  - Carols in the Gardens (December 2011)
  - Part of Enlighten Festival 2012, delivering Twilight: A Family Adventure
  - April School Holiday program including Easter bilby craft workshops and bilby children's trail (April 2012)
  - Lasting Beauty photography workshop (August 2011)
  - Tuckertime Walks (October 2011)
  - Breakfast with the Birds (October 2011)
- Hosted 12,234 school and tertiary students from 240 schools in ANBG education programs (73 per cent of students participated in programs facilitated by ANBG and 27 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
- Participated in a partnership with National Capital Education Tourism Project to attract interstate school excursions to Canberra and the ANBG. Activities included representation at teacher conferences, teacher seminars in Lismore, Port Macquarie, and Coffs Harbour, interstate teacher familiarisation tours in March 2012, and tour operator familiarisation in February 2012
- Participated in the National Capital Exchange of Museum and Cultural Institution Educators to the Smithsonian Museum in May 2012. The exchange program was an initiative of the National Capital Education Tourism Project, partially funded by ACT Government

- Collaborated with the National Capital Attractions Association Inc to represent and promote the ANBG and other national attractions within Canberra and the surrounding region
- Promoted the cultural, artistic and scientific values of Australian native plants through exhibitions including:
  - Lasting Beauty: Peter Garnick
  - The Beauty and Transience of Nature
  - Friends School Photographic Competition
  - International Year of Forests Photographic Exhibition
  - Inner Garden Exhibition
  - Bonsai Exhibition, Symposium and Demonstrations
  - Easter Bilby in the Gardens Schools Bilby Exhibition
  - Art in the Gardens with Friends
  - The Scrolls Illuminated
- The CANBR part of the ANBG website was updated with a new 'look' and improved functionality, and the majority of the botanical/horticultural pages were updated to a matching design. The website has 45,000 pages, providing access to 63,000 images and is accessed on average 30,000 times each day. The ANBG's Facebook and Twitter sites grew in popularity—851 people 'like' ANBG's Facebook page and 392 people follow ANBG on Twitter

#### **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
- Development of the Australian Seed Bank Partnership
- Transition to the new thematic structure for CSIRO collections will require strong stakeholder management in the Centre for Australian National Biodiversity Research partnership

#### Actions

- Continue partnership with CSIRO in the Centre for Australian National Biodiversity Research (CANBR)
- 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 the CANBR can provide to the department and CSIRO in the form of technical and expert advice
- Continue to foster the positive partnership between the ANBG and the Friends of the ANBG
- Continue engagement with the Atlas of Living Australia partnership
- 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 ANBG's active leadership role hosting and supporting the co-ordination of the Australian Seed Bank Partnership
- Continue hosting the Greening Australia Community Seed Bank, the Australian Cultivar Registration Authority, the Australasian Systematic Botany Society, the Australian Network for Plant Conservation, Council of Heads of Australasian Herbaria and Council of Heads of Australian Botanic Gardens on the ANBG website

- Continued ANBG membership of technical working groups under the Global Biodiversity Information Facility and
  Taxonomic Databases Working Group
- Continued to support the coordination of the Australian Seed Bank Partnership. The Partnership is working to implement a 10-year business plan to build a national network of conservation seed banks for Australian flora
- The ANBG has entered into a three-year agreement with the ACT Environment and Sustainable Development Directorate. The ANBG is providing specialist seed banking, orchid conservation and propagation skills and facilities to support the *ex situ* conservation of rare and threatened plants of the Australian Capital Territory ie *Corunastylis ectopa*, *Arachnorchis actensis*, *Prasophyllum petilum* and *Drabastrum alpestre*
- Continued the close collaboration between the ANBG Conservation Seed Bank and Greening Australia, including joint field collecting, seed storage and management; the ANBG also 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 ANBG continued to foster new partnerships and collaboration on science and conservation projects. This included seed collection, propagation and translocation of the EPBC-listed *Swainsona recta* to an offset site near Williamsdale, NSW
- Living Collections staff, in partnership with staff from the NSW Office of Environment and Heritage participated in a workshop and planting of the threatened *Lepidium hyssopifolium* at McLeods Creek, NSW
- The ANBG partnered with the NSW Office of Environment and Heritage, Eurobodalla Regional Botanic Gardens and Booderee Botanic Gardens to collaboratively collect and share new plant material as part of a field program targeting Sydney sandstone flora
- Living collections staff participated in the collecting and growing of plants from the Bush Blitz survey at Skullbone Plains, Tasmania culminating in a collaborative plan to promote, interpret and display the achievements of the work as the plants are planted out in 2012–13
- 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, Flora Explorer driver guides on weekends and facilitators for the Botanical Resource Centre twice a week, and supported the ANBG's annual summer concerts
- The Friends of the ANBG provided financial support for lighting the rainforest walkway, for the Flora Explorer electric minibus and towards the Climate Watch Trail
- 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 CANBR partnership in the Australian Tropical Herbarium in Cairns continued. The ANBG and the CANBR successfully provided database services to support the tropical herbarium's collections management
- Strengthened partnerships with the NSW Office of Environment and Heritage, ACT Government, landholders and NGOs to collaborate in the recovery of threatened species and ecological communities. Specific projects included seed banking, cultivation of plants for translocation, research and germination testing
- Intensified collaboration with the Atlas of Living Australia in the concluding year of the current funding round, especially in the Taxonomic Research and Information Network

#### KRA6: Business management

#### **Major issues**

- Finalisation of the third management plan
- Effective budget management and new revenue opportunities to meet increasing operational costs
- Ongoing development, succession planning and retention of staff
- Minimisation of operational risks to staff, visitors and assets

#### Actions

- Finalise the third management plan for release as a draft for public comment
- Align the strategic risk assessment and business planning timelines to ensure that resources meet existing and emerging needs
- Implement 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 2011–12

- The draft third management plan was released for public comment from 23 November 2011 to 31 January 2012. Following consideration of public comments, the third management plan was finalised and came into effect on 29 May 2012 with a life of 10 years
- The Director signed a five-year licence agreement with the Hellenic Club of Canberra for operation of the ANBG Cafe as *Floresco in the Gardens*. The Cafe was renovated and reopened on Mother's Day 2012
- Continued commitment to health and safety through regular occupational health and safety committee meetings and applying risk management principles in developing capital works projects and operational plans
- Developed and implemented a new emergency management plan
- Developed an online donation system and generated sponsorship for the Summer Sounds concert series
- The ANBG site was rekeyed with a new security system providing improved access and security to the entire gardens site
- The southern and western fence lines were improved with cyclone wire fencing and pest proofing measures along the entire length

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

#### **Major issues**

- Taxonomic botanical research and documentation
- Nationally consistent names for Australian plant species
- Integrating the living collection database, herbarium database and image database
- Uncertainty surrounding the transition of the Atlas of Living Australia (ALA) from current funding to the next phase including continuity of projects established under ALA funding

#### Actions

- Improving access to botanical information and images for application around issues of plant conservation, natural resource management and environmental change
- · Awareness of, and engagement with, national and international collaborative biodiversity projects
- Developing the horticultural knowledge base
- 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 systematics 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
- Manage the transition of ALA supported projects at the conclusion of the current round of funding

- The ANBG and the CANBR participated in national and international biodiversity information management and technical infrastructure projects including many important stakeholders such as the ALA
- Australian National Herbarium staff databased 15,326 herbarium specimens, with a total of 889,804 collection specimens now recorded in the database and available to the public through the internet
- Maintained currency of data for the Australian Plant Name Index, including extensive editing of existing data and capture of new data
- Updated the Australian Plant Image Index to make 4,129 additional images accessible on the internet
- The Australian National Herbarium's highly successful summer botanical intern program completed its 20th year in February 2012. Second and third year university students received work experience and formal training in herbarium botany and plant conservation
- The Australian Seed Bank Partnership collaborated with the ALA to create an online seed knowledge hub. National data standards have been agreed by partners for the sharing of seed data
- Making information available to the public by labelling the plants is a key role of botanic gardens. During the year 2,946 labels were engraved for placement throughout the ANBG and 793 labels were recycled from past plantings
- A special labelling project for the living collection placed 3,739 labels on plants in over 146 sections along parts of the main path and rock garden, significantly improving interpretative use and value of the plant collections for visitors
- The interactive Key to Rainforest Plants, prepared as part of the partnership with James Cook University and the Queensland Herbarium in the Australian Tropical Herbarium in Cairns, was extended to cover the savanna plants of tropical northern Australia as a collaboration between northern Australian herbaria
- Completed data collation for the Fabaceae (legumes), Cyperaceae (sedges), Malvaceae (hibiscuses and relatives) and most of the Asteraceae (daisies) for the Australian Plant Census Project
- Prepared classification hierarchies above the level of genus for all vascular plants in the Australian Plant Census; this classification has been endorsed by the Council of Heads of Australasian Herbaria. Hierarchical classifications were also prepared for the non-vascular plants
- Maintained the Census of Vascular Plants, Hornworts, Liverworts and Slime Moulds of the ACT, including addition of much new data for vascular plants
- Continued the contract with the ALA to build the nomenclature and taxonomic infrastructure for Australian plant and animal species, in association with the Australian Biological Resources Study
- Continued collaboration with the ALA and the Taxonomy Research and Information Network to develop specifications for species profiles for managing digital biodiversity data

- The CANBR's association with the Taxonomy Research and Information Network, and other projects associated with the ALA, are changing due to the conclusion of the current funding round and the ANBG is negotiating transition arrangements with the ALA
- Continued redevelopment of the living collection information system to better support the operational activities of the nursery, seed bank, horticulture and plant records activities and to integrate with provenance data in the herbarium system
- Commenced redevelopment of the CANBR website to match its appearance to that of the ANBG and prepare for a major update of content as the new strategic plan for the Centre progresses
- A consultant was contracted to advise on web accessibility compliance for the ANBG and CANBR websites
- Researchers completed 12 scientific papers or publications resulting from research undertaken at the Australian National Herbarium. Areas of study included Australian Asteraceae (daisies), Orchidaceae (orchids), Amaranthaceae (amaranths) and biogeography of the Australian flora
- The CANBR continued the contract with NSW Roads and Maritime Services to document and manage translocation and conservation of three species of orchids threatened by the Bulahdelah bypass highway realignment
- Australian National Herbarium staff edited weed species descriptive and illustrative profiles for the Commonwealth weed information website. The taxonomy and nomenclature of all profiles has been updated in line with the national Australian Plant Census
- Australian National Herbarium staff undertook an island-wide survey of the flora of Christmas Island, including Christmas Island National Park. Approximately 250 specimens of native and introduced species were collected, with over 1,000 corresponding vouchered digital images. Specimens will be lodged with the Australian National Herbarium and images made available via the Australian Plant Image Index

# **Alive with innovation**

The Australian National Botanic Gardens is approaching the future with a brand new look and energy.

In 2011–12 the Gardens was rebranded, giving this Canberra institution a much more contemporary, upbeat look and feel. The Gardens have developed a range of visitor services and tourism products in line with their new look and put a fundraising program in place to support their future goals.

The Gardens 2012–2022 Management Plan, released in May 2012 will guide the development of the Gardens over the next 10 years and reflects the changing needs and challenges of the institution.

It's hoped that some of these needs will be addressed by a first for the Gardens—an online donation system and a bequest publication. Designed to raise further finance for the organisation, it is part of a long-term strategy to improve the Gardens' education and visitor service programs and develop areas such as horticulture and conservation research and the Gardens themselves.

Visitors are already enjoying Australian bush food and fresh produce dining experiences at the Gardens' new café— *Floresco in the Gardens*. After a competitive selection process, Hellenic Premium Catering were selected as the new proprietors, taking over from Hudsons who ran the cafe for many years.

With the change in proprietors, the café has had a makeover—renovations have lightened the space with an exciting menu providing high quality, affordable meals.

As part of Canberra's Enlighten festival, a new lighting display in the Gardens' Rainforest Gully was turned on for the first time in early March 2012. With 125 LED spotlights illuminating selected trees and shrubs, boardwalk markers and a lighted handrail, the state-of-the-art display works with our misting system, immersing visitors in a unique after-dark experience of the gully's rich diversity of plants. The lighting project was jointly funded by the Director of National Parks and the Friends of the Australian National Botanic Gardens.

The success of Enlighten led to the Gardens creating a permanent public program—*afterDARK*. AfterDARK is a night adventure featuring the lighting in the majestic Rainforest Gully. *AfterDARK* provides a range of experiences for visitors from spotlighting tours to exclusive dining experiences in association with *Floresco in the Gardens*.

In May 2012 the Gardens launched *Flora Explorer*—a 12-seat electric passenger vehicle to help our visitors explore its beautiful landscapes. Supported by the Friends of the Australian National Botanic Gardens, the bus helps visitors, who may be unable to walk far, to discover the Gardens' many highlights while sitting back and enjoying a one-hour guided tour.

The ClimateWatch trail launched this year is yet another innovative way to engage visitors. Aiming to inspire a new generation of young scientists it was developed in partnership with Earthwatch Australia. The trail lets those who walk it become 'citizen scientists', monitoring the effects of climate change on Australian native plants.

Visitors can record information such as flowering times and nesting patterns of birds, to help scientists understand the effects of climate change and how best to respond to it. The ClimateWatch trail has been funded by the Friends of the Australian National Botanic Gardens.



In partnership with ActewAGL, a Canberra-based energy company, the Gardens propagated and grew the endangered small purple pea (*Swainsona recta*) in its Seed Bank laboratory and nursery.

The purple peas have been planted out on ActewAGL's 110 hectare Murrumbidgee to Googong pipeline offset site in the capital.

## **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. Weed control programs are aimed at restoring natural habitat, including kikuyu control and planting on Bowen Island to restore habitat for the little penguin (*Eudyptula minor*) and ground nesting seabirds and bitou control to restore broad areas of coastal vegetation.

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 maintains water quality and 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	on: Sydney Basin
Management plan	First plan expired 3 April 2009, second draft plan released for public comment on 4 May 2011	
Other significant management documents	Risk Assessment and Management Schedule; fire and pest management strategies; Memorandum of Understanding with NSW Rural Fire Service; Fire Management Plan; Memorandum of Understanding with the Department of Defence; Botanic Gardens' Collections Policy; Joint Training Strategy with the Wreck Bay Aboriginal Community Council; Service Contract and Service Level Agreements with the Wreck Bay Aboriginal Community Council	
Financial	Operating	\$7.313 million
	Capital \$0.959 million	
	Revenue \$6.854 million	
	Paid to traditional owners	\$0.555 million
Visitors	468,000 (estimated)	
Permits	26 commercial tour operators, 13 research, 9 wedding	

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 6 endangered 14 vulnerable 25 migratory 59 marine
	Recovery plans applicable	<ul> <li>Humpback whale</li> <li>Southern right whale</li> <li>Threatened albatrosses and giant petrels</li> <li>Gould's petrel</li> <li>Marine turtles</li> <li>Grey nurse shark</li> </ul>
Listed flora	Species Recovery plans applicable	2 vulnerable
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 following the Council elections last held in 2010. Two replacement Council members were appointed to the Board in July 2011. With the expiry of the first management plan in 2009, the Board oversaw preparation of the park's second management plan. A draft plan was released for public comment on 4 May 2011 and public comments are being reviewed by the Board.

## Monitoring

Monitoring continued, including in relation to: the eastern bristlebird, hooded plover, sooty oystercatcher (*Haemotopus fuliginosus*) and little penguin; impacts of macropod herbivory on vegetation cover following fire; the effectiveness of regular fox baiting; and the 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, invasive bitou bush (*Chrysanthemoides monilifera*) and wallaby grazing on native plant regeneration.

The second large Australian Research Council partnership study with the Australian National University, which commenced in 2009, is building on the data collected over the previous five years and is looking in greater depth at the impacts of weeds and fire on native species. Major surveys of 132 long-term sites are ongoing with high quality longitudinal data being assembled and analysed on mammal, reptile, frog and bird responses to vegetation type and fire regime. Major findings of these studies are being compiled and will be published in 2012–13. The partnership is also reviewing the intersection of science and management, and will prepare a paper for publication on adaptive management later this year.

The partnership supports a number of PhD programs including: spatial use of habitats and vegetation communities by the diamond python (*Morelia spilota spilota*); ecology of the long-nosed bandicoot; ecology of the rare eastern chestnut mouse (*Pseudomys gracilicaudatus*); vegetation and fire mosaics and their effects on birds and terrestrial mammals; and impacts of over-abundant macropods on vegetation structure.

## **Future challenges**

Major challenges are:

- completing the park's second management plan and developing concise implementation programs with clear identification of outcomes and feasible measures to report performance
- increasing understanding of fire in a changing climate and managing its impact on biodiversity and public safety
- improving management of the park's marine estate and increasing marine research
- continuing to manage key threats to biodiversity, including bitou bush and foxes, at sustainable levels as their numbers and density decline
- addressing the park's increasing isolation from adjacent natural areas due to development pressures in the region
- completing and implementing the cultural heritage strategy
- supporting the development of new Indigenous business enterprises in the park
- · identifying ways of maintaining and replacing critical ageing assets
- improving and updating business management systems including online campground booking and entry fee management
- completing phase 2 Service Level Agreements and contracting opportunities with the Wreck Bay Aboriginal Community Council to an agreed timetable to improve employment benefits.

## Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Foxes continue to be the most significant feral pest in Booderee and bitou bush continues to be the most significant weed
- Monitoring indicates that over-abundant macropods and increased macropod browsing is changing the post-fire vegetation structure at Booderee
- Restoring biodiversity through re-introductions of native, locally extinct species
- Adopting an ecosystem-based approach to reserve management
- Protection of seabird nesting habitat
- Protecting the marine environment from increasing visitation and use
- Preparing for the impacts of climate change and adapting management strategies accordingly
- Residential development in surrounding areas that is isolating the park from other natural areas through degradation of wildlife corridors and is possibly threatening a range of species
- Implementing a suitable fire management regime

#### **Actions**

- Continue fox control with an emphasis on removing residual, bait-shy individual foxes and introducing alternative fox control methods
- Adapt existing control measures for bitou bush taking into account its declining density (ground and aerial spraying) and monitor ecological impacts of these control measures
- Trial new measures to control the spread of kikuyu on Bowen Island and improve previously restored penguin
   nesting habitat
- Continue to implement an ecologically appropriate and visitor-safe fire management program and upgrade response capacity to cope with larger, more intense fires
- Complete a new fire management program for the current period up until 2015
- Develop long term re-introduction strategies for locally extinct species such as southern brown bandicoot (*Isoodon obesulus*), long-nosed potoroo (*Potorous tridactylus*) and greater glider (*Petauroides volans*)

- Continue to consult with agencies on the park's regional value, the importance of maintaining habitat corridors and links with other natural areas and possible impacts of development
- Maintain strong relationships with partner research institutions, and work closely with researchers to better understand potential impacts of key threats including fire, weeds and climate change on the park
- Monitor impacts of recreational fishing

#### Performance results 2011–12

- Conducted aerial spraying of 125 ha of remote infestations of bitou bush throughout the park in June 2012. Between 2004 and 2012 Booderee's aerial spraying program 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
- Treated a further 48ha of bitou bush by spraying with splatter guns and 45 ha by ground spraying, with the intention of patch burning treated areas in autumn. This technique proved highly successful in 2011 and has minimal impact on high-value native vegetation communities compared to the earlier technique of broad-scale aerial spraying and broad-scale fire block burning
- Despite a wet year, again detected no green and golden bell frogs (*Litoria aurea*). This listed threatened species has not been detected in the park for seven years and is likely to be locally extinct, despite little change to its habitat or hydrology
- Further developed 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 or increasing population trends for eastern bristlebirds, most shorebird populations and other species of interest
- Fire management program 2010–15 in preparation for approval of the Board later in 2012
- The greater glider has not been detected in the park since 2007; natural re-introduction is possible as the species persists in nearby forest, so regular monitoring will continue
- Continued to work with Jervis Bay Marine Park on baited remote underwater video monitoring of fish populations within park waters to improve assessments of the impacts of recreational fishing in the park

#### 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 and curriculum based School programs with an increased focus on cultural interpretation
- Develop Koori cultural themes to promote understanding of Aboriginal plant use
- Continue to consult with the Wreck Bay Aboriginal Community Council concerning endorsement of a 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 2011–12

• Conducted over 150 cultural interpretation sessions for visiting school groups and other visitors as part of the spring, summer and autumn school holiday programs with over 4,500 attendees. The number of attendees increased significantly in 2011–12 when compared with the previous year; better online promotions assisted to raise awareness of these offerings

- Liaised with the Wreck Bay Aboriginal Community Council on a number of proposed developments and potential impacts on cultural heritage
- Continued discussions with the Board regarding broad cultural heritage directions of the draft second management plan. The cultural heritage strategy was held over for further consideration
- Continued the Junior Ranger program with Jervis Bay School, involving delivery of 19 sessions. The program took a different class each term on field trips into the park where staff presented local cultural information for children as well as scientific, historical and management information relevant to their school curriculum studies

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

#### **Major issues**

- Meeting the obligations of the lease agreement for the park
- Progressing the second phase of contracting arrangements between the park and Wreck Bay Aboriginal Community Council to an agreed timetable
- Finalising the second management plan

#### Actions

- Agreement on 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 between the park and the Wreck Bay Aboriginal Community Council
- Complete the second management plan
- Commence a new round of lease negotiations

#### Performance results 2011–12

- Held six meetings of the Booderee Board
- Second round of outsourcing, including grounds maintenance and infrastructure maintenance services expected to be completed September 2012
- Continued to deliver a broad range of training to park staff and Wreck Bay Aboriginal Community Council members in accordance with the training strategy
- New training strategy for the period 2011 to 2015 completed
- Supported six Indigenous students from the Wreck Bay Community in completing work experience in the park
- Three student based apprentices filled by three Wreck Bay Community Year 11 students due to complete apprenticeships October 2012; agreement reached to place an additional three apprentices in November 2012
- Review of public comments on draft second management plan neared completion
- Wreck Bay Aboriginal Community Council contractors undertook \$1.7 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
- Improving efficiency and effectiveness of business management systems, including park entry fees and booking systems
- Reviewing fees and service costs

#### 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 ParkSafe
- Update business management systems, including adopting online capabilities

- Visitation estimated to have increased 4 per cent in 2011–12 based on revenue results. A capital works proposal is in preparation to install a new visitor monitoring (counting) system for the park in 2012–13
- Developed a new e-ticketing system which is expected to be rolled-out in 2012–13. This will involve a new online camping booking system and the ability to book and pay for camping or entry tickets after hours within the park
- Hosted visits by journalists and film crews from key media outlets to promote the park's joint management work and cultural heritage interpretation:
  - the UK Lonely Planet Guide magazine and website profiled the park as one of the top five places to visit in NSW
  - the Sydney Morning Herald and the Age travel section provided a similar profile
  - the Getaway Summer TV series promoted camping
  - the Win TV series *Alive and Cooking* (in production) will showcase five or six key sites within Booderee including camping, bushwalking, cultural food and medicinal knowledge
- Three main events were promoted in which staff participated, with accompanying interpretative information— Clean Up Australia Day, World Environment Day and the annual Whale Census Day (with ORRCA volunteers)
- 102 school holiday interpretation sessions were delivered, focusing on Aboriginal cultural values and conservation themes, with over 2,600 attendees; a further 49 interpretation sessions were delivered to primary schools, high schools, universities and special interest groups, attracting nearly 2,000 attendees
- Continued to upgrade and refresh the park's website with news events and public announcements. Ongoing
  monitoring showed that camping information continued to be the most popular feature. Regular blogs and
  Facebook entries were posted to provide more immediate park information and special interest stories. Podcasts
  promoting key visitation sites were developed, as well as a short bush tucker video and an iPhone App promoting
  the Birds of Booderee
- Finalised a 'Healthy Learning' Education Kit, designed for teachers of Year 5 and 6 students to undertake studies within the park
- All park brochures and park notes were reviewed for a full refresh after a new style guide is produced in 2012–13. Costs of production were benchmarked
- Completed signage for five new information shelters (for key visitation precincts). This included a roll-out of Dhurga/Dharawal language and cultural knowledge concepts and information about camping, park management, rules and regulations and walking trails options
- Completed several visitor facility upgrades including: Cave Beach water mains; Murrays boat ramp; botanic gardens walking trails, bridges and rainforest platform; and a number of campground barbecue shelters. Works are continuing to upgrade visitor information signs and roads, management trails and walking tracks
- Recorded generally high levels of compliance with marine zoning scheme and catch limits

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

#### **Major issues**

- Continuing the cooperative arrangements between the park, the NSW Office of Environment and Heritage, 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

#### Performance results 2011–12

- Continued cooperative arrangements with other agencies including the NSW Office of Environment and Heritage, Jervis Bay Marine Park, NSW Fisheries and Department of Defence. The park continued to lead regional fox management
- Issued 13 research permits including permits for continuing cooperative undergraduate and postgraduate programs with the ANU's Fenner School of Environment and Society and the University of Canberra
- Supported Wreck Bay Youth/Vincentia High School's Students at Risk program through work experience and the continuation of student based apprenticeships at the botanic gardens
- Continued support for volunteers working on natural resource management projects including Booderee parkcare (approx 10,000 person hours)
- Continued to liaise with local, regional and state tourism bodies, represented Booderee at tourism conferences and attended industry workshops relating to online marketing and promotions

#### KRA6: Business management

#### **Major issues**

- Ensuring that staff have all the necessary skills to do their jobs
- Increasing the level of revenue from park fees
- Implementing the management plan
- Managing the budget to accommodate increased salaries, contracting costs, and reduced funding
- 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
- Review park use fees to track with increases in cost of living and align with similar products
- Identify budget savings and efficiencies wherever possible
- Contract work to the Wreck Bay Aboriginal Community Council where possible

- Initiated design of short-term tie-up and loading jetty to replace Murray's Wharf which had become unsafe
- Continued negotiation of a new Service Contract with Wreck Bay Aboriginal Community Council (due for completion by September 2012)
- Completed two new draft Service Level Agreements for infrastructure maintenance and horticultural maintenance services which await sign-off

- A new opening and closing hours schedule for the Entry Station Service Level Agreement was developed in consultation with the contractor. Changes were designed to be more efficient and increase revenue yields
- 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 and commenced a third year of the program
- Revenue generation from all park use fees increased by 4 per cent, despite another wetter than average year. Camping revenue was up by 6.9 per cent, the second best ever result
- Reviewed park use fees (unchanged for six years) in light of cost-of-living increases over that time frame and comparison with similar products within the region; in response, a 10 per cent increase in fees was recommended by the Board and approval sought from the Minister. The peak season periods were also reviewed and some changes recommended based on high seasonal demands for campsites
- Improved compliance systems for the collection of entry fees and camping fees resulted in improved revenue results:
  - 24 infringement notices for non-payment of entry fees were issued to visitors who had entered the park without paying the required fee on at least three occasions
  - the new e-ticketing system to be rolled-out in 2012–13 should provide further productivity gains and process efficiencies
- Staff co-ordinated the transition to \$20 million public liability insurance requirements for all commercial tour operators. Work also continued on implementing Parks Australia policy to convert some permits to a competitive tender multi-year licence fee arrangement
- Two Wreck Bay Community members sought and were granted commercial tour operator permits; park staff are providing ongoing assistance to help promote and support these small businesses
- Continued the roll-out of power and water conservation measures to reduce the park's carbon footprint

## **Student researchers**

Booderee National Park's relationship with major academic institutions is producing high quality, long-term ecological data on its important wildlife.

We work closely with academic institutions including the Australian National University, Sydney University and the University of NSW to find some of the brightest young minds to complete their PhDs in a magnificent field setting. Their research is designed to be fully integrated into the park's operations and management. These important partnerships rely on the support and commitment of our staff at Booderee who help coordinate and guide the students' work.

Eight students have worked in the park this year. Sandra Vogel is commencing a study into the fine-scale population structure and demography in little penguins while Dr Damian Michael has examined the spatial use of habitats and vegetation types by the diamond python, the park's largest natural predator. Martin Westgate is completing his study into amphibians in the park, concluding they appear largely unaffected by wildfire; instead their



Felicia Pereoglou weighing a rare eastern chestnut mouse. Photo: Christopher MacGregor, Fenner School of Environment and Society, The Australian National University

distribution and abundance is more strongly influenced by vegetation type.

Felicia Pereoglou has examined the biology and ecology of the rare eastern chestnut mouse, in particular its use of formerly disturbed habitats in the first stages of recovery. Felicia's work is illustrating how capable the mice are at dispersing to different areas of the park, and their strong response to early and mid stages of heathland recovery following wildfire.



Chris MacGregor measuring bitou bush. Photo: Parks Australia

An unexpected outcome of successfully reducing fox numbers within the park appears to be a substantial increase in wallabies, so this has become a focus of a number of studies. Claire Foster is looking at the effect of too many wallabies browsing on the park's vegetation and the subsequent impact on other animals. Ingrid Stirnemann is well advanced on a study into vegetation and fire mosaics and their effects on birds and terrestrial mammals, using remote cameras, while Rebecca Stutz is determining how trees re-establish in an herbivore abundant environment.

Chris MacGregor from the Australian National University is permanently located at Booderee and works closely with staff and the other students on the wide range of studies conducted in the park. Their work is critical to understanding how Booderee's rich diversity of plants and animals react to climate change and possible increases in the incidence and intensity of fire—and how we can adapt and improve park management in response.

# **Christmas Island National Park**



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

### **Special features**

Christmas Island 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 and faunal components and/or of comparable rainforest and marine ecosystem integrity. However, several of the island's endemic species, particularly native reptiles, are in decline and threatened with extinction.

Christmas Island's geographical isolation, geological history and faunal assemblage, particularly its land crabs, have resulted in the development of distinct tropical rainforest ecosystems that support many endemic animals and plants. 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 and endemic Abbott's booby (*Papasula abbotti*), the endangered and endemic Christmas Island frigatebird (*Fregata andrewsi*) and the endemic golden bosunbird (*Phaethon lepturus fulvus*). Twenty plant species are also endemic to the island.

The island has an extraordinary diversity and abundance of land crabs, with notable species being the world's largest population of the robber crab (*Birgus latro*) as well as the endemic blue crab (*Discoplax celeste*) and red crab (*Gecarcoidea natalis*). Red crabs are the island's iconic and keystone species, as they influence the structure and species composition of the island's rainforests; they are also renowned for their annual migration at the start of the wet season, when tens of millions of crabs move to the sea to spawn.

The marine environments of Christmas Island and the park are relatively intact and under less threat 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 that provide habitat for a number of species including over 622 fish species; the island's waters are an internationally significant fish hybridisation zone. Notable marine fauna include whale sharks (*Rhincodon typus*) which are found in waters around the island from November to May 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 19	989
IUCN category	Category II	
Biogeographic context	Christmas Island is the coral-encrusted, emergent summit of a basaltic, submarine mountain in the Indian Ocean. Its plants and animals are most closely linked with those of South-east Asia	
Management plan	Third plan expired 13 March 2009. Draft fourth plan released for public comment in March 2012	
Other significant management documents	Final Report of the Christmas Island Expert Working Group (April 2010) and the Australian Government response (October 2011) Ecological Character Descriptions for the Dales and Hosnies Spring (wetlands of international importance; Christmas Island Mine-site to Forest Rehabilitation Program Plan 2012–2020; Memorandum of Understanding between the Director and the Department of Regional Australia, Local Government, Arts and Sport	
Financial	Operating	\$3.963 million
	Capital	\$0.506 million
	Revenue	\$3.903 million
Visitors	Reliable estimates are not available	
Permits	5 research permits, 2 commercial tour operator permits, 3 film and photography permits, 1 works permit	

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 and Biodiversity Conservation Act 1999		
Listed fauna	Species Recovery plans applicable	2 extinct 1 critically endangered 4 endangered 7 vulnerable 63 migratory 92 marine • Christmas Island shrew • Christmas Island ninistrelle
		<ul> <li>Christmas Island pipistelle</li> <li>Abbott's booby</li> <li>Christmas Island goshawk</li> <li>Christmas Island frigatebird</li> <li>Christmas Island hawk-owl</li> <li>Lister's gecko and pink blind snake</li> <li>Marine turtles</li> <li>Whale shark</li> <li>A Christmas Island regional (multi-species) recovery plan is being prepared which will incorporate ecosystem and species-specific recovery actions</li> </ul>
Listed flora	Species	2 critically endangered 1 endangered
	Recovery plans applicable	<ul> <li>Christmas Island spleenwort</li> <li>An unnamed fern <i>Tectaria devexa</i> var. <i>minor</i></li> <li>A Christmas Island regional (multi-species) recovery plan is being prepared which will incorporate ecosystem and species-specific recovery actions</li> </ul>
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	
8(a)	95	9	622 species from	Over 2,000	213	
			80 families			

(a) Includes one probably extinct and two extinct terrestrial mammals and three marine mammals

### 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, completed its investigations into the decline of biodiversity on the island in 2010. A whole of government response to the recommendations of the Working Group's final report was completed in October in 2011 and is available at: http://www.environment.gov.au/parks/publications/christmas/ewg-response.html.

In 2011 the Director established the Christmas Island Reptile Advisory Panel to provide scientific advice for the captive breeding and conservation of the island's native terrestrial reptiles. The panel met twice, in August 2011 and April 2012.

In 2010 the Director established an island-based working group, comprising major stakeholders and chaired by the Indian Ocean Territories Administrator, to contribute input into the preparation of the Christmas Island regional (multi-species) recovery plan. A meeting of the working group was held in November 2011.

The Director participates in several island-based consultative and management groups including: the Christmas Island Tourism Association; the Christmas Island Emergency Management Committee; the Indian Ocean Territories Economic Development Consultative Group; the Shire of Christmas Island's Christmas Island 2018 Plan Planning Forum Committee; and the Interagency Coordination Committee.

## Monitoring

An island-wide survey (IWS) has been undertaken every two years since 2001, primarily to guide management of the crazy ant control program by mapping crazy ant supercolonies and identifying areas for future control work; and by monitoring changes in red crab burrow counts and burrow distribution and density across the island. The survey also provides distributional data on other native and exotic species. The most recent IWS was completed in mid-2011.

Monitoring of native reptile abundance and distribution shows that native reptiles continued to drastically decline. The declines are most likely linked to introduced invasive species particularly the wolf snake (*Lycodon aulicus*), the giant centipede (*Scolopendra morsitans*) and feral cats.

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:

- continuing to address threats, particularly invasive species such as crazy ants and feral cats and emerging threats, particularly giant centipedes and wolf snakes
- researching and investigating threats impacting on native species, where threats or the relative impacts of multiple threats are not entirely known, for instance in relation to native reptiles and the endemic Christmas Island flying-fox (*Pteropus melanotus natalis*)
- continuing to facilitate, conduct and contribute to programs for addressing cross-tenure island-wide threats to native species and their habitats in partnership with major stakeholders
- further progressing alternative control methods for crazy ants, particularly research into indirect biological control
- working with relevant stakeholders to address biosecurity threats, particularly reducing the likelihood of new invasive species entering the island and rapidly eradicating invasive species that may enter
- maintaining focus on core park management responsibilities in the face of an increasing requirement to contribute to off-park conservation activities eg emergency response situations and island-wide environmental issues
- implementing a long term plan for the Christmas Island Mine-site to Forest Rehabilitation (CIMFR) program, including establishing new plantings and maintaining and monitoring existing plantings
- long-term control of highly invasive weeds that threaten high value conservation assets
- continuing to upgrade, maintain and potentially develop new infrastructure, particularly visitor facilities
- contributing to the island's long-term sustainable future and economy through supporting the development of appropriate sustainable nature-based tourism and environmental educational opportunities
- research and monitoring to better understand and inform the conservation of the island's marine environments including further documentation of values, threats and interactions between marine and terrestrial ecosystems and species.

## Report on performance by key result areas

#### KRA1: Natural heritage management

#### **Major issues**

- Working with stakeholders to reduce the likelihood of new invasive species entering the island and, where possible, rapidly eradicating invasive species that may enter
- Further developing and implementing programs to mitigate the impacts of known threatening processes, particularly crazy ants and feral cats
- Identifying threatening processes thought to be leading to the current decline of threatened native species, particularly reptiles, as well as developing and implementing threat mitigation actions in the absence of sufficient information about likely threats
- Identification and management of high risk/priority invasive weed species, particularly species that invade relatively undisturbed rainforests, wetlands and other high value conservation assets
- Reducing traffic-related red crab and robber crab mortality
- Assessment of values and threats to marine ecosystems and species
- Potential environmental impacts arising from the sinking of the phosphate cargo vessel MV *Tycoon* at Flying Fish Cove in January 2012

#### Actions

- Yellow crazy ants:
  - complete the 2011 island-wide survey
  - coordinate Crazy Ant Scientific Advisory Panel meetings
  - continue research into the indirect biological control of crazy ants
- Rehabilitate and maintain forest plantings on former mine sites, including significant weed control efforts on planted fields
- Control invasive Siam weed (Chromolaena odorata)
- Continue to develop and implement partnerships and collaborative approaches for cross tenure island-wide cat
  management
- Continue to prepare a Christmas Island regional (multi-species) recovery plan while continuing to implement actions from existing species-specific plans
- Implement road management activities and community educational strategies to reduce vehicle impacts on robber crabs and migrating red crabs
- Conduct a flora survey
- Maintain reptiles in captivity and conduct reptile surveys
- Support and/or facilitate research projects, including seabirds, land crab surveys and marine research
- Assist assessment and monitoring of environmental impacts resulting from the sinking of the MV Tycoon
- Publish research papers including results of the 2009 crazy ant aerial baiting program

- Continued crazy ant management including:
  - the 2011 IWS mapped approximately 600 hectares of crazy ant supercolonies, which will form the basis of programs for their control; detected a slight increase of 3–8 per cent in red crab burrow counts when compared to the 2009 IWS
  - further progressed the three-year research project into the biological control of crazy ants, funded by the Director and conducted by La Trobe University, with the search for potential biological control agents commencing
  - held one meeting of the Crazy Ant Scientific Advisory Panel

- Continued native reptile management including:
  - maintained an on-island captive breeding program for two native reptile species and supported off-island captive breeding through a partnership with Sydney's Taronga Zoo
  - the 2011 IWS together with targeted surveys continued to show native reptiles are under threat of extinction, although the giant gecko (*Cyrtodactylus sadleiri*) persists in the wild and individuals of Lister's gecko (*Lepidodactylus listeri*) have been detected
  - established and held two meetings of the Christmas Island Reptile Advisory Panel
  - assessments of disease status carried out by Taronga Zoo did not indicate that disease was a factor in native reptile decline
- Continued to contain the single known Siam weed outbreak; monitoring has not detected any other outbreaks across the island
- Continued to implement the CIMFR program:
  - conducted earthworks on 3.4 hectares of former mine fields and planted 11,000 pioneer species
  - planted 7,500 secondary forest mix species over 17 hectares which had been planted with pioneer species in 2010
  - maintained 117 hectares of previously planted fields via weed control and application of fertiliser
  - biophysical monitoring of all fields planted since 2005
  - prepared a CIMFR Program Plan 2012–2020 in collaboration with the Department of Regional Australia, Local Government and Sport
- Conducted a flora survey across the island, targeting both native and introduced plants, including weeds. As the first of at least two surveys, a total of 259 species were collected
- Continued preparation of the draft Christmas Island regional (multi-species) recovery plan, including holding of one working group and several stakeholders meetings
- Recorded a significant reduction in red crab mortality during the 2011 migration compared to 2010. Effective cooperation with the Shire of Christmas Island in relation to road management and fostering of stakeholder and community support were central to achieving the reduction
- Recorded 667 robber crab deaths from vehicles in 2011, compared to 854 in 2010, with 650 recorded in the 2011–12 financial year. Provision of signage and other information and enhanced community support are likely to have been key factors contributing to the decline
- Continued to facilitate and contribute to the successful partnership with the Shire, Australian Government agencies and Christmas Island Phosphates for island-wide cross-tenure cat management. Intensive cat control in the island's settled areas has removed at least 300 feral cats since the program began in mid-2011, with a noticeable improvement in nesting success of red-tailed tropicbirds (*Phaethon rubricauda*) at the Settlement nesting colony
- Supported the response by the Department of Regional Australia, Local Government and Sport and the Australian Maritime Safety Authority to the sinking of the phosphate carrier the MV *Tycoon* at Flying Fish Cove in January 2012 by providing initial impact assessments and monitoring of oil, diesel and phosphate plumes; wildlife monitoring and clean up; and logistical support for marine impacts studies by independent and WA Fisheries researchers
- Initiated flying-fox surveys using methods previously adopted for the 2008 Biodiversity Monitoring Program; results of these surveys will be analysed during 2012–13

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

#### **Major issues**

- In conjunction with key stakeholders, developing island-wide approaches to sustainable tourism development that is consistent with protecting park values while providing visitors with opportunities for safe and high quality nature-based experiences
- Maintaining and upgrading existing visitor infrastructure and facilities to safe and serviceable standards and, and, where appropriate, developing new infrastructure and facilities
- Providing educational materials and activities for the Christmas Island community and visitors

#### Actions

- Continue to participate in the Christmas Island Tourism Association (CITA) Executive
- Maintain, and where possible improve, roads, trails and viewpoints
- Support film crews and journalists working in the park
- · Provide environmental educational materials and activities

### Performance results 2011–12

- Contributed to CITA particularly in relation to nature-based tourism marketing and promotion through: joint support of filming of an Australian Geographic documentary which showcased Christmas Island's natural values, including support of the CITA funding application and provision of natural history information for the documentary
- Assisted and/or facilitated a number of other Australian and international film crews and journalists to prepare films or publish articles promoting the island's conservation values
- Provided educational activities for local and visiting schools, the community and other groups and visitors including via articles in the local press, face-to-face talks and tours of the park
- Maintained visitor facilities as effectively as possible. However further work is needed to maintain facilities to safe and functional standards, particularly completion of the project to replace the Dales boardwalk

### KRA5: Stakeholders and partnerships

#### **Major issues**

- Key conservation measures such as cat control and mitigating vehicle impacts on migrating red crabs require cross-tenure approaches and multiple stakeholder engagement
- A multiplicity of forums relating to tourism and emergency management and other issues in which the Director of National Parks has a role or an interest

#### Actions

- Provide in-kind and field support for visiting scientists including permitted researchers
- Liaise with stakeholders on cross-tenure conservation issues particularly in relation to vehicle impacts on red and robber crabs and cat management
- Deliver educational and interpretive sessions for students, residents and selected visitors
- Participate in island-wide forums including the Christmas Island Tourism Association; the Christmas Island Emergency Management Committee; the Indian Ocean Territories Economic Development Consultative Group; the Shire of Christmas Island's Christmas Island 2018 Plan Planning Forum Committee; and the Interagency Coordination Committee
- Continue to support the working group for the preparation of the Christmas Island regional (multi-species) recovery plan

- Held a working group meeting for the preparation of the Christmas Island regional (multi-species) recovery plan in November 2011
- Continued to facilitate and contribute to the successful partnership with the Shire of Christmas Island, Australian Government agencies, WA government agencies and Christmas Island Phosphates for island-wide cat management
- Supported visiting scientists and WA government officers undertaking research projects (including seabird, land crab and marine surveys) and off-park weed control work and environmental assessments
- Held educational sessions for local and visiting school groups, island residents and visitors including bird week participants

- Received high levels of stakeholder and community support for on and off-park road management activities to protect robber crabs and migrating red crabs. Detention centre staff and contractors are now receiving 'crab friendly' driving tips as part of internally-delivered induction programs
- Australian Government response to the recommendations of the 2010 Christmas Island Expert Working Group
  report agreed in October 2011

### 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
- Finalise preparation of the fourth management plan
- Administer Christmas Island and Pulu Keeling national parks as one management entity

- Managed operational and capital budgets within approved parameters
- Draft fourth management plan released for public comment in March 2012; 11 submissions were received which are under consideration
- Supported Pulu Keeling National Park via conduct of an island-wide survey of weeds and crazy ant distribution, together with preparation of a new management plan, expected to be released for public comment in 2012–13

# Tackling a feral killer

Parks Australia has been working hard with stakeholders to tackle one of the threats on Christmas Island—feral cats.

Feral cats threaten several island animals including native reptiles, the flying fox, forest birds like the emerald dove and ground nesting seabirds, particularly the red-tailed tropicbird. Chick mortality rates at the tropicbird's Settlement nesting colony have been almost 100 per cent over recent years—mostly due to predation by cats.

In 2010 the Christmas Island Expert Working Group, tasked by the Minister to look into the decline of native species on the island, identified cat predation as a key threat. The Working Group recommended feral cats should be eradicated.

To do this effectively, a partnership approach was needed that looked at the whole island, rather than just within the park's boundaries. Parks Australia and the Shire of Christmas Island initiated this partnership, bringing in all of the island's major agencies including the Department of Regional Australia, Local Government, Arts and Sport, Phosphate Resources Limited, the Department of Immigration and Citizenship and the Western Australian Department of Environment and Conservation. The support of community members was also essential and, when the Shire introduced new laws requiring pet cats to be registered and de-sexed, actions by responsible cat owners led to de-sexing of more than 150 cats.

In mid-2011 Parks Australia supported the Western Australian Department of Environment and Conservation to start a program to control feral cats in the island's settled areas. Over the next year the Department of Regional Australia, Local Government, Arts and Sport funded the shire to continue the program. Parks Australia, Phosphate Resources Limited and the Department of Immigration and Citizenship provided in-kind or logistical support to the program including vehicle and equipment use, cat traps and accommodation for cat control teams.

The results are now in. Around 300 feral cats have been removed and the nesting success of red-tailed tropicbirds at the Settlement nesting colony has already improved. Planning has now commenced for an island-wide feral cat eradication and rat control program, because removal of cats will have an impact on rat numbers.

The success so far of the Christmas Island feral cat control program highlights both the need to work in partnership with key stakeholders across the island and the value of those relationships. Ongoing community support is also crucial to its success.

## 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, 22 November 1989, 24 June 1991 and 26 May 2007			
IUCN category	Category II			
Biogeographic context	Located in the wet-dry tropics Interim Biogeographic Regionalisation for Australia regions: Darwin Coastal; Arnhem Plateau; Pine Creek			
Management plan	Fifth plan expires 31 December 2013			
Other significant management documents	Tourism Master Plan, District and Stone Country fire management plans, Crocodile Management Strategy, Feral Animal Management Strategy; Gunlom Mine Sites Rehabilitation Strategy, Cultural Heritage Strategy, Weed Management Strategy, Climate Change Strategy, Waste Management Strategy			
Financial	Operating	\$24.048 million		
	Capital	\$2.091 million		
	Revenue	\$18.134 million		
	Paid to traditional owners	\$1.715 million		
Visitors	159,206 visitors (estimate)			
Permits	111 commercial tour operator (April 2010–March 2011 season) and 100 commercial tour operator (April 2011–March 2012 season); 92 film and photography; 20 research; 193 bushwalking; 136 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 and Biodiversity Conservation Act 1999				
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Listed fauna Species	Species	2 critically endangered 8 endangered 11 vulnerable 108 migratory 114 marine		
	Recovery plans applicable	<ul> <li>Bare-rumped sheathtail bat</li> <li>Golden bandicoot and golden-backed tree-rat</li> <li>Northern quoll</li> <li>Gouldian finch</li> <li>Eastern partridge pigeon, crested shrike-tit and northern masked owl</li> <li>Marine turtles</li> </ul>		
Listed flora	Species	1 critically endangered 2 vulnerable		
Heritage	On National Heritage List			

Numbers of native species recorded					
Mammals	Birds	Reptiles	Amphibians	Fish	Plants
68	292	136	26	320 (276 marine and estuarine, 44 freshwater)	2,022

# **Management arrangements: Board of Management**

Membership to the Kakadu National Park Board of Management is through ministerial appointment. 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.

# 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.

Monitoring of two inshore dolphin species in the park was completed in 2011 showing that the park provides significant habitat for these vulnerable species, with one species found 50 kilometres upstream on the South Alligator river. Studies of estuarine crocodile (*Crocodylus porosus*) populations and nesting flatback turtles (*Natator depressus*) in coastal areas of the park also continued.

The collaborative project with the Northern Territory Department of Natural Resources, Environment, the Arts and Sport involving targeted surveys of threatened species in recognised biodiversity hotspots in the park, largely in the Arnhem Land Plateau, is due for completion on 30 June 2013 under the current agreement. All surveys involve park staff (including trainees and school-based apprentices), Northern Territory government staff, neighbouring Indigenous ranger groups and traditional owners from Arnhem Land.

Surveys from October 2011 recorded a threatened Arnhem Land egernia (*Bellatorias obiri*) and an undescribed white-striped gecko (*Strophurus* sp.) which had not previously been recorded in the park. An individual threatened northern quoll (*Dasyurus hallacutus*) was recorded on remote cameras at Leichhardt Billabong. Surveys found eight new sites in the stone country for the rare white-throated grasswren (*Amytornis woodwardi*) with 30 birds found in sites with a wide range of fire histories; further surveys for the grasswren are scheduled.

The collaborative project with the University of Sydney and the Territory Wildlife Park to train northern quolls to avoid cane toads (*Rhinella marina*) as prey and to investigate whether this behaviour is passed on to young quolls is continuing. A total of 67 quolls have been released to date with subsequent trapping events producing promising results. DNA sampling which distinguished wild and trained quolls revealed that roughly half the juvenile quolls in the population are the offspring of trained females, which is encouraging. A larger wild quoll population than was thought to exist in this area of the parks was also detected as a result of this work.

Six projects funded through the Australian Government's National Environmental Research Program (NERP) commenced, focusing on the potential impact of climate change on wetland and coastal environments. A further NERP-funded project focussing on the potential impact of feral cats on small mammals is currently being planned, including consultations with traditional owners.

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 sixth year and continues to achieve positive results in reducing the incidence of 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. This program is currently undergoing a technical review of its first five years. Monitoring of 152 fireplots, as part of the evaluation of the park's fire management program, continued across the park.

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 further developed a cultural heritage sites register, with the support and involvement of Bininj. Among the major oral history projects that were completed were reports on three of Kakadu's historic sites and a DVD on the life of Na Godjok Nayinggul, a senior traditional owner who recently passed away.

The park's new Cultural Heritage Strategy was endorsed by the Board in March 2012 and is now being implemented. Over 150 traditional owners were consulted in the strategy's development which occurred over two years. 394 hours were spent in consultation and supporting activities.

# **Future challenges**

Major challenges are:

- maximising ecological resilience to increase capacity as climate change manifests
- implementing the recommendations of the climate change strategy
- supporting Indigenous business ventures and employment to support Kakadu's World Heritage values and the park's living culture
- implementing the actions identified in the park's new Cultural Heritage Strategy, particularly in relation to rock art maintenance program management
- improving the understanding of the impacts of fire, feral animals and climate change, coordinating research in these areas and adapting management accordingly
- identifying the cause of small mammal decline
- management of pest plant and animal species
- upgrading information management systems and connectivity
- developing staff through formal and informal training programs
- ensuring visitor and staff safety
- impact of the economic environment on visitor numbers
- improving seasonal visitor access to the park.

# Report on performance by key result areas

## KRA1: Natural heritage management

### Major issues

- Information gaps on the potential impact of climate change on Kakadu, particularly on freshwater wetlands
- Management of threatening processes eg fire management (particularly in woodland and sandstone habitats), aquatic and terrestrial weed species and pest animals
- Monitoring and protecting threatened species including small mammals
- Improving the recording, storage and display of species data
- Improving understanding and protection of the marine environments of the Kakadu coast
- Monitoring and management of the South Alligator Valley containment area, which contains low-level radioactive materials from historic mining sites

## Actions

- Develop and implement fire strategies for 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 incorporation of population modelling data
- Monitor threatened species in biodiversity hot spots
- Continue to control serious pest plants, focusing on weeds of national significance
- Review and update the park's Weed Management Strategy
- 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 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
- Develop a plan to manage and monitor the South Alligator Valley containment area

- Monitoring and control programs for invasive weed species including *Mimosa pigra* continued; only one new mimosa plant was found in 12 months. Grassy weeds (mission grass and gamba grass) continue to be major challenges, as are aquatic weeds such as salvinia and olive hymenachne
- Limited feral animal control program implemented in May–June 2012 with 47 buffalo and 1,065 feral pigs shot. The program was restricted to approximately one-third of the park, primarily in the northern wetland areas
- The current agreement for the collaborative project with the NT government monitoring threatened species in biodiversity hotspots continues for a further 12 months up to 30 June 2013
- Continued the collaborative project with the University of Sydney and the Territory Wildlife Park for wild release of captive-bred northern quolls trained to avoid cane toads, with initial results suggesting this behaviour is passed to their offspring. A total of 67 quolls have been released to date
- MoU developed with the Territory Wildlife Park regarding the care of injured or orphaned wildlife
- MoU developed with DAFF Biosecurity to research and monitoring issues related to minimising the risk of exotic pests and diseases entering Australia
- The bushwalking burning program in the Arnhem Land Plateau undertaken as part of the Stone Country Fire Management Strategy has been successful in reducing the incidence of broad-scale late dry season fires as well as in engaging traditional owners in the implementation of fire management in the park. A technical review of the program's implementation is currently underway

- Hosted a three-day workshop with traditional owners in association with a meeting of the Kakadu Research Advisory Committee to discuss how research should be managed and undertaken under the next management plan
- Completed site monitoring for the South Alligator Valley containment rehabilitation area, including minor remediation works to maintain the site's integrity
- Monitoring confirmed steady numbers of estuarine crocodiles and nesting flatback turtles
- The research project for two inshore dolphin species—Australian snubfin (*Orcaella heinsohni*) and Indo-Pacific (*Sousa chinensis*)—in the park has shown that the park provides significant habitat for these vulnerable species. A total of 50 survey days was conducted in the park with populations of the snubfin species found 50 kms upstream on the South Alligator river.

#### 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

#### Actions

- Development and implementation of the park's Cultural Heritage Strategy
- Continuation of rock art protection and maintenance work
- Continuation of cataloguing and preserving cultural heritage materials
- Continuation of population and refinement of the park's 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

- As a consequence of the Cultural Heritage Strategy, developed archaeological projects
- In consultation with Bininj, continued to review recorded cultural material, storage of cultural objects and cultural heritage databases. The review included 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
- Produced a DVD on the preparation of the new management plan for the park
- Produced a retrospective on the life history of a significant traditional owner Na Godjok Nayinggul who recently passed away; similar projects on other key people have commenced
- Continued to transfer 180 approved audio and video materials (approximately 200 hours of content) from the park for long-term storage and protection in accordance with the partnership agreement between the National Archives of Australia and the Director
- Continued rock art management with the involvement of relevant Bininj with approximately 14 sites monitored
- Continued discussions with the Aboriginal Areas Protection Authority and the Northern Land Council about a register of sites of significance and access protocols. One field trip was held and key staff visited the Authority in Darwin for a familiarisation of its operations
- Completed oral history projects recording the history and preparing statements of significance for Anlarr (Nourlangie Camp), the old Jim Jim pub and Munmalary

#### 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 management plan consultation guidelines
- Encourage increased Aboriginal engagement in programs through recruitment and skills development programs
- Support traditional land management projects both internal and external to Kakadu
- Provide administrative and governance support to the Board
- Continue day-to-day consultations with traditional owners

# Performance results 2011–12

- Twelve Bininj staff continued certificate level studies, numeracy and workplace English language and literacy training
- Delivered five health and safety, 12 operational, one IT, five administrative and seven leadership and management development courses
- Engaged Bininj in delivering interpretive and environmental programs
- Continued programs to re-engage young Aboriginal people in education through school and the Junior Ranger program with Jabiru, Gunbalanya and Pine Creek 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 Kakadu
   National Park Officer position
- · Continued day-to-day joint decision-making by relevant Bininj and park staff
- Held quarterly meetings of the Board with additional days to allow for development of the new management plan
- Conducted planning and consultation workshops across the park to develop the new management plan
- Convened training and workshop forums between the park and neighbouring Indigenous Protected Areas and other Indigenous managed areas
- The Kakadu Indigenous Ranger Program, funded by Working on Country, provided resources which enabled Kakadu to host 11.5 community rangers in park related employment

# KRA4: Use and appreciation of protected areas

#### **Major issues**

- Decline of visitation to the park
- Improving the quality and range of visitor experiences and seasonal access
- Improving visitor safety
- Implementing the park's Tourism Master Plan and strategic direction for increasing the benefits from tourism

#### Actions

- Implement the Tourism Master Plan
- Monitor the tour operations permit system and tour guide accreditation
- Increase knowledge of visitation patterns and experiences through visitor surveys for specific projects including the Seasonal Ranger Program and the proposed park Walking Strategy
- Development of a park Walking Strategy
- Regularly review safety of visitor areas and key messages through social and printed media including Facebook and blogs

- Develop a bird app and a general visitor app for the park
- Develop and implement an e-newsletter
- Regularly inspect and maintain visitor facilities
- Develop and implement an e-ticket kiosk to provide automated ticket sales for credit card purchases

# Performance results 2011–12

- Continued to refine the Kakadu visitors' website to better match visitor expectations to experiences in the park and to convey essential information to travellers. Web site traffic increased by seven per cent from 2010–11 to 235,239 visits
- Kakadu.com.au saw a 15 per cent increase to 61,440 visitors; the main increase was through social media channels with 1,192 fans recorded, an enormous increase on the 75 fans in 2010–11. The Kakadu blog had a 157 per cent increase in visitors with over 4,400 people reading the park's stories
- Developed an e-newsletter in March 2012 which obtained 746 subscribers and continues to grow
- · Conducted safety audits at key visitor sites to address potential risks
- Liaised with major tourism industry stakeholders including Tourism Top End and Tourism NT to facilitate activities to promote Kakadu including local, national and international media campaigns
- In March 2012 the park was named as one of Australia's top three tourist attractions, behind Sydney's Taronga Zoo and first place winner the Melbourne Museum. This followed Kakadu taking out the top prize in the Northern Territory's Brolga Awards, winning the Major Tourist Attraction
- Participated in a Kakadu/Nitmiluk Industry Forum with the tourist industry
- Delivered 1,084 seasonal interpretive programs incorporating natural and cultural content
- Conducted planning and consultation around the development of a draft Walking Strategy for the park
- Delivered essential orientation, safety and interpretive information to 43,728 visitors prior to and upon arrival in Kakadu via the Bowali Visitor Centre
- On-line and automated ticket sales are now available at the Bowali Visitor Centre and roll-out at various secondary sales agents is being planned

#### KRA5: Stakeholders and partnerships

#### **Major issues**

- Effective and supportive relationships with the tourism industry, NT 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 NT government
- Develop an operational relationship with park neighbours, in particular Aboriginal associations and neighbouring Indigenous ranger groups
- Take an active role in community programs
- 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
- Continued work with the Kakadu Tourism Consultative Committee to advise the Board on tourism issues

# Performance results 2011–12

- Continued the relationship between the Australian and NT governments, with joint funding and planning to advance tourism in the park
- Continued to work with the Bushfires Council NT and other NT government agencies, West Arnhem Shire and the Northern Land Council to cooperatively manage fire across tenure
- Continued the Junior Ranger program as part of the Year 6 curriculum and implemented a Junior Ranger program at West Arnhem College to raise awareness of environmental issues and park employment opportunities
- Continued to engage with major tourism industry stakeholders and facilitated a Kakadu/Nitmiluk Industry forum in October 2011
- 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
- The Kakadu Research Advisory Committee met in May 2012, with a focus on how traditional owners wanted research managed and undertaken under the next management plan; the values of the park and the development of a management evaluation framework were also discussed
- The Kakadu Tourism Advisory Committee met quarterly to provide advice to the Board

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

#### **Major issues**

- Securing resources to implement the fifth management plan and meet park lease obligations
- Commencement of planning and consultation for the sixth management plan
- Complying with obligations under the EPBC Act and EPBC Regulations for the management of Commonwealth
   reserves
- Developing, maintaining and upgrading park visitor and management infrastructure
- Existence of remnant asbestos material in park assets

#### 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
- Undertake a technical audit of the fifth management plan and commence public consultation on development of the sixth plan
- Develop and implement an asbestos remediation project
- Review the park's Compliance and Enforcement Strategy

- Continued ParkSafe, occupational health and safety training and incident reporting and assessment
- Worked in a partnership approach with ComCare to ensure operating procedures are consistent with new work health and safety standards
- Allocated and prioritised resources to meet the aims of the park lease and fifth management plan
- Continued to carry out the management plan implementation strategy
- Commissioned a technical audit of the fifth management plan and undertook public consultation through a 'have your say' process to support the development of the sixth plan
- 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
- Finalised and commenced implementation of the park's Compliance and Enforcement Strategy
- Completed 90 per cent of the assessment of park assets for asbestos contamination
- Undertook review of commercial licensing in the park and developed and implemented a new licensing policy

# Flatback turtle surveys on Gardangarl

Around August each year, staff and volunteers at Kakadu National Park embark on a major survey of flatback turtles on Gardangarl (Field Island).

The island lies just off the coast and forms part of the park. It provides crucial habitat for flatback turtles, which are listed nationally as a vulnerable species.

The annual survey provides much-needed data on how the turtle populations are faring. Very little is known globally about flatback turtle numbers, and it is the only marine turtle species listed globally as 'data deficient'. When the IUCN attempted to assess the conservation status of the flatback turtle there wasn't enough data to know whether turtle numbers are declining, stable or increasing, so the park's ongoing work is crucial.

Anne O'Dea is a research project officer at Kakadu and has organised the turtle surveys for the last few years.

"The turtle surveys are a real team effort," she said. "Park staff and traditional owners are joined by rangers from Garig Gunak Barlu National Park and volunteers including some overseas volunteers through Conservation Volunteers Australia—everyone pitches in help.

"We camp out on the island and work in shifts over 20 nights, watching the beach at night and recording details of the many turtles that use the island as a nesting beach.

"The number of turtles surveyed has stayed pretty steady over the last five years, with the team recording an average of three and four turtles a night. We had a small spike in 2010 when we were finding up to five or six a night, but in 2011 the numbers seem to have returned to more normal levels.

"It's great to see more than 70 per cent of the turtles successfully nesting over the survey period—that's been consistent over the last five years."

The surveys are based on a methodology developed over 40 years of turtle research in Australia. Incidental monitoring was done for nesting turtles on Field Island starting with Ian Morris and some trainees in the early 1980s, and annual surveys began in 1994.

The turtle surveys are a highlight for Kakadu staff each year and are generating important information for park management. A summary of the 2002–2005 monitoring data from Field Island concluded that the 'Kakadu Marine Turtle Monitoring Program has proven its worth by generating useful data of ever increasing quality that will be of pivotal use in monitoring flatback turtle populations at a regional and on a national scale.'



Flatback turtle hatchlings head out to sea off Gardangarl. Photo: Parks Australia

# 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) Botanic garden 31 January 1986		
IUCN category	Norfolk Island National Park: Category II (national park) Norfolk Island National Park Forestry Zone: Category VI (managed resource protected area) 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. 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	\$1.070 million	
	Capital	\$0.375 million	
	Revenue	1.078 million	
Visitors	22,600 (estimated). Visitor survey indicates over 90 per cent of visitors to Norfolk Island visit the national park and/or botanic garden		
Permits	10 commercial tour operator; 7 commercial photography; 7 scientific research; 7 other activities; 3 collection for traditional use		

Environment Protection a	Environment Protection and Biodiversity Conservation Act 1999		
Listed fauna	Species	5 extinct 5 critically endangered 2 endangered 5 vulnerable 37 migratory 57 marine	
	Recovery plan applicable	A regional threatened species recovery plan for the island came into effect in August 2010. This plan identifies priorities for management actions to assist the recovery of all listed plant and animal species on Norfolk Island. It replaces two previous recovery species-specific recovery plans covering three taxa (green parrot; Norfolk Island golden whistler and Norfolk Island scarlet robin).	
Listed flora	Species	15 critically endangered 16 endangered 15 vulnerable	
	Recovery plan applicable	A regional threatened species recovery plan for the island came into effect in August 2010. This plan identifies priorities for management actions to assist the recovery of all listed plant and animal species on Norfolk Island.	
Heritage	Phillip Island is on the Comm	nonwealth Heritage List	

Numbers of native species recorded			
Mammals	Birds	Reptiles	Plants
2	52	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 as required.

The Norfolk Island Administration currently manages forestry operations within the forestry area of the national park. Any operations require approval from the Director of National Parks. The future management of this area is under review.

# 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 on Norfolk Island, but eradication is not likely to be achieved in the short term. For this reason, monthly surveys for Argentine ants have been conducted at all visitor areas and around the periphery of the park, particularly focusing on areas near known infestations. In March 2012, Argentine ants were detected in the botanic garden for the first time. The colony has been treated and initial monitoring suggests that the early treatment has been successful.

Rat populations are monitored as part of a park-wide rodent management program. Records of bait taken and animals trapped are kept; in addition, eight rat monitoring stations are set three times per year to provide an indication of rat activity. Throughout 2010–11, monitoring results indicated that some bait resistance was developing, with decreased bait take but increased rat activity. In May 2011 a new toxin, brodifacoum, was introduced to bait stations. A dramatic increase in bait take for the first four months suggested that the new bait was attracting rodents; monitoring of the effectiveness of baiting via remote cameras at one of the bait stations revealed that, unexpectedly, feral chickens were responsible for the high initial bait take. Fortunately, chicken numbers are now much reduced and the bait is again available to rodents. Continued monitoring will determine if the new bait is being successful in reducing rodent numbers.

A new monitoring program for the park and garden is in its early stages of implementation. The program is based on assessing the effectiveness of natural resource management programs by assessing outcomes rather than outputs.

Previously, monitoring was largely based on the evaluation and reporting of pest and weed management programs by the number of pests removed or the area of vegetation treated. Likewise, green parrot and boobook owl monitoring focussed on the number of chicks reared in artificial nest boxes. These types of 'output' data are relatively easy to collect and report but give little insight into a program's effectiveness in achieving conservation 'outcomes'. For example, it has not been possible to identify whether native regrowth in weed treated areas exceeds weed regrowth or if total populations of green parrots or boobook owls had been changing (despite an enormous past investment in monitoring of these two species). Instead of these previous 'output' approaches, the new monitoring program will focus on tracking trends in population numbers of forest birds over time, and assessing the extent of increase in the area and density of native habitat.

Monitoring of visitor satisfaction continued with a survey conducted over January and February 2012. Overall, the majority of visitors to the national park rated their visit as 'excellent' (46 per cent) or 'very good' (54 per cent) which represents an overall 100 per cent visitor satisfaction result with the national park experience. For the botanic garden, 43 per cent of respondents rated their visit as 'excellent' and 49 per cent as 'very good'.

# **Future challenges**

Major challenges are:

- transitioning to a more effective feral animal control/eradication program, particularly for rodents, cats, chickens and crimson rosellas
- moving towards a whole-of-ecosystem management and monitoring framework
- 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 area
- maintaining progress in the rehabilitation of Phillip Island to support the significant seabird breeding opportunities the island provides.

# Report on performance by key result areas

## **KRA1: Natural heritage management**

## Major issues

- Managing pest animals and weeds
- Rehabilitation of highly degraded sections of the forestry area
- 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
- Continue vertebrate pest species management programs
- Plan for the improved management of the forestry area to increase habitat for listed species
- Manage rehabilitation areas
- Develop and implement a rehabilitation strategy for Phillip Island
- Increase research and survey work within the park and botanic garden

## Performance results 2011–12

• Completed weed control in 5 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 management of morning glory (Ipomea cairica and I. indica) in the botanic garden
- Developed an operational strategy for Phillip Island based on a rotational plan with the aim of maintaining larger areas of the island; continued weed management activities in line with the operational strategy
- Increased estimation of seabird abundance on Phillip Island with several species showing evidence of increased nesting sites and higher numbers; a new species was identified, the white-bellied storm petrel (*Fregetta grallaria*)
- Sooty terns (*Onychoprion fuscata*) also known as whalebirds attempted to breed on Norfolk Island for the first time in many years (Phillip Island is the species stronghold)
- Engaged a consultant to provide advice on a sustainable forestry industry on Norfolk Island and the role of the national park in such an industry. Negotiations are underway with the Norfolk Island Government to develop an agreement on future management in light of the consultant's findings
- Trapped two cats within the park under the feral cat control program
- Continued the rat baiting program with a new bait and made plans for a trial mini-eradication
- · Actively supported seven scientific researchers in monitoring and research activities on listed species

# 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
- A growing demand for a professional environmental information centre
- A strong community and tourism desire for additional recreational opportunities, particularly mountain bike riding, in the forestry area of the national park

#### **Actions**

- Continue management of walking tracks to reduce slipping hazard and improve amenity
- Complete the redevelopment of the Captain Cook visitor area
- Complete the installation of new signs through the park and garden
- Construct a professional and functional interpretation centre
- Develop podcasts to assist self-guided tours of the park and garden
- Conduct a visitor survey to assess visitor satisfaction

- Continued to resurface and maintain all walking tracks in the national park and botanic garden
- Completed the upgrade of the visitor area at Captain Cook monument which has been extremely well received by visitors and locals
- Continued to design, produce and install new interpretive signs, including plant identification, historic information, site information and other natural resource information
- Completed construction of an interpretive centre in the botanic garden
- Conducted the annual visitor survey which confirmed continuing high level of visitor satisfaction among visitors to both the national park and the botanic garden

#### **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

## 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 twice-yearly meetings of the Norfolk Island National Park Advisory Committee as the formal mechanism for community input into park management

## Performance results 2011–12

- 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 and providing educational visits to Phillip Island
- 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
- · Maintained a popular Facebook site providing up to date information about park management and wildlife
- Coordinated community tree planting day and ran a school holiday junior ranger program
- Gave talks to local groups and organisations about park activities

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

#### **Major issues**

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

#### Actions

- Maintain park management services within budget
- Manage permits and contracts and ensure compliance with conditions

- Managed operational and capital budgets within allowed parameters
- Completed four capital works projects

# Protecting Norfolk's wildlife

For the first time in many years whale birds have attempted to breed on Norfolk Island, however, these migratory seabirds are facing a number of challenges from introduced predators as well as human impacts.

Known locally as whale birds because their return to the area to breed coincides with the northern migration of the humpback whale, these birds are also known as sooty terns. While Phillip Island has long been a stronghold of the whale birds they have now been detected nesting in the Cord area of the national park.

Local residents contacted park staff early in the season with concerns that cats were killing large numbers of nesting whale birds in the Cord area.

Unfortunately, cat control is very difficult. Trapping is not very successful when there is such a huge food source available outside the traps. But we set some traps anyway—and not surprisingly, had very little success in capturing the offenders.



The whale bird or sooty tern is a familiar sight in the skies above Norfolk's offshore islands where flocks of many thousands return to breed each year. Photo: Parks Australia

To try to find out more about what was happening in the breeding area and to see if we could better target our cat control, we set up a couple of remote cameras. Not only have we filmed cats, but the footage has given us a better understanding of other threats—from people, dogs and rats.

In one of the camera locations, at the start of the 10 day recording period, there were eight adult birds, two young chicks and three eggs in the viewing area. A few days later, we captured images of a cat going through the colony at night. Interestingly, the adult birds did not flinch and remained on their eggs and protecting their chicks. While we didn't observe the cat taking any birds we know they are doing some damage from the feathers in the many cat faeces collected from the area.

We're continuing to monitor what happens in the colony in the hope of improving our management of threats to these nesting whale birds.

This year we've also managed to capture a fantastic development for our park—the first recorded breeding of boobook owls in three years.

The boobook was almost extinct in the mid 1980s, with just one female bird left on the island—therefore the world.

After a concerted effort to reintroduce the species by breeding it with the closely related New Zealand morepork owl, numbers grew to around 40 birds. In 2007 breeding began to drop off again and we weren't sure why. There are a number of theories we are investigating,

it could be genetic inbreeding or lack of food supply due to a long dry spell a few years ago.

This year we monitored one family. What was particularly interesting was the amount of daytime activity from what is typically a nocturnal species. We caught them hunting in broad daylight which is really unusual.

We're also investigating the possibility of testing the owls to see if they have retained their Norfolk Island characteristics.

The story of the birds' activity has renewed a lot of interest in them and their conservation story, both on Norfolk, and with interest and offers of help coming in from New Zealand and Australia.

# **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 comprises the whole of North Keeling Island as well as a surrounding marine area, 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 only known habitat of the endangered Cocos buff-banded rail (*Gallirallus philippensis andrewsi*) which is restricted to the Cocos (Keeling) Islands.

Green turtles (*Chelonia mydas*) regularly nest on the island and hawksbill turtles (*Eretmochelys imbricata*) inhabit the

waters of the park; both species are listed as vulnerable. The park also supports remnant vegetation (eg *Pisonia grandis* forest) which is uncommon or no longer found on the islands of the neighbouring southern atoll.

Location	Latitude 11°50' South, Longitude 96°49' East		
Area	2,602 hectares (including marine area extending 1.5 kilometres around North Keeling Island)		
Proclamation date	12 December 1995		
IUCN category	Category II overall comprising: Terrestrial Zone Category Ia (122 hectares) 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 expired 27 April 2011. Draft third plan currently being prepared and due to be released for public comment in 2012–13		
Other significant management documents	Visitor access, boating, diving and fishing strategies; Risk Assessment and Management Schedule; Emergency Management Plan; park lease agreement between the Director of National Parks and the Cocos (Keeling) Islands Shire Council		
Financial	Operating	\$0.557 million	
	Capital	not applicable	
	Revenue \$0.606 million		
Visitors	31 visitors to the park including 1 school trip		
Permits	15 marine access; 1 commercial film and photography; 1 scientific research (crustaceans)		

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 4 endangered 5 vulnerable 24 migratory 36 marine
	Recovery plans applicable	<ul><li>Cocos buff-banded rail</li><li>Marine turtles</li></ul>
Listed flora	Species	None
Heritage	North Keeling Island on Commonwealth Heritage List	

Numbers of native species recorded			
Mammals	Birds	Reptiles	Plants
5 (marine)	24	7 (5 marine)	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. One survey was conducted in 2012 which revealed nesting success and suggested that breeding has been as normal. However, the long-term raw data have yet to be fully analysed.

High levels of green turtle nesting activity were observed in the park in the regular survey area. Several observations indicate that a new nesting site with high activity levels has also been established at a second location in the park.

With a current estimate of around 1,000 the Cocos buff-banded rail population remains stable in the park and staff continue to monitor the population.

An independent scientific risk assessment for the establishment of a second population of buff-banded rail on the neighbouring southern atoll was completed and supported the previous translocation proposal. Collaboration with the Shire Council resulted in the endorsement of Direction Island in the southern atoll as the translocation site. Direction Island has been the subject of significant rat control work over the past year.

The second Island Wide Survey (IWS) was conducted in 2012 and continued to show that invasive yellow crazy ants (*Anoplolepis gracilipes*) are fairly widespread, with some sites recorded at supercolony density. An independent survey by a scientist from La Trobe University, who is investigating the role played by scale insects in crazy ant supercolony formation on Christmas Island, did not detect any scale insects of concern.

# **Future challenges**

Major challenges are:

- preventing new introductions and diseases eg scale insects, rats, Siam weed (*Chromolaena odorata*) and other weeds. Possible vectors are day visitors, illegal local vessels and, recently, Suspected Illegal Entry Vessels (SIEVs) from neighbouring countries
- managing current threatening exotic species, most notably coral berry (Rivina humilis) and yellow crazy ants
- ability to implement fieldwork and compliance programs, as regular access can be difficult due to high sea swell conditions and limited access to suitable vessels
- supporting off-park conservation initiatives for threatened species, particularly marine turtles and buff-banded rail conservation programs and environmental education programs
- adapting management actions in response to the impacts of climate change 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**

- Logistical issues (sea conditions, unreliable access to vessels) impede access to the park
- Monitoring and managing the potential entry of rats and other invasive species from the recent landing of a SIEV (and possibly future SIEVs)
- Local illegal entry to the park and illegal wildlife harvesting
- Supporting off-park conservation initiatives
- Monitoring of red-footed booby and buff-banded rail populations
- Monitoring and management of existing threatening exotic species
- Monitoring and maintaining the ecological character of the Ramsar-listed park

## Actions

- Acquire a marine vessel to supplement access (in suitable weather conditions)
- Conduct surveys and baiting for rats
- Continue to survey threatened species and other aspects of biodiversity
- Undertake island-wide surveys and control exotic weeds and pests
- Continue with compliance patrols and public education

- Installed bait stations and monitoring cameras and conducted visual impact surveys in response to the potential entry of rats from a shipwrecked SIEV in June 2012; preliminary investigations found no evidence of rats however further monitoring will be undertaken
- Via the IWS, weed and crazy ant distributions were mapped and an estimate made of the buff-banded rail population. The IWS also detected an exotic flowerpot snake (*Ramphotyphlops braminus*), never previously recorded while the white-breasted waterhen (*Amaurornis phoenicurus*), a recent self-introduction to the southern atoll, was also recorded for the first time
- Undertook weed control during several trips to the park, funded in part by the Australian Government's Caring for our Country program. Coral berry was recorded at a lower number of survey sites compared to the 2009 IWS and with significantly reduced density; while this result is encouraging, follow-up control work is required at further survey sites as well as emergent seedlings
- Marine turtle surveys undertaken in the southern atoll by a contractor suggested populations in the Cocos (Keeling) Islands continue to be healthy. Sea swell and restrictions on vessel access prevented these particular surveys from being conducted in the park
- Facilitated a survey of the park's crab fauna by researchers from the National University of Singapore which produced an updated species list; a final species list is expected to be published in 2012–13
- Completed risk assessment and initial planning for translocation of a small population of buff-banded rail from the park to an island in the southern atoll, as per the recovery plan
- Progressed the purchase of a suitable marine vessel to provide increased access opportunities to the park (expected to become available in early 2012–13)

#### 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 2011–12

- Participated in meetings concerning arrangements for the proposed event in 2014 to commemorate the centenary of the wrecking of the SMS *Emden*
- Facilitated an international visit and film production on the history of the wreck

## KRA4: Use and appreciation of protected areas

#### **Major issues**

- Promoting the conservation values of the park and the region while respecting access limitations applying to the park
- Potential for park visitors to introduce exotic species

## Actions

- Support educational activities
- Implement quarantine procedures
- Prevent introduction of exotic species

## Performance results 2011–12

- Assisted Australian Geographic with the filming of a natural and cultural history documentary
- Continued to inspect visitors' equipment, clothing and footwear prior to visitors swimming ashore
- Quarantine signage for boat jetties neared completion

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

#### **Major issue**

• Continuing a positive working relationship with the community and stakeholders to promote the parks conservation values and address relevant conservation issues of mutual interest

## Actions

- Promote the conservation values and benefits of the park
- Continue community relations and education programs
- Work with the Shire Council in relation to translocation of the buff-banded rail

- Parks Australia's Home Island office was mostly staffed full-time, providing ample opportunity for public liaison
- Engaged three local community members to undertake temporary field and administration duties and implemented an agreement with the Shire Council to engage the Council Ranger on a casual basis
- Shire Council and the Director provided in-principle agreement to the translocation of buff-banded rail to Direction Island in accordance with the buff-banded rail recovery plan
- Held three meetings of the Pulu Keeling National Park Community Management Committee
- Provided logistical and operational support for WA Fisheries to conduct fish surveys and studies and educational activities

- Conducted two environmental educational sessions with the Cocos Islands District High School and one community 'hands on' marine turtle talk
- Supported Year 9 student work experience program
- Participated in community and school functions
- Conducted the annual high school trip to the park
- Over 300 native plant seedlings planted in the southern atolls or distributed to community members

### KRA6: Business management

#### **Major issues**

- Completion of the park's management plan
- Isolation limits access to business management support networks

#### Actions

- Finalise management plan
- Facilitate visits to the park by external Parks Australia support staff and facilitate off-island training

- Managed operational and capital budgets within approved parameters
- Completed consultations on the draft management plan with the members of the park's management committee. The draft management is expected to be released for public comment in early 2012–13
- Received regular support from Christmas Island National Park staff. However, logistical issues associated with providing support for the park from Christmas Island remain challenging
- Park staff completed off-island training
- Hosted visits from external field and administration support staff

# **Action stations on Pulu Keeling**

Pulu Keeling National Park doesn't see a lot of visitors. The park covers North Keeling Island, an uninhabited coral atoll far out in the Indian Ocean as well as its surrounding waters to 1.5 km. This remote and isolated oceanic island is 3,000 kilometres north-west of Perth and 24 kilometres from the nearest Cocos (Keeling) Islands.

The island's very remoteness has helped maintain its internationally significant seabird life and rich biodiversity. Even the park rangers can land only when seas are calm, and they reach the island by swimming over a reef, floating their equipment onto the shore.

Oceanic islands are particulary vulnerable to introduced invasive species. Therefore, access to the island is normally strictly controlled to minimise the accidental introduction of invasive animals, weeds and diseases.

When smoke was seen coming from the island in June 2012, it was clear something was afoot. An asylum seeker boat had beached on the island, and authorities quickly launched search and rescue boats in response, resulting in the safe rescue of all asylum seekers.

The landing of the boat immediately rang alarm bells for the national park because of its potential to introduce rats. Pulu Keeling is the only place in the world where you find the Cocos buff-banded rail—a ground dwelling bird about the size of a small chicken. The atoll's native species have never had to deal with rats, which would pose a major threat by raiding nests and destroying eggs.

To complicate matters, rough seas were making access to the island extremely difficult. Rangers from the national park attended as soon as they could, searching for any sign of rats.

Chief Ranger, Ismail Macrae was one of four staff to visit the island to search for rats.

"Thankfully, we didn't find any signs of rats," Ismail said. "We searched around the asylum seeker boat and checked for rat evidence around camp areas and food stores, but there were no signs of rodents."

"We hope the risk is over, but we have to do continued monitoring to make sure. There are cameras that will be automatically triggered by any rats investigating the area. We've also set up an ink card tracking system, which captures the footprints of any curious wildlife. In combination, these measures should give us a good feel for any remaining rat risk. We have already been back once to check the monitoring equipment, a few weeks after we set it up, and that first round of results showed no signs of rats.

"We are also progressing a translocation project for the buff-banded rail. In collaboration with the Cocos Keeling Island Shire Council we plan to move a population of the birds to nearby Direction Island, which is rat-free. It's an insurance policy, so if something like a cyclone or introduced pest strikes Pulu Keeling we'll have a safe and healthy population living nearby."



The introduction of rats to Pulu Keeling would be a major threat to the endemic and endangered Cocos buff-banded rail. Photo: Parks Australia

# 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 Tjura 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 regionalisatio	on: Great Sandy Desert	
Management plan	Fifth plan came into effect 9 January 2010 and expires 8	January 2020	
Other significant management 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 Master Plan; Ulu <u>r</u> u Climb Health and Safety Report; Cultural Heritage Action Plan; Vertebrate Pest Strategy; Women's Cultural Heritage Plan; Fire Management Strategy and Operations Manual; Buffel Grass Management Strategy, Tourism Directions Strategy Stage 1		
Financial	Operating	\$16.470 million	
	Capital	\$0.239 million	
	Revenue	\$11.087 million	
	Paid to traditional owners	\$1.813 million	
Visitors	265,144 visitors (16 years and above) based on park tickets sold		
Permits	185 media permits; 97 tour operators; 3 research		

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	Species	6 extinct 2 endangered 3 vulnerable 16 migratory 36 marine (birds)
	Recovery plans applicable	<ul> <li>Mala or rufous hare-wallaby</li> <li><i>Tjaku<u>r</u>a</i> or great desert skink</li> <li><i>Itjari-itjari</i> or southern marsupial mole</li> </ul>
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 then Minister for the Environment, Water, Heritage and the Arts in November 2008 for a period of five years.

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

Monitoring of the park's suite of threatened species is a high priority for the natural and cultural resource management team and 2011–12 has been no exception.

The park's population of *tjaku<u>r</u>a* or great desert skink (*Liopholis kintorei*) remained stable, although there is some concern for the species in the next few years due to the present uniformity of habitat. The majority of great desert skink habitat was burnt in 2002 and now lacks the complexity on which the species relies (older spinifex for nesting and shelter from predators and younger or bare areas to provide rich feeding grounds). Park staff have been working throughout the recent controlled winter burn sessions to improve the habitat condition for the great desert skink and continued monitoring over the next few years will demonstrate if the population is expanding into the newly burnt areas.

It has been a particularly successful year for the park's population of brush-tailed mulgara (*Dasycercus blythi*) with the largest population figures encountered in many years, based on both spoor and trapping surveys. In addition, in 2011–12 a previously unknown population of the species was discovered approximately 20 kilometres from the park's known population. Further surveys in coming years will quantify the size and distribution of this second population within the park.

The park's population of the threatened mala or rufous hare wallaby (*Lagorchestes hirsutus*) is now the largest on mainland Australia, with surveys in 2011–12 showing that the mala enclosure now holds in excess of 200 individuals. The park's responsibility to the species is therefore paramount and the park is working in partnership with recovery team partners to ensure the long-term survival of the species as a whole.

Introduced vertebrate predators remain a great concern and pose a key threatening process to the park's threatened species. Foxes and feral cats have benefited from the rainfall received throughout the latter half of 2011 with an increase in reported sightings and incidence of detection on both remote camera and track-based regular monitoring programs. Several control programs are being trialled over the next few years in line with the park's

vertebrate pest strategy. While coordinated spotlighting and shooting programs have been unsuccessful, there has been great success with the trial of a new cat trap design, with 50 feral cats removed from key habitat areas including the threatened species habitat on the borefields and the fragile mesic ecosystems around the base of Uluru. This is, by far, the largest number of feral cats ever removed from the park. Next year, in consultation with Victorian government agencies, the park will be instigating a cat baiting trial and the use of ecotraps targeted at foxes.

The seasonal conditions of late 2011 have also benefited rabbits across the park. Of most concern are rabbits in the mala enclosure so monitoring and control efforts were concentrated there during 2011–12. The number of active warrens was reduced from over 200 to 30 however these last warrens are proving problematic to control. In the coming months calicivirus will be released around the remaining active warrens to further reduce their number.

Camel control programs during the year around the mala enclosure and Ulu<u>r</u>u were successful in reducing camel impacts in these areas. However, waterholes at Kata Tju<u>t</u>a and some plant species throughout the park—particularly *mangata* or quandong (*Santalum acuminatum*)—are still being impacted by camels and support will be sought from the Board to extend these control programs across the whole park.

Rare flora monitoring continued in 2011–12, targeting particular species of management concern. There are currently a low number of healthy wild *mangata* trees in the park, with latest monitoring identifying just seven healthy individuals. Whilst camel control work will continue, further monitoring is planned for 2012–13 to determine the extent of seed disturbance by animal and human interference and examine whether juvenile recruitment is occurring from seed. Concurrent to the field study, germination trials within the park's nursery will aim to determine whether wild *mangata* seeds are viable. Overall the *utjulpar* or sandhill wattle (*Acacia ammobia*) population remained steady, although recruitment appears to be very modest and will continue to be monitored. Results of monitoring indicated that fire may be having a positive impact on juvenile recruitment, with levels significantly higher in monitoring sites in burnt areas compared to those in areas which had not been recently burnt.

The health of waterhole ecosystems at the base of Ulu<u>r</u>u remains a priority for monitoring and management. This year saw a repeat of the amphibian mortality event first seen in 2010, albeit at a reduced level. The park has teamed with Newcastle University and the Northern Territory Veterinary Laboratory in Darwin in an attempt to understand the cause of amphibian mortality and assess the health of these important ecosystems. While many potential causes have been ruled out via these investigations (heavy metals, faecal contamination, water chemistry imbalances, chytridiomycosis, ranavirus) it has not been possible to determine the reason for amphibian mortality. Newcastle University has provided a PhD student to continue to study waterhole health over the next few years.

As a direct result of a recognised knowledge gap, the first ever survey of the park's ant fauna was undertaken during the year, in partnership with the CSIRO. Fortunately, the survey did not discover any exotic ant species in the park and surprisingly discovered 50 new species, many previously undescribed. Efforts in 2012–13 will now turn to an understanding of termite distribution and abundance, in view of their role as key ecosystem drivers in arid areas.

An increase in graffiti reported at the base of Ulu<u>r</u>u is cause for concern. Removal techniques are being trialled whilst the park works with the tourism industry and local community organisations to communicate the difficulty in removing graffiti from the porous sandstone of Ulu<u>r</u>u.

# **Future challenges**

Major challenges are:

- establishing the existence and then quantifying the abundance and distribution of common brushtail possums (*Trichosurus vulpecula*) in the park and instituting management actions to conserve the species
- controlling the increase in introduced predators expected following good seasonal rains over the last couple of years
- 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
- retaining and developing staff in a remote area
- increasing Anangu engagement and employment in management of the park
- managing the budgetary impact of decreasing visitor numbers
- maintaining a whole-of-government approach to ongoing service provision (municipal, essential, social and other services) to the Mutitjulu Community.

# Report on performance by key result areas

## KRA1: Natural Heritage management

#### Major issues

- Restricting the spread of introduced buffel grass (*Cenchrus ciliaris*) and reducing its abundance throughout the park
- Reducing the impacts of vertebrate pests (particularly foxes, feral cats, camels and rabbits)
- 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

#### Actions

- Implement the fire and vegetation management strategy to guide fire planning and activity within the park
- Implement the Buffel Grass Management Strategy to improve the effectiveness and efficiency of resource use to achieve improved conservation and recreational outcomes over the life of the strategy
- · Implement the vertebrate pest strategy to control feral pests and their impacts on endangered species
- Continue to involve all stakeholders in annual fire planning to ensure a regional approach to planning of 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
- Maintain the pest-free mala enclosure
- Implement targeted surveys of major invertebrate groups involved in ecosystem function ie termites and ants
- Improve data and geographic information system (GIS) management

- The Fire Management Strategy and Operations Manual are now being used to plan all burns within the park. Several burns were conducted
- The Buffel Grass Management Strategy is now being used to prioritise buffel grass control activities
- Over the life of the Conservation Volunteers Australia contract, in place for 10 years, more than 6,400 volunteer days have contributed to removing around 80 hectares of buffel grass around the base of Uluru and in other parts of the park to reduce its spread
- 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 regular vertebrate pest monitoring for cats and foxes in the borefields area of the park
- Successfully trapped 50 feral cats throughout the park and controlled camel incursions at Ulu<u>r</u>u and the mala enclosure, disposing of more than 100 camels
- Mapped rabbit burrows across the mala enclosure and reduced burrow numbers from more than 250 to 30
- Conducted the annual mulgara, great desert skink and mala surveys
- The park's mala population is now in excess of 200 individuals and is the largest on mainland Australia
- In collaboration with the CSIRO and the University of Sydney, began analysis of over 20 years of fauna survey data to inform park management, particularly in the face of climate change
- Continued monitoring of selected rare plant species including propagation trials and trials to understand fire requirements

- Began collaboration with Newcastle University to investigate waterhole and frog health at the base of Uluru
- Implemented first ever targeted surveys of the park's ant fauna, one of the major invertebrate groups involved in ecosystem function

#### KRA2: Cultural heritage management

#### **Major issues**

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

## Actions

- 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 Ulu<u>r</u>u
- Maintain the Cultural Sites Management System database as an information repository, planning and reporting tool
- 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

## Performance results 2011–12

- Held three Cultural Heritage and Scientific Consultative Committee meetings to provide advice to the Board on natural and cultural heritage issues
- Began oral history recordings with senior traditional owners concerning traditional medicine production
- Continued to revise the Cultural Heritage Action Plan, with a revised draft presented to the Board for approval in mid-2012
- Continued cultural site patrols and added the resulting data to the Cultural Site Management System
- Continued monitoring and removing graffiti where possible
- Improved the security of the current men's keeping place and instigated visitor monitoring in the area
- Successfully gained funding from the department's Indigenous Heritage Program to build a new men's keeping place

## KRA3: Joint management and working with Indigenous communities

## **Major issues**

- Managing the park in accordance with lease obligations, joint management principles and the management plan
- Supporting 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

## Actions

- · 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 and encourage 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 Mu<u>t</u>itjulu Community Rangers Program to increase levels of A<u>n</u>angu engagement in park
  management activity
- Continue to develop the Junior Ranger Program in consultation with the Mutitjulu school and Anangu

## Performance results 2011–12

- Held three meetings of the Board, supported by meetings of the Board's consultative committees
- Continued to engage community, build capacity, provide training and employment and support Anangu in the region via the park's workplace development coordinator
- Completed the park's Intergenerational Employment and Training Strategy
- Completed a review of the park's Anangu Trainee Management Guidelines
- Developed a six-day community engagement and work readiness development program
- Two Anangu trainees completed accredited programs of study in Conservation and Land Management
- Continued to support the agreement between the Mutitjulu Community Aboriginal Corporation and the park in employing Anangu, including acknowledging and recompensing senior Anangu for their traditional knowledge and skills
- A<u>n</u>angu participation in flexible employment at Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park through the Mu<u>t</u>itjulu Community Ranger program has declined due in part to the cessation of funding for two workforce development coordinators (previously funded by the Department of Education, Employment and Workplace Relations).
- Developed a regional A<u>n</u>angu cultural appreciation program which can be delivered by A<u>n</u>angu for new park staff and other regional stakeholders
- Supported the attendance of Anangu staff and the park's workforce development coordinator at the department's Indigenous employees conference and supported Anangu Indigenous Staff Network committee members to attend leadership and governance training. The park hosted network members during their network meeting held in Yulara in March 2012
- Undertook Junior Ranger activities with three local schools to facilitate intergenerational transfer of knowledge, including an overnight camp with junior rangers, participating schools and Mutitjulu community members
- Engaged Pitjantjatjara interpreters for Board, consultative committee and other meetings to improve communication with traditional owners and community members
- Worked with Mu<u>t</u>itjulu Community and Board members to facilitate the 26th anniversary of Handback celebrations held at the Cultural Centre on 25 October 2011
- Held NAIDOC week celebrations with Mutitjulu Community members at the Cultural Centre
- A<u>n</u>angu Board members and the Park Manager presented a paper, via video, to the World Heritage Area Remote Access conference held in Edinburgh in November 2011
- The park manager attended a national joint management workshop held in Alice Springs in April 2012

# KRA4: Use and appreciation of protected areas

#### Major issues

- Implementation of an online ticket system for the park
- Managing the expectations of international and Australian film crews and professional photographers
- Managing ageing infrastructure
- Facilitating new tourism development proposals for the park identified through the Tourism Directions Strategy
- 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

# Actions

- Monitor visitor satisfaction
- Continue media briefings (using face-to-face briefings and electronic communications)
- Develop collaborative marketing campaigns between the park, Tourism Australia and Tourism NT
- Develop new interpretive signage, including visitor safety messages for electronic, print and other media
- Provide key interpretive messages to park visitors prior to arrival
- Maintain visitor infrastructure including walking tracks and pathways
- Continue tour operator workshops and orientation programs for tour guides and industry stakeholders to further knowledge on the park's natural and cultural values
- Monitor the number of tour guides who have completed the compulsory tour guide certification
- Develop pre-visit information for visiting school groups and educational tourism groups
- Develop guidelines and processes to facilitate and support potential new tourism opportunities and events to benefit traditional owners and the park
- Implement the Tourism Directions Strategy Stage 1

- Visitor survey conducted in June 2012, with 96 per cent of respondents satisfied overall with their visit
- Facilitated VIP visits to the park for international parliamentarians and other guests, including visits by Minister Burke in July 2011 and April 2012
- Continued to implement the Ulu<u>r</u>u-Kata Tju<u>t</u>a Knowledge for Tour Guides Program; 612 guides have completed
  the program with 919 currently enrolled
- Implemented regular newsletter for accredited guides to provide additional information to assist them to improve their tours
- Undertook five rescues of visitors on Uluru and responded to a further 30 emergency alarm responses
- Facilitated successful marketing campaigns between Tourism Australia, Tourism NT and the park with VIP visits
- Commenced project with consultants to undertake an assessment of the Cultural Centre infrastructure to improve maintenance of the built environment at that site
- Maintained the park's emergency response, first aid and fire suppression capabilities
- Negotiated with Northern Territory Emergency Services to provide vertical rescue capability for the Ulu<u>r</u>u climb
- Celebrated the 26th Anniversary of Handback of title to the park to traditional owners with a cultural festival at the park's Cultural Centre
- Delivered free interpretive events to visitors including the daily ranger-guided Mala Walk at Uluru
- Delivered education programs for visiting school groups
- Continued to work with regional partners on the Red Centre National Landscape and Red Centre Way tourist drive
- Held a brand repositioning workshop at the park in May 2012 with traditional owners, Mu<u>t</u>itjulu Community members and other key stakeholders to identify the park's marketing position in the Red Centre National Landscape
- Rolled out new interpretative signage for key park visitor sites
- In consultation with Anangu, continued design and development of new interpretive signage for the base of climb and entry station
- Continued development of event policies and guidelines to facilitate new and innovative events in the park
- Board members, Mutitjulu Community members and park staff attended the inaugural Pacific Asia Indigenous
   Tourism Conference in Darwin in March 2012
- Facilitated pre-feasibility workshops with relevant Anangu, Tourism NT, Indigenous Business Australia and the Central Land Council for potential new tourism developments on land surrounding the park
- Commenced collection of data on the Uluru climb as part of the climb closure strategy

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

#### **Major issues**

- · Providing opportunities for new Indigenous business enterprises
- Maintaining an effective working relationship with the Mutitjulu Community
- Developing and maintaining good relationships between the park and the Ayers Rock Resort, now owned by the Indigenous Land Corporation
- Maintaining an ongoing partnership with the tourism industry
- Maintaining good relationships with regional training, education and employment stakeholders
- Engaging with NT and Australian government agencies working with the Mutitjulu Community

#### **Actions**

- Hold meetings of the Board's consultative committees
- Participate in building relationships with Ayers Rock Resort and its owner, the Indigenous Land Corporation
- Communicate clearly with all parties about developments in the park and the Mu<u>t</u>itjulu Community and report on progress to stakeholders
- Maintain a Cultural Centre tenants group
- Meet regularly with local stakeholder groups
- Continue to support volunteer and community groups in protecting park values

# Performance results 2011–12

- Held three meetings of the Tourism Consultative Committee and the Film and Photography Consultative Committee
- Continued to lead the development of an Anangu literacy and numeracy development program in collaboration with Anangu Jobs and the Nyangatjatjara College
- Maintained a relationship with Batchelor Institute of Indigenous Tertiary Education to provide accredited study programs in conservation and land management for the park's Anangu staff and selected Mutitjulu Community Ranger Program participants
- Established a partnership with Voyages Indigenous Tourism Australia to share training events and facilities, creating efficiencies with training delivery
- Commenced discussions on development of an MoU between Parks Australia and Ayers Rock Resort
- Facilitated orientation programs for resort staff about the park
- Supported teams from Conservation Volunteers Australia working on weed control in the park
- Met regularly with Mutitjulu Community Aboriginal Corporation representatives and the Department of Families, Housing, Community Services and Indigenous Affairs Government Business Manager
- Participated in Yulara Counter Disaster Committee meetings
- · Produced quarterly e-newsletters to communicate park news and activities to stakeholders
- Negotiated draft permit conditions for the construction of new developments in the Mutitjulu Community

## **KRA6: Business management**

#### **Major issues**

- Implementing the fifth management plan
- Recruiting and maintaining staff to the park
- Providing suitable staff housing and an improved office environment
- Managing fluctuations in 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

- Ensure that Housing, Training and Occupational Health and Safety committees are functional and meet regularly
- 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 in line with new Workplace Health and Safety legislation
- · Manage infrastructure maintenance and repairs
- Support asbestos remediation project

- Completed development of a staff cultural awareness training package. A smaller cultural awareness package was also developed to induct new staff in the joint management work environment
- Developed and implemented a fire fitness policy for staff who participate in fire management duties on-park
- Staff, Anangu and Mutitjulu Community members attended 32 training events, ranging from informal information sessions to accredited training
- Engaged with University of New England to assess the potential for Central Enterprises Australia to deliver the Quick Start Literacy and Numeracy Program in Mutitjulu in 2012–13
- · Implemented Parks Australia's staff mobility policy to support the retention and development of staff
- Developed Parks Australia's mentoring program guidelines for implementation in 2012–13
- Delivered certificate level training in project management to a number of the park's project and middle management staff
- Held regular meetings of the Occupational Health and Safety Committee and the Training and Employment
  Committee
- Staff participated in the Health Futures Program
- Senior park staff attended science and Parks Australia forums
- Continued the review of essential services for Mutitjulu Community
- Key staff undertook a water management planning workshop facilitated by Power Water Corporation at the park in April 2012, as a basis for preparing a water management plan for the park
- Facilitated asbestos survey of park staff housing and park infrastructure
- Reviewed first response to emergencies on the Uluru climb and implemented safer work practices
- Completed first stage of radio communications replacement project and commenced second stage of project
- Purchased four new fire units and all-terrain vehicles

# Thanks to our volunteers

For more than 10 years a partnership between Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park and Conservation Volunteers Australia has been tackling one of the Northern Territory's most invasive weeds—buffel grass.

Volunteers from all over the world have given over 6,400 individual days to remove buffel grass by hand from over 80 hectares in some of the most visited areas at Ulu<u>r</u>u. The progam has received both national and international media exposure, including Channel Nine's Getaway travel program. The volunteer tourists attracted through the program have contributed significantly to Central Australia's regional economy through the purchase of food supplies, use of local services, optional tours and coach and airline transfers.

Ulu<u>r</u>u's ranger team have also been working with volunteer staff members from Ayers Rock Resort. Together they are tackling buffel grass infestations around Ulu<u>r</u>u and in the more remote areas of the park. This work is part of Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park's ongoing buffel grass control strategy.

Historically, buffel grass was planted at Uluru to help stabilise the soil around the monolith. Unfortunately, it is an extremely efficient weed that out-competes the native grasses to form large monocultures, particularly in drainage lines and disturbance areas. For these reasons, the grass particularly affects the moist, rare habitats at the base of both Uluru and Kata Tjura, potentially endangering those species that seek refuge from the heat in these shady niches including echidnas, fat-tailed pseudoantechinuses and burrowing frogs.

The last group of conservation volunteers have finished their buffel work in the park. Conservation Volunteers Australia and Parks Australia will continue to work together to deliver conservation outcomes in the park and more broadly across Australia's Red Centre National Landscape.

# **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*) and red-lored whistler (*Pachycephala rufogularis*), the regionally vulnerable bush stone-curlew (*Burhinus grallarius*) and the nationally vulnerable southern bell frog (*Litoria*)

ramiformis). The floodplain system is internationally recognised as a significant part of the Riverland Ramsar site.

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				
	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)				
Other significant	Management contract with Austland Services Pty Ltd; Biosphere Reserves Seville Strategy and statutory framework				
management					
documents					
Financial	Operating *	\$0.456 million			
	Capital	\$0.036 million			
	Revenue	\$0.103 million			
Visitors	Over 2,700 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	17 of 81 listed species		
Japan-Australia Migratory Birds Agreement	15 of 77 listed species		
Korea-Australia Migratory Birds Agreement	13 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 13 migratory 46 marine (birds)	
	Recovery plans applicable	<ul><li>Malleefowl</li><li>Black-eared miner</li></ul>	
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	
26	189	70	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. 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, rainfall and atmospheric gas and energy flows (the last as part of the Ozflux network, a national ecosystem research network set up to provide the Australian and global ecosystem modelling communities with nationally consistent observations of energy, carbon and water exchange between the atmosphere and key Australian ecosystems). Special purpose monitoring activities conducted during the year included intensive rabbit monitoring in restoration areas and additional black-eared miner surveys to locate new colonies.

Rainfall on both properties was well above the long-term average in 2010, 2011 and 2012, with some exceptional monthly totals (frequently in excess of 100 mm) being recorded in the period from August 2010 to March 2012. These high rainfalls have led to strong ecological responses from plant and animal communities across the properties. Significant recruitment of vegetation was readily apparent at long-term monitoring sites while informal observations indicated that widespread increases in associated faunal populations also occurred. Among the fauna populations, these increases have been most obvious among insect and bird species. Since 2010–11 populations of migratory woodswallow species have been substantially higher across the properties compared to previous years, with estimates of a total population in excess of 100,000 birds, while species such as the black-shouldered kite (*Elanus axillaris*) which have not been recorded on the properties in the past decade have been numerous and have been recorded breeding.

The high rainfall has also resulted in regional increases in populations of invasive animals, especially rabbits and feral goats. These increases prompted elevated levels of control activity such that populations of these species are now relatively low on Calperum and Taylorville compared with many other properties in the region.

Generally high rainfall within the Murray–Darling Basin, and subsequent management of these flows, also generated prolonged high water levels in the waterways and wetlands of Calperum, with repeated and extensive overbank flows inundating areas that had not been watered since the early 1990s. This in turn produced high levels of breeding activity of birds in Lake Merreti and Lake Woolpolool—key lakes of the Riverland Ramsar site. For example, breeding rookeries of darters, cormorants and ibis of several species formed on the lakes in 2010 for the first time since 1995 and produced at least three broods. This breeding event was followed in 2011 by a second smaller breeding event.

Floodplain inundation has rejuvenated substantial areas of floodplain vegetation, increasing the vigour of existing river red gum (*Eucalyptus camaldulensis*), black box (*Eucalyptus largiflorens*) and lignum (*Muehlenbeckia florulenta*) stands and supporting recruitment of new vegetation. For example, preliminary surveys have detected health improvements in approximately 60 per cent of the trees around Lake Woolpolool compared to pre-inundation condition. The high flows have also recharged fresh groundwater reserves within the floodplain and these reserves can be expected to support continued recovery of floodplain vegetation for some time after river flows return to more typical levels.

The recent inundations have also resulted in the germination of a wide diversity of flood-dependent plant species; recent surveys of the Calperum floodplain by SA Herbarium staff, with assistance from ALT staff, have revealed populations of nine state-listed plant species.

# **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'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

#### Performance results 2011–12

- Continued regular feral animal control programs, including laying over 3,000 fox baits and 70 km of rabbit control bait trail and ripping/fumigating over 100 rabbit warrens. Feral goat and feral pig control programs were intensified in response to favourable climatic conditions
- Collaborated (through on-ground implementation and management support) in regional pig and goat control programs being managed by the SA Murray–Darling Basin Natural Resources Management Board and the SA Department of Environment, Water and Natural Resources
- Continued and enhanced a diverse program of biological monitoring including broad-scale small vertebrate surveys, threatened species monitoring, floodplain tree health surveys, vegetation photopoint surveys and aquatic and terrestrial wetland/floodplain species assessments
- Conducted additional wetland monitoring activities to assess impacts of floodplain inundation
- Continued to develop data collection and management techniques, particularly the use of Calperum's geographic information system to manage and track research and landscape management programs
- Supported postgraduate research projects on mallee ecology, freshwater ecology, and salt-tolerant floodplain
  trees
- Supported ongoing management of atmospheric gas flux monitoring tower on Calperum and collaborated in efforts to develop associated ecological monitoring programs to establish a virtual transect from the mallee woodlands to the floodplain
- Continued to implement the Bookmark Mallee Fire Management Plan
- Replaced and/or repaired approximately 20 km of pipeline serving fire-fighting water storages
- Continued to maintain fire access tracks, forward fire fighting bases and associated infrastructure
- Actively supported threatened species recovery programs for the black-eared miner and malleefowl through biological surveys, predator control and fire management
- Continued to manage survey data on behalf of the black-eared miner recovery team
- Initiated a new project 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
- Continued major restoration projects to restore the vegetation of floodplain and adjacent semi-arid woodland on Calperum
- Completed a draft paper outlining ecological factors and practical management issues to provide a rigorous guide to planning and implementation of restoration projects in Calperum's floodplain communities
- Continued monitoring floodplain groundwater through a network of over 70 groundwater test wells
- Secured funding from the SA Department of Environment, Water and Natural Resources regional goat control program for the decommissioning of one dam and the construction of exclusion fencing at three other dams, resulting in the elimination of all but two artificial water sources in northern Calperum
- Worked with the SA Department for Water (now SA Department of Environment, Water and Natural Resources) in developing water allocation management plans for Lake Merreti and Lake Woolpolool; these plans will secure rights to environmental water allocations for these lakes into the future
- Secured funding from the SA Murray–Darling Basin Natural Resources Management Board for enhancement of control structures on Lake Woolpolool, including the installation of fish gates to aid in the management of pest fish species

#### 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 2011–12

- 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
- Continued to host the Working on Country: Riverland Aboriginal Rangers 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 Riverland region
- Hosted NAIDOC Week events including an exhibition on the theme of 'Aboriginal Art and Artefacts' at the
  McCormick Centre for the Environment in Renmark to promote community awareness and appreciation of the
  region's Indigenous heritage
- In April 2012 hosted the first gathering of Working on Country Aboriginal Rangers teams from south-eastern Australia for a week of programmed activities and informal networking and knowledge sharing
- Continued to identify and formally report sites on indigenous cultural significance for inclusion on appropriate registers
- Hosted and encouraged visits by regional Aboriginal elders to promote engagement in cultural heritage
   management
- Engaged with members of the regional indigenous community to support development of economic activities with cultural heritage components
- Provided on-ground support to SA Aboriginal Heritage Branch officers and other agencies to assist in managing and preserving regional heritage
- Conducted occasional guided tours through more remote areas of Calperum, 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
- 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 volunteer and visitor accommodation, especially floodplain tracks and camping facilities
- Continued to upgrade interpretive signs and materials, including enhancement of roadside information stand and parking area
- Commenced development of riparian walking track and associated materials to highlight Calperum's ecology and cultural heritage

- Continued occasional 'tag-along' tours to provide the public with safe access to the remote mallee woodland
   areas of Calperum
- Provided more than 3,000 bed-nights of accommodation to volunteers, students and visitors to Calperum (a 10 per cent increase over 2010–11)
- Continued to support the development of sustainable ecotourism in the region through the Riverland Ecotourism Association and Riverland Tourism Association
- Conducted education programs for students from pre-primary through to tertiary level, using Calperum and the McCormick Centre for the Environment as key activity sites
- Conducted a series on public lectures on natural resource management topics and hosted numerous community capacity building activities, including the Upper Murray Junior Youth NRM Forum and Questacon's *Our Water* travelling exhibition at the McCormick Centre for the Environment
- Continued to support field trips for students in Year 8 and Year 9 Renmark High School Science and Society and Environment courses
- Hosted numerous field trips and camps for TAFE SA, university and non-government groups studying biology, ecology and environmental management
- Supported professional development days for teachers of environment-related subjects, and hosted secondary students on work experience placements
- Hosted three groups of North American tertiary students under the International Student Volunteers program
- 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 SA education and legal/law-enforcement agencies and provided nature-based training activities for participants in the program
- Hosted professionals training workshop in AusPlots survey techniques for ecology field workers and researchers
- Supported continued development of Calperum as a Terrestrial Ecosystem Research Network (TERN) supersite, including conduct of intensive reference sites surveys and installation of additional monitoring equipment

## **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

#### Actions

- 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 for the Environment as sites for research and monitoring, education, skill-sharing and public recreation
- Continued to provide various forms of support and encouragement to existing and potential volunteers, and maintained a database to record and analyse volunteer contributions to management of the properties
- Continued to use the McCormick Centre for the Environment to disseminate information on the Man and the
  Biosphere Programme
- 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
- Continued to engage with Adelaide-based Rotary clubs to promote Calperum and Taylorville as a focus for activity, especially in the context of 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

### Performance results 2011–12

- Continued routine maintenance of buildings, plant and equipment, fencing, tracks and other infrastructure
- Upgraded kitchen facilities in volunteer housing
- Upgraded main floodplain access track to improve all-weather access
- Re-aligned and/or closed selected floodplain tracks to improve visitor control and reduce adverse impacts
- Upgraded visitor facilities at Windmill Bend campsite, including provision of new shelters, information displays, (non-potable) water supply and traffic management infrastructure
- Installed UHF CB radio base station at Oak Bore Outstation
- Further upgraded computing and communications infrastructure, including boosting range of wi-fi computer network to section of the Calperum floodplain
- Continued upgrading of hot water systems in accommodation areas to more energy efficient systems
- Maintained a recycling program

## 2 Marine reserves summaries for 2011–12

### 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 Commonwealth Marine Reserves Network Great Australian Bight Marine Park (Commonwealth Waters) North-west Commonwealth Marine Reserves Network Ashmore Reef National Nature Reserve Cartier Island Marine Reserve Mermaid Reef Marine National Nature Reserve Ningaloo Marine Park (Commonwealth Waters) North Commonwealth Marine Reserves Network **Coral Sea Commonwealth Marine Reserves Network** Coringa-Herald National Nature Reserve Lihou Reef National Nature Reserve Temperate East Commonwealth Marine Reserves Network Cod Grounds Commonwealth Marine Reserve Elizabeth and Middleton Reefs Marine 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

### http://www.environment.gov.au/coasts/mbp/index.html

Australia's marine bioregional planning program is improving the way our oceans are managed to ensure that we can continue to use and enjoy them into the future. Marine Bioregional Plans are being prepared under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to improve the way decisions are made about the protection of marine biodiversity and the sustainable use of our oceans. New Commonwealth marine reserves are also being identified through the marine bioregional planning process as part of Australia's commitment to establish a National Representative System of Marine Protected Areas by 2012.

The marine bioregional planning process is targeted at waters managed by the Australian Government (Commonwealth waters), which generally start three nautical miles from the coast and extend to the edge of Australia's Exclusive Economic Zone.

Marine Bioregional Plans are being developed for the South-west, North-west, North and Temperate East marine regions (regions shown in the map below). Marine Bioregional Plans will help improve the way decisions are made under the EPBC Act, particularly in relation to the protection of marine biodiversity and the sustainable use of our oceans and their resources by marine-based industries.

There are three main steps in the preparation of a Marine Bioregional Plan:

- preparation of a bioregional profile
- release of a draft Marine Bioregional Plan for public comment
- completion of a final Marine Bioregional Plan.

Bioregional profiles were released for the South-west, North-west, North and East (Temperate East and Coral Sea) marine regions between 2007 and 2009. Bioregional profiles for these marine regions were developed from a range of information including scientific papers, commissioned reports, industry performance reporting, census data and expert advice. Bioregional profiles describe the ecosystems of each marine region, their conservation values and the goals and principles that guide the identification and design of new Commonwealth marine reserves.



Between May 2011 and February 2012, draft Marine Bioregional Plans were released for public comment for the South-west, North-west, North and Temperate East marine regions. Public submissions received during the public comment periods has been considered in their completion and final marine bioregional plans are expected to be released in the second half of 2012.

As part of the marine bioregional planning process, new Commonwealth marine reserves networks in the Southwest, North-west, North and Temperate East marine regions and the Coral Sea have also been identified. These Commonwealth marine reserves networks will play an important role in the long-term conservation of marine ecosystems and the biodiversity of our oceans. They will also meet Australia's international and national commitments to establish a National Representative System of Marine Protected Areas (NRSMPA).

Identification of the new Commonwealth marine reserves networks has been guided by the *Goals and Principles for the Establishment of the National Representative System of Marine Protected Areas in Commonwealth Waters* (described in detail in the bioregional profiles for each region). Consistent with those goals and principles, the government's objective in developing the new networks of representative marine reserves is to ensure sound conservation outcomes while seeking to minimise adverse impacts on users of the marine environment. The general approach has been to design marine reserves that, where possible, avoid areas highly valued by industry and recreational users while at the same time meeting conservation outcomes.

Between May 2011 and February 2012 the Australian Government released draft Commonwealth marine reserves network proposals for public comment for the South-west, North-west, North, and Temperate East marine regions and for the Coral Sea. More than 566,000 submissions were received across all regions during the consultation periods.

Information received through public submissions and stakeholder consultations, together with detailed socioeconomic assessments, was considered by the Australian Government in finalising the marine reserve network proposals for each region. Final Commonwealth marine reserves network proposals will be subject to a final round of public comment during the second half of 2012 as part of the process for proclaiming them under the EPBC Act.

After the marine reserves networks have been proclaimed, there will be two opportunities for the public to provide input to the development of a management plan for each marine reserve network. Firstly, stakeholder feedback will be invited on a proposal to prepare a draft management plan for the marine reserve network. Stakeholder feedback will then be invited on the draft management plan itself.

A network of marine reserves for the South-east Marine Region was established in 2007 through a separate process to the existing marine bioregional planning process.

The following sections report on reserve management in the South-east, South-west, North-west and Temperate East marine regions and the Coral Sea. The North Marine Region does not yet contain marine protected areas.

More information about the Commonwealth marine reserves developed through the marine bioregional planning program is available at: http://www.environment.gov.au/coasts/mbp/index.html.

## **South-east Commonwealth Marine Reserves Network**



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

## **Special features**

Australia's South-east Commonwealth Marine Reserves Network covers 388,458 square kilometres of representative examples of the diverse seafloor features and associated habitats found in the South-east Marine Region. The region stretches from the far south coast of New South Wales, around Tasmania and Victoria and west to Kangaroo Island off South Australia and includes Macquarie Island and its surrounding waters. The reserves include features such as underwater canyons and mountains and marine life associated with them.

## **Existing Commonwealth Marine Reserves**

The 14 reserves in the South-east Commonwealth Marine Reserves 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 Reserves Network Overview

Area	388,458 square kilometres	388,458 square kilometres	
Proclamation date	All reserves 28 June 2007 (effective 3 September 2007), with the exception of Macquarie Island Commonwealth Marine Reserve (27 October 1999)		
IUCN category	Includes Categories Ia, II, IV and VI; see individual reserve	Includes Categories Ia, II, IV and VI; see individual reserves	
Biogeographic context	Includes various Integrated Marine and Coastal Regionalisation for Australia (IMCRA) 4.0 provincial bioregions; see individual reserves		
Management plan	A network management plan is currently being developed (the management plan will include the Macquarie Island Commonwealth Marine Reserve)		
Other significant management documents	A departmental memorandum of understanding between Parks Australia and the Marine Division; Australian Government annual service agreements with the South Australian Government and Tasmania Police; memorandum of understanding between the department and the Australian Fisheries Management Authority		
Financial	Operating	\$250,717*	
	Capital	nil	
	Revenue	nil	
Permits/approvals	Operating under interim management arrangements with:		
	1 general approval for commercial fishing and 389 individual registrations		
	17 commercial tourism approvals		
	4 scientific approvals		

\* Operating costs include relevant annual business agreements, aerial surveillance and incident management. This excludes services provided by the Australian Fisheries Management Authority and the Australian Customs and Border Protection Service. Additionally, costs incurred across all reserves that are not attributable by region amount to \$2,243,490 for salaries and service provision.

International conventions and agreements	
World Heritage Convention	Macquarie Island and waters within a 12 nautical mile radius were listed as a World Heritage Area in 1997
Migratory Species (Bonn) Convention	Relevant to all reserves
China-Australia Migratory Birds Agreement	Relevant to all reserves
Japan–Australia Migratory Birds Agreement	Relevant to all reserves
Korea-Australia Migratory Birds Agreement	Relevant to all reserves
Agreement on the Conservation of Albatrosses and Petrels	Relevant to all reserves

Environment Protection and Biodiversity Conservation Act 1999		
Listed fauna	Species	21 endangered 44 vulnerable 30 migratory 72 marine
	Recovery plans applicable	<ul> <li>Southern right whale</li> <li>Blue, fin and sei whales</li> <li>Humpback whale</li> <li>Sub-Antarctic fur seal and southern elephant seal</li> <li>Threatened albatrosses and giant petrels</li> <li>Ten species of seabirds</li> <li>Marine turtles</li> <li>Four species of handfish</li> <li>Grey nurse shark</li> <li>Whale shark</li> </ul>
	Threat abatement plans applicable	Impacts of marine debris on vertebrate marine life Incidental catch of seabirds during oceanic longline fishing operations
Listed flora	None	
Heritage	Part of Macquarie Island Commonwealth Marine Reserve on National Heritage List Tasmanian Seamounts, within the Huon Commonwealth Marine Reserve, on Commonwealth Heritage List	
Other	Macquarie Island listed as a crit	tical habitat for grey-headed albatross and wandering albatross

### **Management arrangements**

A single management plan that will include all 14 Commonwealth marine reserves in the Reserves Network is currently being developed. The draft management plan is expected to be released for public consultation in the second half of 2012. Management arrangements are in place to manage use of the Reserves 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. The department intends to develop a national Commonwealth marine reserve research and monitoring strategy to identify and address national priorities and synergies. Network level research and monitoring implementation plans that focus on integrated data sharing and knowledge gaps will be developed as part of the management plan.

## **Future challenges**

Major challenges include:

- managing impacts of climate change on conservation values
- improving knowledge and management of the environmental values associated with the Reserves Network, and the threats that impact those values
- establishing an effective and appropriate monitoring program to guide and support management of the Reserves Network over the longer term
- full delivery of a management plan with supporting management systems.

## Report on performance by key result areas

### KRA1: Natural heritage management

### **Major issues**

- Limited understanding of the state of conservation values of the Reserves Network particularly in deepwater habitats
- Management plan not yet in place to guide management of the Reserves Network
- Need to evaluate the effectiveness of management arrangements and their ability to protect the conservation values of the Reserves Network

### Actions

- Work in collaboration with Australia's leading marine science institutions to identify requirements and develop capacity to monitor, evaluate and report on the effectiveness of management arrangements and improve understanding of conservation values
- Assess and approve applications for proposed research activities in the Reserves Network
- Continue drafting of South-east Reserves Network management plan for release in the second half of 2012

### Performance results 2011–12

- Draft management plan for the South East Marine Reserves Network developed and supporting documentation readied for commencement of public consultation in July 2012
- Commenced multi-year research projects to design a monitoring program framework, identify performance indicators and data requirements, collate and analyse existing data and provide recommendations to improve national capacity to meet data requirements
- All applications to conduct research in the Reserves Network successfully assessed and, when approved, conducted without significant impact on conservation values

### KRA4: Use and appreciation of protected areas

### **Major issues**

- Ensuring effective monitoring of use in marine reserves
- Promote sustainable use of the Reserves Network to stakeholders
- Detection of illegal activities

### **Actions**

- Develop strategies to monitor potential illegal activities consistent with the 2011–12 compliance plan, including information sharing arrangements and contracting compliance services with relevant parties
- Continue to monitor use of the Reserves Network through the collection and analysis of aerial and vessel surveillance activities and Vessel Monitoring System (VMS) data
- Continue to process commercial fishing registrations
- Continue annual service arrangements with Australian Government and state agencies to deliver operational compliance and enforcement activities in the Reserves Network

### Performance results 2011–12

- Management arrangements providing for use of the Reserves Network were implemented consistent with
   reserve zoning
- Compliance workshop conducted in March 2012, in cooperation with state government agencies, the Australian Fisheries Management Authority (AFMA) and Australian Customs and Border Protection Service. Compliance priorities for 2012–13 were successfully identified

- Conducted over 40 aerial and vessel surveillance patrols, targeted at high risk areas, resulting in more than 50 visits to individual reserves in the network
- Commercial use monitored effectively in cooperation with AFMA through VMS data sharing arrangements, including provision of monthly VMS reports and data analysis to the department. VMS successfully used to detect prohibited activity
- Two enforcement actions undertaken

### KRA5: Stakeholders and partnerships

### **Major issue**

• Ensuring ongoing and constructive engagement with the community, key stakeholders, interest groups and government agencies for effective management of the Reserves Network

### Actions

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

### Performance results 2011–12

- Annual service agreements developed with Tasmanian and SA governments to undertake vessel patrols within the Reserves Network. Conducted stakeholder communication and education in conjunction with patrols
- Continued to consult with stakeholders and engage the community on the values of the reserves and developing a draft management plan for the Reserves Network
- Met with the South-east Region commercial fishing sector on the draft management plan and proposed operational rules for commercial fishing under the plan

## **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 seas are foraging areas for such species as Australian fur seal

(Arctocephalus pusillus doriferus) and 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 (Multiple Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Bass Strait Province
Management plan	Reserves Network management plan in development

## **Beagle Commonwealth Marine Reserve**



#### 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 indicated to be very rich in biodiversity 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 (Multiple Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Southeast Transition
Management plan	Reserves Network management plan in development

## **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 seafloor-dwelling animal groups.

The reserve contains a rich array of life, particularly bottomdwelling 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 divingpetrel (*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 (Multiple Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Bass Strait Province
Management plan	Reserves Network management plan in development

## **East Gippsland Commonwealth Marine Reserve**

# NEW SOUTH WALES Eden VICTORIA 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. 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, influencing biodiversity and local productivity, in particular phytoplankton communities.

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 (Multiple Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Southeast Transition
Management plan	Reserves Network management plan in development

## **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 depths ranging from about 40 metres on the shallow continental shelf to abyssal 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

sediment 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; these 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, Harrisson's dogfish (*Centrophorus harrissoni*) and southern dogfish (*C. zeehaani*). Among the fishes, sponges and deep-water corals of this reserve is found 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:
	Category la 2,581,195 hectares (Sanctuary Zone)
	Category VI 123,111 hectares (Multiple Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregions: Tasmanian Province, Southeast Transition
Management plan	Reserves Network management plan in development

## Franklin Commonwealth Marine Reserve

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



### **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.

The reserve includes feeding grounds 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 (Multiple Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregions: Western Bass Strait Transition, Tasmanian Transition
Management plan	Reserves Network management plan in development

## **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 abyssal 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, Harrisson'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:
	Category la 5,679,269 hectares (Sanctuary Zone)
	Category II 32,330 hectares (Recreational Use Zone)
	Category VI 82,649 hectares (Multiple Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregions: Tasmania Province, Southeast Transition, Tasmanian IMCRA Province
Management plan	Reserves Network management plan in development

## **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 supporting a diverse range of fish, coral, squid, crabs and other animals which inhabit these seamounts.

The reserve's most remarkable feature is a cluster of coneshaped 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 fauna, 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 included in the Commonwealth Heritage List to recognise these 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*) travelling from adjacent nesting areas. Based on the distribution of larvae, this area is also known to provide spawning areas for important commercial fishes including ocean perch (*Helicolenus barathri* and also *H. percoides*) and blue warehou (*Seriolella brama*).

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:
	Category la 38,897 hectares (Benthic Sanctuary)
	Category VI 960,177 hectares (Multiple Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregions: Tasmanian IMCRA Province, Tasmania Province
Management plan	Reserves Network management plan in development

## Macquarie Island Commonwealth Marine Reserve

#### www.environment.gov.au/coasts/mpa/southeast/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 internationally 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:
	Category la 5,713,710 hectares (Sanctuary Zone)
	Category IV 10,475,756 hectares (Habitat Species Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Macquarie Island Province
Management plan	Reserves Network management plan in development

## **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 represents habitat samples and key features of the region, including continental shelf and slope, abyssal plain and canyons. It includes foraging areas for Australian sea-lion (*Neophoca cinerea*) and New Zealand fur seal (*Arctocephalus forsteri*), 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 and contains one of the most spectacular geological formations on the Australian continental block, the Murray Canyons. These 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, where 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:			
	Category la 1,274,916 hectares (Sanctuary Zone)		
	Category VI 590,687 hectares (Multiple Use Zone)		
	Category VI 714,709 hectares (Special Purpose Zone)		
Biogeographic context	IMCRA 4.0 provincial bioregions: Spencer Gulf IMCRA Province, Southern Province, West Tasmania Transition		
Management plan	Reserves Network management plan in development		

## **Nelson Commonwealth Marine Reserve**

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



## **Special features**

Nelson Commonwealth Marine Reserve lies off the far southeast 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 for sightings of 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 (Special Purpose Zone)		
Biogeographic context	IMCRA 4.0 provincial bioregion: West Tasmania Transition		
Management plan	Reserves Network management plan in development		

## South Tasman Rise Commonwealth Marine Reserve



### 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. It encompasses 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.

The reserve contains several seamounts, some with flat summits which is indicative of 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 (Special Purpose Zone)		
Biogeographic context	IMCRA 4.0 provincial bioregion: Tasmania Transition		
Management plan	Reserves Network management plan in development		

## **Tasman Fracture Commonwealth Marine Reserve**

## TASMANIA Hobart Hobart Hobart Hobart TASMAN FRACTURE COMMONWEALTH MARINE RESERVE Special Purpose Zone Multiple Use Zone Multiple Use Zone

#### 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 and complements the Port Davey Marine Reserve declared by the Tasmanian Government.

The reserve 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 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 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)		
JCN category Category VI overall comprising:			
	Category 1a 69,212 hectares (Sanctuary Zone) Category VI 2,049,572 hectares (Multiple Use Zone)		
Category VI 2,131,272 hectares (Special Purpose Zone)			
Biogeographic context	IMCRA 4.0 provincial bioregions: Tasmania Province, West Tasmania Province, Tasmanian IMCRA Province		
Management plan	Reserves Network management plan in development		

## 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 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 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 habitats for a variety of commercially significant species, including the giant crab (*Pseudocarcinus gigas*).

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: Category VI 93 298 hectares (Multiple Use Zone)
	Category VI 1,896,399 hectares (Special Purpose Zone)
Biogeographic context	IMCRA 4.0 provincial bioregions: West Tasmania Transition, Western Bass Strait IMCRA Transition, Tasmania Transition
Management plan	Reserves Network management plan in development

## South-west Commonwealth Marine Reserves Network

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



## **Special features**

The South-west Marine Region covers more than 1.3 million square kilometres of Commonwealth 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 cape of Tasmania. However, this warm shallow current suppresses predictable large-scale upwellings of nutrient-rich cold water on the west coast of Australia, thus maintaining low levels of productivity on the west coast. The Flinders 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 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 great 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 including the Australian lesser noddy (*Anous tenuirostris melanops*) 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.

## **Existing Commonwealth marine reserves**

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

## Marine bioregional planning

A Commonwealth marine reserves network proposal for the South-west Marine Region was released in May 2011 for a public consultation period which closed in August 2011. The Australian Government has finalised the details of the South-west Commonwealth marine reserves network proposal after considering information received through public submissions and feedback on the draft proposal as well as detailed socio-economic assessments. This final South-west marine reserves proposal will be subject to a final round of public comment in the second half of 2012 as part of the proclamation process under the EPBC Act. Once proclaimed, the South-west network will form part of the Commonwealth waters component of the National Representative System of Marine Protected Areas.

## South-west Commonwealth Marine Reserves Network Overview

Area	1,937,162 hectares		
Proclamation date	22 April 1998		
IUCN category	Category VI overall comprising: Category VI 385,380 hectares (Marine Mammal Protection Zone) Category VI 1,608,463 hectares (Benthic Protection Zone) (Overlap of these two zones = 56,681 hectares)		
Biogeographic context	IMCRA 4.0 provincial bioregions: Great Australian Bight Shelf, and Southern Province		
Management plan	Second management plan expired 16 May 2012; currently managed under interim management arrangements		
Other significant management documents	A departmental memorandum of understanding between Parks Australia and the Marine Division; Australian Government annual service agreement with the South Australian Government; memorandum of understanding between the department and Australian Fisheries Management Authority		
Financial	Operating	\$113,723*	
	Capital	nil	
	Revenue	nil	
Permits/approvals	<ul> <li>Permits under management plan:</li> <li>2 research, 30 commercial fishing, 1 mining</li> <li>General approvals under interim management arrangements since 17 May 2012:</li> <li>1 commercial fishing, 1 recreational fishing, 1 commercial vessel transit</li> </ul>		

NB: All information is specific to the Great Australian Bight Marine Park (Commonwealth Waters)

\* Operating costs include relevant annual business agreements, aerial surveillance and incident management. This excludes services provided by the Australian Fisheries Management Authority and the Australian Customs and Border Protection Service. Additionally, costs incurred across all reserves that are not attributable by region amount to \$2,243,490 for salaries and service provision.

International conventions and agreements		
Migratory Species (Bonn) Convention	Relevant to reserve	
China-Australia Migratory Birds Agreement	Relevant to reserve	
Japan–Australia Migratory Birds Agreement	Relevant to reserve	
Korea-Australia Migratory Birds Agreement	Relevant to reserve	
Agreement on the Conservation of Albatrosses and Petrels	Relevant to reserve	

Environment Protection and Biodiversity Conservation Act 1999		
Listed fauna	Species	6 endangered 17 vulnerable 31 migratory 57 marine
	Recovery plans applicable	Southern right whale Threatened albatrosses and giant petrels Marine turtles Great white shark
	Threat abatement plans applicable	Impacts of marine debris on vertebrate marine life Incidental catch of seabirds during oceanic longline fishing operations
Listed flora	None	

### **Management arrangements**

The management plan for the park expired on 16 May 2012 and interim management arrangements came into effect on 17 May 2012.

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 SA government agencies.

The management plan established a steering committee which represented the agencies involved in managing the park and a community consultative committee consisting of local community representatives.

## Monitoring

Analysis continued of deep-water benthic biodiversity samples collected in August 2010. The data contributes to the 20-year performance assessment program for the Benthic Protection Zone. The census of Australian sea-lion pups was maintained. The southern right whale population continued to be monitored.

## **Future challenges**

Major challenges are:

- consolidating past and ongoing data to assess environmental change and management effectiveness over time
- increasing the park's effectiveness in fulfilling one of its primary functions to protect the Australian sea-lion
- promoting voluntary compliance with park management requirements
- ensuring adequate aerial surveillance coverage
- understanding the impact of climate change on natural values.

## Report on performance by key result areas

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

### **Major issues**

- Paucity of baseline information on seabed surface and below seabed surface species and their biology
- Managing threatened species recovery efforts

### Actions

- Continue to establish baseline data through collection of deep-water benthic biodiversity samples
- Provide funding for the southern right whale population census and photo-identification studies at the Head of Bight
- Complete the Australian sea-lion pup census for the Bunda Cliffs population for the 2011–12 breeding season
- Identify opportunities to implement recovery plans within available resources

### Performance results 2011–12

- Improved baseline information and data on: deep water benthic biodiversity; the southern right whale population at the Head of Bight; and the Australian sea-lion population at Bunda Cliffs
- Updated the database to assist with continuing population studies on regional southern right whales

### KRA4: Use and appreciation of protected areas

#### **Major issues**

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

### Actions

- Support aerial surveillance activities by Australian Customs and Border Protection Service, on-ground surveillance by Yalata Land Management and sea patrols by the South Australian Department of Primary Industries and Resources
- Support the Yalata Community's participation in park management activities
- Review and implement a communications plan and compliance programs
- Disseminate the management plan and interpretive material

### Performance results 2011–12

- Community understanding and appreciation of the park's values enhanced through advertising of the annual Marine Mammal Protection Zone closures and implementation of a communications plan which included online information on state and Australian Government websites
- Agencies undertook land, sea and aerial surveillance and operational patrols
- The Yalata Community undertook surveillance and beach clean-ups
- One incidence of alleged illegal fishing by an Australian fishing vessel was detected in the park. A show cause letter was sent but it was decided that no action would be pursued

### KRA5: Stakeholders and partnerships

### **Major issue**

· Maintain productive working relationships with key stakeholders and management partners

### Actions

- Negotiate and implement an annual service agreement with the SA Government, covering research, management operations, visitor management, education, and compliance and enforcement
- Liaise with stakeholders from multiple sectors through the steering and consultative committee
- · Maintain consultative arrangements with stakeholders in management activities

### Performance results 2011–12

- Partnership with the SA Government strengthened and formalised through implementation of the annual service agreement
- Inter-Australian Government agency relations strengthened with the Australian Fisheries Management Authority through initiating ongoing discussions on compliance issues
- Maintained productive working relationships with key stakeholders through engagement in steering and consultative committee meetings

## **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 species listed under EPBC Act 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 31°43' South, Longitude 130°23' East		
Area	1,937,162 hectares		
Proclamation date	22 April 1998		
IUCN category	Category VI overall comprising: Category VI 385,380 hectares (Marine Mammal Protection Zone) Category VI 1,608,463 hectares (Benthic Protection Zone) (Overlap of these two zones = 56,681 hectares)		
Biogeographic context	IMCRA 4.0 provincial bioregions: Great Australian Bight Shelf, and Southern Province		
Management plan	Second plan expired 16 May 2012: currently managed under interim management arrangements		

## **North-west Commonwealth Marine Reserves Network**



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 shallower 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

A Commonwealth marine reserves network proposal for the North-west Marine Region was released in August 2011 for a public consultation period which closed in November 2011. The Australian Government has finalised the details of the North-west Commonwealth marine reserves network proposal after considering information received through public submissions and feedback on the draft proposal as well as detailed socio-economic assessments. This final North-west marine reserves proposal will be subject to a final round of public comment in the second half of 2012 as part of the proclamation process under the EPBC Act. Once proclaimed, the North-west network will form part of the Commonwealth waters component of the National Representative System of Marine Protected Areas.

## **Existing Commonwealth marine reserves**

The North-west Commonwealth Marine Reserves Network includes four existing Commonwealth marine reserves:

- Ashmore Reef National Nature Reserve (west of Darwin, NT)
- Cartier Island Marine Reserve (west of Darwin, NT)
- Mermaid Reef Marine National Nature Reserve (north-west of Broome, WA)
- Ningaloo Marine Park (Commonwealth Waters) (west of North West Cape, WA).

### North-west Commonwealth Marine Reserves Network Overview

Area	373,075 hectares		
Proclamation Date	See individual reserves		
IUCN Category	See individual reserves		
Biogeographic context	Includes various Integrated Marine and Coastal Regionalisation for Australia (IMCRA) 4.0 provincial bioregions; see individual reserves		
Management plan	The management plans for all the reserves in the network have expired. The reserves are currently managed under interim management arrangements		
Other significant management documents	A departmental memorandum of understanding between Parks Australia and the Marine Division; memorandum of understanding between the department and Australian Fisheries Management Authority; Australian Government Memorandum of Understanding with Indonesia; Marine and Terrestrial Introduced Species Prevention and Management Strategy.		
Financial	Operating	\$378,558*	
	Capital	nil	
	Revenue	nil	
Permits/approvals	Operating under interim management arrangements with: 18 commercial tourism approvals 11 research approvals		

\* Operating costs include relevant annual business agreements, aerial surveillance and incident management. This excludes services provided by the Australian Fisheries Management Authority and the Australian Customs and Border Protection Service. Additionally, costs incurred across all reserves that are not attributable by region amount to \$2,243,490 for salaries and service provision.

International conventions and agreements		
Wetlands (Ramsar) Convention	Ashmore Reef is listed	
World Heritage Convention	Ningaloo is listed as part of the Ningaloo Coast World Heritage Area	
Migratory Species (Bonn) Convention	Relevant to all reserves	
China-Australia Migratory Birds Agreement	Relevant to all reserves	
Japan–Australia Migratory Birds Agreement	Relevant to all reserves	
Korea-Australia Migratory Birds Agreement	Relevant to all reserves	
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 surrounds Ashmore and Cartier reserves	

Environment Protection and Biodiversity Conservation Act 1999			
Ashmore Reef National Nature Reserve			
Listed fauna	Species	2 vulnerable 51 migratory 104 marine	
	Recovery plans applicable	Marine turtles	
	I hreat abatement plans applicable	<ul> <li>Impacts of marine debris on vertebrate marine life</li> <li>Incidental catch of seabirds during oceanic longline fishing operations</li> <li>Reduction in impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100,000 hectares</li> <li>Reduction in impacts of tramp ants on biodiversity in Australia and its territories</li> </ul>	
Listed flora	None		
Heritage	On Commonwealth Heritage L	ist	
Cartier Island Marine Reserve	e		
Listed fauna	Species	8 marine	
	Recovery plans applicable	Marine turtles	
	Threat abatement plans	Impacts of marine debris on vertebrate marine life	
	applicable	Incidental catch of seabirds during oceanic longline fishing operations	
Listed flora	None		
Mermaid Reef Marine Nation	al Nature Reserve		
Listed fauna	Species	2 endangered 7 vulnerable 13 migratory 48 marine	
	Recovery plans applicable	<ul><li>Humpback whale</li><li>Marine turtles</li><li>Great white shark</li></ul>	
	Threat abatement plans	Impacts of marine debris on vertebrate marine life	
	applicable	Incidental catch of seabirds during oceanic longline fishing operations	
Listed flora	None		
Heritage	On Commonwealth Heritage L	ist (part of reserve only)	
Ningaloo Marine Park (Comr	nonwealth Waters)		
Listed fauna	Species	1 endangered 9 migratory 19 marine	
	Recovery plans applicable	<ul><li>Marine turtles</li><li>Great white shark</li><li>whale shark</li></ul>	
	Threat abatement plans applicable	<ul><li>Impacts of marine debris on vertebrate marine life</li><li>Incidental catch of seabirds during oceanic longline fishing operations</li></ul>	
Listed flora	None		
Heritage	On Commonwealth Heritage List and included in Ningaloo Coast National Heritage Place		

### **Management arrangements**

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

The management plans for all the reserves in the network have expired. The next management plan will be developed following the conclusion of the bioregional planning process for the North-west Marine Region. In the meantime, the reserves are being managed through interim arrangements under the EPBC Act.

The Australian Customs and Border Protection Service carries out on-site management for Ashmore Reef and Cartier Island reserves and has maintained a permanent enforcement presence since April 2008. Departmental staff, or WA Government staff under annual business agreement arrangements, visited all the reserves during 2011–12.

## Monitoring

The department has continued to work with PTTEP Australasia to implement the Environmental Monitoring Program developed in response to the 2009 Montara oil spill. More information is available at http://www.environment.gov.au/coasts/oilspill.html.

The control program for tropical fire ants (*Solenopsis geminata*) at Ashmore Reef which commenced in 2011 moved into its second phase in 2011–12, in conjunction with Monash University and the CSIRO. Baiting of ants continued and monitoring of the results will inform future implementation of the control program.

Monitoring to date has shown that the major threats to Mermaid Reef are from climatic disturbances such as cyclones and coral bleaching and from 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 for such activities.

The ReserveWatch volunteer monitoring program for Mermaid Reef was promoted by providing stakeholders with relevant information including report forms and guides for completing reports. This program, implemented under arrangements with the WA Government, aims to strengthen partnerships between industry and communities and reserve managers while providing managers with valuable information on the condition of reserves.

The WA Marine Science Institution is conducting a number of research projects in Ningaloo Marine Park. Most projects to date have been undertaken largely in the state waters of the park. Sampling for one project has extended into Commonwealth waters and is expected to provide information on the deep-water sponge communities in Commonwealth waters. The Australian Institute of Marine Science, in a consortium with Australian and United States research organisations, has maintained a satellite tracking program since 2004 on the range and behaviour of whale sharks (*Rhincodon typus*) that visit the Ningaloo region.

## **Future challenges**

Major challenges are:

- identifying the reasons for the apparent decline in sea snake abundance and diversity on Ashmore Reef
- managing introduced species
- improving visitor understanding of the reserves' conservation values and management requirements and promoting voluntary compliance with management arrangements
- ensuring on-going targeted aerial surveillance coverage
- understanding the impact of climate change on natural values
- maintaining a compliance presence in the region.

## Report on performance by key result areas

### KRA1: Natural heritage management

### **Major issues**

- Illegal fishing activities
- Illegal access to closed areas
- Impacts of climate change including coral bleaching and consequent species loss
- Preventing anchor damage to reefs
- · Lack of information on the distribution, migration, behaviour and abundance of key species
- Effects of commercial interactions on the reserves' key attributes
- Introduction of pest species
- Damage to marine life from marine debris, in particular fishing gear and ghost nets

### 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
- Maintain the close working relationship with the Australian Customs and Border Protection Service, Australian Fisheries Management Authority and Australian Defence Forces for patrol and surveillance purposes and for enforcement and other management actions
- Encourage and facilitate research and monitoring of reef and island environments eg assessment of sea cucumbers and trochus shell fisheries, and a study on the behaviour and migration of whale sharks travelling to Ningaloo Marine Park
- Manage threats identified in the Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve Marine and Terrestrial Introduced Species Prevention and Management Strategy (2004)
- Maintain moorings
- Implement tropical fire ant control program at Ashmore Reef
- Removal of ghost nets

### Performance results 2011–12

- Enhanced enforcement of reserve management arrangements through the Australian Customs and Border Protection Service vessel *Ashmore Guardian* continuing its near-permanent compliance and management presence at Ashmore Reef, together with ongoing aerial surveillance
- Minimised introduction of pest species through customs officers implementing quarantine, bilge and ballast water protocols
- Improved understanding of marine debris issues in the Reserves Network, through continued collection and analysis of marine debris
- Moorings maintained
- Improved understanding of the behaviour and migration habits of whale sharks in Ningaloo
- Continued a volunteer monitoring program that monitors marine turtles at Ningaloo
- Continued tropical fire ant control program at Ashmore Reef, with assistance from CSIRO and Australian Customs
- Minimised impacts of marine debris through removal of two large ghost nets from Mermaid and Ashmore reefs

### KRA4: Use and appreciation of protected areas

### **Major issues**

- Visitor understanding of reserve values and management arrangements
- Establishment of unapproved moorings
- Reporting of commercial use within reserves
- Ensuring commercial tourism ventures are managed effectively, including minimising impacts to reefs and islands from visitors

### **Actions**

- Continue engagement with the WA Department of Environment and Conservation and the WA Department of Fisheries with regard to roles and cooperative arrangements for compliance and enforcement activities
- Install, monitor and maintain moorings, including removal of an unauthorised mooring from Mermaid Reef
- Issue approvals for commercial tour operators
- Monitor visitation and ensure adherence with visitation protocols
- Conduct regular surveillance by air and sea

### Performance results 2011–12

- Continued liaison with WA partner agencies and users regarding management of reserve values and moorings use
- Enhanced efforts to improve visitor understanding of reserve values and management arrangements through close collaboration with WA partner agency counterparts
- Addressed threats to the reserves associated with unauthorised moorings
- Promoted commercial tour operator compliance with permit and condition requirement through issuing of approvals
- Greater information obtained on visitation, use and compliance with visitor protocols through aerial surveillance and vessel patrol
- Detected numerous compliance incidents in the network, most of which derive from foreign fishing activity, including two instances of illegal fishing by a foreign fishing vessel and 82 restricted area entry instances
- In response to compliance incidents, seven warning notices were issued and two civil prosecutions and six criminal prosecutions were undertaken

### KRA5: Stakeholders and partnerships

### **Major issues**

- Illegal, unregulated and unreported fishing
- Tourism industry stewardship of reserves to support effective management
- Ensuring effective and efficient management supported by state and Australian government agencies
- Maintaining effective working and liaison arrangements with 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, Australian Fisheries Management Authority and Australian Defence Forces for patrol and surveillance purposes and for enforcement and other management actions
- Provide EPBC Act warden training for officers of WA partner agencies

### Performance results 2011–12

- Compliance and enforcement activities supported through implementation of annual service and business agreements with WA partner agencies; this included 19 boat patrols across Ningaloo Reef and Mermaid Reef
- Kept stakeholders informed of and involved in management activities. Steps taken to improve management of the MoU Box fishery, including prevention of illegal foreign fishing
- Illegal foreign fishing deterred and compliance with management arrangements promoted at Ashmore Reef through the operations of the *Ashmore Guardian*
- Effective and efficient management supported through managing and maintaining an effective relationship with the WA Department of Environment and Conservation and the WA Department of Fisheries

## **Ashmore Reef National Nature Reserve**

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



## **Special features**

Ashmore Reef National Nature Reserve is located approximately 830 kilometres west of Darwin on the North-west Shelf. It is renowned for its high biological diversity and unique marine ecosystems and contains a variety of marine habitats, including a coral reef system, lagoons, abundant seagrass beds and extensive tidal sand flats. It includes four 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. The reserve is also an important breeding and feeding habitat for a number of threatened species, including dugong (*Dugong dugon*), green turtle (*Chelonia mydas*), loggerhead turtle (*Caretta caretta*) and hawksbill turtle (*Eretmochelys imbricata*).

The reserve's four islands have a combined area of about

56 hectares and support some of the most important seabird rookeries on the North-west Shelf. The reserve is an internationally 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 1a overall comprising: Category Ia: 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: currently managed under interim management arrangements
## **Cartier Island Marine Reserve**

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



## **Special features**

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

A variety of fish, coral, sponge, echinoderm, mollusc and other invertebrate species inhabit the reserve. The reserve supports a very high diversity and density of sea snakes, some of which are endemic to the region. The reserve also supports populations of feeding, breeding and nesting sea turtles.

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; currently managed under interim management arrangements	

## **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.

Mermaid Reef is totally submerged at high tide and therefore falls under Australian Government jurisdiction. The other two reefs of the Rowley Shoals, Clerke Reef and Imperious Reef are managed by the Western Australian Government as the Rowley Shoals Marine Park.

The three reefs of the Rowley Shoals have been described as some of the best examples of shelf-edge reefs occurring in Australian waters. The reefs are similar in shape, size, orientation and distance from each other. Each has a large lagoonal area containing small sand cays or islands, narrow lagoon entrance channels on the eastern side and an outer reef edge dropping off relatively steeply into oceanic waters

between 500 and 700 metres deep. Oval in shape, the reefs follow a south-west to north-east alignment along the edge of the continental shelf and lie 30 to 40 kilometres apart.

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

Location	Latitude 17°06' South, Longitude 119°38' East
Area	53,987 hectares
Proclamation date	21 March 1991
IUCN category	Category la
Biogeographic context	IMCRA 4.0 provincial bioregion: Northwest Transition
Management plan	First plan expired 16 May 2007; currently managed under interim management arrangements

## 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 characteristics are among those that make Ningaloo unique among the tropical reefs off the northern coast of Australia.

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 Commonwealth and state components of the park are included in the Ningaloo Coast World Heritage Area.

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.

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 2 July 2009; currently managed under interim management arrangements

## **North Commonwealth Marine Reserves Network**



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

## **Special features**

The North Marine Region comprises the Commonwealth waters of the Gulf of Carpentaria, Arafura Sea and the Timor Sea as far west as the Northern Territory–Western Australian border. It covers approximately 715,000 square kilometres of shallow tropical waters and comprises Australia's most extensive areas of continental shelf.

The North Marine Region water temperatures are among the highest in Australian waters and high by global standards and mostly very low in nutrients. The region includes globally significant populations of internationally threatened species such as turtles, dugong (*Dugong dugon*) and sawfish.

The region is dominated by monsoonal climatic patterns characterised by a pronounced wet season between December and March and generally dry conditions for the remainder of the year. The monsoonal weather pattern is a major driver of important ecological processes in the marine environment, particularly in the Gulf of Carpentaria. The interplay between predominantly dry south-east trade winds from May to October and moister north-westerly winds over the wet season (December to March) contributes to a slow, clockwise movement of water in the Gulf of Carpentaria.

## Marine bioregional planning

A Commonwealth marine reserves network proposal for the North Marine Region was released in August 2011 for a public consultation period which closed in November 2011. The Australian Government has finalised the details of the North Commonwealth marine reserves network proposal after considering information received through public submissions and feedback on the draft proposal as well as detailed socio-economic assessments. This final North marine reserves proposal will be subject to a final round of public comment in the second half of 2012 as part of the proclamation process under the EPBC Act. Once proclaimed, the North network will form part of the Commonwealth waters component of the National Representative System of Marine Protected Areas.

## **Existing Commonwealth marine reserves**

There are no existing Commonwealth reserves in the North Marine Region.

## **Coral Sea Commonwealth Marine Reserves Network**



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

### **Special features**

The Coral Sea Marine Region covers 989,842 square kilometres of Commonwealth waters east of the Great Barrier Reef Marine Park and is a remote ocean ecosystem. The nearest point is approximately 60 kilometres from the coast and extends out to 1,100 kilometres. These offshore waters extend from just north of the tip of Cape York south to offshore waters just north of Bundaberg in Queensland and range from shallow waters around reefs and cays to depths of almost five kilometres in remote, little-known, deep ocean environments.

The Coral Sea is environmentally significant because of the diverse array of coral reefs, atolls, deep sea plains and canyons and the wildlife they support and the extent to which the region's natural and heritage values have remained relatively undisturbed by direct human impact.

## **Existing Commonwealth marine reserves**

The Coral Sea region includes two existing Commonwealth marine reserves:

- Coringa-Herald National Nature Reserve
- Lihou Reef National Nature Reserve.

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

The Coringa-Herald National Nature Reserve and Lihou Reef National Nature Reserve Management Plan expired on 4 September 2008 and the reserves are currently managed under interim management arrangements. These arrangements allow activities to be conducted consistent with the IUCN category for the reserve until a network management plan is developed under the marine bioregional planning process.

## The Coral Sea Conservation Zone

The Coral Sea Conservation Zone was declared in May 2009. The Coral Sea Conservation Zone is an interim measure to protect this environmentally significant area while it was assessed under the marine bioregional planning process.

Three permits for commercial tourism (charter fishing) and four permits for research, including for benthic mapping and plankton distribution, were issued for the Coral Sea Conservation Zone.

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

### Marine bioregional planning

A Commonwealth marine reserve proposal for the Coral Sea Region was released in November 2011 for a public consultation period which closed in February 2012. The Australian Government has finalised the details of the Coral Sea Commonwealth marine reserve proposal after considering information received through public submissions and feedback on the draft proposal as well as detailed socio-economic assessments. This final Coral Sea marine reserve proposal will be subject to a final round of public comment in the second half of 2012 as part of the proclamation process under the EPBC Act. Once proclaimed, the Coral Sea marine reserve will form part of the Commonwealth waters component of the National Representative System of Marine Protected Areas.

## **Coral Sea Commonwealth Marine Reserves Network Overview**

Area	388,458 square kilometres	
Proclamation date	Coringa-Herald and Lihou Reef reserves were proclaime	d on 16 August 1982
IUCN category	Coringa-Herald and Lihou Reef reserves are category la	
Biogeographic context	Includes various Integrated Marine and Coastal Regionalisation for Australia (IMCRA) 4.0 provincial bioregions. See individual reserves	
Management plan	The management plan for the Coringa-Herald and Lihou Reef reserves expired on 4 September 2008. The reserves are currently managed under interim management arrangements	
Other significant management documents	A departmental memorandum of understanding between Parks Australia and the Marine Division; memorandum of understanding between the department and Australian Fisheries Management Authority	
Financial	Operating	\$37,813*
	Capital	nil
	Revenue	nil
Permits/approvals	Operating under interim management arrangements with:	
	1 commercial tourism approval	

\* Operating costs include relevant annual business agreements, aerial surveillance and incident management. This excludes services provided by the Australian Fisheries Management Authority and the Australian Customs and Border Protection Service. Additionally, costs incurred across all reserves that are not attributable by region amount to \$2,243,490 for salaries and service provision.

International conventions and agreements		
Wetlands (Ramsar) Convention	Coringa-Herald and Lihou Reef reserves are listed	
Migratory Species (Bonn) Convention	Relevant to both reserves	
China-Australia Migratory Birds Agreement	Relevant to both reserves	
Japan–Australia Migratory Birds Agreement	Relevant to both reserves	
Korea–Australia Migratory Birds Agreement	Relevant to both reserves	

Environment Protection and Biodiversity Conservation Act 1999		
Coringa-Herald National Nature Reserve		
Listed fauna	Species	2 endangered 8 vulnerable 16 migratory 51 marine
	Recovery plans applicable	Marine turtles Great white shark
	Threat abatement plans applicable	Impacts of marine debris on vertebrate marine life Incidental catch of seabirds during oceanic longline fishing operations Reduction in the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100,000 hectares
Listed flora	None	
Lihou Reef National Nature F	Reserve	
Listed fauna	Species	2 endangered 8 vulnerable 17 migratory 51 marine
	Recovery plans applicable	<ul><li>Marine turtles</li><li>Great white shark</li></ul>
	Threat abatement plans applicable	<ul> <li>Impacts of marine debris on vertebrate marine life</li> <li>Incidental catch of seabirds during oceanic longline fishing operations</li> <li>Reduction in the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100,000 hectares</li> </ul>
Listed flora	None	

## Monitoring

Regular monitoring of use within the reserve is provided by Australian Customs and Border Protection Service aerial surveillance.

Current projects include the establishment of a remote monitoring system through the use of satellite imagery to map vegetation and shallow reef habitats. Over time these high-resolution satellite images will be compared to assess changes to the reserve's habitats. Ground-truthing for this project was undertaken during 2011–12.

Seabird monitoring activities have not been undertaken in recent years but are planned to be re-established in 2012–13. A rapid assessment of the condition of natural systems was undertaken during 2011–12.

## **Future challenges**

Ongoing challenges include:

- logistics associated with managing isolated reserves
- conserving *Pisonia* forest ecosystem health including controlling pest insects
- understanding the impact of climate change on natural values
- achieving voluntary compliance with park management requirements
- managing potential changes in usage patterns as a result of the implementation of the proposed Coral Sea Marine Reserve zonings
- ensuring on-going targeted aerial surveillance coverage.

## Report on performance by key result areas

### KRA1: Natural heritage management

### **Major issues**

- Illegal fishing
- introduction of pest species and marine debris
- Monitoring reef health

### Actions

- Surveillance and monitoring activities through collaboration with the Australian Customs and Border Protection Service
- Undertake ecosystem assessments to measure reef health and assess impacts of pest insects and climate change

### Performance results 2011–12

- A number of surveillance flights were conducted by the Australian Customs and Border Protection Service throughout the year to monitor use and deter illegal fishing activities
- A Royal Australian Navy supported patrol was made to the reserves in May 2012 to undertake ecosystem assessments, establish monitoring protocols and remove marine debris

### KRA4: Use and appreciation of protected areas

### **Major issues**

- Managing visitor access and permitting of activities
- · Improving awareness among stakeholders of reserve management arrangements
- Introduction of pest species by visitors to the reserve

### Actions

- Maintain partnerships with other Commonwealth agencies to assist with activity monitoring
- Manage permit applications for visitor access
- Maintain the department's website and signage at the reserves

### Performance results 2011–12

- No illegal activity was reported by the Australian Customs and Border Protection Command Service through aerial surveillance activities
- Sign maintenance undertaken at the reserves and the departmental website was kept up to date
- Responded to public enquiries regarding information about the reserves or permits for visitor access

### KRA5: Stakeholders and partnerships

### **Major issues**

- Awareness among stakeholders of reserve management arrangements
- Maintaining monitoring partnerships with Australian Government and other agencies

### **Actions**

- Consult key government and non-government stakeholders to provide information on reserve management
   arrangements
- Maintain partnerships with other Commonwealth agencies, including the Australian Customs and Border Protection Command Service to assist with monitoring

### Performance results 2011–12

- Held ongoing discussions with the Bureau of Meteorology to establish arrangements for use of and access to the reserve
- MoU with the Australian Customs and Border Protection Command Service maintained

## **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 reserve 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 provide critical habitat for resident birds and also migratory seabirds which gather on the islets 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 also 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
Area	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; currently managed under interim management arrangements

## 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 (bottomdwelling) 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 several species of whales and dolphins use the area.

Seven islets in the reserve are vegetated, consisting of 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 land bird 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	8843,670 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; currently managed under interim management arrangements

## **Temperate East Commonwealth Marine Reserves Network**



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

### **Special features**

The Temperate East Marine Region comprises approximately 1.47 million square kilometres of Commonwealth waters and stretches from approximately 40 kilometres north of Bundaberg to Bermagui on the far south coast of New South Wales. It also includes the waters surrounding Lord Howe and Norfolk islands. Commonwealth waters adjoin the state waters surrounding Lord Howe Island however they extend to the high-water mark on Norfolk Island, which is a territory of the Commonwealth.

The East Marine Region has a significant array of unique ecosystems, habitats and species including pristine coral reefs, deep canyons and trenches, abyssal plains and whole ranges of submerged seamounts. More than 80 per cent of the Region's total area is covered by waters between one and five kilometres deep.

The East Australian Current dominates the surface waters of the region. This current is the largest ocean current off the coast of Australia. It moves up to 30 million cubic metres of low-nutrient tropical ocean water per second southwards down the Australian coastline.

### **Existing Commonwealth marine reserves**

The Temperate East Marine Region includes four existing Commonwealth marine reserves:

- Cod Grounds Commonwealth Marine Reserve (off the coast of NSW)
- Elizabeth and Middleton Reefs Marine National Nature Reserve
- Lord Howe Island Marine Park (Commonwealth Waters)
- Solitary Islands Marine Reserve (Commonwealth Waters).

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

Elizabeth and Middleton Reefs Marine National Nature Reserve is currently managed under a management plan which commenced in 2006 and expires on 9 April 2013. The other three reserves are managed under interim arrangements which allow activities to be conducted consistent with the IUCN category for each reserve until a network management plan is developed under the marine bioregional planning process.

### Marine bioregional planning

A Commonwealth marine reserves network proposal for the Temperate East Marine Region was released in November 2011 for a public consultation period which closed in February 2012. The Australian Government has finalised the details of the Temperate East Commonwealth marine reserves network proposal after considering information received through public submissions and feedback on the draft proposal as well as detailed socio-economic assessments. This final Temperate East marine reserves proposal will be subject to a final round of public comment in the second half of 2012 as part of the proclamation process under the EPBC Act. Once proclaimed, the Temperate East network will form part of the Commonwealth waters component of the National Representative System of Marine Protected Areas.

## **Temperate East Commonwealth Marine Reserves Network Overview**

Area	503,560 hectares	
Proclamation date	See individual reserves	
IUCN categories	Includes Categories Ia, II, IV and VI; see individual reserve	S
Biogeographic context	Includes two Integrated Marine and Coastal Regionalisation for Australia (IMCRA) 4.0 provincial bioregions: Central Eastern Shelf Transition and Lord Howe Province; see individual reserves	
Management plans	See individual reserves	
Other significant management documents	A departmental memorandum of understanding between Parks Australia and the Marine Division; memorandum of understanding between the department and Australian Fisheries Management Authority; and service level agreement and subsidiary annual business agreements between the Australian and NSW governments	
Financial	Operating	\$295,897*
	Capital	nil
	Revenue	nil
Permits/approvals	<ul> <li>Managed under a combination of a management plan a</li> <li>69 commercial fishing approvals</li> <li>19 commercial tourism approvals</li> <li>19 recreational access permits</li> <li>3 research approvals</li> </ul>	and interim management arrangements with:

\* Operating costs include relevant annual business agreements, aerial surveillance and incident management. This excludes services provided by the Australian Fisheries Management Authority and the Australian Customs and Border Protection Service. Additionally, costs incurred across all reserves that are not attributable by region amount to \$2,243,490 for salaries and service provision.

International conventions and agreements		
World Heritage Convention	The Lord Howe Island Group with surrounding state and Commonwealth waters was included on the World Heritage List in 1982	
Wetlands (Ramsar) Convention	Elizabeth and Middleton Reefs are listed	
Migratory Species (Bonn) Convention	Relevant to all reserves	
China-Australia Migratory Birds Agreement	Relevant to all reserves	
Japan-Australia Migratory Birds Agreement	Relevant to all reserves	
Korea-Australia Migratory Birds Agreement	Relevant to all reserves	

Environment Protection and Biodiversity Conservation Act 1999		
Cod Grounds Commonwealth Marine Reserve		
Listed fauna		1 endangered 4 vulnerable
		5 migratory
	Species	4 marine
		Humpback whale
		Marine turtles
		Grey nurse shark
	Recovery plans applicable	Great white shark
	Threat abatement plans applicable	<ul> <li>Impacts of marine debris on vertebrate marine life</li> <li>Incidental catch of seabirds during oceanic longline fishing operations</li> </ul>
Listed flora	None	
Elizabeth and Middleton Ree	efs Marine National Nature Res	erve
Listed fauna	Species	1 vulnerable 8 migratory 13 marine
	Recovery plans applicable	Marine turtles
	Threat abatement plans	Impacts of marine debris on vertebrate marine life
	applicable	Incidental catch of seabirds during oceanic longline fishing operations
Listed flora	None	
Lord Howe Island Marine Par	rk (Commonwealth Waters)	
Listed fauna	Species	3 endangered 10 vulnerable 15 migratory 20 marine
	Recovery plans applicable	Threatened albatrosses and giant petrels     Marine turtles
	Threat abatement plans	Impacts of marine debris on vertebrate marine life
	applicable	<ul> <li>Incidental catch of seabirds during oceanic longline fishing operations</li> </ul>
Listed flora	None	
Heritage	On National Heritage List	
Solitary Islands Marine Rese	rve (Commonwealth Waters)	
Listed fauna	Species	4 endangered 7 vulnerable 24 migratory 38 marine
	Recovery plans applicable	<ul> <li>Humpback whale</li> <li>Marine turtles</li> <li>Grey nurse shark</li> <li>Great white shark</li> </ul>
	Threat abatement plans	Impacts of marine debris on vertebrate marine life
	applicable	Incidental catch of seabirds during oceanic longline fishing operations
Listed flora	None	

### **Management arrangements**

The reserves in the network are 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 Australian and NSW Government agencies including the Australian Customs and Border Protection Service, Australian Fisheries Management Authority and NSW Department of Primary Industries.

All the reserves are managed under interim management arrangements except for Elizabeth and Middleton Reefs which has a management plan in force. A single management plan that will include all four reserves will be developed following the conclusion of the bioregional planning process for the Temperate East Marine Region.

## Monitoring

Current and ongoing research and monitoring projects conducted in the reserves include: grey nurse shark numbers and movements in the Cod Grounds and Solitary Islands including a community based 'Grey Nurse Shark Watch' photo identification program; identification of fish biodiversity patterns in deep reef habitats and representation of fish assemblages in the Solitary Islands; charter fishing catch effort in Lord Howe Island; and sea temperature monitoring in all reserves.

## **Future challenges**

Ongoing challenges include:

- educating the public on marine reserve values and management arrangements
- understanding the impact of climate change on natural values
- achieving voluntary compliance with park management arrangements
- ensuring adequate aerial and surface surveillance coverage
- implementing regular monitoring.

## Report on performance by key result areas

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

### **Major issues**

- Supporting the recovery and conservation of grey nurse sharks
- Assessing ecosystem health in response to the impacts of climate change

### Actions

- Support monitoring research and implement management arrangements to prevent detrimental impacts on grey nurse sharks and their habitat
- Undertake ecosystem assessments

### Performance result 2011–12

• Issued research approvals and collaborated with researchers for the monitoring of grey nurse sharks and other key indicator species

### KRA4: Use and appreciation of protected areas

### **Major issues**

- · Managing visitor access and permitting of activities
- · Improving awareness among stakeholders of reserve management arrangements
- Compliance with marine reserve requirements

### Actions

- · Administer permits and approvals for recreational and commercial activities
- Communicate reserve values and provide information to users
- Maintain signs and other communications products
- Enforce compliance requirements through regular surveillance and monitoring patrols

### Performance results 2011–12

- Permits and approvals were issued and managed for recreational activities, commercial fishing activities and commercial tourism activities
- Responded to public enquiries regarding information about the reserves or permits for visitor access
- Information and advice provided to users operating in and near the reserves
- · Maintained signs and maintained existing communications products
- NSW Government conducted 51 vessel-based surveillance patrols
- Conducted six aerial surveillance patrols
- Used VMS data to monitor commercial fishing vessels operating in and near the marine reserves
- Undertook compliance and enforcement activities that led to the recording of 16 compliance incidents, which in turn resulted in 17 enforcement actions for recreational and commercial fishing offences

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

#### Major issue

• Maintaining relationships and ensuring effective engagement with the community, commercial users and government agencies

### **Actions**

- Develop and implement agreed annual service arrangements with the NSW Government to support on site management and undertake compliance activities in the reserves
- Consult key stakeholders
- · Maintain partnerships with other Commonwealth agencies to assist with activity monitoring

### Performance results 2011–12

- Implemented service agreement with NSW Department of Primary Industries to undertake vessel-based patrols within the reserve
- Advised commercial operators, researchers and other government agencies on the status of reserve values and
  management arrangements

## **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 the 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.

Located off Laurieton in northern New South Wales, the Cod Grounds reef is the most northerly of a series of reefs extending south and south-west. 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—on occasions, over 80 sharks are sighted

at any one time. The Cod Grounds also 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.

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 (Sanctuary Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Central Eastern Shelf Transition
Management plan	Interim management arrangements in place until a new management plan is developed under the marine bioregional planning process

## 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 southern most open-ocean platform reefs in the world.

Isolation and exposure to convergent tropical and temperate ocean currents and climates have resulted in distinct and diverse assemblages of marine species including a number of endemic species. In addition many species are near the northern or southern limit of their distribution.

The reserve supports populations of the black cod (*Epinephelus daemelii*), once common along the New South Wales coast but now considered rare, and has high numbers

of juvenile 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 recognised as a feeding ground for green turtles (*Chelonia mydas*); bottlenose dolphins (*Tursiops truncatus*) and short-finned pilot whales (*Globicephala macrochynchus*) have been observed feeding in the region.

The reserve has a notable 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 the wreck continues to break-up, it 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:
	Category la 143,146 hectares (Sanctuary Zone)
	Category II 44,580 hectares (Habitat Protection Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Lord Howe Province
Management plan	Second plan expires 9 April 2013

## 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 Island's marine ecosystem is largely in an undisturbed, natural state. Alternating warm and cool currents create a transition zone between temperate and tropical regions that contributes to an unusual mix of tropical, sub-tropical and temperate marine fauna and flora and a high level of endemism.

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 (Sanctuary Zone)
	Category IV 204,121 hectares (General Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Lord Howe Province
Management plan	First plan expired 24 September 2009; interim management arrangements in place

## **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 provides habitat for 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.

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 (Sanctuary Zone)
	Category IV 3,746 hectares (Habitat Protection Zone)
	Category VI 11,408 hectares (General Use Zone)
Biogeographic context	IMCRA 4.0 provincial bioregion: Central Eastern Shelf Transition
Management plan	First plan expired 3 April 2008; interim management arrangements in place

## **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 very remote, being located approximately 4,140 kilometres south-west of Perth, Western Australia.

Heard Island and McDonald Islands are 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 point (Mawson Peak 2,750 metres) outside the Australian Antarctic Territory. Heard Island contains significant cultural relics and heritage sites originating from 19th century sealing activities and 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 24 August 2012			
Financial	Operating \$91,000			
	Capital	nil		
	Revenue nil			
Visitors	1 vessel <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 (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 Living Resources	The territorial sea and Exclusive Economic Zone lie within the convention area
Agreement on the Conservation of Albatrosses and Petrels	11 of 26 species
Treaty between the Government of Australia and the Government of the French Republic on Cooperation in the Maritime Areas adjacent to the French Southern and Antarctic Territories, 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
The Australia-France Cooperative Enforcement Agreement	The agreement allows joint Australian and French patrols to enforce each countries' fishing laws in their respective Exclusive Economic Zones

Environment Protection and Biodiversity Conservation Act 1999			
Listed fauna	Species <sup>(a)</sup>	1 endangered 10 vulnerable 14 migratory 51 marine	
	Recovery plan applicable	Threatened albatrosses and giant petrels	
Listed flora	None		
Heritage	On National 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 challenge**

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 on the potential control or eradication of species of concern

### Performance results 2011–12

- Maintained consultations 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
- Maintained remote camera to monitor activities at Atlas Cove

#### 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 2011–12

• 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 2011–12

• 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 2011–12

• 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 2011–12

- Completed review of the Heard Island and McDonald Islands Marine Reserve Management Plan 2005–2012
- Draft Heard Island and McDonald Islands Marine Reserve Management Plan 2013–2023 being prepared for release for public comment in early 2013

## 3 Appendices

Appendix A – Portfolio Budget Statements reporting – 2011–1 Appendix B – Glossary and shortened forms

# Appendix A: Portfolio Budget Statements reporting 2011–12

### **KEY RESULT AREA 1—NATURAL HERITAGE MANAGEMENT**

#### PBS Target—Viable populations of selected significant species maintained

• Park managers have nominated 37 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 3 species are increasing; 16 species are remaining steady; 8 species are falling; 1 species is likely to be extinct; 2 species may be locally extinct; and population data are deficient for 7 species.

### **Booderee National Park**

Species	EPBC Act status	Monitorina	Actions	Trend
Eastern bristlebird	Endangered	Monitoring program for distribution	Controlling fox populations and	▲Numbers rising
Dasyornis brachypterus		and abundance in place since 2004.	preserving suitable bristlebird habitat.	Numbers continue to steadily increase in burnt sites since the last major wildfire in 2003 and remain steady in unburnt sites.
Sooty	No	Monitoring program for distribution	Controlling fox populations and	► Numbers steady
oystercatcher Haemotopus fuliginosus		and abundance in place since 2004.	protecting Bowen Island nesting sites. Public education programs.	Numbers have been stable for the life of the monitoring program. Ongoing nesting activity has been observed.
Pied oystercatcher	No	Monitoring program for distribution	Controlling fox populations.	► Numbers steady
Haematopus longirostris		and abundance in place since 2004.	Working with other land management agencies to control threats posed by vehicles. Public education programs.	Numbers have been stable for the life of the monitoring program.
Little penguin	Marine	Irregular counts of beach landings.	Maintained native plantings to	► Numbers steady
Eudyptula minor		Irregular monitoring of chick mortality.	re-establish penguin nesting habitat on Bowen Island. Control of invasive kikuyu grass in nesting habitat.	This is a stable and very healthy population displaying exceptionally high breeding success.
Long-nosed	No	Monitoring program for bandicoots	Controlling fox populations.	► Numbers steady
bandicoot Perameles nasuta		and primary food source (invertebrates) in place since 2003.		Populations peaked in 2005–06 before declining in 2008–09. Numbers increased in 2010 and are now steady. This is typical of documented trends in recovering bandicoot populations.
Green and golden	Vulnerable	Call back monitoring of breeding	No action being undertaken.	Presumed to be locally extinct
bell frog Litoria aurea		sites since 1996. PhD research project on all frogs has been underway since 2007.		Not positively detected in the park for seven years. Likely to be locally extinct, despite little change to habitat or hydrology. Viable populations nearby.
Giant burrowing	Vulnerable	Call back monitoring of breeding	No action being undertaken.	► Numbers steady
trog Heleioporus australiacus		sites since 1996. PhD research project on all frogs has been underway since 2007.		Numbers were stable for the life of the monitoring program. Regular monitoring has ceased.
Common brushtail	No	Monitoring programs for	Controlling fox populations.	▼Numbers falling
possum Trichosurus vulpecula		distribution and abundance in place since 2003.		Populations increased after intensive fox baiting was implemented but have now started to decline.

Species	EPBC Act status	Monitoring	Actions	Trend
Hooded plover Thinornis rubricollis	Marine	Monitoring program in place since 2004.	Controlling fox populations. Working with other land management agencies to control threats posed by vehicles. Public education programs.	► Numbers steady Numbers have been stable for the life of the monitoring program.
Greater glider Petauroides volans	No	Monitoring program in place since 2003 via ANU researchers.	Targeted research into reasons for decline and possible re- introduction.	May be locally extinct Numbers declined strongly in early 2000s and the species has not been detected in the park since 2007.
Eastern chestnut mouse Pseudomys gracilicaudatus	No	PhD research project commenced in 2008.	Controlling fox populations. Protecting habitat from fire.	▼ Numbers falling Population peaked in 2008–09 and is continuing to decline.

### **Christmas Island National Park**

Species	EPBC Act status	Monitoring	Actions	Trend
Christmas Island pipistrelle Pipistrellus murrayi	Critically Endangered	Opportunistic monitoring of pipistrelle call activity but established program no longer conducted.	-	<b>Presumed to be extinct</b> The pipistrelle is likely to be extinct.
Native reptiles (blue-tailed skink <i>Cryptoblepharus</i> <i>egeriae</i> , Lister's gecko <i>Lepidodactylus</i> <i>listeri</i> and forest skink <i>Emoia</i> <i>nativitatis</i> )	No (except for Lister's gecko listed as Vulnerable)	Surveys of native reptile fauna conducted as part of broader island-wide biennial biodiversity monitoring (island-wide survey or IWS) as well as targeted monitoring.	The on-island captive breeding program for native reptiles established in 2009 was expanded in 2010–11. Off-island populations of Lister's gecko and blue-tailed skink were established at Taronga Zoo. Assessment of disease threats completed and assessments of other threatening processes (invasive species) continued. Christmas Island Reptile Advisory Panel established to provide scientific advice for the	▼ Numbers falling Reptile species are continuing to undergo a rapid population decline in the wild. However, captive populations of Lister's gecko and blue-tailed skinks are being maintained or increasing. Forest skinks have not bred in captivity and may be extinct in the wild.
Red crab Gecarcoidea natalis	No	Biennial monitoring (IWS) of burrow counts to determine distribution and density. Survey has used consistent methodology since 2001. Most recent IWS was conducted in 2011. An independent scientific study monitoring the off-target impacts of Fipronil baiting, published in 2011, showed that Fipronil did not have off-target impacts.	management of reptiles. Continued crazy ant management program including completion of IWS in 2011 and continuation of indirect biological control research project. Aerial baiting is being planned and will be conducted in mid to late 2012. Australian Government announcement in 2011 of \$4m to continue management of crazy ant and other invasive species. Continued red crab management program including traffic management, road infrastructure development and education. Crazy Ant Scientific Advisory Panel continued to provide advice for the management of crazy ants.	► Numbers steady (possible slight decline) Population numbers appear to have declined from 2001 to 2009. However, an analysis of data collected from the 2011 IWS indicates a slight recovery since the 2009 IWS of between 3% and 8%.

#### Christmas Island National Park continued

Species	EPBC Act status	Monitoring	Actions	Trend
Abbott's booby Papasula abbotti	Endangered; Marine; Migratory	Aerial nest count survey last conducted in 2009 and distribution mapped in 2009 through the IWS, but the results were inconclusive. However, mapping undertaken as part of the 2011 IWS showed that distribution (nest occupancy) across the island was relatively stable from 2009 to 2011. External researcher is investigating aspects of population ecology, particularly demographics. Initial results suggest low reproduction success in recent years due to intense rains in 2010.	Continuation of the Christmas Island Mine-site to Forest Rehabilitation Program, which focuses on the rehabilitation of Abbott's booby nesting habitat.	? Data deficient Trend is currently unknown but short-term data, which should be used with caution, suggest the nest occupancy rate was relatively stable from 2009 to 2011.

### Kakadu National Park

Species	EPBC Act status	Monitoring <sup>1</sup>	Actions	Trend
Northern quoll Dasyurus hallucatus	Endangered	Biodiversity Hotspot Surveys and targeted monitoring at the East Alligator Ranger Station where a remnant population persists, albeit in low numbers. Incidental sighting database records any sightings or road kills. Next five-year full floristic and fauna survey commences in 2012–13.	Landscape unit-based fire management to improve habitat quality. Off-shore species relocation program conducted in conjunction with NT government agencies. Release program in place for captive bred 'toad smart' quolls trained to avoid toads, with monitoring of survival rates.	► Numbers steady Significant population decline occurred following the arrival of cane toads. The remaining population is low but stable. Reports of sightings throughout the park are received periodically. A number of captive-bred 'toad-smart' quolls are surviving and reproducing.
Northern brown bandicoot Isoodon macrourus	No	Biodiversity Hotspot Surveys. Incidental sighting database records any sightings or road kills. Next five-year full floristic and fauna survey commences in 2012–13.	Landscape unit-based fire management to improve habitat quality.	▼ Numbers falling Population declining consistent with pattern of small mammal decline across northern Australia.
Northern brushtail possum Trichosurus arnhemensis	No	Biodiversity Hotspot Surveys. Incidental sighting database records any sightings or road kills. Next five-year full floristic and fauna survey commences in 2012–13.	Landscape unit-based fire management to improve habitat quality.	▼Numbers falling Population declining consistent with pattern of small mammal decline across northern Australia.
Brush-tailed rabbit-rat <i>Conilurus</i> <i>penicillatus</i>	Vulnerable	Biodiversity Hotspot Surveys and targeted monitoring at the Mardugal Campground. Incidental sighting database records any sightings or road kills. Next five-year full floristic and fauna survey commences in 2012–13.	Landscape unit-based fire management to improve habitat quality. Sightings in new areas are followed up with targeted surveys.	▼ Numbers falling Population declining consistent with pattern of small mammal decline across northern Australia.
Black-footed tree-rat Mesembriomys gouldii	No	Biodiversity Hotspot Surveys. Incidental sighting database records any sightings or road kills. Next five-year full floristic and fauna survey commences in 2012–13.	Landscape unit-based fire management to improve habitat quality.	▼ Numbers falling Population declining consistent with pattern of small mammal decline across northern Australia.

<sup>1</sup> The full floristic and fauna survey of the park's 132 permanent fire plots was the initiative that first identified the small mammal decline across Australia's Top End. These surveys are conducted five-yearly and the survey scheduled for 2012–13 provides the next opportunity to gauge the status of many of these threatened species.

#### Kakadu National Park continued

Species	EPBC Act status	Monitoring <sup>1</sup>	Actions	Trend
Pale field rat Rattus tunnneyi	No	Biodiversity Hotspot Surveys. Incidental sighting database records any sightings or road kills. Next five-year full floristic and fauna survey commences in 2012–13.	Landscape unit-based fire management to improve habitat quality.	▼ Numbers falling Population declining consistent with pattern of small mammal decline across northern Australia.
Flatback turtle Natator depressus	Vulnerable; Marine; Migratory	Continuation of yearly survey and capture program (annual survey since 1995).	-	► Numbers steady Monitoring shows population is steady.
Estuarine crocodile Crocodylus porosus	Marine; Migratory	Continuation of survey and capture program that has been underway since 1979. Satellite tracking project has been underway since 2005.	_	► Numbers steady Crocodile populations in East Alligator River and South Alligator River are healthy and beginning to plateau. Crocodile population in West Alligator River is still increasing. Further information is required to determine population dynamics in the Wildman River.

### **Norfolk Island National Park**

Species	EPBC Act status	Monitoring	Actions	Trend
Green parrot Cyanoramphus cookii	Endangered; Migratory	Annual monitoring of assisted breeding nesting sites throughout breeding season (October to June). Monitoring commenced in the 1980s and birth-rate data collected since 1986. Monitoring focus is now moving from individual species to multiple species and ecosystem health. 2010 survey indicated species may have recovered past endangered threshold but an island-wide survey is needed to improve the accuracy of this estimate before any change to conservation status is considered.	Active feral animal control (rats, cats, crimson rosellas) through most of their habitat.	► Numbers steady Current population estimate of 240 individuals (Dutson, 2010). 300% increase over the past decade (approx). Probably stable at present and not likely to increase further until more habitat is available.
Norfolk Island morepork (boobook) owl <i>Ninox</i> novaeseelandiae undulata	Endangered; Migratory	Artificial nesting boxes are monitored annually to record breeding activity (October to January). Breeding recorded in one nest box this year. Monitoring focus is now moving from individual species to multiple species and ecosystem health.	Active monitoring of owl nest sites. Rodent and cat control focused around known breeding nests.	► Numbers steady Current population estimate of 40 individuals. In the mid-1980s there was only one bird, so there has been a historic increase in population numbers.
Golden whistler Pachycephala pectoralis xanthoprocta	Vulnerable	No monitoring program at present. 2010 survey suggested numbers may be increasing though it should remain categorised as vulnerable.	Weed and feral animal control.	? Data deficient Current population estimate of 2,200 mature individuals (Dutson, 2010). Insufficient data to estimate trend.
Pacific robin Petroica multicolor multicolor	Vulnerable	No monitoring program at present. 2010 survey did not include population estimate due to bias in data.	Weed and feral animal control.	? Data deficient May be gradual decline that is continuing but too little data to confirm trend. Appears to be a high rate of fledgling success but a low rate of adult male survival (Dutson, 2010).
Wedge-tailed shearwater Ardenna pacifica	Marine; Migratory	No monitoring program at present.	Weed and feral animal control.	? Data deficient Unable to determine. No trends at present.

### Pulu Keeling National Park

Species	EPBC Act status	Monitoring	Actions	Trend
Red-footed booby Sula sula	Marine; Migratory	Annual fauna survey conducted since 1985. However, monitoring was not undertaken in 2011 due to access issues.	Community education and compliance activities.	► Numbers steady Analysis of data indicates population remains steady at around 30,000 breeding pairs.
Cocos buff- banded rail Gallirallus philippensis andrewsi	Endangered	Monitoring commenced in late 1999. Monitoring now included in the IWS (so far, conducted in 2009 and 2012).	In collaboration with the Cocos Islands Shire and scientists, translocation of a small population (in accordance with the recovery plan) is being planned for 2012–13.	► Numbers steady Most recent monitoring results estimated the current population at approximately 1,000 individuals.

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

Species	EPBC Act status	Monitoring	Actions	Trend
<i>Tjaku<u>r</u>a</i> —great desert skink <i>Liopholis kintorei</i>	Vulnerable	15th annual <i>tjaku<u>t</u>a</i> survey (Feb– Mar 2012) identified 93 active burrows.	Continued fire management to improve habitat quality. Continued predator monitoring. Feral strategy finalised and acted upon—cat trapping programs successful but unable to effectively trap foxes.	► Numbers steady The number of <i>tjakura</i> burrows in 2012 is not significantly different from 2011 numbers.
Mala—rufous hare-wallaby <i>Lagorchestes</i> <i>hirsutus</i>	Endangered	Annual mala survey undertaken in September 2011. 70 individuals were caught and the mark- recapture population estimate was 214 animals (95% confidence limits 168–282).	Continued active management within the 170-hectare predator- proof enclosure, such as mosaic burning (20% regeneration to 80% mature spinifex) and supplementary feeding. Daily inspection of enclosure fence.	▲ Numbers rising The number of mala is increasing within the predator-proof enclosure. Further research will begin in 2012 to help ascertain when mala have reached their carrying capacity within the enclosure. UKTNP now has the largest known population of mainland mala in existence and as such is extremely important to the species' ongoing survival.
Murtja—brush- tailed mulgara Dasycercus blythi	No <sup>2</sup>	Active mulgara burrows, fresh scats and feed diggings found in large numbers across all 21 survey quadrats in the habitat area. 23 individuals were trapped and a new population was discovered in the east of the park.	Continued fire management to improve habitat quality. Continued predator monitoring. Feral strategy finalised and acted upon—cat trapping programs successful but unable to effectively trap foxes.	▲ Numbers rising A significant increase in the mulgara population detected in 2012 as compared to 2011 and 2010.
<i>Itjariitjari—</i> southern marsupial mole <i>Notoryctes typhlops</i>	Endangered	None	Currently determining habitat preferences and distribution across the park. Future studies will involve trench surveying.	? Data deficient Marsupial mole signs (tracks/pop holes) found in all 8 spinifex habitat types in 2010 surveys—surface habitat preferences apparent but unable to conclude from the data how those sites differed statistically in respect to the number of signs that occurred at each site. Currently analysing and publishing the results.
Common wallaroo or euro <i>Macropus robustus</i>	No	Initial survey began in May 2010 and is continuing, utilising surveillance cameras at four waterholes at the base of Ulu <u>r</u> u. Two of the waterholes are accessible to tourists and two are not.	Currently determining habitat preferences and visitor influences on existing populations.	? Data deficient No baseline data or trends to date. Although the number of euros captured on camera has been low, incidental information recorded regarding potential predators, particularly feral foxes and cats and reptiles such as the perentie ( <i>Varanus</i> <i>giganteus</i> ), will be very useful in guiding future management decisions.

2 Current EPBC Act listings for two species of mulgara may not accurately reflect their correct conservation status due to taxonomic confusion between the two species.

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

Species	EPBC Act status	Monitoring	Actions	Trend
Striated grasswren Amytornis striatus	No	Biannual monitoring (next monitoring to be conducted in September 2012).	Continued active fire management to reduce large-scale habitat loss from wildfire. Planned future research will aim at quantifying the exact size of the species' habitat, population size and key habitat elements to inform future management.	? Data deficient Monitoring in 2010 located 5 pairs in a small area of complex spinifex in the south of the park. This is the largest number recorded since initial surveys in 1992; however, birds are unable to be located at any other sites in the park, suggesting this part of the park provides key habitat elements.
Rare plant survey	No	Three-year baseline study and annual monitoring of 15 prioritised plants completed in 2010.	Individual management actions for each species, including fire management regimes, erosion control and camel control.	► Numbers steady Numbers stable for most species. Further monitoring of 5 species will include studies to understand fire tolerances and factors that influence juvenile recruitment rates in the rarer species.

PBS Target—No net increase in distribution/abundance of significant invasive species

• Park managers have nominated 24 significant invasive species across the six terrestrial reserves to identify changes in overall distribution and abundance. Of the selected species, the populations of 12 species are increasing; 3 species are remaining steady; 3 species are falling; and population data are deficient for 6 species.

### **Booderee National Park**

Species	Monitoring	Actions	Trend
European red fox Vulpes vulpes	Utilising fauna surveillance cameras, fox bait take and sand plot monitoring to monitor residual fox population.	Continue to undertake fox control activities with an emphasis on removing residual, bait-shy individual foxes and introducing alternative fox control methods.	▲ Numbers rising Numbers increased in 2011–12, possibly due to an exceptionally productive season as numbers are up across the Shoalhaven Region. Fox numbers nevertheless remain very low and alternative fox control techniques are effective in controlling residual foxes.
Bitou bush Chrysanthemoides monilifera	Aerial survey undertaken. Density and distribution mapped and recorded on GIS. Annual aerial spray efficacy mapped and recorded on GIS. Post treatment exclosure trials to assess vegetation recovery.	125 ha aerially sprayed in June 2012, with further spraying of 48 ha using splatter guns and 45 ha using ground spraying. No burning conducted in 2012. Ground application of herbicide followed by spot burning is the more prevalent strategy with decreasing aerial application as bitou density reduces.	<ul> <li>▼ Numbers falling</li> <li>90% reduction in the area of high density infestation and 75% reduction in the area of medium density infestation between 2004 and 2012. Effective aerial treatment undertaken this year.</li> <li>Post treatment recovery of native plant species is slow due to high levels of preferential grazing by native species.</li> </ul>

### **Christmas Island National Park**

Species	Monitoring	Actions	Trend
Yellow crazy ant Anoplolepis gracilipes	Biennial biodiversity IWS to determine supercolony distribution. The survey has used consistent methodology since 2001. A survey was completed in 2009 and a further survey was completed in 2011.	Undertook 2011 IWS, which underpins control program. Prepared for aerial baiting program to be conducted later in 2012. Continued to fund research by La Trobe University into biological control. Completed a study on the off-target species impacts of Fipronil bait.	▲ Numbers rising Significant decline in supercolony numbers occurred in 2002 after successful aerial baiting program followed by slow increase in supercolonies. Aerial baiting program conducted in 2009 with 784 ha supercolonies baited. Ongoing monitoring indicates aerial baiting has been successful in reducing ant numbers in former supercolonies. However, based on the results from the 2011 IWS, new supercolonies are emerging with about 600 ha mapped.

Christmas Island National Park continued

Species	Monitoring	Actions	Trend
False curry bush	Survey conducted as part of 2011 IWS.	No specific control work has been	? Data deficient
			No baseline data to date so no trend can be detected. The risk of increasing numbers and distribution under intact rainforest canopy would be of significant concern.
Siam weed Chromolaena	Siam weed was first detected on Christmas Island in 2010 but it is only	Control of the only known infestation continues (as seeds stored in the soil	▼Numbers falling (for known infestation)
odorata	known to be in one small location. Monitoring of roadsides commenced and has continued and was surveyed as part of 2011 IWS.	continued to germinate). Currently being contained to this infestation site.	Trend is declining but it is possible that, despite monitoring, there are other undetected infestations that may be increasing.
Feral cat Felis catus	Determining feral cat numbers is extremely difficult.	Collaborative island-wide cat control commenced with the introduction of new Shire of Christmas Island by-laws, de-sexing of all pet cats and control of cats in settled areas. This work is supported by Australian Government agencies, the Shire and Phosphate Resources Ltd and has resulted in the removal of over 300 feral cats since the program commenced in mid-2011.	? Data deficient (possible decline) Little baseline data to date so no trend can be accurately detected. Until recent control efforts, anecdotal evidence suggested that numbers appeared to be rising. However, current efforts have removed a significant part of the feral cat population.

### Kakadu National Park

Species	Monitoring	Actions	Trend
Mimosa Mimosa pigra	Mimosa stands have been mapped and there is an annual monitoring program.	Integrated eradication program conducted.	► Numbers steady Under control, virtually absent from the park.
Para grass Brachiaria mutica	Ongoing monitoring as part of integrated weed program. Species is subject to several current research projects.	Treated in a number of strategic areas; opportunistic control elsewhere.	▲ Numbers rising The range of this species is increasing.
Gamba grass Andropogon gayanus	Ongoing monitoring as part of integrated weed program.	Eradication program conducted.	► Numbers steady Under control within the park, but a large infestation is advancing towards the park's southern boundary and presents a high risk to the park.
Mission grass Pennisetum polystachion	Ongoing monitoring as part of integrated weed program.	Treated in a number of strategic areas; opportunistic control elsewhere.	▲ Numbers rising The range of this species is increasing.
Olive hymenachne Hymenachne amplexicaulis	Ongoing monitoring as part of integrated weed program. Species is subject to several current research projects.	Systematic control at a number of key locations; opportunistic control elsewhere.	▲ Numbers rising The range of this species is increasing.
Salvinia Salvinia molesta	Ongoing monitoring as part of integrated weed program.	Introduction of biological control agent and minor mechanical and chemical control in key sites.	► Numbers steady Extent of infestations varies greatly between locations and over time.
Water buffalo <i>Bubalus bubalis</i>	Incidental sightings database maintained.	Limited control program implemented in May–June 2012 with 75 buffalo seen and 47 shot. Program was limited to approximately 1/3 of the park, primarily in the northern wetland areas. Some southern sections of the park, which have the greatest number of buffalo, could not be included. Ongoing opportunistic control.	▲ Numbers rising Numbers are increasing.

#### Kakadu National Park continued

Species	Monitoring	Actions	Trend
Feral pig Sus scrofa	Incidental sightings database maintained.	Limited control program implemented in May–June 2012 with 1,389 pigs seen and 1,065 shot. Program was limited to approximately 1/3 of the park, primarily in the northern wetland areas. Ongoing opportunistic control.	▲ Numbers rising Numbers are increasing.

### **Norfolk Island National Park**

Species	Monitoring	Actions	Trend
Black rat Rattus rattus	Monthly survey of presence/absence of rats. Trapping and baiting program provides an indication of presence/ absence.	Over 1,000 bait stations are set through the park and baited each month. Snap traps are also set in some areas. Predation by rodents is listed as a priority threatening process under the Norfolk Island Region Threatened Species Recovery Plan.	? Data deficient Interesting results from a change in bait (previous bait had been in place for 12 years). Initial very high bait take, which began to settle after seven months. Too early to be able to assess impacts on rat populations.
Feral cat Felis catus	Trapping program provides a presence/ absence indication. Continued gut analysis to determine prey composition (e.g. rats, native birds).	Cat trapping occurs every second month. Predation by feral cats is listed as a priority threatening process under the Norfolk Island Region Threatened Species Recovery Plan.	? Data deficient Unable to quantify population size. Uncertain whether rodent control program in park is impacting on feral cat numbers in the park.
Red guava Psidium cattleianum	Monitoring program recently commenced.	Completed weed control in 4 of the 19 coups identified in the rehabilitation strategy; 4 ha weeds controlled. Invasion of habitat by exotic weeds is listed as a priority threatening process under the Norfolk Island Region Threatened Species Recovery Plan.	<b>? Data deficient</b> Unable to determine. No trends at present.
African olive Olea europaea africana	Monitoring program recently commenced.	Completed weed control in 4 of the 19 coups identified in the rehabilitation strategy; 4 ha weeds controlled. Invasion of habitat by exotic weeds is listed as a priority threatening process under the Norfolk Island Region Threatened Species Recovery Plan.	<b>? Data deficient</b> Unable to determine. No trends at present.

### Pulu Keeling National Park

Species	Monitoring	Actions	Trend
Yellow crazy ant Anoplolepis gracilipes	Monitoring included in the IWS (so far completed in 2009 and 2012).	Continued monitoring program and planning for control programs. Revised quarantine protocols to control access.	▲ Numbers rising Colonies fairly widespread, with some sites recorded at supercolony density. Analysis of the results of 2012 IWS will provide further baseline data.
Coral berry <i>Rivina humilis</i>	Ongoing mapping activities. IWS completed in 2012.	Coral berry treated with herbicide as part of trial to devise suitable long-term control measures. Revised quarantine protocols to control access.	▼ Numbers falling Increased distribution and density observed in western part of the park over recent years. Analysis of the results of 2012 IWS will provide an indication of trends following control program, although densities have been reduced in controlled areas.

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

Species	Monitoring	Actions	Trend
Buffel grass Cenchrus ciliaris	Monitoring of native biodiversity following buffel removal around Ulu <u>r</u> u.	Final round of contracted buffel control program completed in October 2011. Ongoing control actions will be carried out opportunistically by rangers when possible. Trial study to determine the effects of fire and spraying on buffel conducted in 2011 but proved unsuccessful; trial will be repeated in 2012.	▲ Numbers rising A high rainfall year and failure of control trials has seen buffel grass distribution and density increase.
Feral cat Felis catus	UKTNP Vertebrate Pest Monitoring Plan activated. This involves a combination of track monitoring and remote surveillance cameras.	Continued cat trapping program.	▲ Numbers rising Despite successful cat trapping activities, numbers across the whole park continue to rise. This rise in numbers is due to the favourable conditions experienced in the previous 12 months and the subsequent boom in small mammal numbers.
European wild rabbit Oryctolagus cuniculus	Monitoring prioritised to the mala enclosure and involves active burrow counts.	Phostoxin used to treat and re-treat warrens in the mala enclosure. Rabbit burrow numbers decreased from more than 200 burrows to 30.	▼Numbers falling in the mala paddock ▲Numbers rising in the remainder of the park Rabbit numbers have increased across the park as a result of extremely good conditions in the past 12 months. Rabbit control work in the mala enclosure has been prioritised over the rest of the park due to the negative impact rabbits have on mala populations.
European red fox <i>Vulpes vulpes</i>	UKTNP Vertebrate Pest Monitoring Plan activated. This involves a combination of track monitoring and remote surveillance cameras.	Continued fox trapping program.	▲ Numbers rising Fox trapping activities have been unsuccessful and numbers across the whole park continue to rise. This rise in numbers is due to the favourable conditions experienced in the previous 12 months and the subsequent boom in small mammal numbers.

### 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 declined slightly throughout the year in the jointly managed parks. The overall number of Parks Australia staff has also declined.
- The number of Indigenous staff engaged as intermittent and irregular employees and contractors to provide services at Kakadu National Park has increased slightly. PBS
- The Kakadu Indigenous Ranger Program, funded by Working on Country, also provides resources allowing Kakadu to host 11.5 community rangers in park related employment.
- A<u>n</u>angu participation in flexible employment at Ulu<u>r</u>u–Kata Tju<u>t</u>a National Park through the Mu<u>t</u>itjulu Community Ranger program has declined due in part to the cessation of funding for two workforce development coordinators (previously funded by the Department of Education, Employment and Workplace Relations).
- The number of Indigenous staff directly employed at Booderee National Park remained stable.
- In its 2011 annual report, WBACC Contracting Services reported that it employed 14 full time, 4 permanent part time and up to 10 casual staff to deliver services to Booderee National Park.

### **KEY RESULT AREA 4—USE AND APPRECIATION OF PROTECTED AREAS**

#### PBS Target—Visitor satisfaction levels greater than 95 per cent

• Visitor surveys were undertaken at Norfolk Island and Ulu<u>r</u>u–Kata Tju<u>t</u>a national parks and the Australian National Botanic Gardens, with high overall satisfaction levels recorded from respondents (Norfolk Island—100 per cent, Ulu<u>r</u>u–Kata Tju<u>t</u>a—96 per cent, Australian National Botanic Gardens—93 per cent).

### KEY RESULT AREA 6—BUSINESS MANAGEMENT

## PBS Target—Five per cent reduction in number of risks identified in risk watch lists as 'extreme', 'very high' or 'high'

- There was no net reduction in the number of extreme, very high or high risks in risk watch lists in 2011–12.
- The Director has participated in the Comcover Risk Management Benchmarking Scheme since 2002–03. In 2011–12, the Director scored 7.9 out of a possible 10 compared to an average score for all Australian Government agencies of 6.6. For the past seven years, the Director has consistently scored above the average for all agencies.

PBS Target—No major injuries to staff, contractors, volunteers and visitors relating to an undertaking of the Director of National Parks

• Parks staff and contractors sustained two major injuries. Two park visitors died (a drowning of a rock fisherman in Christmas Island National park and a missing person in Kakadu National Park, presumed by police to be due to crocodile attack) and there were four major injuries to visitors.

## PBS Target—Three new actions implemented which produce significant reduction in greenhouse gas emissions

- A significant decrease in total energy consumption by parks and reserves was recorded in 2011–12, confirming the trend of recent years. This represented an 11.9 per cent reduction in the volume of CO<sub>2</sub> emissions from stationary sources compared to the average over the past three years and a 10.2 per cent reduction for transport sources.
- Replacement of two diesel-powered generators in the South Alligator District of Kakadu National Park with more efficient systems that require less fuel resulted in a saving of approximately 85 litres of diesel fuel per day, reducing CO, emissions by over 83 tonnes per annum.
- Booderee National Park's ongoing program of improvements at Bristol Point campground continued with the installation of instantaneous gas hot water heaters, energy efficient lights and a second solar inverter.
- Although more labour intensive, the move to fertilise newly planted trees by hand instead of using large dieselpowered machinery for the Christmas Island Mine-site to Forest Rehabilitation program reduced both fuel costs and the quantity of fertiliser wasted. Targeting fertiliser specifically to newly planted trees, rather than blanketing the area, limits weed growth and subsequent competition. By fertilising the forest rehabilitation site in this way, less vehicle fuel and chemicals are used and staff time spent on weed control is also reduced.

### KEY RESULT AREA 7—BIODIVERSITY KNOWLEDGE MANAGEMENT

### PBS Target—Five per cent increase in website unique users and publications accessed

• The Parks Australia websites and blog (parksaustralia.gov.au and kakadu.com.au) received 757,527 visits (an average of 2,081 visits a day) in the 2011–12 financial year. This was a 27 per cent increase in visitation on the prior year; this strong growth was boosted by increased social media initiatives, rich media content and more material that met the Government Web Content Accessibility Guidelines 2.0.

## **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, and other Aboriginals entitled to enter upon or use or occupy the Park in accordance with Aboriginal 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 Birds Agreement (CAMBA)	Agreement between the Government of Australia and the Government of the People's Republic of 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 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	
Korea–Australia Migratory Birds Agreement (ROKAMBA)	Agreement between the Government of Australia and Republic of Korea for the Protection of Migratory Birds	
KRA	Key result area	
Migratory Species (Bonn) 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	
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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