Australian Government
Director of National Parks





Director of National Parks | State of the Parks Report

Director of National Parks Annual Report 2010–11 Supplementary Information

Managing the Australian Government's protected areas

ISSN 1443-1238

Director of National Parks Australian business number: 13 051 694 963

Credits

Front cover

Umbrella tree flower – *Australian National Botanic Gardens*
Kakadu escarpment – *Ian Oswald-Jacobs*
Uunguu Indigenous Protected Area – *Peter Morris*
Land crab – *Parks Australia*
Kookaburra – *June Andersen*

Maps – *Environmental Resources Information Network*
Designer – *Papercut*
Editor – *Ethos CRS*
Indexer – *Barry Howarth*

Printed by New Millennium Print on Australian paper
made from sustainable plantation timber

Map data sources

Indigenous Protected Areas (Declared), Collaborative Australian Protected Areas Database – CAPAD 2008: © Commonwealth of Australia, Department of Sustainability, Environment, Water, Population and Communities, 2011.

Localities, State and Territory Borders: © Commonwealth of Australia, Geoscience Australia.

Caveat: All data are presumed to be correct as received from data providers. No responsibility is taken by the Commonwealth for errors or omissions.
The Commonwealth does not accept responsibility in respect to any information or advice given in relation to, or as a consequence of anything contained herein.

Geographic Coordinate System on the GDA94 Datum.

Guide to the State of the Parks report

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

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

- **Area and locational information** is derived from the Collaborative Australian Protected Areas Database and from a departmental Marine Protected Areas dataset which includes data sourced from Geoscience Australia.
- The 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 2010–11.

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

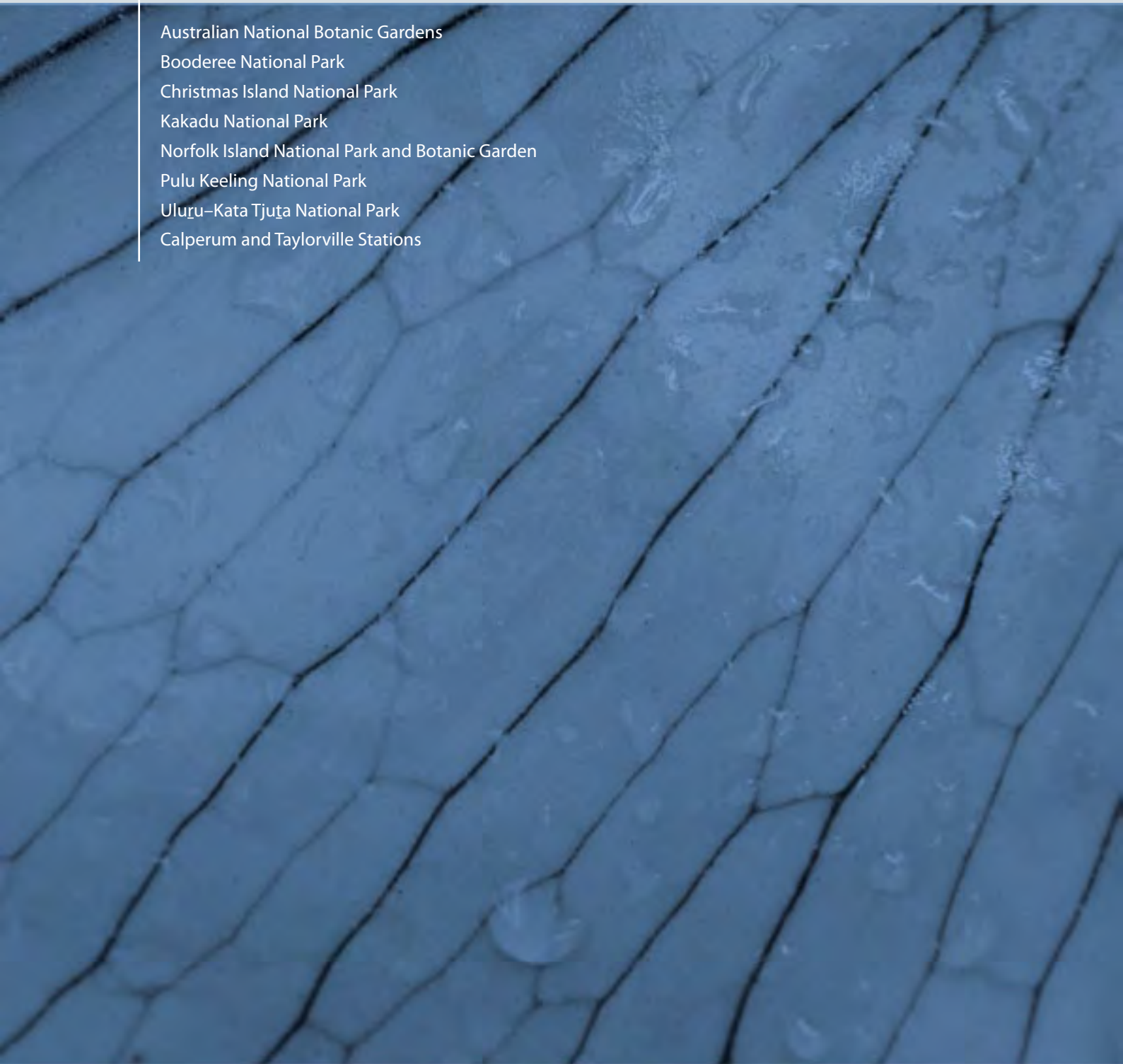
The Director of National Parks is included in the Portfolio Budget Statements for the Sustainability, Environment, Water, Population and Communities portfolio and contributes to the achievement of Outcome 1 (Environment). The Director contributes to this outcome through the sub-outcome *Conservation and appreciation of Commonwealth reserves through the provision of safe visitor access, the control of invasive species and working with stakeholders and neighbours* and Program 1.1 *Parks and Reserves*. Detailed reporting on the Portfolio Budget Statements 2010–11 targets is provided at Appendix A.

Sooty tern—with their black back and white underside, you might see these birds in large noisy flocks of thousands returning to one of Norfolk's offshore islands to breed. *Photo: Fusion Films*

Contents

A team from the Australian National Botanic Gardens propagated, nursed and transplanted back into the wild a nationally endangered plant this year. The aromatic shrub Zieria obcordata *is found on only seven sites in New South Wales. Notoriously difficult to cultivate, gardens' horticulturalist Paul Carmen, pictured left with conservation volunteer Cathy Hook, and his team experimented with various techniques. Today 46 plants have been restored to the wild.* Photo: Helen McHugh

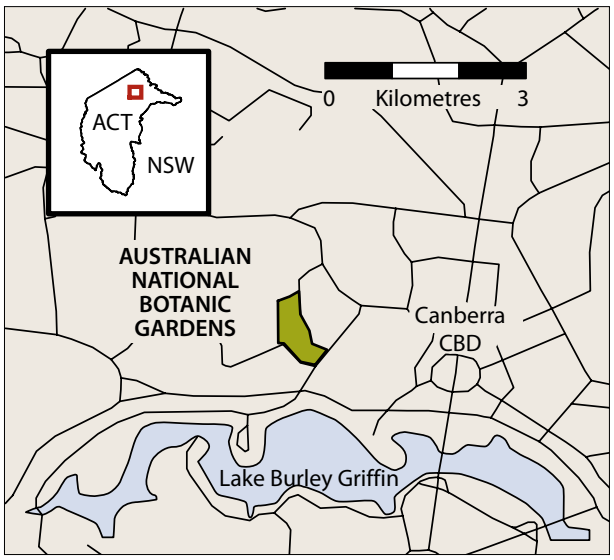
1 Terrestrial reserves summaries for 2010–11



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
Uluṟu–Kata Tjuṯa National Park
Calperum and Taylorville Stations

Australian National Botanic Gardens

www.anbg.gov.au



Special features

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

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

Location	Latitude 35°16′ South, Longitude 149°06′ East
Area	85 hectares
Proclamation date	17 September 1991
IUCN category	Category IV
Biogeographic context	Displays plants from a diverse range of climatic and biogeographic regions—alpine to tropical, coastal to central desert
Management plan	Second management plan expired 9 January 2009. A draft third management plan is in preparation for release for public comment in 2011–12
Other significant management documents	Risk Assessment and Management Schedule; ANBG Masterplan (National Capital Authority); ANBG Emergency 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	$9.777 million
	Capital	$3.561 million
	Revenue	$11.782 million
Visitors	450,480 to ANBG 104,635 to visitor centre	
Living plants	Planted in 2010–11: 4,265 Total number of taxa in the living collection: 6,267 Total number of plants in the living collection: 76,946	
Herbarium specimens	Specimen records added to database in 2010–11: 17,199 Specimen records in database: 874,478 Total number of specimens in collection approximately 1.2 million: 918,200 items databased, plus approximately 300,000 not databased	
Australian Plant Name Index	Names added to APNI database in 2010–11: 10,530 Total names in APNI database: 215,807	
Seed Bank	Total number of collections in the Seed Bank: 5,061 Number of collections added to Seed Bank in 2010–11: 164	
Australian Plant Census	Names added to APC database in 2010–11: 2,299 Total names in APC database: 19,431	
Australian Plant Image Index	Images added in 2010–11: plant images 12,751, other 615 Total number of images in collection: 76,449	
Permits	9 commercial activity permits; 37 wedding licences; 5 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 horticultural and educational 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	Collaborates with international organisations including: • Botanic Gardens Conservation International • International Association of Plant Taxonomists • International Plant Propagators Society • International Union of Biological Sciences Taxonomic Databases Working Group • International Plant Name Index (Royal Botanic Gardens, Kew, and Harvard University) • Global Biodiversity Information Facility • International Organisation for Plant Information World Vascular Plant Checklist Project • Species 2000 • Millennium Seed Bank Partnership • American Public Gardens Association • Global Strategy for Plant Conservation

Environment Protection and Biodiversity Conservation Act 1999	
Heritage	On Commonwealth Heritage List

Management arrangements

The ANBG is managed by an Executive Director supported by a General Manager, both appointed by the Director of National Parks. Since 1993 the ANBG has been a partner in the Centre for 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 plants at the ANBG.

Monitoring

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

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

Future challenges

Major challenges are:

- strengthening scientific research through the acquisition of new resources and partnerships
- integrating climate change considerations into conservation programs and research
- securing future expanded accommodation for the Australian National Herbarium collections
- 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 reviewing contingency plans for major risks such as bushfires, drought, pests and resourcing issues.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

- Water management and associated infrastructure
- *Ex situ* conservation
- Enhancing the living collection and visitor experience through new developments

Actions

- Increase water use efficiency and sustainability
- Position the ANBG as a leader in *ex situ* conservation including seed banking
- Planning for new developments to expand the range of species represented within the living collection

Performance results 2010–11

- The non-potable water infrastructure improvement project for the ANBG was completed within budget in March 2011. The project enables up to170 million litres of water to be delivered from Lake Burley Griffin to irrigate the Gardens each year. The Gardens will no longer have to rely on Canberra's drinking water supply to sustain the extensive collection of native plants and regular irrigation will be possible, even in times of tough water restrictions
- Continued a program for *ex situ* alpine plant conservation supported by a three-year partnership between the ANBG, Australian National University, University of Queensland and the Friends of the ANBG. The program studies the effect climate change will have on the reproductive ecology and demography of Australian alpine flora. Eight field trips to the Mount Kosciuszko area were undertaken and 94 seed samples were collected
- Made 64 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

- Following completion of the rehabilitation of the old nursery site in June 2010, design of an arid garden with a 'Red Centre' theme for the site's redevelopment was initiated and is being finalised; the first stage of construction is scheduled to commence in 2011–12
- The grassy woodlands garden at the main entrance was redeveloped to showcase local flora and create a sense of arrival to the Gardens. The redevelopment was opened in October 2010 and acts as a shopfront for interpreting and displaying plants from this threatened ecological community
- 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*
- The *ANBG Pest Animal Management Strategy* was reviewed and fauna surveys were completed for rabbits, foxes and kangaroos. The ANBG collaborated with ACT Parks Conservation and Lands staff to reduce rabbit numbers within the Gardens
- The ANBG continued to display approximately one-third of the plant species occurring naturally in Australia, in a managed horticultural setting

KRA4: Use and appreciation of protected areas

Major issues

- Visitor services including signage, interpretation and education programs
- Education programs need to be 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

Performance results 2010–11

- Received a total of 450,480 visitors of which 24 per cent were recorded at the visitor centre
- In October 2010, the ANBG celebrated its 40th anniversary (see case study page 11). The range of events held to mark this milestone included a public open day that attracted 5,000 people, a gala dinner held within the Gardens, a 40th anniversary exhibition in the visitor centre, an orchid exhibition and development of a native 'five senses' garden at Floriade. The celebrations provided extensive media exposure and public interaction with the Gardens
- Continued to evaluate and redevelop education programs to incorporate the national curriculum and inquiry-based learning techniques
- Hosted 8,958 school and tertiary students from 206 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, primary and secondary teacher and tour operators familiarisation tours
- Collaborated with the National Capital Attractions Association Inc to represent and promote the ANBG and other national attractions within Canberra and the surrounding region

- Implemented a successful events and outreach program including:
  - NAIDOC Week (July 2010)
  - Making Music, Weaving Nature's Wonders, Wearing Nature's Treasures: School Holiday programs (July 2010)
  - Science Week: Twilight An Adventure (16 ,19, 20 August 2010)
  - Go Native, Papermaking, and Budding Artists: School Holiday Programs (28 September to 8 October 2010)
  - Wattle walks (1–7 September 2010)
  - spring flower walks (11 September to 10 October 2010)
  - Floriade display and outreach program 'Five Senses Garden' (11 September to 10 October 2010)
  - Canberra Youth Orchestra (24 September 2010)
  - Christmas Concert (4 December 2010)
  - Snakes Alive (13–25 January 2011)
  - St Patrick's Day Concert (17 March 2011)
  - Easter Bilby Storytime (19, 20, 26, 27 April 2011)
- The annual Summer Sounds concert series held in January 2011 was highly successful with 12,000 people attending over four weekends. The concerts were held in partnership with the Friends of the ANBG and commercial sponsorship funded a temporary stage and a proportion of the Garden's event costs
- Hosted a short film festival Flix in the Stix on 26 February 2011. The event was managed and promoted by the event organiser with the ANBG providing the venue
- 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
- Promoted the cultural, artistic and scientific values of Australian native plants through exhibitions including:
  - Working on Country Photo exhibit
  - 40th anniversary exhibition '40 years and growing'
  - Friends schools photographic exhibit
  - Sex and Death in the Display Glasshouse
  - United Nation Photo Competition: Year of Biodiversity
  - Rhythm Interrupted – Life Redirected
  - Friends Botanical Art Group Exhibition
  - Australian Plants Bonsai Exhibition'
  - Lasting Beauty: Peter Garnick
- The Gardens part of the ANBG website was updated with a new 'look' and improved functionality. The website has 45,000 pages and provides access to 63,000 images. The ANBG's Facebook and Twitter sites grew in popularity-453 people 'like' ANBG's Facebook page and 214 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
- Continuing a collaborative partnership with the Friends of the ANBG

- Supporting and engaging with the Australian Cultivar Registration Authority, the Australian Network for Plant Conservation and Greening Australia
- Ongoing support for the Centre for Australian National Biodiversity Research (CANBR)
- Providing leadership and co-ordination of the Australian Seed Bank Partnership
- Fostering opportunities and partnerships with new stakeholders

Actions

- Continue the ANBG's active leadership role with the Council of Heads of Australian Botanic Gardens
- Continue strategic partnerships and cooperative data management with the Taxonomic Databases Working Group, Global Biodiversity Information Facility, Taxonomy Research and Information Network and Atlas of Living Australia
- Continue the Australian National Herbarium's engagement in the Council of Heads of Australasian Herbaria
- Undertake and promote the services that the ANBG and 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 hosting the Greening Australia Community Seed Bank, the Australian Cultivar Registration Authority and the Australian Network for Plant Conservation on the ANBG website
- Continue and further develop the joint ANBG–CSIRO partnership in the CANBR
- Co-ordinate the Australian Seed Bank Partnership

Performance results 2010–11

- The ANBG's 17-year partnership with CSIRO Plant Industry was renewed for a further 10 years in December 2010. A new strategic plan for the renamed Centre for Australian National Biodiversity Research was put in place and a new Director for the Centre was appointed in January 2011
- Continued ANBG membership of technical working groups under the Global Biodiversity Information Facility and Taxonomic Databases Working Group
- Engaged a national coordinator for the Australian Seed Bank Partnership in July 2010 to co-ordinate national conservation seed banking efforts. Partners from across Australia met at the ANBG in November 2010 and prepared a 10-year seed collecting and research program to build the national safety net for Australian plant species; a partnership website was also launched
- Continued the close collaboration between the ANBG Conservation Seed Bank and Greening Australia, including joint field collecting, seed storage and management. The ANBG provided Greening Australia with space and irrigation for seedling production
- The Australian National Herbarium continued to play a driving and coordinating role on behalf of the department for projects undertaken by the Council of Heads of Australasian Herbaria. This included continued work with Australia's Virtual Herbarium, and the Australian Plant Census
- The CANBR continued its close association with the Taxonomy Research and Information Network, housing the network's core staff and participating in projects such as systematic and diversity studies of weeds of national significance and biodiversity information management
- The ANBG and the CANBR entered into a partnership with the Australian Biological Resources Study and the Atlas of Living Australia to develop and manage a common taxonomic infrastructure for databases held by these organisations and to develop web services, including a species profile template for the Atlas
- The CANBR participated in a 'Bush Blitz' collaborative biodiversity survey in the Dananbilla, Illunie and Koorawatha Nature Reserves in the south-west slopes of NSW, coordinated by the Australian Biological Resources Study. The results of these surveys will contribute to such projects as Australia's Virtual Herbarium and the Atlas of Living Australia
- The Friends of the ANBG ran the annual students' photographic competition and the autumn and spring plant sales; published quarterly newsletters; provided volunteer guided walks each day and facilitators for the Botanical Resource Centre twice a week; and supported the ANBG's annual summer concerts in January 2011

- The Friends of the ANBG provided funds to enable the development of a shade shelter over the Crosbie Morrison Amphitheatre, two environmental monitoring stations, interpretative signage in the grassy woodland garden, an orchid display in the visitor centre and a new lichen website
- 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 National Parks and Wildlife Service, 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

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 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
- Investigate new revenue opportunities to offset operational costs
- Continue staff development through targeted training programs, regular communication and a team-based approach to projects
- Embed risk management principles in project planning and operational processes

Performance results 2010–11

- Further developed the draft management plan for public consultation in 2011–12
- Addressed the challenge posed by increases in the cost of water through the new project to extract water from Lake Burley Griffin
- Undertook recruitment of essential ongoing positions that were previously non-ongoing contracts, maintained and improved staff consultation, involvement and capacity building through training, staff working groups and planning sessions
- 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
- Undertook an energy audit and commenced stage 1 of recommended works
- Developed a draft Fund Raising Strategy, developed a fund raising prospectus and generated sponsorship for the Summer Sounds concert series

KRA7: Biodiversity science, knowledge management and use

Major issues

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

Actions

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

Performance results 2010–11

- Databased 17,199 herbarium specimens with a total of 874,478 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 13,366 additional images accessible on the internet
- A special labelling project for the living collection was initiated in June 2011 with 2,000 labels placed on plants in over 80 sections along parts of the Main Path and Rock Garden. This has significantly improved interpretative use and value of the plant collections for visitors. The project will continue next year, focusing on the Rainforest Gully and other areas of high visitor use
- Hosted a national myrtle rust workshop in March 2011 to share information on potential threats posed by this introduced fungus disease to plant collections in botanic gardens (as well as bushland) throughout Australia. A range of information and resources on myrtle rust was made available on the ANBG website
- The interactive Key to Rain Forest Plants, prepared as part of the partnership with James Cook University and the Queensland Herbarium in the Australian Tropical Herbarium in Cairns, was launched as an on-line version. 9,808 images from this project have been imported into the Australian Plant Image Index
- Completed data collation for an agreed list of scientific names for Australian liverworts and hornworts through the Australian Plant Census project

- Maintained the Census of Vascular Plants, Hornworts and Liverworts of the ACT, including addition of much new data for vascular plants
- Negotiated a contract for a partnership with the Atlas of Living Australia to redevelop the nomenclature and taxonomic infrastructure for Australian plant and animal species in association with the Australian Biological Resources Study. This will effectively combine Australian plant and animal names data through a common interface
- Collaborated with the Atlas of Living Australia and the Taxonomy Research and Information Network to develop specifications for species profiles for managing digital biodiversity data. The Atlas of Living Australia also provided additional computer hardware to support increased demand for biodiversity name services
- 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
- Appointed research and technical staff to the CANBR to undertake spatial analyses and research into the occurrence and distribution of Australian plants
- 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
- Continued research on the ecological function, structure and small-scale dynamics of grassland communities in south-eastern Australia, using grasslands in the West Wyalong district of NSW as model systems. A paper on this work was published in the journal *Global Change Biology* and other papers resulting from this work are in preparation
- The ANBG and the CANBR participated in national and international biodiversity information management and technical infrastructure projects including the Atlas of Living Australia, the Australian Faunal Directory, the Taxonomy Research and Information Network, the Australian Plant Census, Australia's Virtual Herbarium, the Global Biodiversity Information Facility, the Encyclopedia of Life and the Taxonomic Databases Working Group
- Researchers completed 12 scientific papers or publications resulting from research undertaken at the Australian National Herbarium. Areas of study included Australian Asteraceae, Orchidaceae, Amaranthaceae, Rutaceae, Myrtaceae, Malvaceae, Mimosaceae, Santalaceae, weeds and bryophytes
- The Australian Plant Image Index undertook a contract to collect, database and manage images of weeds for the department's Weeds Australia website
- The Centre for Australian National Biodiversity Research was contracted by the NSW Roads and Traffic Authority to document and manage translocation and conservation of three species of orchids threatened by the Bulahdelah bypass highway realignment

Case study: Australian National Botanic Gardens – 40 years and still growing strong

Dr Judy West started working with plants about the same time as the Australian National Botanic Gardens in Canberra opened its gates — 40 years ago.

And while the Gardens celebrated its 40th birthday last October with a gala dinner, a garden party, activities for the kids and talks and walks, behind the scenes staff were hard at work.

Today as the Gardens' Executive Director Judy still 'loves working with plants' and, wearing her other hat as Assistant Secretary of Parks and Biodiversity Science, is working tirelessly to promote the Gardens as a national scientific institution.

"What many people don't realise is that the Gardens were actually developed as a scientific institution," Judy says. "A key focus over the last year has been boosting the science side of our work.

"We've managed to make substantial progress in this area and have developed and strengthened some of our key partnerships."

One of these partnerships was the renewing of the 17-year agreement between the Director of National Parks and CSIRO to form the Centre for Australian National Biodiversity Research, which includes the Australian National Herbarium with strong links to the Gardens.

"The National Herbarium is doing critical work providing botanical knowledge for Australia," Judy says. It plays an essential role identifying plants and weeds and documenting the country's vast diversity of plant life. I'm now keen to see the herbarium working more closely with our Commonwealth parks helping out with plant surveys.

"Another milestone was our appointment of a national coordinator for the new Australian Seed Bank Partnership which the Gardens is leading, expanding our role in seed conservation.

"We have our own seedbank in Canberra, and we're now working with partners around the country to collect specimens of all plant species nationally listed as threatened or endangered. Our ambition is to have seedbanks in every state to insure against the loss of Australia's flora from threats such as climate change."

As part of its scientific focus, the Gardens also brought together Australia's leading plant and fungal scientists to explore options for managing outbreaks of myrtle rust, a newly introduced fungal disease which infects plants in the Myrtaceae family such as bottlebrushes, tea trees and eucalypts.

"On the physical side of things we also made major improvements to the Gardens infrastructure," Judy adds.

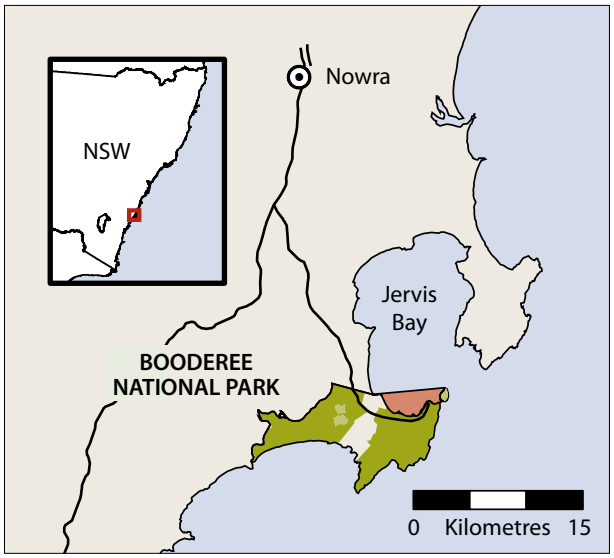
The Gardens now has a drought-secure irrigation supply thanks to the completion of the non-potable water pipeline from Lake Burley Griffin which will save up to 170 million litres of Canberra's drinking water each year.

"We've redeveloped the grassy woodland at the main entrance showcasing local plants and giving a sense of arrival at the Gardens and, close to my heart, we've started work on the Red Centre Garden — a massively challenging project to develop an arid area plant display in Canberra's environment."

Dr Judy West, Parks Australia's Assistant Secretary Parks and Biodiversity Branch has an international reputation for her work in plant systematics and phylogenetics and conservation biology. Judy – Congress President and Chair (right) – speaking with International Botanic Congress delegates Megan Clark CEO of CSIRO and Pat Raven from Missouri Botanic Gardens in St Louis, USA. Photo: Tim Pascoe

Booderee National Park

www.environment.gov.au/parks/booderee



Special features

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

Booderee National Park protects most of the southern peninsula of Jervis Bay, the Bherwerre Peninsula, Bowen Island, and the waters and seabed in the southern part of the bay. Staff work cooperatively with the adjoining NSW Jervis Bay National Park and Jervis Bay Marine Park to protect much of the region's biodiversity. Intensive pest control, such as the fox control program, allows species such as the endangered eastern bristlebird (*Dasyornis brachypterus*) and shore nesting hooded plover (*Thinornis rubricollis*) to flourish in Booderee.

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

Location	Latitude 35° 09′ South, Longitude 150°39′ East	
Area	6,379 hectares (including a marine area of 875 hectares)	
Proclamation date	4 March 1992	
IUCN category	Category II	
Biogeographic context	Interim Biogeographic Regionalisation for Australia region: 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; 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	$6.800 million
	Capital	$0.903 million
	Revenue	$6.801 million
	Paid to traditional owners	$0.553 million
Visitors	450,000 (estimated)	
Permits	21 commercial tour operators, 12 research, 5 wedding celebrants	

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

Environment Protection and Biodiversity Conservation Act 1999		
Listed fauna	Species	1 critically endangered 6 endangered 14 vulnerable 25 migratory 59 marine
	Recovery plans	7 being implemented: humpback whale (*Megaptera novaeangliae*); southern right whale (*Eubalaena australis*); albatross (*Diomeda* spp. and *Thalassarche* spp.); Gould's petrel (*Pterodroma leucoptera*); giant petrels (*Macronectes* spp.); marine turtles; grey nurse shark (*Carcharias taurus*) 4 in preparation: grey-headed flying-fox (*Pteropus poliocephalus*); eastern bristlebird (*Dasyornis brachypterus*); green and golden bell frog (*Litoria aurea*); giant burrowing frog (*Heleioporus australiacus*)
Listed flora	Species	2 vulnerable
	Recovery plans	1 in preparation: magenta lilly-pilly (*Syzygium paniculatum*)
Heritage	On Commonwealth Heritage List (part of several listings)	

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

Management arrangements: Board of Management

The Booderee National Park Board of Management has 12 members, including seven representatives nominated by the Wreck Bay Aboriginal Community Council. A new board was appointed in 2009. Two replacement members were nominated by Wreck Bay Aboriginal Community Council in January 2011 and their appointment to the Board is progressing. 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.

Monitoring

A five-year study in partnership with the Australian National University (ANU), which documented the role of fire in determining species distribution and abundance, was completed in 2008 and results are progressively being published. A new partnership study with the ANU commenced in 2009, building on the data collected over the previous five years and looking in greater depth at the impacts of weeds and fire on native species. The published results of these studies indicate several important points. The first is that the 2003 Windermere wildfire generally had little impact on populations of native mammals, in contrast to a number of other studies of the impact of wildfire. The second is that bird diversity decreased at individual sites with the increasing number of fires a site had suffered. Thirdly, eastern bristlebird numbers recovered much more quickly after fire than studies at other sites have shown, probably due to the existence of small pockets of unburnt refuges and intensive fox control. The fourth is that after the 2003 fire it was noted that greater gliders (*Petauroides volans*) which had previously been common in the park were no longer being observed. It is unclear to what extent fire contributed to this apparent local extinction and will be the subject of future research.

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

Another study is examining the combined effects of fire, invasive bitou bush (*Chrysanthemoides monilifera*) and wallaby grazing on native plant regeneration. Monitoring results have confirmed that wallabies have a major suppressive effect on the number of plant species and the abundance of individual plant species, with bracken (*Pteridium esculentum*) tending to dominate the grazed blocks and bitou dominating the ungrazed blocks. The park participated in the construction of an ecological model (fuzzy logic) to examine a range of management options and their potential impacts on over-abundant grazers.

Comprehensive visitor surveys are conducted every two years. Key results from the January 2011 (peak visitation period) survey included 97 per cent satisfaction ratings (68 per cent very satisfied), 73 per cent definitely wanting to re-visit and 73 per cent also strongly recommending a visit to Booderee by others. Most positive comments related to beaches, interactions with wildlife and relaxing and enjoying time with family and friends in a natural setting while most negative comments related to people leaving rubbish, overcrowding, parking and noisy campers.

Monitoring compliance with the park's regulations continued, with a range of incidents reported including those related to the marine zoning scheme and catch limits.

Future challenges

Major challenges are:

- continuing to improve control measures for key threats to biodiversity including bitou bush and foxes
- increasing understanding of fire management and its effect on biodiversity outcomes
- maintain wildfire suppression response capabilities
- improving management of the park's marine estate and increasing marine research
- addressing the park's increasing isolation from adjacent natural areas due to development pressures in the region
- supporting the development of new Aboriginal business enterprises in the park
- identifying ways of replacing critical ageing assets
- completing and implementing the cultural heritage strategy
- completing and development implementation programs for the second management plan with clear identification of outcomes for the next ten years and effective ways to measure and report on their implementation
- developing a new training strategy to support joint management and staff development for the period 2011 to 2015
- progressing phase 2 Service Level Agreements and contracting opportunities with the Wreck Bay Aboriginal Community Council to an agreed timetable and with clear employment benefits
- implementing the Booderee National Park Climate Change Strategy 2010–2015.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

- Foxes continue to be the most significant feral pest in Booderee and bitou bush continues to be the most significant weed
- Monitoring indicates that 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
- Refine integrated control measures for bitou bush taking into account its declining density (fire, ground and aerial spraying) and monitor ecological impacts of these control measures
- Control the spread of kikuyu on Bowen Island and improve penguin nesting habitat
- Continue to implement an ecologically appropriate and visitor-safe fire management program and upgrade monitoring to cope with larger, more intense fires
- Develop 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
- 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
- Work 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 2010–11

- Conducted aerial spraying of remote infestations of bitou bush throughout the park in June 2011. Between 2004 and 2011 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
- Trialled a new technique for treating bitou, involving ultra-low volume ground spraying with splatter guns and spot aerial spraying followed by selective burning in autumn. Encouragingly the impact of this technique on high-value native vegetation communities was minimal compared to the previous technique of broad-scale aerial spraying and broad-scale fire block burning and made little call on resources
- Despite a wet year, again detected no green and golden bell frogs. This listed threatened species has not been detected in the park for six 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 population trends for eastern bristlebirds and most shorebird populations
- Progressively implemented (subject to resourcing) the Booderee National Park Climate Change Strategy 2010–2015
- Draft fire management program 2010–15 prepared for approval of the park Board later in 2011
- The greater glider has not been detected in the park for the last five years and discussions commenced with researchers on monitoring and a possible re-introduction plan for the species
- Continued to locate a suitable source population for proposed re-introduction of southern brown bandicoots and long-nosed potoroos. A proposal using animals from Victoria failed at the approval stage but negotiations are well underway with NSW State Forests regarding an alternative proposal
- Continued to negotiate with NSW agencies regarding securing the conservation future of the heritage estates area which lies in the 'neck' of the peninsula connecting the park to NSW
- Installed baited remote underwater video (BRUV) cameras to monitor fish populations within park waters and 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 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 2010–11

- Conducted over 150 cultural interpretation sessions for visiting school groups, special interest groups and as part of the spring, summer and autumn school holiday programs with over 3,000 attendees
- Incorporated broad cultural heritage directions into the draft second management plan. The cultural heritage strategy was held over for further consideration
- Included examples of south coast languages—Dhurga and Dharawal—into signage as part of the new Munjunga Dhugan (Eagles Nest) self-guided walking trail at Murrays Beach
- Continued the Junior Ranger program with Jervis Bay School, involving delivery of approximately 20 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. Park staff also assisted in the planning of a Junior Ranger 'cultural exchange' excursion to Alice Springs and Uluṟu-Kata Tjuṯa National Park, called 'Black Rock to Red Rock'

KRA3: Joint management and working with Indigenous communities

Major issues

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

Actions

- Continue to negotiate the second phase of Service Level Agreements for provision of agreed park services under the terms of the Services Contract between the Wreck Bay Aboriginal Community Council and the Director
- Implement an integrated training strategy agreed between the park and the Wreck Bay Aboriginal Community Council
- Prepare the second management plan

Performance results 2010–11

- Progressed the second round of outsourcing, including grounds maintenance and infrastructure maintenance services via finalisation of draft Service Level Agreements
- Continued to deliver a broad range of training to park staff and Wreck Bay Aboriginal Community Council members in accordance with the training strategy
- Completed an audit of the training strategy and commenced the development of a new draft training strategy for the period 2011 to 2015
- Supported six Year 10 indigenous students from the Wreck Bay Community in completing work experience in the park
- Became a host employer of Student Based Apprentices filled by three Wreck Bay Community Year 11 students
- Completed a draft second management plan which was released for public comment on 4 May 2011
- Wreck Bay Aboriginal Community Council (formerly Wreck Bay Enterprises Ltd) contractors undertook $1.87 million of works in the park
- Hosted Kokoda Track Authority management staff to assist and develop asset and track management practices (see case study page 20)
- Hosted Parks Victoria staff and Indigenous members of the Yorta Yorta and Bidwell nations regarding joint management arrangements in the park

KRA4: Use and appreciation of protected areas

Major issues

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

Actions

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

Performance results 2010–11

- Visitation stable at approximately 450,000 visits per annum. Work commenced on sourcing and implementing a new visitor monitoring (counting) system for the park
- Delivered 150 school holiday interpretation sessions, focusing on Aboriginal cultural values and conservation themes, with over 3,000 attendees. A further 65 interpretation sessions were delivered to primary schools, high schools, universities and special interest groups, with nearly 3,000 attendees in total
- In November 2010 the park won an International Responsible Tourism award for conservation of cultural heritage. This award generated much media and tourism industry interest in the park's joint management model and provided a platform for free promotional and marketing messages
- In November 2010 the park was runner-up in the NSW/ACT Regional Achievement and Community Events and Tourism Awards
- Held a two-day Visitor Experience Assessment (VEA) Workshop in November 2010 with representatives from the Wreck Bay Aboriginal Community Council and NSW conservation and tourism agencies. A report detailing recommendations for follow-up from the 14 VEA assessment criteria was produced and priority actions will be implemented as resources become available

- Continued to upgrade the park's website with news events and public announcements. Monitoring showed that camping information continued to be the most popular feature. An e-newsletter for visitors was published quarterly and regular BLOGs were posted on park website for more immediate park information and special interest stories. Podcast information was compiled for the first time and is designed for download from the park website to help enhance park experience when visiting key sites within the park
- Conducted a comprehensive visitor survey in January 2011 (peak visitation period) with very high satisfaction levels recorded
- Continued to upgrade visitor facilities including the Green Patch water mains, Murrays boat ramp, the botanic gardens walking trails and bridges, visitor information signs and roads, management trails and walking tracks and completed work on a number of campground barbecue shelters
- Opened a new self-guided walking trail at Murrays Beach which includes cultural and conservation information on 14 new signs. The new trail is called Munjunga Dhugan (Eagles Nest) and also introduces visitors to south coast Indigenous languages
- In June 2011 completed a new education kit for schools called the healthy learning program, aimed at Stage 3 students and including a series of lesson plans for teachers and worksheets for students to use when visiting Booderee. The education kit will be downloadable from the park website and hard copies will be made available from the visitor centre
- Recorded generally high levels of compliance with marine zoning scheme and catch limits but there continues to be a problem with a small number of fishers allegedly taking quantities of squid above the bag limit
- Installed five new information shelters at key visitor destination sites; new interpretative signage for these shelters remains in preparation
- Installed stepped outdoor seating at the botanic gardens top lawn area

KRA5: Stakeholders and partnerships

Major issues

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

Actions

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

Performance results 2010–11

- Continued cooperative arrangements with other agencies including the NSW National Parks and Wildlife Service, Jervis Bay Marine Park, NSW Fisheries and Department of Defence. The park continued to lead regional fox management
- Issued 12 research permits including 10 undergraduate conservation studies in accordance with the management plan, a permit to the Jervis Bay Marine Park as part of cooperative marine research and monitoring and a permit to conduct research into the wreck of the convict ship *Hive*. Cooperative undergraduate and postgraduate programs continued with the University of Canberra and the ANU
- Supported Wreck Bay youth/Vincentia High School's Students at Risk program through work experience and the commencement of three student based apprenticeships at the botanic gardens
- Continued support for volunteers working on natural resource management projects including Booderee parkcare (approx 750 hours) and Australian Trust for Conservation Volunteers (approx 320 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
- Sustaining the level of revenue from park fees
- Implementing the management plan
- Managing the budget to accommodate increased salary and contracting costs
- Supporting outsourcing to the Wreck Bay Aboriginal Community Council

Actions

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

Performance results 2010–11

- Commenced negotiation of a new Service Contract agreement with Wreck Bay Aboriginal Community Council
- Developed two new draft Service Level Agreements for infrastructure maintenance and horticultural maintenance services for consideration and pricing by Wreck Bay Aboriginal Community Council
- 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 second year of the program
- Helped establish and participated in the Parks Australia human resources and workforce development group
- Revenue generation from park use fees declined with an 8.6 per cent fall in camp fee revenue and a 5.9 per cent fall in entry fee revenue. The wettest year for over a decade contributed to this result however the months of December and February had record results for entry fee revenue and the months of January, March and April were record results for campground revenue. There remains a declining trend in purchase of annual entry permits which is to be addressed through a promotional campaign in 2011–12
- Compliance systems in the collection of entry and camping fees continued to improve, with particular emphasis on weekend compliance at the entry station
- Staff continued the roll-out of power and water conservation measures to reduce the park's carbon footprint

Case study: Booderee – helping PNG rangers safeguard the Kokoda Track

Booderee National Park has become a new training home for Papua New Guinea rangers from the Kokoda Track Authority.

As part of the Australian Government's $4.9 million Kokoda Track Safety Package, over the past year two groups of rangers left their highland villages to learn how Booderee provides a safe environment for trekkers.

It has been an emotional experience for Booderee staff — an opportunity to give something back to a people who fought side by side with Australians during bloody battles along the Kokoda Track in World War II.

"My dad was a fighter pilot in Papua New Guinea so I felt a real bond with these rangers, some of whom are direct descendents of the Fuzzy Wuzzy angels who helped so many Australians during the war," acting park manager Martin Fortescue says.

"Many other park staff also had family fighting in PNG. This is a way of keeping the memories of those friendships alive and continuing to help each other."

As an award winning tourism destination and a jointly managed park with a strong Indigenous ranger program, Booderee was an ideal place for the Kokoda rangers to learn new skills and share their cultural heritage. Both places embrace local Indigenous involvement as integral to their management.

"With hundreds of thousands of people now walking the Kokoda Track, safety is a growing concern," Martin says. "So too is maintaining the cultural integrity of the remote villagers who rarely saw white people a couple of decades ago.

"For some of the Kokoda rangers, this trip was the first time they had left their highland villages, so they got a real kick out of joining us for ocean surveys of shorebirds and seals."

Booderee staff and Wreck Bay Aboriginal Community members shared experiences in building and maintaining walking tracks, controlling soil erosion, managing visitors and campgrounds, monitoring native wildlife and joint management.

Minister for the Environment, Tony Burke also took time out from a family camping trip at Booderee to meet the PNG rangers.

Chair of the Kokoda Track Authority James Enge describes the program as "invaluable — with Booderee's joint management model a great example of how traditional owners can benefit from their lands".

Kokoda Track Authority communication officer Pauline Riman meets Australian National Botanic Gardens' ranger Rosella-Uwedo Hampshire. Pauline was one of several Papua New Guinea officers who spent time with Parks Australia staff at Booderee National Park and in Canberra as part of an exchange program to improve safety on the historic Kokoda Track. Photo: Parks Australia

Christmas Island National Park

www.environment.gov.au/parks/christmas

Special features

The Christmas Island landscape is a characteristic example of a relatively large oceanic island that has been tectonically uplifted, with a distinct series of stepped terraces (which few islands exhibit). There are few islands at similar latitudes with similar floral or faunal components or comparable landscape and marine ecological integrity although several of the island's species are threatened, particularly native reptiles. Christmas Island's remoteness, climate and the influence of land crabs have resulted in the development of distinct tropical rainforest ecosystems that support a number of endemic animal species and 20 endemic plant species. The island provides important habitat for seven endemic land bird species and eight species (and one endemic subspecies) of resident seabirds, including the last remaining nesting habitat of the endangered Abbott's booby (*Papasula abbotti*). The island has an extraordinary diversity and abundance of land crabs, with notable species being robber crabs (*Birgus latro*) and red crabs (*Gecarcoidea natalis*). Red crabs are the island's 'keystone' species as they influence the structure and species composition of the island's rainforests. Red crabs are renowned for their annual migration at the start of the wet season, when tens of millions of crabs migrate to the sea to spawn.

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

Location	Latitude 10°29′ South, Longitude 105°38′ East	
Area	8,719 hectares	
Proclamation dates	21 February 1980, 31 January 1986 and 20 December 1989	
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. The fourth plan is currently being prepared	
Other significant management documents	Christmas Island Mine-site to Forest Rehabilitation Memorandum of Understanding	
Financial	Operating	$4.493 million
	Capital	$0.075 million
	Revenue	$3.896 million
Visitors	Reliable estimates are not available	
Permits	11 research; 3 other activities	

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

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

Numbers of native species recorded					
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**	**Plants**
8[(a)]	95	9	622 species from 80 families	Over 2,000	213

(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 (CASAP) 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. The final report of the Expert Working Group was released in September 2010.

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

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

Monitoring

An island-wide survey is undertaken every two years to assess the effectiveness of the crazy ant control program, identify areas for future control and estimate relative changes in red crab burrow distribution and densities. The survey also provides distributional data on other native and exotic species. A survey was completed in August 2009 and a survey in 2011 has commenced (and will be completed in 2011).

Additional long-term monitoring sites and programs are also being established to help monitor ecosystem and species changes and threats.

Ongoing monitoring of native reptile abundance and distribution showed that native reptiles continued to decline. The reasons for these declines are not known but may be linked to disease and to exotic species, including centipedes and cats.

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

Future challenges

Major challenges are:

- developing, funding, coordinating and implementing island-wide landscape and ecosystem conservation approaches and programs, including through the regional recovery plan
- further progressing the island-wide eradication of cats, including assessing interactions with their prey species, particularly rats
- further progressing alternative control methods for crazy ants particularly indirect biological control research currently being undertaken
- working with relevant stakeholders to improve quarantine measures to reduce the likelihood of new invasive species entering the island and rapidly eradicating invasive species that may enter
- determining the reasons for the decline in terrestrial biodiversity, particularly reptiles, and implementing appropriate and feasible threat mitigation actions
- assessing the risks to species and habitats (such as ground-nesting seabirds, land birds and marine habitats) that may currently be secure but could be vulnerable to threatening processes such as invasive species
- developing a long term approach to implementing the Christmas Island Mine-site to Forest Rehabilitation Program, including maintaining and monitoring existing plantings
- establishing long-term control of major invasive weeds, including Siam weed which was first detected in 2010, threatening high value conservation assets
- contributing to the island's long-term sustainable future and economy through the development of nature-based tourism and of educational and scientific research opportunities, including maintaining and upgrading existing infrastructure and developing new infrastructure
- research and monitoring to better understand the island's marine environments including their values, threats and interactions between marine and terrestrial ecosystems and species.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

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

Actions

- Yellow crazy ants:
  - commence another island-wide survey
  - conduct an assessment of the off-target impacts of baiting with Fipronil
  - convene Crazy Ant Scientific Advisory Panel meetings
  - progress research into the indirect biological control of crazy ants
  - seek funding to continue crazy ant control for the next four years
- Rehabilitate and maintain former mine site areas, including significant weed control efforts on planted fields
- Control Siam weed and parthenium weed outbreaks
- Cat management including developing partnerships and collaborative approaches to commence the implementation of island-wide cat management
- Prepare a Christmas Island Regional Recovery Plan while continuing to implement actions from existing single species recovery plans
- Implement road management (road underpasses and fencing, stakeholder engagement) and community educational strategies to reduce vehicle impacts on red crabs (during their migration) and robber crabs
- Conduct reptile surveys and/or studies to better understand threatening processes and to inform recovery and reintroduction needs
- Establish a captive breeding program to secure populations of key threatened species
- Facilitate and support research projects, including seabird, robber crab and marine research

Performance results 2010–11

- Commenced the island-wide survey in May 2011 including the addition of scientifically rigorous sampling methodologies for additional species
- Maintained and expanded the on-island captive breeding program for native reptiles
- Contained the single known Siam weed outbreak and island-wide monitoring has not detected any other outbreaks
- Entered into a partnership with Taronga Zoo which resulted in the establishment of captive populations at Taronga Zoo of two native reptile species (see case study page 27)

- Commenced work to identify and manage potential threats to address the decline in native reptiles, including assessing the risks of disease via a contract with Taronga Zoo
- Continued crazy ant management including:
  - further progressed the three-year research project for the biological control of crazy ants, funded by the Director and conducted by La Trobe University
  - held one CASAP meeting
  - completed a study of the off-target impacts of Fipronil which indicated no off-target impacts
  - the Australian Government allocated $4 million over the next four years to continue crazy ant and other invasive species management programs
- Heavy rainfall in 2010 (second highest ever recorded at 3,500 mm and continuing into early 2011) severely hampered earthworks associated with rehabilitation of former mine sites, resulting in only less than one hectare of primary species being planted. Secondary and infill plantings across 18.4 hectares of fields planted in 2008–09 were carried out in early 2011 and weed control was given a greater focus, in response to the higher than normal weed loads arising from the extensive rains
- Continued preparation of the draft Christmas Island Regional Recovery Plan, incorporating ecosystem and species recovery actions
- Established a successful partnership and collaborative approach for island-wide cat management, resulting in the joint funding and supporting de-sexing programs for pet cats and the initiation of cat control in settled areas

KRA4: Use and appreciation of protected areas

Major issues

- Developing island-wide approaches to sustainable tourism development in conjunction with key stakeholders, that is consistent with protecting park values while providing visitors with opportunities for safe and high quality nature-based experiences
- Maintaining, upgrading and developing visitor infrastructure
- Providing educational materials and activities for the community and public

Actions

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

Performance results 2010–11

- Contributed to Christmas Island Tourism Association meetings, particularly on issues related to nature-based tourism opportunities
- Completed installation of new road and walking track directional signs
- Maintained unsurfaced roads and management tracks
- Produced interpretive brochures on Christmas Island species and a reptile watch poster
- Assisted film crews (Australian and international) and journalists publicising the island's biodiversity and conservation values
- Provided a range of school-based educational activities for Christmas Island District High School, visiting schools and the community including articles in the local paper and talks/tours of the park for visiting dignitaries

KRA5: Stakeholders and partnerships

Major issues

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

Actions

- Provide in-kind and field support for visiting scientists
- Liaise with stakeholders on conservation and park management issues particularly road maintenance, red crab and cat management
- Deliver educational and interpretive sessions for students, residents and selected visitors
- Liaise with the Department of Immigration and Citizenship on induction and education for staff and contractors working on Christmas Island
- Participate in island-wide forums including the Christmas Island Tourism Association Executive and the Christmas Island Emergency Management Committee

Performance results 2010–11

- Established an island-based stakeholder working group, which met three times, to assist with the preparation of the Christmas Island Regional Recovery Plan; consulted with the community and other stakeholders
- Supported visiting scientists and state government officers undertaking research projects including seabirds, land crabs and marine surveys
- Held educational sessions on park and conservation management for students from the Christmas Island District High School, island residents and visiting tour groups including bird-watching groups
- Worked effectively with stakeholders on key conservation programs:
  - development of a cat management partnership with the Shire of Christmas Island, Phosphate Resources Ltd and Australian Government agencies
  - fostered broad stakeholder and community support for road management activities aimed at protecting red crabs during migration periods

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 the preparation of the fourth management plan
- Manage Christmas Island and Pulu Keeling National Parks as one management entity

Performance results 2010–11

- Managed operational and capital budgets within approved parameters
- Largely completed preparation of the draft fourth management plan, to be released for public comment in 2011
- Increased Christmas Island National Park staff support for Pulu Keeling National Park including conducting an island-wide survey of weeds and crazy ant distribution, continuing preparation of a new Pulu Keeling management plan and providing administrative support

Case study: Saving species from extinction

Zoologist Mike Smith arrived on Christmas Island in November 2008, fresh from an academic career at Melbourne's Arthur Rylah Institute — and what was to prove an extremely useful post-doctorate, breeding frogs in the USA.

He found a park community grappling with the imminent extinction of the pipistrelle bat and quickly concluded that the island's reptiles were also in imminent risk of dying out.

Within weeks Mike and team members Brendan Tiernan and Dion Maple made some great discoveries. On the island's rugged far south- west tip, Mike found a Lister's gecko, thought to be extinct and Brendan discovered a coastal skink last seen in 2004. Dion found a Christmas Island blind snake on the western central plateau, another species not seen for decades

Inspired that all was not lost for Christmas Island's threatened ecosystems, Mike and his team began devising a captive breeding program for the nationally vulnerable Lister's gecko and dramatically declining blue-tailed skink. It was no mean task on a remote island with no scientific labs, no huge hardware store and where the ships bring supplies only every month or two if you're lucky.

With remarkable ingenuity, the team scrimped and scrounged and experimented. At the rundown old mine rail station — the 'Pink House'— they took over an old gazebo, stripping back panels to mimic the dappled light of a forest habitat, fencing against robber crab attack and building cages from abandoned steel. A camelback – a camping watering bladder – provided humidity and drinking water and when that failed, Brendan 'borrowed' drips from the medicos at the island's hospital. When the old recycled metal began to deteriorate, the team designed new perspex and aluminium cages, this time waiting for supplies from the mainland.

The geckoes were easy to spot by their eyeshine, and easy to catch. But the blue-tailed skinks are acrobats, jumping high in the air – so Mike designed a sticky wand which captured them at a touch, tails intact. A second-hand shipping container became a lab and another, an insect breeding site to provide food for the lizards.

The reptiles thrived – and bred. They expanded into an old carport and a bunkhouse – but as no-one could yet control the introduced wolf-snake and centipede thought to be causing their rapid decline in the wild, they could not be safely released.

Taronga Zoo accepted the scientific challenge of working collaboratively with Parks Australia to develop a detailed captive breeding and research plan. Dozens of lizards were placed in moist paperlined containers, packed in styrofoam meat boxes and netted to prevent their escape. In April and May the lizards were flown to the waiting quarantine keepers at Taronga Zoo.

Every lizard survived the long journey. All have lived – and they are now happily breeding in Sydney, a safeguard against on-island catastrophes and a population to be eventually released into their former habitat once current threats have been understood and overcome.

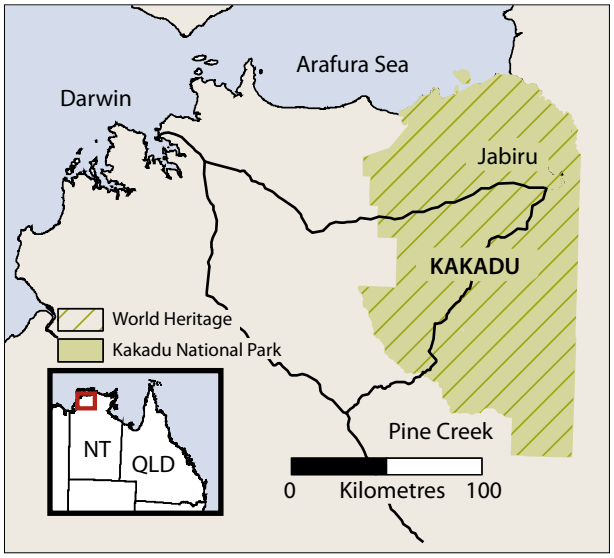
Back on island, not a day goes by without the remaining captive lizards being carefully fed and monitored – at the same time as this national park team controls crazy ants, manages robber crab road kill, undertakes island-wide surveys and monitors other endangered species.

Christmas Island National Park is working with Sydney's Taronga Zoo on a captive breeding program to save the island's reptiles. Left: Christmas Island's blue-tailed skink. Photo: Parks Australia. Right: Lister's Gecko. Photo: Parks Australia

Kakadu is working with the University of Sydney and Territory Wildlife Park on a cane toad trial in the East Alligator area. Quolls eat almost anything – the park is now trying to train them not to eat cane toads by feeding captive-bred quolls a small dead cane toad laced with a nausea-inducing chemical. We're hoping the toad-smart quolls will teach a next generation not to eat the toads. Photo: Bruce Thomson (Australian Wildlife Conservancy)

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	$17.913 million
	Capital	$11.511 million
	Revenue	$28.799 million
	Paid to traditional owners	$1.637 million
Visitors	175,423 visitors	
Permits	75 film and photography; 111 commercial tour operator (April 2010–March 2011 season) and 91 commercial tour operator (April 2011–March 2012 season); 20 research; 151 bushwalking; 383 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		
Listed fauna	Species	2 critically endangered 8 endangered 11 vulnerable 108 migratory 114 marine
	Recovery plans	6 being implemented: bare-rumped sheathtail bat (*Saccolaimus saccolaimus nudicluniatus*); golden bandicoot (*Isoodon auratus*) and golden-backed tree rat (*Mesembriomys macrurus*); northern quoll (*Dasyurus hallucatus*); Gouldian finch (*Erythrura gouldiae*); eastern partridge pigeon (*Geophaps smithii smithii*), crested shrike tit (*Falcunculus frontatus whitei*) and northern masked owl (*Tyto novaehollandiae kimberli);* marine turtles 6 in preparation: water mouse (*Xeromys myoides*); red goshawk (*Erythrotriorchis radiatus*); yellow chat (Alligators River Region) (*Epthianura crocea tunneyi*); freshwater sawfish (*Pristis microdon*); speartooth shark (*Glyphis glyphis*); northern rivers shark (*Glyphis garricki*)
Listed flora	Species	1 critically endangered 2 vulnerable
	Recovery plans	1 in preparation: multi-species boronia
Heritage	On National Heritage List	

Numbers of native species recorded					
Mammals	**Birds**	**Reptiles**	**Amphibians**	**Fish**	**Plants**
68	292	135	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 NT government. The Minister has approved the appointment of new board members for a five year term which commenced in April.

Monitoring

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

Park staff continued to work with Bininj to identify the park values that are threatened by feral animals and this work will be used in developing future feral animal control programs. On-going monitoring of sites of recent infestations of introduced invasive ants in Jabiru indicated that control work appears to have been successful as no new infestations were detected.

The monitoring of two inshore dolphin species was extended to the West Alligator River and the Wildman River which means that all the major river systems of the park have or are being surveyed for these species. 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 NT 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, has been extended for a further three years. All surveys involve park staff (including trainees and school-based apprentices), NT government staff, neighbouring Indigenous ranger groups and traditional owners from Arnhem Land.

Recent surveys targeted species such as white-throated grasswrens (*Amytornis woodwardi*) where 29 individuals were recorded in 25 search areas.

A project in collaboration with the University of Sydney and the Territory Wildlife Park to train northern quolls to avoid cane toads (*Rhinella marina*) as prey and investigate whether this behaviour is passed on to young quolls is in place. Trained quolls were released in the area surrounding the East Alligator Ranger Station and several subsequent trapping events produced promising results. A larger wild quoll population than was thought to exist in the area has also been detected as a result of this work.

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 fifth year, and continues to achieve positive results in preventing late dry season intense fires on the sensitive stone country. The program involves Bininj in bushwalking/burning activities and aims to establish an appropriate fire regime to protect sensitive biodiversity values and facilitate cultural activities on country.

Cultural heritage site monitoring and management continued, including visits to remote areas by Bininj and staff. Park staff also added to existing oral history recordings and development of a cultural heritage sites register, with the support and involvement of Bininj. Major oral history projects that were completed included a booklet on the traditional uses of the South Alligator floodplain, the life history of a significant traditional owner Butcher Knight and a comprehensive report and DVD on the Mudginberri abattoir.

Consultants from the Australian National University worked with Bininj and park staff to finalise a Cultural Heritage Strategy for the park. A cultural heritage workshop was held in May 2011 to facilitate finalisation of the strategy. An associated meeting of Elders was convened which discussed some of the more sensitive aspects of managing cultural material.

Future challenges

Major challenges are:

- ongoing implementation of management plan actions that support Indigenous business ventures and employment including capacity building, address caring for country challenges, support Kakadu's living cultural values and support its World Heritage values
- 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
- maximising ecological resilience to increase capacity as climate change manifests
- identifying the cause of small mammal decline and taking appropriate action
- controlling the spread of weeds and the impact of introduced animals
- developing systems and partnerships to make the best use of resources
- upgrading information management systems
- implementing the recommendations of the climate change strategy
- developing staff through formal and informal training programs
- ensuring visitor and staff safety.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

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

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 population modelling
- Monitor threatened species in biodiversity hot spots
- Continue to control serious pest plant species, 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 (GIS) technology in recording weed locations and weed data
- Continue to commission and support research that will improve management of the park's natural and cultural values

Performance results 2010–11

- Published the proceedings from the Feral Animal Workshop, the last in the 2008–09 symposia and workshop series on landscape change, with the assistance of the Environmental Research Institute of the Supervising Scientist
- Monitoring and control programs for invasive weed species including *Mimosa pigra* continued. Grassy weeds (mission grass and gamba grass) continue to be major challenges, as are aquatic weeds such as salvinia and hymenachne
- The collaborative project with the NT government monitoring threatened species in biodiversity hotspots was extended for a further three years
- 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 may be passed to their offspring
- The bushwalking burning program in the Arnhem Land Plateau undertaken as part of the Stone Country Fire Management Strategy continued to be successful in reducing the incidence of broad-scale late dry season fires as well as the engagement of traditional owners in the implementation of fire management in the park
- In collaboration with Bushfires NT and Warddeken Indigenous Protected Area which adjoins the park, in April 2011 developed and presented the Stone Country Ecological and Cultural training package to at least 20 people from the park and the IPA. The presentation was very successful and a program of delivering the package to other areas will be developed soon
- The collaborative project being undertaken with the NT government on two species of coastal dolphins, the Indo-Pacific humpback (*Sousa chinensis*) and Australian snubfin (*Orcaella heinsohni*), has been extended for a further 12 months to survey the West Alligator and Wildman rivers. The previous project concentrated on the East and South Alligator Rivers which now means that all the park's major river systems have been surveyed for these species

KRA2: Cultural heritage management

Major issues

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

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
- Seek opportunities to transfer knowledge between generations
- Ensure that Kakadu's living cultural status is recognised in tourism strategy development and decision-making
- Review the approach to protection and interpretation of historic heritage in the park

Performance results 2010–11

- Continued the review of recorded cultural material, storage of cultural objects, and cultural heritage databases in consultation with Bininj. The review will include development of protocols to ensure that these sensitive cultural resources can be accessed appropriately and in a user-friendly format
- Produced DVDs recording the views of Bininj on various management issues
- Produced a report on the life history of a significant traditional owner Butcher Knight; similar reports on other key people have commenced
- Completed report and DVDs on traditional uses of the South Alligator Floodplain
- Continued to transfer approved audio and video materials from the park for long-term storage and protection in accordance with the partnership agreement between the National Archives of Australia and the Director
- Held a two-day cultural heritage workshop in May 2011 which included discussions on how best to implement the Cultural Heritage Strategy
- Continued rock art management with the involvement of relevant Bininj
- Continued discussions with the Aboriginal Areas Protection Authority and Northern Land Council about a register of sites of significance and access protocols
- Commenced oral history projects recording the history of and preparing statements of significance for Anlarr (Nourlangie Camp), the old Jim Jim pub and Munmalary
- Completed development of Sickness Country protocols for the southern part of the park

KRA3: Joint management and working with Indigenous communities

Major issues

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

Actions

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

Performance results 2010–11

- Bininj staff continued certificate level studies, numeracy and workplace English language and literacy training
- Engaged Bininj in delivering interpretive and environmental programs
- Continued programs to re-engage young Aboriginal people in education and continued the Junior Ranger program with Jabiru and Gunbalanya area schools
- Continued skill development and training for Bininj staff via internal and external courses
- Consulted on wide-ranging park management issues with Bininj through the Northern Land Council
- Continued day-to-day joint decision-making by relevant Bininj and park staff
- Continued supporting a Northern Land Council Kakadu Officer position under contractual arrangements with the Northern Land Council
- Held regular meetings of the board
- Convened a training and workshop forum between the park and neighbouring Indigenous Protected Areas and other Indigenous managed areas
- Engaged Bininj as part of the Kakadu Indigenous Ranger Program, with 8.5 FTE positions filled for the entire year plus up to an additional 6 temporary positions at various times throughout the year

KRA4: Use and appreciation of protected areas

Major issues

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

Actions

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

Performance results 2010–11

- Continued to refine the Kakadu visitors' website to better match visitor expectations to experiences in the park and convey essential information to travellers
- Continued to update pre-visit and on-site visitor information to integrate the new brand
- Conducted quarterly visitor surveys to monitor satisfaction of visitors with their experience. Visitor satisfaction levels with the park averaged 91 per cent over the survey period
- 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
- Delivered a range of seasonal interpretive programs incorporating natural and cultural content
- Awarded to Inspiring Place Pty Ltd the tender to develop a park-wide walking strategy in consultation with relevant stakeholders
- Delivered essential orientation, safety and interpretive information to visitors prior to and upon arrival in Kakadu via Bowali Visitor Centre
- Implemented Park Pass sales via authorised agents and online
- Continued to provide detailed visitor information for use in tourism planning and resource allocation

KRA5: Stakeholders and partnerships

Major issues

- Continuing effective 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
- Establish and support links with managers of other World Heritage areas
- Build a strategic alliance with the West Arnhem College and Charles Darwin University to progress education to work programs
- Work with the Kakadu Research Advisory Committee to advise the board and the Director on research matters

Performance results 2010–11

- Continued the relationship between the Australian and NT governments, with joint funding and planning to advance tourism in the park
- Continued to work cooperatively with the Bushfires Council NT and other NT government agencies, West Arnhem Shire and the Northern Land Council
- Continued the Junior Ranger program as part of the Year 6 curriculum and implemented a Junior Ranger program at West Arnhem College
- Continued to engage with major tourism industry stakeholder group
- 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 new Kakadu Research Advisory Committee met in May 2011, where it was agreed that research proposals should address Bininj research priorities and facilitate Bininj participation and on-country visits

KRA6: Business management

Major issues

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

Actions

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

Performance results 2010–11

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

Case study: World Heritage for Koongarra – a traditional owner's battle

For more than two decades, Kakadu traditional owner Jeffrey Lee has refused to consent to uranium mining on his traditional lands of Koongarra, a 1,200 hectare site within the boundaries but never under the protection of Kakadu National Park.

Koongarra is a stunning woodland area overlooked by Nourlangie Rock, one of Kakadu's most popular visitor destinations with ancient rock art galleries, first settlement paintings and stunning views and walks. With burial sites and its own rock art, Koongarra faces east to Lightning Dreaming, home of the powerful creation ancestor Namarrgon or Lightning Man, who is responsible for the dramatic electrical storms on the Arnhem plateau.

Koongarra was excluded from the park boundaries in 1979 because of its potential uranium resources — and from later inclusion by UNESCO in the Kakadu World Heritage Area. A subsidiary of the French mining company Areva holds outstanding applications for exploration permits and mineral leases over the property — but under Aboriginal Lands Right law, has not been able to explore or mine without Aboriginal consent.

Jeffrey is the last surviving member of the Djok clan, the key traditional owners of Koongarra — although other clans have traditional responsibilities in the area.

Two years ago through the Northern Land Council, he and other traditional owners wrote to then Environment Minister Peter Garrett, saying they wanted the threat of mining removed forever by making Koongarra part of Kakadu National Park. The national newspaper, The Age, reported it as a generous offer — a gift casting aside possibly huge mining royalties and asking no compensation.

Jeffrey Lee's plea was answered in the 2010 election campaign, with a commitment by the Gillard Government to incorporate Koongarra into Kakadu — a commitment supported by the Coalition shadow minister and the Northern Territory Government.

Over the past year Jeffrey Lee has continued his fight with some frustration at the impediments he has had to overcome.

He has watched while the Government and the Director of National Parks have carefully afforded Areva natural justice while moving through the legal steps towards Koongarra's incorporation. The company has so far reserved its right for legal action to protect its interests.

So in June 2011, when the UNESCO World Heritage Committee was to consider including Koongarra as part of the Kakadu World Heritage area and Areva threatened legal action, Jeffrey took action again.

In a recorded video message he successfully petitioned Environment Minister Tony Burke to support his travel to Paris to put his story to the World Heritage Committee.

Environment Minister Tony Burke and Djok traditional owner Jeffrey Lee. Photo: Parks Australia

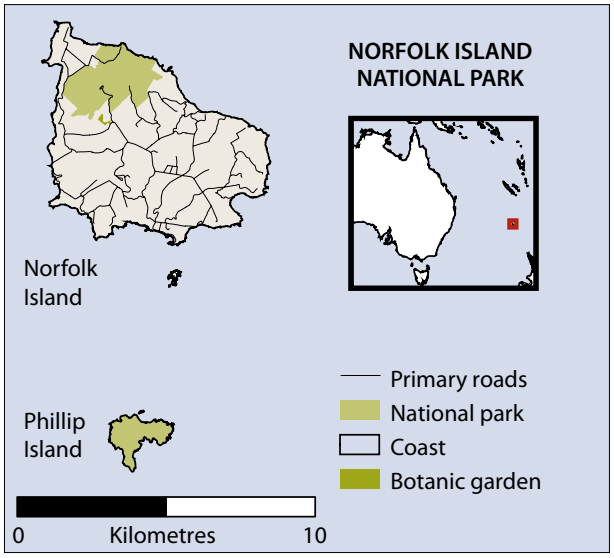
"I want to ensure that the traditional laws, customs, sites, bush tucker, trees, plants and water at Koongarra stay the same as when they were passed on to me by my father and great-grandfather," Jeff told the committee.

The World Heritage Committee included Koongarra in the Kakadu World Heritage Area.

Jeffrey's battle is not yet over. He is now working with the Government and the Northern Land Council on what he hopes are the final steps — the incorporation of Koongarra into Kakadu National Park, with all the protection the *Environmental Protection and Biodiversity Conservation Act 1999* offers.

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	$1.149 million
	Capital	$0.440 million
	Revenue	$1.011 million
Visitors	23,700 (estimated). Visitor survey indicates over 90 per cent of visitors to Norfolk Island visit the national park and/or botanic garden	
Permits	12 commercial tour operator; 3 commercial photography; 8 scientific research; 4 other activities; 1 collection for traditional use	

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

Environment Protection and Biodiversity Conservation Act 1999		
Listed fauna	Species	5 extinct 5 critically endangered 2 endangered 5 vulnerable 37 migratory 57 marine
	Recovery plans	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. Previous recovery plans for the Norfolk Island green parrot (*Cyanoramphus cookii*) and for the Norfolk Island golden whistler (*Pachycephala pectoralis xanthoprocta*) and Norfolk Island scarlet robin (*Petroica multicolor multicolor*) have been replaced by the regional threatened species recovery plan.
Listed flora	Species	15 critically endangered 16 endangered 15 vulnerable
	Recovery plans	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 Commonwealth Heritage List	

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

Management arrangements

The Norfolk Island community provides guidance to the Director on national park and botanic garden management through the Norfolk Island National Park Advisory Committee, which meets formally twice a year and informally as required. A new Norfolk Island National Park Advisory Committee with revised terms of reference and operating structure was appointed in August 2010.

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, but the distribution of the ants across the island continues to increase. For this reason, monthly surveys for Argentine ants are conducted at all visitor areas and around the periphery of the park, particularly focusing on areas near known infestations. At 30 June 2011, Argentine ants had not been detected in the park or botanic garden, although they have been detected in adjacent properties.

Rat populations are monitored as part of a park-wide rodent management program. Records are kept of bait taken and animals trapped. In addition, eight rat monitoring stations are set three times per year to provide an indication of rat activity. Monitoring results indicate that, although bait take has reduced in the past 12 months, it rose sharply in the previous two years. The number of rodents killed in snap traps also continues to rise. These results suggest the baiting program is only showing moderate success and rodents may have developed aversion to the previous bait regime. Racumin has been in use in the park for over 15 years and in May 2011 a new toxin; brodifacoum, was introduced to bait stations.

External researchers provided encouraging results of surveys for forest and seabirds during the year. For example, a 2010 forest bird survey indicated that the endemic Norfolk Island gerygone (*Gerygone modesta*) and slender-billed white-eye (*Zosterops tenuirostris*) and the threatened golden whistler and green parrot are present in higher numbers than previously estimated. As a consequence, their conservation status appears to be slightly more secure than previously assessed.

Research on Phillip Island indicated an increase in numbers of providence petrels (*Pterodroma solandri*), new breeding locations for threatened western Kermadec petrels (*Pterodroma neglecta neglecta*) and an increase in the number of nests of white-necked petrels (*Pterodroma cervicalis*). A fledgling flesh-footed shearwater (Ardenna carneipes) was also discovered, confirming this species now breeds on Phillip Island.

Monitoring of visitor satisfaction continued with a survey conducted over December 2010 and January 2011. Overall, the majority of visitors to the national park rated their visit as 'excellent' (53.7 per cent) or 'very good' (45.1 per cent). This represents a significant increase from the previous year (20 per cent and 42 per cent respectively). Similarly, 43.6 per cent of respondents rated their visit to the botanic garden as 'excellent' and the same percentage as 'very good' (37 per cent and 43 per cent respectively in the previous year).

It is unclear why visitor satisfaction has risen, though significant resources have been directed to improving visitor facilities including new brochures and signage, resurfaced walking tracks and enhanced facilities at the Captain Cook lookout. Park management has also increased the focus on vegetation management along tracks and in the more visible areas of the park to showcase Norfolk's natural environment (see case study page 43).

Future challenges

Major challenges are:

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

Report on performance by key result areas

KRA 1: 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
- Plan for the improved management of the forestry area to increase habitat for listed species
- Implement identified recovery actions for endangered species
- Continue vertebrate pest species management programs
- Increase research and survey work within the park and botanic garden

Performance results 2010–11

- Increased population estimates for forest birds – the endemic Norfolk Island gerygone and slender-billed white-eye and the threatened golden whistler and green parrot are present in higher numbers than previously estimated
- Increased estimation of abundance of seabird numbers on Phillip Island with several species showing evidence of increased nesting sites and higher numbers; breeding of flesh-footed shearwaters was also confirmed
- Completed weed control in 6.5 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 weed management activities on Phillip Island, effectively keeping the east end of the island relatively weed free and making a significant difference in weed cover in Long Valley
- Continued management of morning glory (*Ipomea cairica* and *I. indica*) in the botanic garden
- Completed a discussion paper on the future management of the forestry area and sought community input. The proposal includes consolidating the area of the park used for timber plantations, replacement of eucalypt plantations with native species, rehabilitating degraded areas and providing greater public access with new recreational opportunities. Negotiations are now underway with the Norfolk Island Government to come to an agreement on future management
- Trapped 13 cats within the park under the feral cat control program
- Rodents took approximately 714 kg of bait in the park and more than 329 rats and 15 mice were caught in traps
- Removed over 35 feral chickens from the park and botanic garden
- Actively supported 4 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
- Providing high quality interpretive signs and pamphlets
- 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

- Improve park entrances to provide a sense of entry into the park and garden
- Resurface walking tracks to reduce slipping hazard and improve amenity
- Redevelop the Captain Cook visitor area
- Redesign and replace interpretive signs and brochures
- Construct a professional and functional interpretation centre

Performance results 2010–11

- Modern sawn post and rail fences installed at all five park entrances and new welcome signs installed
- Resurfaced and maintained all walking tracks in the national park and botanic garden

- Constructed new toilet block, boardwalk, lookout and picnic facilities to improve the visitor area at Captain Cook monument
- Designed, produced and installed new interpretive signs, including plant identification, historic information, site information and other natural resource information
- Began construction of an interpretive centre in the botanic garden. Work is expected to be completed on the structure by the end of 2011, with fitout to occur in 2012
- 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
- Revitalising and redirecting operations of the Norfolk Island National Park Advisory Committee

Actions

- Meet regularly with tourism industry representatives
- Work with the teachers and students of Norfolk Island Central School as a way to engage the younger members of the community
- Coordinate twice-yearly meetings of the Norfolk Island National Park Advisory Committee as the formal mechanism for community input into park management

Performance results 2010–11

- Celebration of the 25th anniversary of the declaration of Norfolk Island National Park, coinciding with a postage stamp release recognising the park
- 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
- Gave talks to local groups and organisations about park activities
- Appointed a new Norfolk Island National Park Advisory Committee with revised terms of reference and operating structure

KRA6: Business management

Major issues

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

Actions

- Maintain park management services within budget
- Transition from contractors to staff as a more cost-effective and productive way of operating

Performance results 2010–11

- Managed operational and capital budgets within allowed parameters
- Improved tracking and compliance with permit conditions for commercial operators and contractors

Case study: Norfolk Island National Park – keeping our visitors satisfied—the information challenge

When Norfolk Island National Park Manager Coral Rowston left the mainland more than two years ago, she took with her a PhD in ecology and a background in natural resource management. Luckily for the island and its 20,000 or so annual visitors, she also has a passion for education and interpreting the natural world.

Voted this year as a 'woman of change' by a Norfolk Island Year 7 student, Coral's energy has paid off with visitors to the national park being overwhelmingly satisfied with their experience — with 98 per cent rating it as 'excellent' or 'very good' in a recent survey.

Coral has been a driving force in promoting Norfolk Island National Park and Botanic Garden as a major attraction for visitors to the island.

"Visitor surveys tell us that more than 90 per cent of people who travel to Norfolk Island spend at least some time in the park and garden," Coral says. "We also know that most of our visitors are aged between 50 and 69 years, are quite well educated, have a thirst for knowledge and want to know about the places they visit.

"To meet the needs of our visitors we've embarked on a major revamp of our communications with a swathe of new materials produced including brochures, track signs colour-coded to match a new walking track brochure, plant identification signs for the botanic garden as well as road and park entrance signs. Information panels cover features of the natural environment and the park's history.

"The feedback we're getting is really encouraging. Our last visitor survey showed an increase in satisfaction about the park — with 80 per cent of visitors rating the signage as either 'excellent' or 'very good' compared to 60 per cent in 2010", Coral says.

The national park is also using social networking to promote this natural tourism destination through facebook — with 400 friends already on board — mostly in the 35–40 years age group, a key target for tourism on the island.

To celebrate the park's 25th anniversary last January, Coral worked with Norfolk Island philatelic to bring out a commemorative stamp series featuring four endangered plants now on their way to recovery — the Norfolk Island abutilon, Phillip Island hibiscus, popwood and broad-leaved myrta. A great conservation success story!

A new interpretive centre, currently being built and due to be completed mid-2012, will also boost the quality and availability of information provided to visitors about the park's special environment and how it is managed for future generations to enjoy.

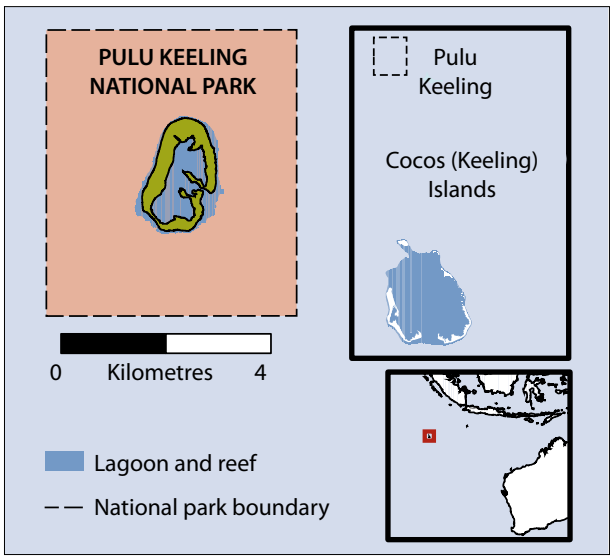
Norfolk's facebook page:
www.facebook.com/home.php?#!/pages/Norfolk-Island-National-Park-and-Botanic-Garden/352922925338)

Norfolk Island National Park turned 25 this year. To celebrate Norfolk Island philatelic released a stamp series featuring four endangered plants that are now on their way to recovery — Norfolk Island abutilon, Phillip Island hibiscus, popwood and broad-leaved myrta. Photo: Parks Australia

A hawksbill turtle tagged in Cocos waters back in 2003 was found this year in the Lindi district of Tanzania—representing an incredible journey of 6,100 kilometres. In fact it is the longest recorded migration for a hawksbill turtle and the first ever trans-Indian Ocean crossing reported for any sea turtle species. Photo: Parks 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 makes up the whole of North Keeling Island, is an internationally significant seabird rookery. The breeding colony of the dominant bird species—the red-footed booby (*Sula sula*)—is one of the largest in the world. The island is also the main habitat of the endangered Cocos buff-banded rail (*Gallirallus philippensis andrewsi*) found only on the Cocos (Keeling) Islands.

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

Location	Latitude 11°50′ South, Longitude 96°49′ East	
Area	2,602 hectares (including marine area extending 1.5 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. The third plan is currently being prepared	
Other significant management documents	Visitor access, boating, diving and fishing strategies; Management Plan Implementation Schedule; Risk Assessment and Management Schedule	
Financial	Operating	$0.511 million
	Capital	not applicable
	Revenue	$0.602 million
Visitors	23 visitors to Pulu Keeling National Park	
Permits	20 marine access; 1 commercial dive tour; 1 commercial photography; 1 scientific research	

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	2 being implemented: Cocos buff-banded rail (*Gallirallus philippensis andrewsi*); marine turtles 2 being partially implemented: blue whale (*Balaenoptera musculus*) and sei whale (*Balaenoptera borealis*); Round Island petrel (*Pterodroma arminjoniana*)
Listed flora	Species	None
Heritage	North Keeling Island on Commonwealth Heritage List	

Numbers of native species recorded			
Mammals	**Birds**	**Reptiles**	**Plants**
5 (marine)	24	6 (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. Unfavorable weather patterns and vessel unavailability to access the park resulted in no surveys carried out during the 2010 breeding season.

With a current estimate of 1,000 individuals, the buff-banded rail population remains stable in the park and staff continue to monitor the population. A project to investigate the establishment of a second viable population within the Cocos (Keeling) Islands group which began in 2008 continued. Funding has been allocated for rat control on one of the southern atolls which would be critical before a translocation program could be considered.

Systematic marine turtle monitoring has been maintained in the park over the last ten years. However, no detailed surveys were conducted during 2010–11.

Following an island-wide survey in 2009, data continue to show that invasive yellow crazy ants (*Anoplolepis gracilipes*) are fairly widespread with some sites recorded at supercolony density. A first round of survey was performed to detect the presence of scale insects and whether there are any honeydew producing mutualistic partners for yellow crazy ants at the park.

Future challenges

Major challenges are:

- preventing new introductions of and containing the impact of existing exotic pest species and diseases. Island fauna is especially vulnerable to the introduction of exotic species; outbreaks of scale insects and weeds, especially Siam weed (*Chromolaena odorata*) and die-back (*Phytophthera* spp.) on nearby Christmas Island and in Western Australia, may pose a threat to the park
- managing the current threatening exotic species coral berry (*Rivina humilis*) and yellow crazy ants
- 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 National Park
- ability to implement fieldwork and compliance programs, as regular access can be difficult to maintain.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

- Regular access to the park to perform routine tasks
- Illegal entry to the park
- Illegal wildlife harvesting
- Monitoring of the red-footed booby and buff-banded rail populations
- Monitoring and management of threatening exotic species
- Maintaining and monitoring the ecological character of the Ramsar listed wetland

Actions

- Maintain a workable arrangement with the service provider to provide boats for access to the park
- Maintain surveillance and boat patrols
- Survey bird numbers regularly
- Undertake an island-wide survey targeting exotic weed and pest species
- Develop a research and monitoring program plan to increase knowledge of park ecosystems and management of threatening processes

Performance results 2010–11

- Continued working with the community and with other stakeholders to detect incidents involving protected species
- The baseline data on the distribution and abundance of exotic species allow quantitative assessments of weed control work to be made. Approximately 11,200 m2 of area covered with weed (paw paw), which is equivalent to 19 per cent of its total estimated distribution, was treated
- Updated the park's map of main vegetation communities using GIS
- Undertook survey to detect scale insects as part of efforts to manage the threat of yellow crazy ants
- Completed a Ramsar site Ecological Character Description for the park
- Access difficulties to the park reduced the capacity to undertake some management duties

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 2010–11

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

KRA4: Use and appreciation of protected areas

Major issue

- Potential for park visitors to introduce exotic species

Actions

- Implement quarantine procedures
- Prevent introduction of exotic species

Performance results 2010–11

- Continued to inspect visitors' equipment, clothing and footwear prior to visitors swimming ashore and ensure that it is scrubbed. No evidence was found that new species have been introduced
- Educational activities with local students and community member performed

KRA5: Stakeholders and partnerships

Major issues

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

Actions

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

Performance results 2010–11

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

KRA6: Business management

Major issue

- Isolation limits access to business management support networks

Action

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

Performance results 2010–11

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

Park management — a community affair on the Cocos Islands

Pulu Keeling National Park — Australia's most remote and one of its smallest national parks — is also chief ranger Ismail Macrae's office.

Weather permitting, Ismail takes a boat across 24 kilometres of open ocean to work in his 'office', an isolated coral atoll some 1.2 square kilometres in size and a haven for seabirds which flock in their thousands to this environment which has never seen continuous occupation by people.

The national park is part of the Cocos Keeling Islands, Australia's most remote island territory lying over 2,900 kilometres north-west of Perth, a small speck in the vast Indian Ocean.

Ismail has called the Cocos (Keeling) Islands home for 26 years, ever since he returned with his island-born parents who had been working in North Borneo.

Looking after Pulu Keeling is the job of Ismail and his senior ranger, Trish Flores — with a key focus on invasive species such as weeds and yellow crazy ants.

It is also a community affair, consulting back on the main Cocos' islands with the 500 or so residents, many of them Cocos-Malay. Unlike most park rangers, Ismail and Trish spend much of their time off park, educating the local community about Pulu Keeling's ecological significance — its internationally-recognised seabird rookery. They see that raising awareness in the community about the fragility of the stunning environment around them, as an investment — creating passionate champions.

The community gets involved in looking after the Cocos' environment through initiatives such as school projects, junior rangers, care of injured birds and revegetation programs on the southern atolls.

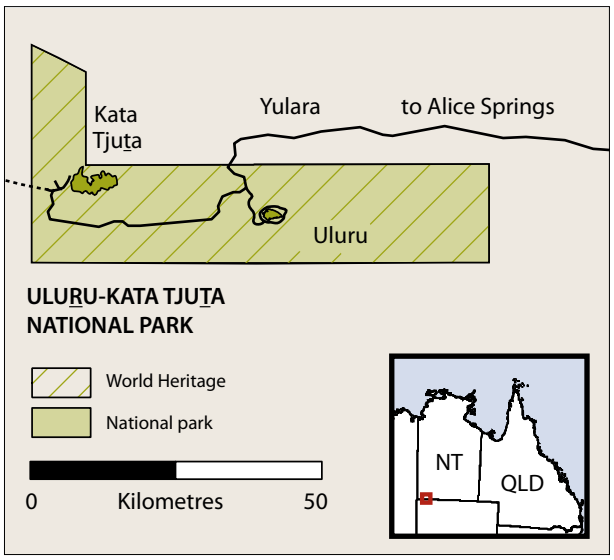
With the help of the community Ismail and Trish are revegetating small areas of the southern atolls with Pisonia trees — favoured nesting sites for seabirds. The community has helped to plant out 350 Pisonia cuttings that were propagated from trees on Pulu Keeling National Park — the only Cocos island which still has large and original stands of these trees.

Ismail Macrae. Photo: Parks Australia

Parliamentary Secretary for Sustainability, Environment, Water, Population and Communities Don Farrell and Chair of the Uluṟu–Kata Tjuṯa National Park Board of Management Harry Wilson symbolically exchange paintings during the 25th anniversary celebrations marking the handback of Uluṟu and Kata Tjuṯa to Aṉangu traditional owners. Photo: Grenville Turner

Uluṟu–Kata Tjuṯa National Park

www.environment.gov.au/parks/uluru



Special features

Uluṟu–Kata Tjuṯa 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 Uluṟu and Kata Tjuṯa and outstanding examples of arid zone flora and fauna.

Uluṟu–Kata Tjuṯa National Park is a place of great spiritual and cultural importance to Aṉangu (western desert Aboriginal people). For countless generations this ancient landscape has been influenced by the activities of Aṉangu 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 Aṉangu and Parks Australia.

Location	Latitude 25°15′ South, Longitude 130°43′ East	
Area	132,566 hectares	
Proclamation dates	24 May 1977, 28 October 1985	
IUCN category	Category II	
Biogeographic context	Interim Biogeographic Regionalisation for Australia region: 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 Uluṟu–Kata Tjuṯa Aboriginal Land Trust and the Director of National Parks; Visitor Infrastructure Master Plan; Uluṟu 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	$13.472 million
	Capital	$2.339 million
	Revenue	$14.044 million
	Paid to traditional owners	$1.708 million
Visitors	269,242 visitors (16 years and above) based on park tickets sold	
Permits	184 media permits; 95 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	6 extinct 2 endangered 3 vulnerable 16 migratory 36 marine (birds)
	Recovery plans	3 being implemented: mala or rufous hare wallaby (*Lagorchestes hirsutus*); tjakura or great desert skink (*Liopholis kintorei*); itjari-itjari or southern marsupial mole (*Notorcytes typhlops*) 2 in preparation: murjta or brush-tailed mulgara (*Dasycercus blythi*); waru or black-flanked rock-wallaby (*Petrogale lateralis*)
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 Uluru–Kata Tjuta 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

The fourteenth annual tjakura or great desert skink (*Liopholis kintorei*) survey took place in February–March 2011. Numbers of breeding burrows and burrows containing juveniles continues to increase.

The second spoor-based brush-tailed mulgara (*Dasycercus blythi*) survey occurred this year and continued to build on our understanding of mulgara habitat preferences across the park. Trapping surveys provided anecdotal evidence that areas of mature spinifex are important to this small marsupial carnivore. Further surveys will permit more robust conclusions about mulgara habitat requirements to be made. As a matter of caution, fire management of mulgara habitat areas is being adapted pending future results.

The seventeenth vertebrate survey of the park was undertaken in October–November 2010, the first in many years to be held during a year of consistent and above average rainfall. The most exciting discovery was confirmation of spoor of the common brushtail possum (*Trichosurus vulpecula*), thought to be extinct in the park previous to this survey. Additionally, reptile abundance was one of the best ever recorded with total captures two to three times higher than for most other surveys and with the second highest species diversity on record.

The park's rare flora survey was finalised this year with 14 out of 15 target species found within the park. These baseline surveys will be used to monitor the impact of management activities and climatic variation on the distribution and abundance of the species in the coming decades. Further monitoring and study is required for five of the target species including *Santalum acuminatum* and *Acacia ammobia* to gain a better understanding of recruitment strategies, fire sensitivities and suitable propagation techniques.

Monitoring for the striated grasswren (*Amytornis striatus*) conducted in September 2010 located five pairs of birds living in a small area of complex spinifex habitat in the south of the park. This is the largest number of the species recorded since initial surveys in 1992, however we are still unable to locate the birds in any other sites on the park

making this small habitat extremely important to the continued survival of the species. Research planned for 2011–12 will aim at quantifying the exact size of the species' habitat, the population size and the key habitat elements that have led to the bird's survival in this area of the park. Based on this knowledge, future management activities will be aimed at recreating this habitat on a larger scale to allow the population to expand.

The park's waterhole monitoring program continued throughout 2010–11 to quantify the health of the waterholes at the base of Uluṟu and gain an improved understanding of the cause of frog mortality at Muṯitjulu waterhole. Bacterial disease has been excluded as a cause, as has the most common viruses affecting amphibians. Additional monitoring in 2011–12 will focus on water chemistry and heavy metal concentrations. Monitoring of the invertebrate population on the Uluṟu summit also continued with the suspected discovery of a new sub-species of fairy shrimp (confirmation awaits the results of DNA analysis).

The park's remote camera-based monitoring program for euros (*Macropus robustus*) and feral animals also continued at the waterholes at the base of Uluṟu and at the Ayers Rock Resort sewerage treatment facility. A camera will also be installed in the near future on neighbouring Aboriginal land. This program continued to give important information on the activity and abundance of these species in the park and surrounding areas and on the impact of tourism and other human use at some of these areas. Track-based monitoring of the distribution and abundance of introduced predators continued in the sensitive borefields area of the park which is essential habitat for a number of endangered species. Rabbit burrow mapping also occurred in key target areas, enabling successful rabbit control to be carried out throughout the year.

The visitor survey conducted in December 2010 found domestic visitor satisfaction of 94 per cent and 89 per cent for international visitors. Vehicle counters also provided information on traffic movement across the park on the main roads.

Future challenges

Major challenges are:

- quantifying the abundance and distribution of the park's common brushtail possum population and instituting management actions to conserve the species
- controlling the increase in introduced predators expected following the above average rainfall experienced this year
- managing the impact of visitors on cultural sites particularly those with high visitation around Uluṟu
- managing visitor safety in the harsh environment, in particular for visitors who choose to climb Uluṟu
- retaining and developing staff in a remote area
- increasing Aṉangu engagement in park management
- managing the budgetary impact of decreasing visitor numbers
- maintaining a whole of government approach to ongoing service provision (municipal, essential and social and other services) to the Muṯitjulu 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 (fox, cat, camel, rabbit, feral dogs)
- Monitoring the status of threatened species and managing threatening processes
- Reintroducing locally extinct species
- Controlling erosion and repairing existing damage
- Using fire effectively as a habitat management tool
- Quantifying the impact of climate change on semi-arid ecosystems
- Ensuring that monitoring activities provide effective data on ecosystem health

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 next five years
- Implement the draft vertebrate pest strategy to control feral pests and their impacts on endangered species
- Continue the annual fire planning workshop to include all stakeholders in a regional approach to planning the seasonal burn program
- Continue to monitor the park's threatened species to improve understanding of these species and ensure management is effective and adaptive
- Maintain the pest-free enclosure
- Continue to develop a species reintroduction program
- Continue to propagate important species in the park's nursery and undertake revegetation programs in construction areas, sacred sites and locations where buffel grass has been successfully removed
- Continue the erosion control program
- Improve data and geographic information system (GIS) management

Performance results 2010–2011

- 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 and included continuation of the Conservation Volunteers Australia program around the base of Uluṟu and removal of buffel grass from roads and tracks throughout the rest of the park to reduce spread
- Finalised the Vertebrate Pest Management Strategy and worked with the board to gain direction for future camel control activities in the park
- Used GIS technology to map burns and the distribution of invasive weeds, feral animals and threatened species, resulting in efficiencies in planning and implementing management programs
- Mapped and assessed several rare flora species
- Conducted monthly vertebrate pest monitoring for cats, foxes and dogs in the borefields area of the park
- Mapped rabbit burrows across the park and treated over 400 burrows with the poisonous gas phostoxin to reduce population explosions after good rainfall received this year
- Conducted the annual mulgara, great desert skink and marsupial mole surveys
- Undertook the 17th vertebrate survey in October–November 2010, the first in many years to be held during a year of consistent and above average rainfall
- Confirmed the presence of the common brushtail possum which was previously thought extinct in the park; this species is of particular significance to Aṉangu and is a candidate for reintroduction
- Conducted sampling for invertebrates and water quality testing at Uluṟu waterholes

KRA2: Cultural heritage management

Major issues

- Supporting the continuation of Aṉangu living culture and knowledge
- Protecting historic and Aṉangu 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 Uluṟu

- Maintain the Cultural Sites Management System database as an information repository, planning and reporting tool
- Support Anangu participation in the annual Women's Law and Culture meeting
- Support and promote the use of traditional knowledge and skills in all areas of park management and especially in fire management
- Facilitate and support the transfer of knowledge between Anangu generations

Performance results 2010–2011

- Began a successful program aimed at increasing the number of women engaged in cultural work throughout the park. Work includes revegetation of sacred sites, tool and medicine making and public interpretation activities
- Held two Cultural Heritage and Scientific Consultative Committee meetings to provide advice to the board on natural and cultural heritage issues
- Applied for a grant from the Australian Institute of Aboriginal and Torres Strait Islander Studies to fund archaeological survey work throughout the park, in partnership with archaeologists from the University of Queensland
- Continued cultural site patrols and added the resulting data to the Cultural Site Management System
- Through meetings of the Joint Management Partnership Team, facilitated Anangu Board members' involvement in the World Heritage Periodic Report and the review of the retrospective Statement of Outstanding Universal Value
- Undertook an overnight cultural trip with Anangu and park staff to the community of Lila to assist in the preparations for the 25th Anniversary of Handback
- Facilitated the transfer of knowledge through *inma* (ceremony) performances at the 25th Anniversary of Handback celebrations

KRA3: Joint management and working with Indigenous communities

Major issues

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

Actions

- Maintain productive working relationships with joint management partners
- Work with the Central Land Council (CLC) 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 Mutitjulu Community Rangers program to increase levels of Anangu engagement in park management activity
- Continue to develop the Junior Ranger program in consultation with the Mutitjulu school and Anangu

Performance results 2010–2011

- 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 workplace development coordinators first engaged in 2010
- Employed two additional Anangu trainees in specified trainee ranger roles

- Developed a literacy and numeracy program which is attended weekly by Ananangu trainees and Mutitjulu Community Rangers program participants
- Established accredited programs of study in Conservation and Land Management for all Ananangu trainees and selected Mutitjulu Community Rangers program participants
- Jointly recruited and employed the Community Liaison Officer position with the Mutitjulu Community Aboriginal Corporation representatives and the CLC Joint Management Officer
- Formally entered into a contract with the CLC for the employment of the CLC Joint Management Officer
- Continued to support the agreement between the Mutitjulu Community Aboriginal Corporation and the park in employing Ananangu, including acknowledging and recompensing senior Ananangu for their traditional knowledge and skills
- Ananangu participation in flexible employment through the Mutitjulu Community Rangers program has remained high with a number of *wati* (men) and *kunga* (women) regularly engaged in park activities
- Developed a regional cross cultural appreciation program which can be delivered by Ananangu for new park staff and other regional stakeholders
- Supported the attendance of Ananangu staff and the park's workforce development coordinators at the department's Indigenous Employees Conference in early 2011
- Through the Mutitjulu Community Rangers program, increased Ananangu participation in cultural interpretation presentations at the cultural centre, with presentations now delivered twice weekly
- Undertook Junior Ranger activities to facilitate intergenerational transfer of knowledge
- Engaged Pitjantjatjara interpreters for board, consultative committee and other meetings to improve communication with traditional owners and community members
- Worked with Mutitjulu Community and board members to facilitate the 25th Anniversary of Handback celebrations held at the park on 25 October 2010

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 a number of 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 visitors on the park 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

Performance results 2010–2011

- Conducted visitor surveys in December 2010. An average 94 per cent of domestic respondents and 89 per cent of international respondents were satisfied overall with their visit
- Facilitated VIP visits to the park for international parliamentarians and other guests, in particular the visit of Oprah Winfrey in December 2010
- Successfully introduced the Uluṟu-Kata Tjuṯa Knowledge for Tour Guides program on 1 April 2011; currently 636 guides are enrolled in the course
- Undertook one rescue of a visitor on Uluṟu and responded to a further 21 emergency alarm activations
- Issued 184 media permits for the park
- Issued 95 tour operator permits
- Facilitated successful marketing campaign between Tourism Australia, Tourism NT and the park with VIP visits
- Implemented the Cultural Centre Tenants group meetings
- Progressed consultation and planning for upgrading the Cultural Centre for future use and interpretation
- Maintained the park's rock rescue, emergency response, first aid and fire suppression capabilities
- Celebrated the 25th Anniversary of Handback of title to the park to traditional owners with a cultural festival and concert at Talinguṟu Nyakunytjaku (see case study at page 60)
- Delivered free interpretive events to visitors including the daily ranger-guided Mala Walk at Uluṟu
- 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
- Facilitated a visit of Aṉangu members of the board and the Tourism Consultative Committee to meet with members of the Red Centre National Landscapes Steering Committee in Alice Springs
- Facilitated a discovery tour for Aṉangu board members and Tourism Consultative Committee members to visit tourist sites and venues along the Red Centre way and to learn from other Indigenous tourism business owners about starting a business
- Consulted tourism stakeholders about developing an online ticket system for the park
- In consultation with Aṉangu continued design and development of new interpretive signage for the park
- Continued development of event policies and guidelines to facilitate new and innovative events in the park
- Under the new plan of management, the first event was held in the park at Muṯitjulu Waterhole in December 2010
- Graphic design and construction of the 291 new interpretative signs for the park are in the final stages of completion

KRA5: Stakeholders and partnerships

Major issues

- Providing opportunities for new Indigenous business enterprises
- Maintaining an effective working relationship with the Muṯitjulu Community
- Developing and maintaining good relationships between the park and the new owners of the Ayers Rock Resort (Indigenous Land Corporation)
- Maintaining an ongoing partnership with the tourism industry
- Maintaining good relationships with regional training, education and employment stakeholders
- Engaging with Northern Territory and Australian government agencies working with the Muṯitjulu Community

Actions

- Hold meetings of the board's consultative committees
- Participate in building relationships with new resort owners, the Indigenous Land Corporation
- Communicate clearly with all parties about developments in the park and the Mutitjulu Community and report on progress to stakeholders
- Establish a Cultural Centre tenants group to agree on future direction for the cultural centre
- Meet regularly with local stakeholder groups
- Continue supporting volunteer and community groups in protecting park values

Performance results 2010–2011

- Held four meetings of each of the Tourism Consultative Committee and the Film and Photography Consultative Committee and two meetings of the Cultural Heritage and Scientific Consultative Committee
- Facilitated a visit by Parks Canada for industry stakeholders on developing the visitor experience and an audit of the destination
- Led the development of an Anangu literacy and numeracy development program in collaboration with Anangu Jobs and the Nyangatjatjara College
- Established 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
- Attended meetings with and provided briefings for the new owners of Ayres Rock Resort, the Indigenous Land Corporation
- 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 based at the Community
- Participated in Yulara Counter Disaster Committee meetings
- Held tourism stakeholder meetings to seek feedback on online ticketing and other issues
- Formed the Uluru Regional Employment Group to ensure a regional approach to training and employment of Indigenous job seekers
- Produced quarterly e-newsletters to communicate park news and activities to stakeholders
- Approved several applications for renovations to infrastructure within Mutitjulu Community

KRA6: Business management

Major issues

- Implementing the fifth plan of management
- 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 the Housing, Training, and Occupational Health and Safety committees are functional and meet regularly
- Develop the park's Intergenerational Training and Employment Strategy
- 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

Performance results 2010–2011

- Commenced implementation of the fifth management plan
- Continued to develop the staff cultural awareness package
- Staff, Anangu and Mutitjulu Community members attended numerous training events, ranging from informal information sessions to accredited training
- Two staff members received assistance under the department's Study Support Scheme
- 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 2011–12
- Delivered certificate level training in frontline management to a number of the park's middle management staff
- Held regular meetings of the Occupational Health and Safety Committee and the new Training and Employment Committee
- Staff provided with resilience and wellbeing training specifically developed for staff living in remote areas
- Continued deeds of standing offer or contracts for sewerage and septic systems, cleaning, air conditioner maintenance, fleet servicing and fire detection
- Senior park staff attended science and Parks Australia forums
- Negotiated with the NT government and Australian government agencies, a tripartite agreement and funding for a review of essential services for Mutitjulu Community and commenced contract for the review

Case study: Uluṟu–Kata Tjuṯa National Park – a turning point for tourism

***Tjukurpa munu manta kuṉpungku kanyintjaku* | Keeping culture and country strong together**
Theme of the 25th anniversary of handback celebrations in October 2010.

Watching the sun come up over Uluṟu on the morning of the handback celebrations gave its board members, past and present, a chance to reflect on the history and future directions of the park.

The handback celebrations provided Aṉangu with the opportunity to come together with local businesses and visitors to celebrate this momentous occasion.

Board chair Harry Wilson said the festival offered an opportunity for Aṉangu to teach visitors about *Tjukurpa* (law) so they could better understand Aṉangu culture and help protect the country and its people. Hundreds of people attended on the day, watching *inma* (traditional song and dance), local artists and craftsmen at work and dancing to contemporary Aboriginal bands from the Northern Territory.

The celebration was one of many steps Aṉangu and park staff took this year to promote Uluṟu-Kata Tjuṯa as a living cultural landscape and support Aṉangu businesses.

Over the years many people have visited and enjoyed Uluṟu and Kata Tjuṯa. Many have also gone away learning only a little about the cultural importance of the park, about *Tjukurpa* and Aṉangu connection to the land.

This year the park is addressing this challenge through its Tourism Directions: Stage 1 strategy, released in September. The strategy provides a renewed focus on building partnerships between Aṉangu, government and industry to develop and maintain tourism opportunities.

Harry said that Aṉangu had many ideas for potential tourism developments and were keen to see tourism outcomes for Aṉangu.

"We've been thinking about developing tourism businesses so that in future our children and our children's children will be working. We need more jobs here. Working with key stakeholders to help get business off the ground is really important," he said.

Aṉangu took advantage of one such opportunity to promote their culture and businesses to an international audience when American superstar Oprah Winfrey announced she would visit the park in December.

Aṉangu elder Judy Trigger presented Oprah with a beautiful, handmade *ininti* (red bean) necklace and guided Oprah on one of the many cultural walks at the park.

"Oprah was excited to learn about our culture through the walks and talks we took her on. She was quick to learn that we don't climb Uluṟu and happy to respect this request from Aṉangu. It is a very important message for all visitors to the park," Judy said.

Oprah described her visit to the rock as 'awesome' and said she planned to return.

"Me being here is a way of paying respects to the Aboriginal people and showing respect for the land and their culture and all that this rock means to them and the continent and to the world," she said.

Oprah spent time with Aṉangu during her visit to Uluṟu–Kata Tjuṯa National Park. Photo: SDP Media

The Tourism Directions strategy is also focused on another major source of employment in the region – Ayers Rock Resort at Yulara.

The Indigenous Land Corporation's $300 million purchase of the resort this year could create historic Indigenous employment training opportunities.

Harry Wilson said the Uluṟu-Kata Tjuṯa Board of Management was keen to develop a memorandum of understanding for how the board would work together with the resort.

"We're looking forward to seeing what ideas and projects can be developed that will complement activities at the park and the resort," Harry said.

"The memorandum of understanding is an opportunity to work with the resort to achieve outcomes that we are all interested in, including promoting Aṉangu culture appropriately to visitors and building opportunities for Aṉangu to be employed in a range of different jobs at the park and the resort."

Inspiration is coming from many directions. Aṉangu members of the board of management and the Uluṟu-Kata Tjuṯa Tourism Consultative Committee went on a road trip to Alice Springs where they experienced first-hand some of the wonderful Indigenous tourism experiences on offer in the Red Centre.

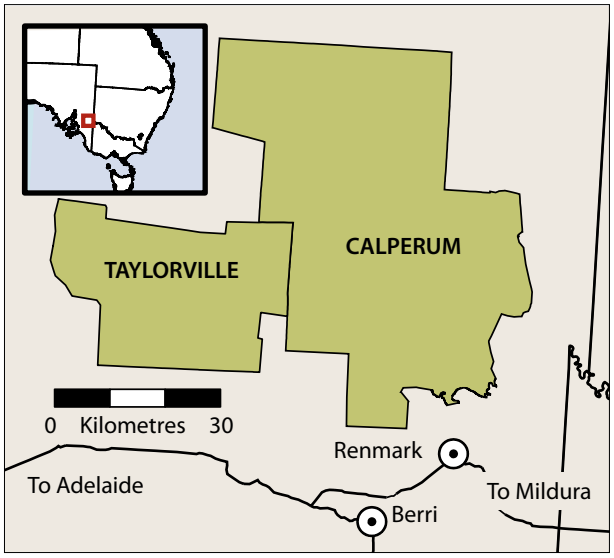
The park's events manager Nick Ambrose said that Aṉangu came away with loads of ideas and were very excited by what they had seen and heard. The group also met the Red Centre National Landscape Steering Committee at the Alice Springs Desert Park and took the opportunity to provide the meeting with feedback from the trip.

A follow up meeting at Muṯitjulu is now being organised to discuss the next steps forward.

Aṉangu elder Judy Trigger presented Oprah with a necklace made from ininti (red bean) when Oprah visited Uluṟu–Kata Tjuṯa National Park. Photo: SDP Media

Calperum and Taylorville Stations

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



Special features

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

Calperum and Taylorville are important locally, nationally and internationally because of their intact mallee vegetation, the presence of several threatened bird species, and their wetlands and related species. The properties form critical habitat for the endangered black-eared miner (*Manorina melanotis*). They are also important for the conservation of the nationally vulnerable malleefowl (*Leipoa ocellata*), the regionally vulnerable bush stone-curlew (*Burhinus grallarius*) and the nationally vulnerable southern bell frog (*Litoria ramiformis*). The 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 documents	Management contract with Austland Services Pty Ltd; Biosphere Reserves Seville Strategy and statutory framework	
Financial	Operating *	$0.528 million
	Capital	$0.008 million
	Revenue	$0.102 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	2 being implemented: malleefowl (*Leipoa ocellata*); black-eared miner (*Manorina melanotis*)
Listed flora	Species	None
Heritage	On Commonwealth Heritage List	
Other	Taylorville and most of Calperum listed as critical habitat for black-eared miner	

Numbers of native species recorded					
Mammals	**Birds**	**Reptiles**	**Amphibians**	**Fish**	**Plants**
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, additional black-eared miner surveys to locate new colonies and vegetation surveys.

Rainfall on both properties was well above the long-term average in 2010–11, with some exceptional monthly totals (frequently in excess of 100 mm) being recorded in the period from August 2010 though to March 2011. 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 have indicated that widespread increases in associated faunal populations also occurred. Among the fauna populations, these increases have been most obvious among insect and bird populations. Populations of species of migratory woodswallows were substantially higher across the properties compared to past years, with estimates of a total population in excess of 100,000 birds. Notable observations during the 2010 spring/summer small vertebrate surveys included high reptile species diversity, enhanced numbers of small mammals in mallee sites and new records for three reptiles and one mammal.

Generally high rainfall within the Murray Darling Basin also generated sustained high water levels in the waterways and wetlands of Calperum, with 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 for the first time since 1995 and produced at least three broods.

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.

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.

Report on performance by key result areas

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 2010–11

- Continued regular feral animal control programs, including laying over 3,000 fox baits and 50 km of rabbit control bait trail and ripping over 400 rabbit warrens. Feral goat and feral pig control programs were intensified to respond 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 and Natural Resources
- Supported regional efforts to control locust outbreaks within the region, through temporary placement of trainees with state government control teams
- Continued and enhanced a diverse program of biological monitoring including broadscale small vertebrate surveys, threatened species monitoring, floodplain tree health surveys, vegetation photopoint surveys, and aquatic and terrestrial wetland/floodplain species assessments
- 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 four postgraduate research projects on mallee woodland carbon cycles, freshwater ecology, bird population genetics 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, including grading of 255 km of fire control tracks
- Hosted training exercises by local Country Fire Service units
- Actively supported threatened species recovery programs for the black-eared miner and malleefowl through biological surveys, predator control and fire management
- 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
- Collaborated with the SA Department of Environment and Natural Resources in the development of a bird monitoring program for areas of neighbouring Chowilla Station
- Continued major restoration projects to restore the vegetation of floodplain and adjacent semi-arid woodland on Calperum
- Completed a paper outlining ecological factors and practical management issues to provide a rigorous guide to planning and implementation of restoration projects in Calperum's semi-arid woodland environments; a similar paper focussed on floodplain communities was also commissioned
- Continued monitoring floodplain groundwater through a network of over 70 groundwater test wells
- Partnered in the finalisation of the Riverland Ramsar Site Management Plan 2010–15
- Supported a range of activities associated with the notification of a change in ecological character under Article 3.2 of the Ramsar Convention
- Actively participated in the drafting of the Lock 1 to SA Border Water Delivery Plan as part of the Australian Government's Lower Murray Environmental Water Use Options project
- Secured funding from the Foundation for National Parks and Wildlife and the SA Department of Environment and Natural Resources for two additional dam/water point decommissioning projects
- Secured environmental water allocations for filling Lake Merreti and Lake Woolpolool, and conducted enhanced monitoring to document the impact of the lakes' filling
- 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 2010–11

- 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
- A second group of full-time trainees under the Aboriginal Learning on Country: Calperum project graduated. This major project develops natural resource and cultural heritage management skills in the region's Aboriginal population and is run in collaboration with state, Australian Government and private partners. In 2010 the program was expanded, with a new intake of five trainees and a team leader
- 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 and encouraged visits by regional Aboriginal elders to promote engagement in cultural heritage management
- Conducted study tour to Mungo National Park, with emphasis on joint management, and cultural tourism issues
- Hosted 3-day workshop on 'Discovering the Cultural History of the Riverland', including training on recording and registering significant sites
- Conducted occasional guided tours through more remote areas of Calperum, including cultural heritage sites, for members of the general public
- Supported SA Aboriginal Heritage Branch officers in on-ground works to preserve a regional heritage site
- Sent delegates to the National Indigenous Land and Sea Management Conference

KRA4: Use and appreciation of protected areas

Major issues

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

Actions

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

Performance results 2010–11

- Continued to redevelop and enhance volunteer and visitor accommodation.
- Provided more than 2,700 bed-nights of accommodation to volunteers, students and visitors to Calperum
- Continued to upgrade interpretive signs and materials
- Continued occasional 'tag-along' tours to provide the public with safe access to the remote mallee woodland areas of Calperum
- Continued to support the development of sustainable ecotourism in the region through the Riverland Ecotourism Association and Riverland Tourism Association
- Participated in the development of a new Regional Tourism Growth Plan by the SA Tourism Commission
- 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
- Continued field trips for students in Year 8 and Year 9 Renmark High School Science and Society and Environment courses
- Supported professional development days for teachers of environment-related subjects
- Continued to provide a Vocational Education and Training program for senior secondary students studying for Certificate 1 and 2 units in Conservation and Land Management
- Hosted three groups of North American tertiary students under the International Student Volunteers program
- Hosted numerous field trips and camps for TAFE SA, university and non-government groups studying biology, ecology and environmental management
- 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

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

Performance results 2010–11

- Continued to promote Calperum and the McCormick Centre as places available for research and monitoring, education, skill-sharing and public recreation. Encouraged volunteers to foster these objectives at all suitable opportunities
- Continued to provide various forms of support and to encourage existing and potential volunteers, and maintained a database to record and analyse volunteer contributions to management of the properties
- Two long-standing volunteers each passed the 3,000 hours mark for accumulated activity
- Continued to use the McCormick Centre to disseminate information on the Man and the Biosphere Programme
- Initiated a series on monthly public lectures on natural resource management topics at the McCormick Centre
- 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 under Rotary's Preserve Planet Earth program

KRA6: Business management

Major issues

- Property maintenance
- Business management
- Environmentally sustainable management

Actions

- Maintain infrastructure
- Manage the two properties professionally and accountably

Performance results 2010–11

- Upgraded infrastructure to support expanded in-house production of seed and tube-stock for use in revegetation projects
- Upgraded equipment storage facilities
- Maintained existing equipment, buildings, fencing, tracks and other infrastructure
- Constructed new, multi-bay vehicle parking shelter
- Continued enhancement of mallee evacuation points and forward fire-fighting bases
- Continued to maintain and develop visitor accommodation and related infrastructure
- Further upgraded computing and communications infrastructure
- Maintained a recycling program

A guided beach walk in Pulu Keeling National Park—one of Australia's smallest and most remote national parks, a tiny speck in the vast Indian Ocean about 2,000 north-west of Perth. Photo: Parks Australia

2 Marine reserves summaries for 2010–11

Marine bioregional planning

South-east Commonwealth Marine Reserve Network

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

South-west Marine Region

Great Australian Bight Marine Park (Commonwealth Waters)

North-west Marine Region

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

East Marine Region

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

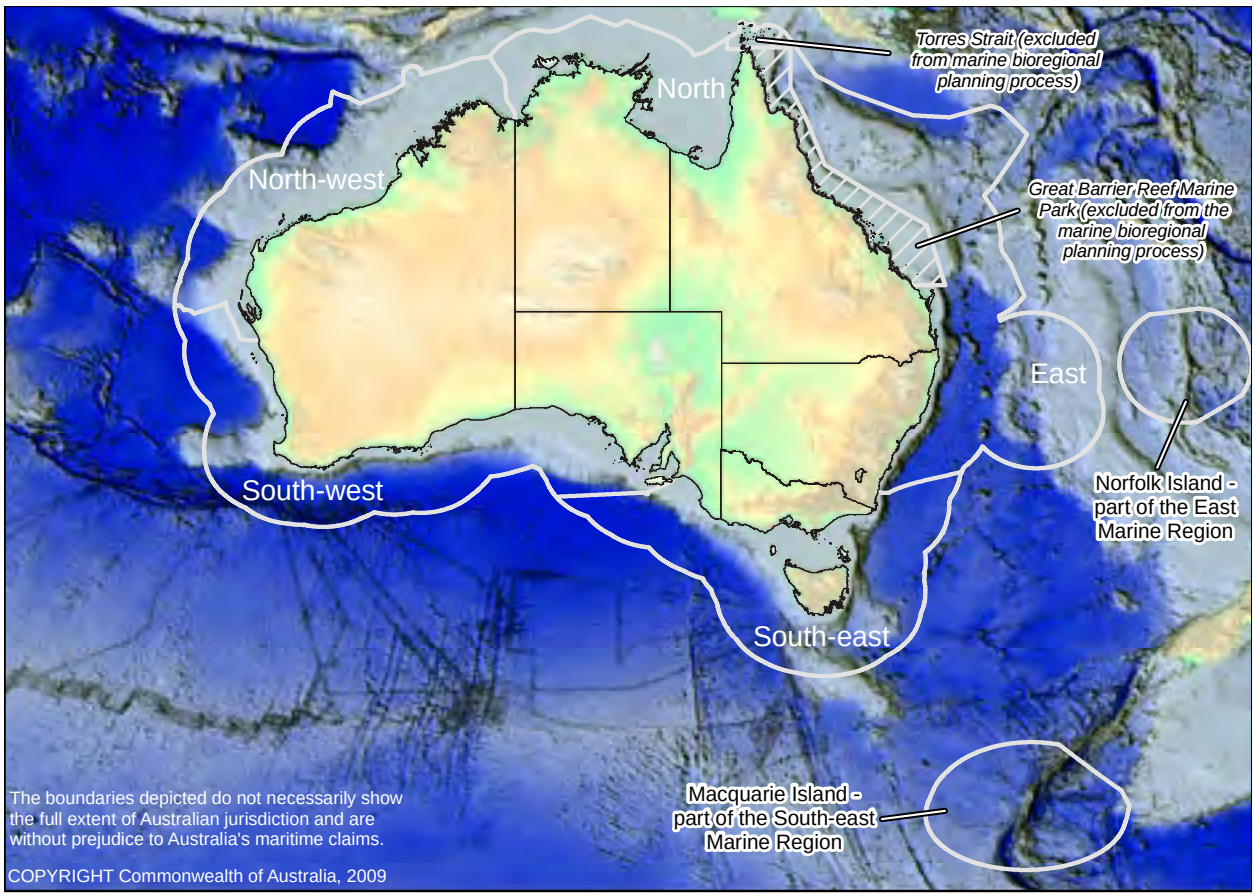
North Marine Region

Heard Island and McDonald Islands Marine Reserve

Marine bioregional planning

www.environment.gov.au/coasts/mbp

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



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

Marine bioregional plans are developed in three stages: first is a profile of the region's characteristics; second, a draft plan; and finally a marine bioregional plan and a proposed network of representative marine protected areas. Marine protected areas must be declared under the EPBC Act. Once these are declared, activities within marine protected areas are regulated through a management plan, a statutory document prepared by the Director of National Parks under the EPBC Act.

The Director of National Parks is responsible for Commonwealth marine reserves which already exist in four of the five marine regions and are managed under delegation from the Director by the department's Marine Division. Bioregional profiles for each marine region can be accessed at: **http://www.environment.gov.au/coasts/mbp/index.html**.

The South-east Commonwealth Marine Reserve Network was established in 2007 and areas for further assessment for the South-west, North, North-west and East marine regions were released in 2009–10. Areas for further assessment do not define the proposed boundaries for new marine reserves rather they are intended to aid analysis of information at a detailed scale and thus narrow the areas of focus for locating new marine reserves. They provide detailed information about social and economic interests that can be used to minimise and/or avoid impacts on industry when designing the marine reserves.

In May 2011 the Australian Government released a draft South-west Marine Bioregional Plan and a proposal for a South-west Network of Commonwealth Marine Reserves for public consultation; both are expected to be completed by the end of 2011. Draft marine bioregional plans and marine reserve network proposals for the North, North-west and East marine regions will be released later during 2011 for public consultation, providing a clear and transparent process that involves wide consultation and engagement with all stakeholders.

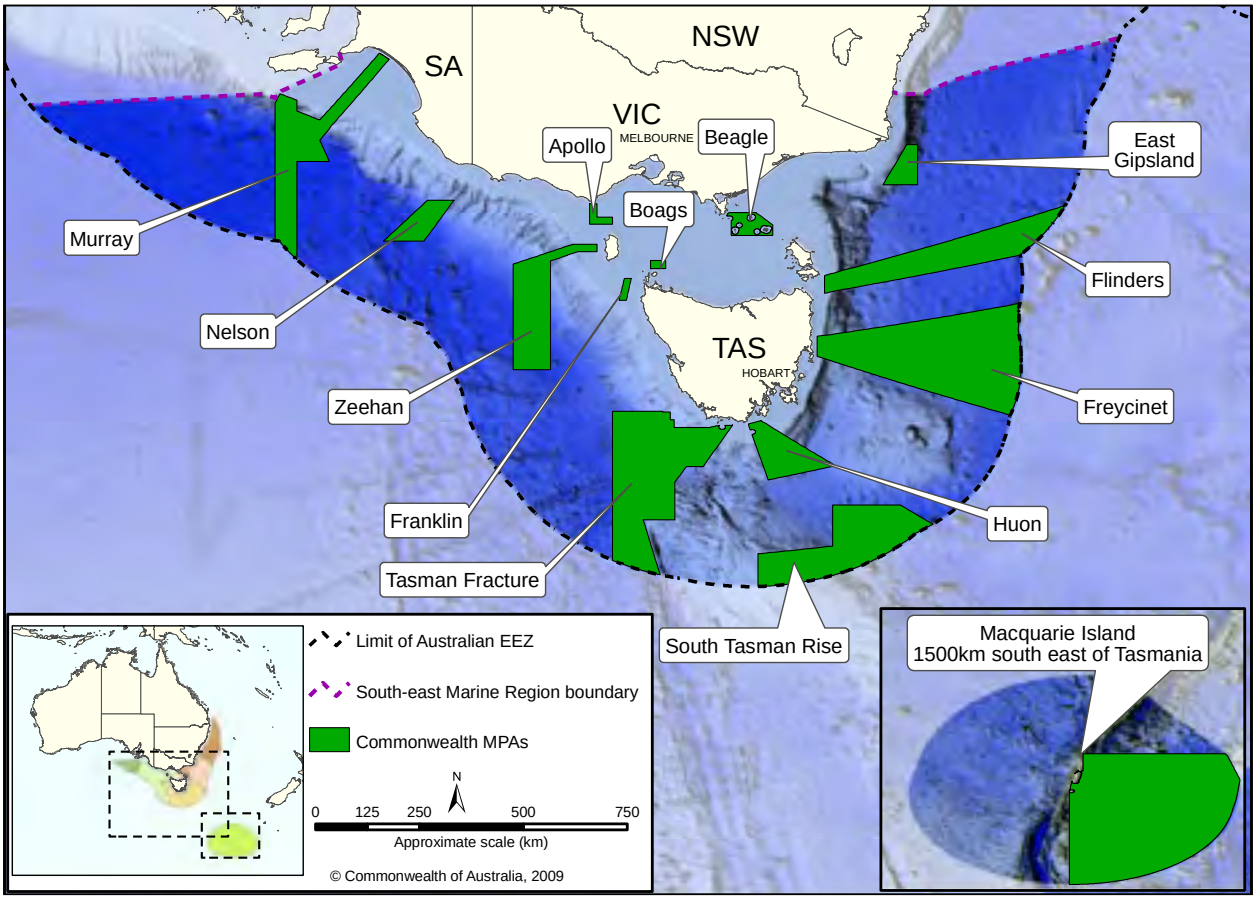
The following sections report on reserve management in the South-east, South-west, North-west and East marine regions. The North Marine Region, which covers an area more than 715,000 square kilometres in the Gulf of Carpentaria, Arafura Sea and the Timor Sea as far west as the Northern Territory–Western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

The most numerous seabird on Christmas Island, the red-footed booby nests in colonies in trees on shore terraces. Photo: Parks Australia

Dolphins—well known for their intellect, their gregarious nature, and their acrobatic abilities, these cetaceans are a much-loved sight in our oceans.
Photo: Parks Australia

South-east Commonwealth Marine Reserve Network

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



Special features

Australia's South-east Commonwealth Marine Reserve Network is the first temperate deep sea network of marine reserves in the world. This large network (388,458 square kilometres) covers 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 striking features such as underwater canyons and mountains and the diverse marine life associated with them, some of which is new to science, and found nowhere else in the world.

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

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

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

South-east Commonwealth Marine Reserve Network Overview

Area	388,458 square kilometres	
Proclamation date	28 June 2007 (effective 3 September 2007)	
IUCN category	Includes Categories Ia, II, IV and VI. See individual reserves	
Biogeographic context	Includes various Integrated Marine and Coastal Regionalisation for Australia (IMCRA) 4.0 provincial bioregions. See individual reserves	
Management plan	A management plan (to include the Macquarie Island Commonwealth Marine Reserve) is currently being developed	
Other significant management documents	A departmental memorandum of understanding between Parks Australia and the Marine Division; Australian Government annual service agreements with the Victorian and South Australian governments, Tasmania Police and Tasmanian Parks and Wildlife Service; memorandum of understanding between the Department of Sustainability Environment, Water, Population and Communities and Australian Fisheries Management Authority.	
Financial	Operating	$310,400*
	Capital	nil
	Revenue	nil
Permits/approvals	Operating under interim management arrangements with: 389 commercial fishing approvals 17 commercial tourism approvals 4 scientific approvals	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded (a)				
Mammals	**Birds**	**Reptiles**	**Fish**	**Plants**
At least 44	At least 61	At least 4	At least 158	Not known

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

Management arrangements

A single management plan that will include all 14 Commonwealth marine reserves in the Reserve Network is currently being developed. The draft network management plan is expected to be released for public consultation in the second half of 2011. Interim arrangements are in place to manage use of the Reserve Network until a management plan is in operation.

Monitoring

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

In the meantime, the Director of National Parks will continue to undertake and approve research projects that support management needs for the Reserve Network.

Future challenges

Major challenges include:

- understanding the full extent of the environmental values associated with the Reserve Network
- improving knowledge and management of threats impacting on the values of the Reserve Network
- encouraging appropriate use of the Reserve Network, compliance with its rules and active stakeholder involvement in its day-to-day management
- establishing a monitoring program to guide and support management of the Reserve Network over the longer term

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

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

Actions

- Continue to work in partnership with the relevant state governments to protect and develop understanding of species, habitats and marine systems and their interaction with Commonwealth marine reserves
- Continue to monitor use of the Reserve Network through the collection and analysis of aerial surveillance and Vessel Monitoring Systems
- Conduct 2011 Compliance Risk Workshop with Commonwealth and state partners to identify and assess risks to natural heritage values

Performance results 2010–11

- Managed impacts of commercial activities on the natural heritage values of the Reserve Network through a comprehensive compliance and enforcement program, including continued monitoring
- Conducted 2011 Compliance Risk Workshop

KRA4: Use and appreciation of protected areas

Major issues

- Monitoring and detection of illegal activities

Actions

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

Performance results 2010–11

- Continued interim management arrangements providing for use of the Reserve Network consistent with the zoning of the individual reserves
- Continued annual service arrangements with state and Australian Government agencies to deliver an active compliance and enforcement capacity in the South-east Marine Region

KRA5: Stakeholders and partnerships

Major issues

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

Actions

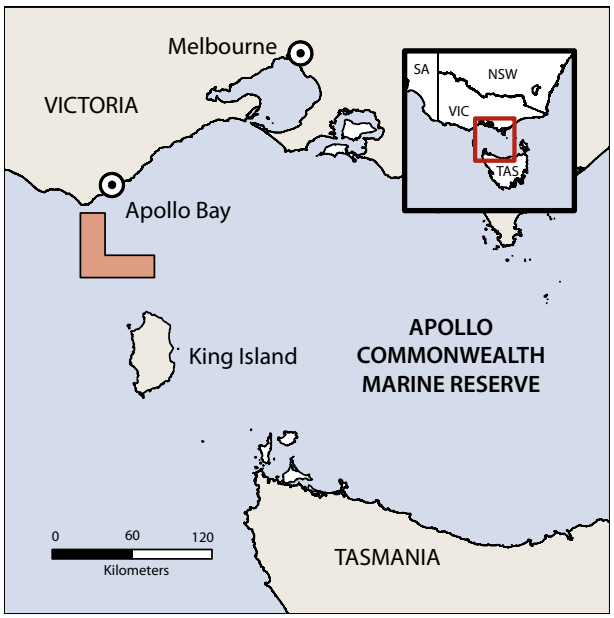
- Consult with key stakeholders and interest groups on management arrangements and planning
- Develop formal partnerships with state and Australian Government agencies to maintain an active compliance and enforcement capacity for the South-east Marine Region

Performance results 2010–11

- Signed annual service agreements with, Tasmanian and SA government departments to undertake vessel patrols and air surveillance within the Reserve Network
- Continued the service level agreement with the Tasmanian Government on the cooperative management of marine protected areas, including Macquarie Island Commonwealth Marine Reserve
- Continued engagement with the South-east Region Fishing Industry Working Group and fishing industry representatives
- Continued to consult with stakeholders and engage the community on the values of the reserves and developing a draft management plan for the Reserve Network

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.

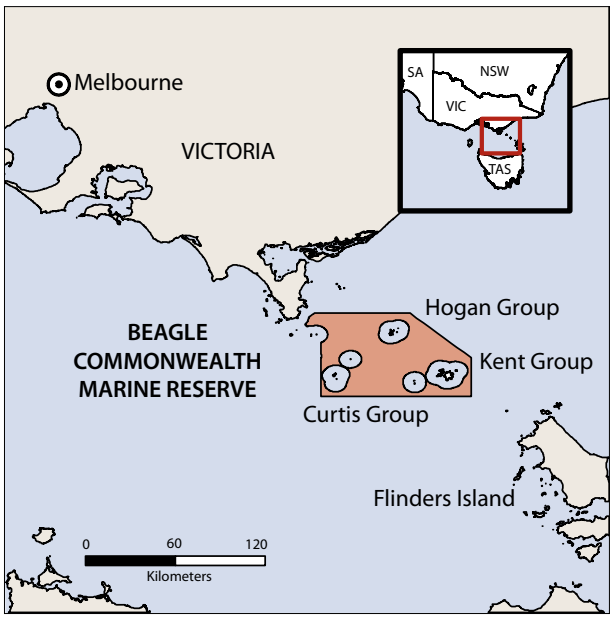
The reserve contains representative samples of the Bass Strait Province bioregion that extends from South Australia to the west of Tasmania. The area includes the Otway Depression, an undersea valley that joins the Bass Basin to the open ocean. This valley was an outlet channel from the old Bass Lake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

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 landbridge with Tasmania as recently as 10,000 years ago during the last ice age.

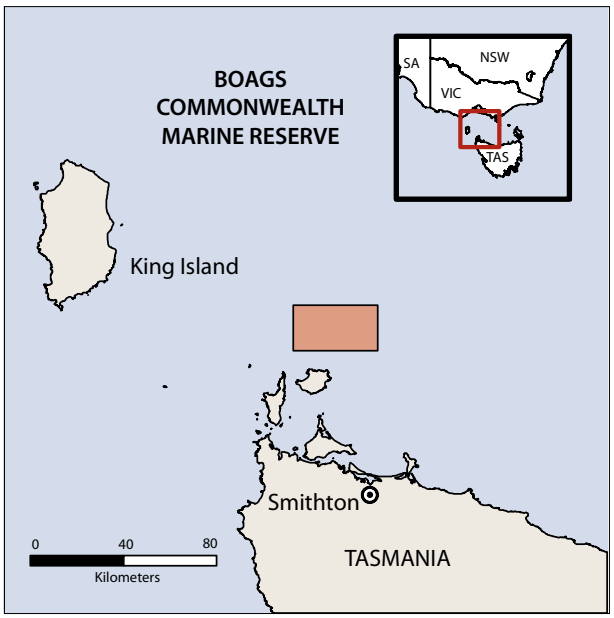
The reserve encompasses the fauna of central Bass Strait which is indicated to be very rich in biodiversity based on studies of several sea floor dwelling animal groups. Its boundary encloses the Tasmanian Kent Group Marine Reserve and the Hogan and Curtis Island groups. Its ecosystems are similar to 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 shellgrit 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

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.

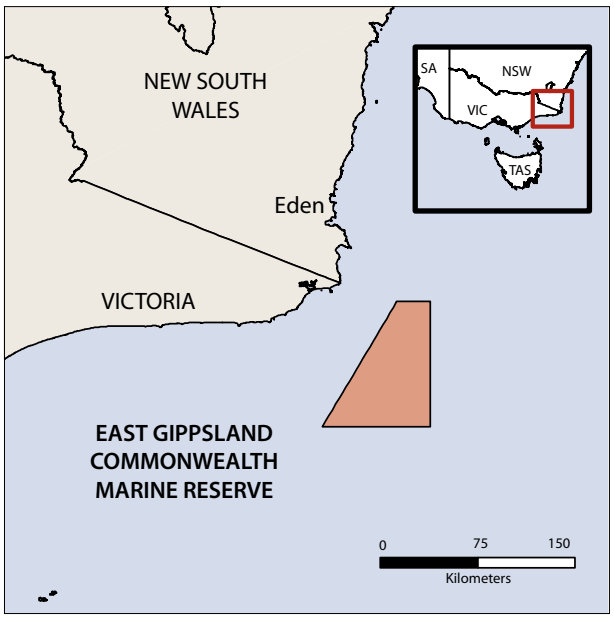
The reserve represents an area of shallow continental shelf ecosystems that extends through central Bass Strait. It encompasses the fauna of central Bass Strait, which is expected to be especially rich based on studies of several seafloor-dwelling animal groups.

The reserve contains a rich array of life, particularly bottom-dwelling animals, as is common for the central Bass Strait area. It is also a foraging area for a variety of seabirds, including the fairy prion (*Pachyptila turtur)*, shy albatross (*Thalassarche cauta cauta)*, silver gull (*Chroicocephalus novaehollandiae)*, short-tailed shearwater *(Ardenna tenuirostri*), blackfaced cormorant (*Phalacrocorax fuscescens)*, Australian gannet (*Morus serrator)*, common diving-petrel (*Pelecanoides urinatrix)* and little penguin *(Eudyptula minor)*. It lies adjacent to an important breeding area in Tasmania's north-west, particularly the Hunter group of islands.

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

East Gippsland Commonwealth Marine Reserve

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



Special features

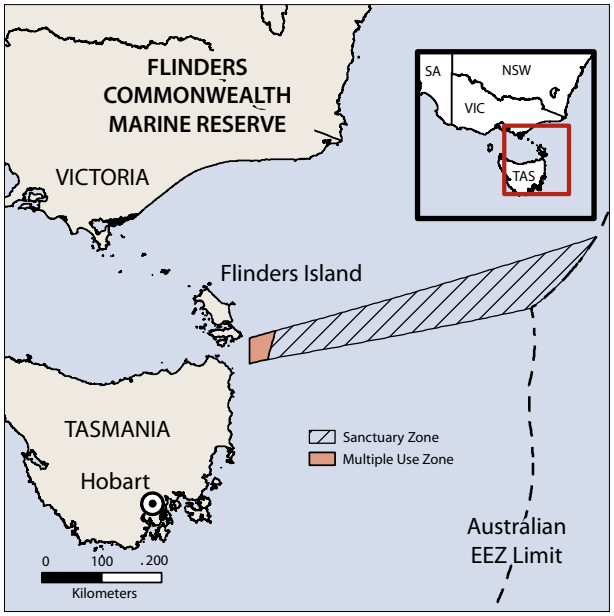
East Gippsland Commonwealth Marine Reserve is located off the coast near the NSW–Victoria border. The reserve contains representative samples and impressive geomorphic features: such as rocky-substrate habitat, an extensive network of submarine canyons, an escarpment in depths from 600 metres to deeper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

The reserve includes both warm and temperate waters. 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

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.

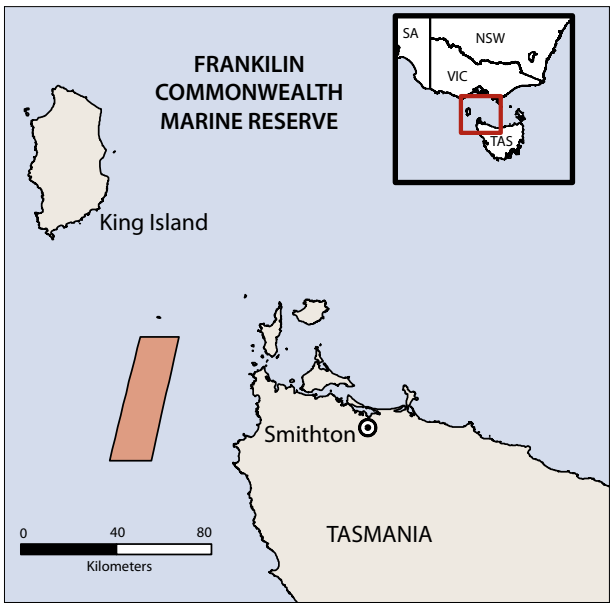
Biodiversity is influenced by summertime incursions of the warm East Australian Current and associated large-scale, anti-clockwise whirlpools. Another prominent feature is a large offshore seamount; these are generally considered to be important centres of deep ocean biodiversity.

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 Ia overall comprising: Category Ia 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

Franklin Commonwealth Marine Reserve

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



Special features

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

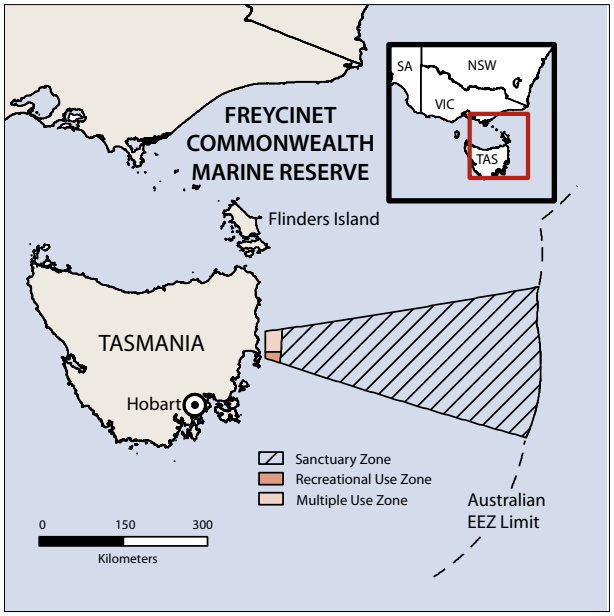
The reserve represents an area of shallow continental shelf ecosystems. It incorporates two major biological zones: the Franklin Zone, which runs down the west coast of Tasmania (from which the reserve takes its name); and the biological zone that extends from South Australia and western Victoria.

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

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.

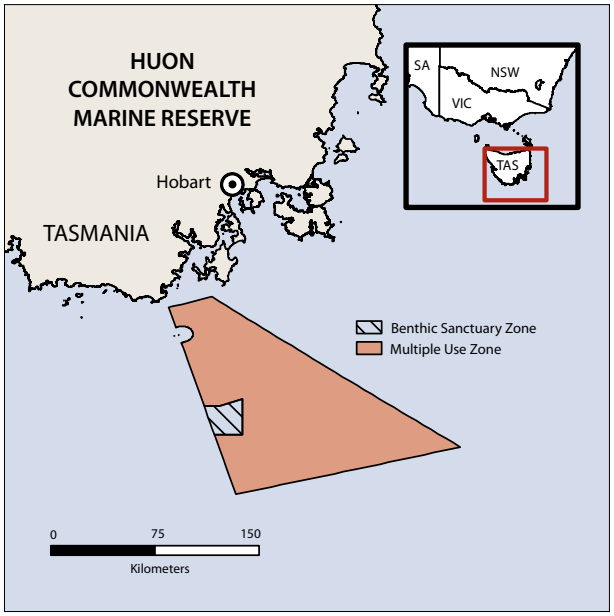
The shallower part of the reserve includes habitat important to the white-fronted tern (*Sterna striata)*, Australian gannet *(Morus serrator)*, black-faced cormorant (*Phalacrocorax fuscescens)*, common diving-petrel *(Pelecanoides urinatrix)*, fairy prion *(Pachyptila turtur)*, little penguin (*Eudyptula 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 Ia overall comprising: Category Ia 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

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.

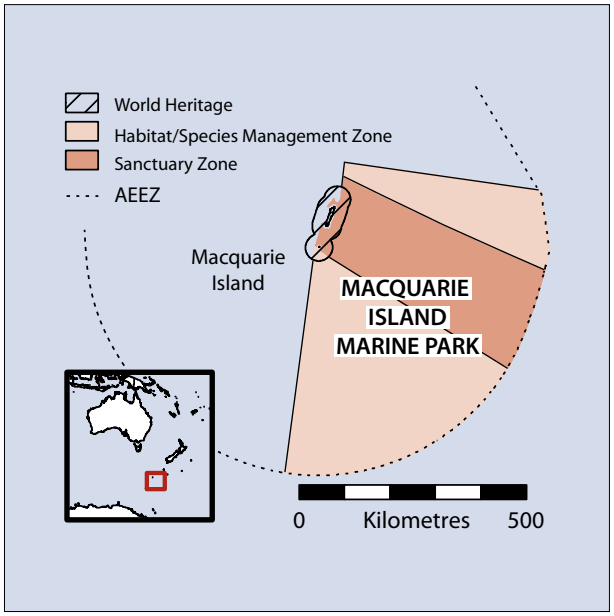
The reserve's most remarkable feature is a cluster of cone-shaped submerged seamounts. The natural values of these seamounts include a rich seabed fauna characterised by high numbers of endemic species and the presence of large, erect seabed fauna, including habitat-forming corals and sponges. Some of 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 the 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 Ia 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

Macquarie Island Commonwealth Marine Reserve

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



Special features

Macquarie Island Commonwealth Marine Reserve protects the unique and vulnerable marine ecosystems of the south-eastern portion of Commonwealth waters around Macquarie Island. The reserve includes 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.

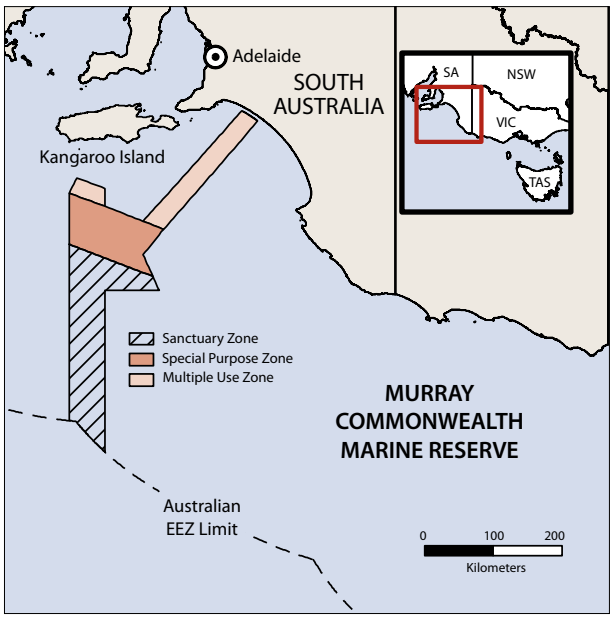
In 1997, Macquarie Island and waters within a 12 nautical mile radius were inscribed on the World Heritage List.

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 Ia 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

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.

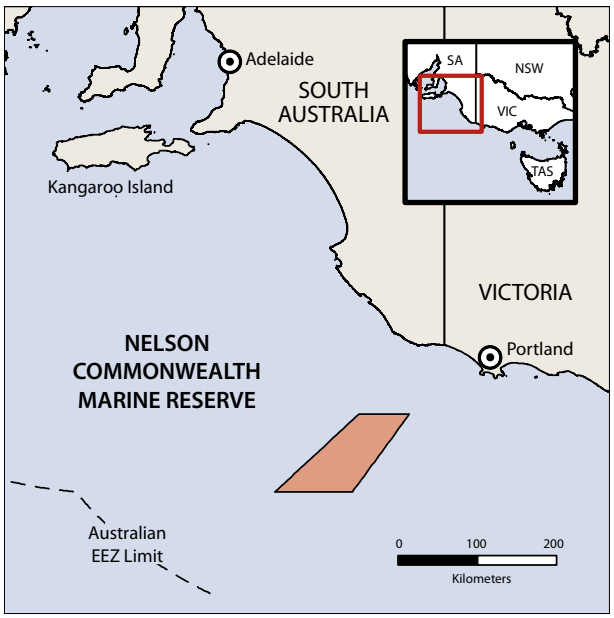
The reserve spans an extensive area across the Lacapede shelf, continental slope and deeper water ecosystems that extends from South Australia to the west of Tasmania and contains one of the most spectacular geological formations on the Australian continental block, the Murray Canyons. These canyons 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 Ia overall comprising: Category Ia 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

Nelson Commonwealth Marine Reserve

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



Special features

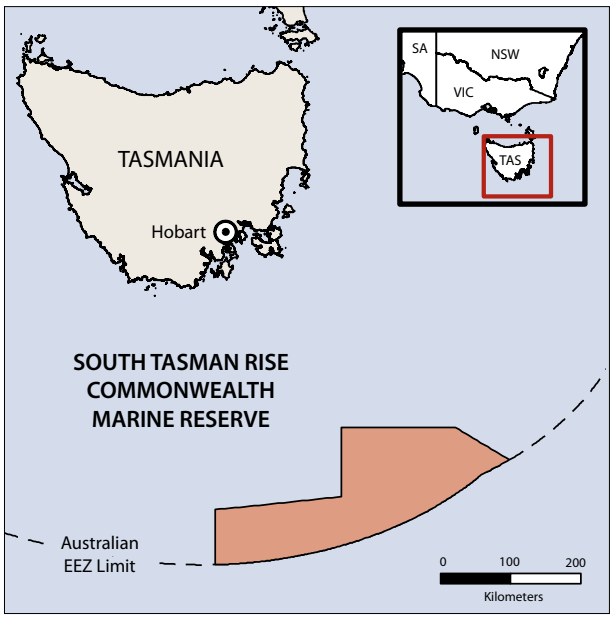
Nelson Commonwealth Marine Reserve lies off the far south-east corner of South Australia and spans the deep water ecosystems (below 3,000 metres) extending from South Australia to the west of Tasmania. It encompasses geological features including plateaus, knolls, canyons and the abyssal plain (a large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

Scientists believe these areas are home to unique fauna, but little is known about what lives on the seabed of this reserve. The reserve is known 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

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.

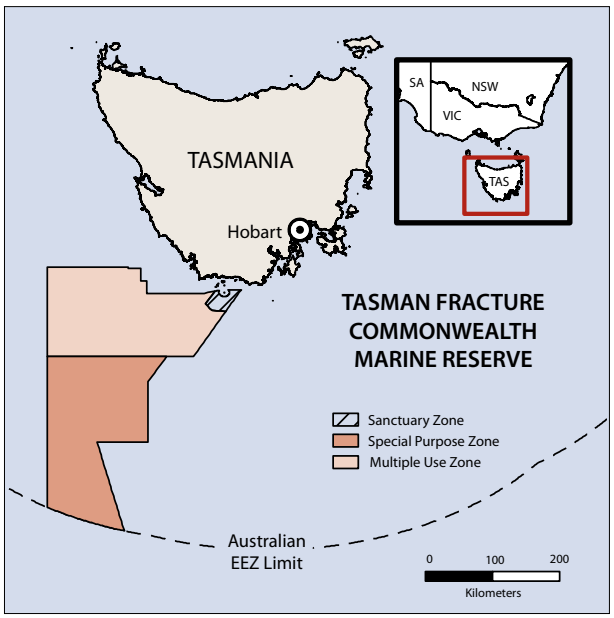
Deformed by the massive rifting process when the Australian continental block moved north, the South Tasman Rise supports unique environments for marine life.

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

Tasman Fracture Commonwealth Marine Reserve

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



Special features

Tasman Fracture Commonwealth Marine Reserve extends south-west of Tasmania from the continental shelf to the Exclusive Economic Zone boundary 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.

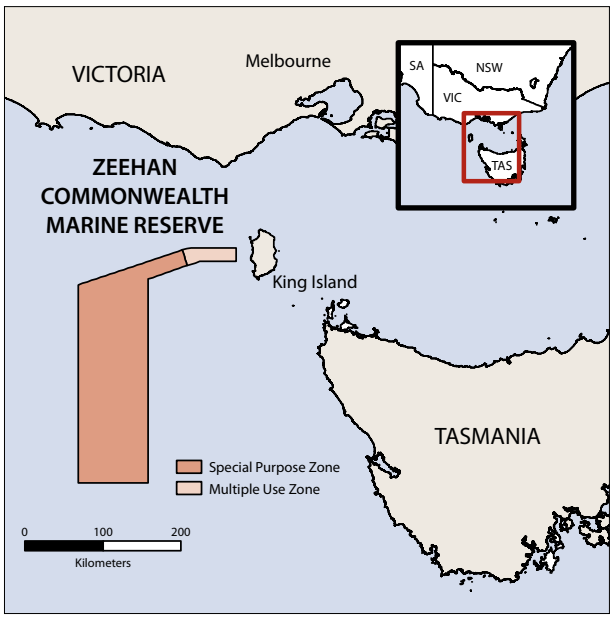
The natural values of this reserve include important habitat for the fairy prion (*Pachyptila turtur)*, little penguin (*Eudyptula minor)*, common diving-petrel (*Pelecanoides urinatrix)*, short-tailed shearwater (*Ardenna tenuirostris*), silver gull (*Chroicocephalus novaehollandiae)*, school shark (*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)
IUCN 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

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*).

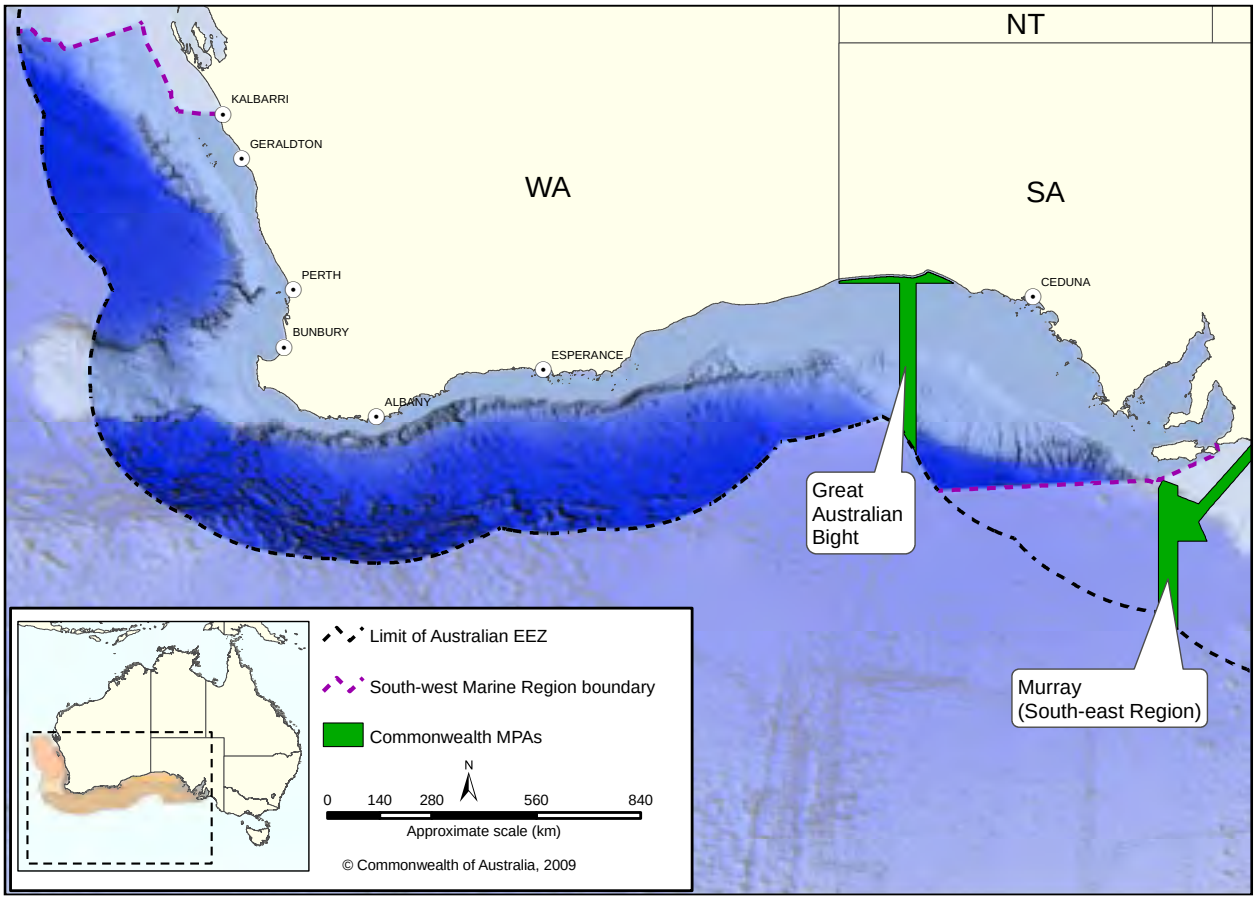
The reserve is also a foraging area for a variety of seabirds, including the fairy prion (*Pachyptila turtur*), shy albatross (*Thalassarche cauta cauta*), silver gull (*Chroicocephalus novaehollandiae*) and short-tailed shearwater (*Ardenna tenuirostris*).

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

A majestic sight—a humpback whale breaching. *Photo: Mark Simmons, GBRMPA*

South-west Marine Region

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



Special features

The South-west Marine Region covers more than 1.3 million square kilometres of 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 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.

Marine bioregional planning

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

The draft South-west Marine Bioregional Plan and a proposal for a South-west Network of Commonwealth Marine Reserves were released for public consultation in May 2011. Both the Plan and the Network are expected to be completed by the end of 2011.

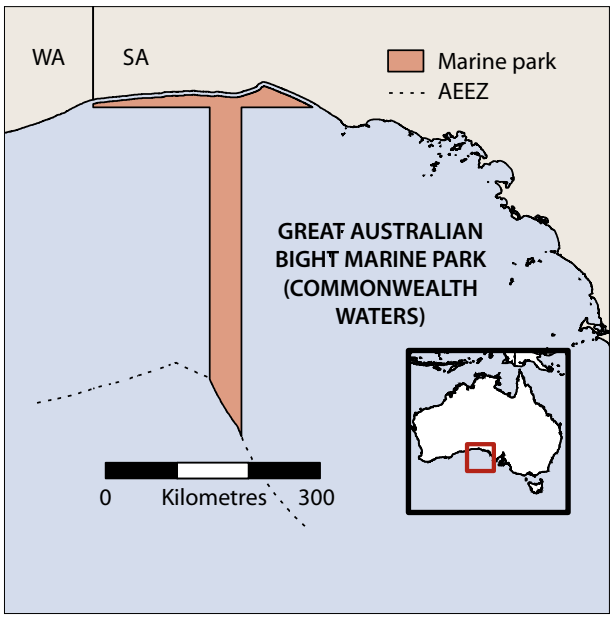
Existing Commonwealth marine reserves

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

The Australian lesser noddy is confined to the tropical and sub-tropical Indian Ocean. Photo: Parks Australia

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 expires 16 May 2012	
Other significant management documents	Service level agreement between the Australian and SA governments	
Financial	Operating	$112,800*
	Capital	nil
	Revenue	nil
Visitors	None recorded in Commonwealth waters. There were approximately 30,000 visitors to the Head of Bight Visitor Centre.	
Permits	59 commercial fishing	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded[a]				
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**
38	29	1	185	Over 800[b]

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

(b) Based on the following research:

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

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

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

Management arrangements

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

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

Monitoring

Samples taken from a survey of the Benthic Protection Zone's deep-water seabed communities in August 2010 were analysed in 2011. The data contributes to the 20-year performance assessment program for the Benthic Protection Zone.

Future challenges

Major challenges are:

- consolidating past and ongoing data to assess environmental management over time
- increasing the park's effectiveness in fulfilling one of its primary functions to protect the Australian sea-lion
- ensuring 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

Action

- Continue to establish baseline data

Performance results 2010–11 (in cooperation with the SA Government)

- Provided funding for the southern right whale population census and photo-identification studies at the Head of Bight
- Updated the database to assist with continuing population studies on regional southern right whales
- Completed the Australian sea-lion pup census for the Bunda Cliffs population for the 2010–11 breeding season

KRA4: Use and appreciation of protected areas

Major issues

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

Actions

- Continue aerial surveillance by Border Protection Command, on-ground surveillance by Yalata Land Management, and sea patrols by the South Australian Department of Primary Industries and Resources
- Continue to 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 2010–11 (in cooperation with the SA Government)

- Advertised annual Marine Mammal Protection Zone closures
- Agencies undertook land, sea and aerial surveillance and operational patrols
- The Yalata Community provided surveillance and beach clean-ups
- Reviewed and implemented the communications plan
- Informed the public about park values and uses, including via state and Australian Government websites and the department's information booth at the annual Australian Petroleum Production and Exploration Association Conference

KRA5: Stakeholders and partnerships

Major issue

- Maintain productive relationships with partners

Actions

- Negotiate and implement the annual service agreement with SA
- Maintain consultative arrangements with stakeholders in management activities

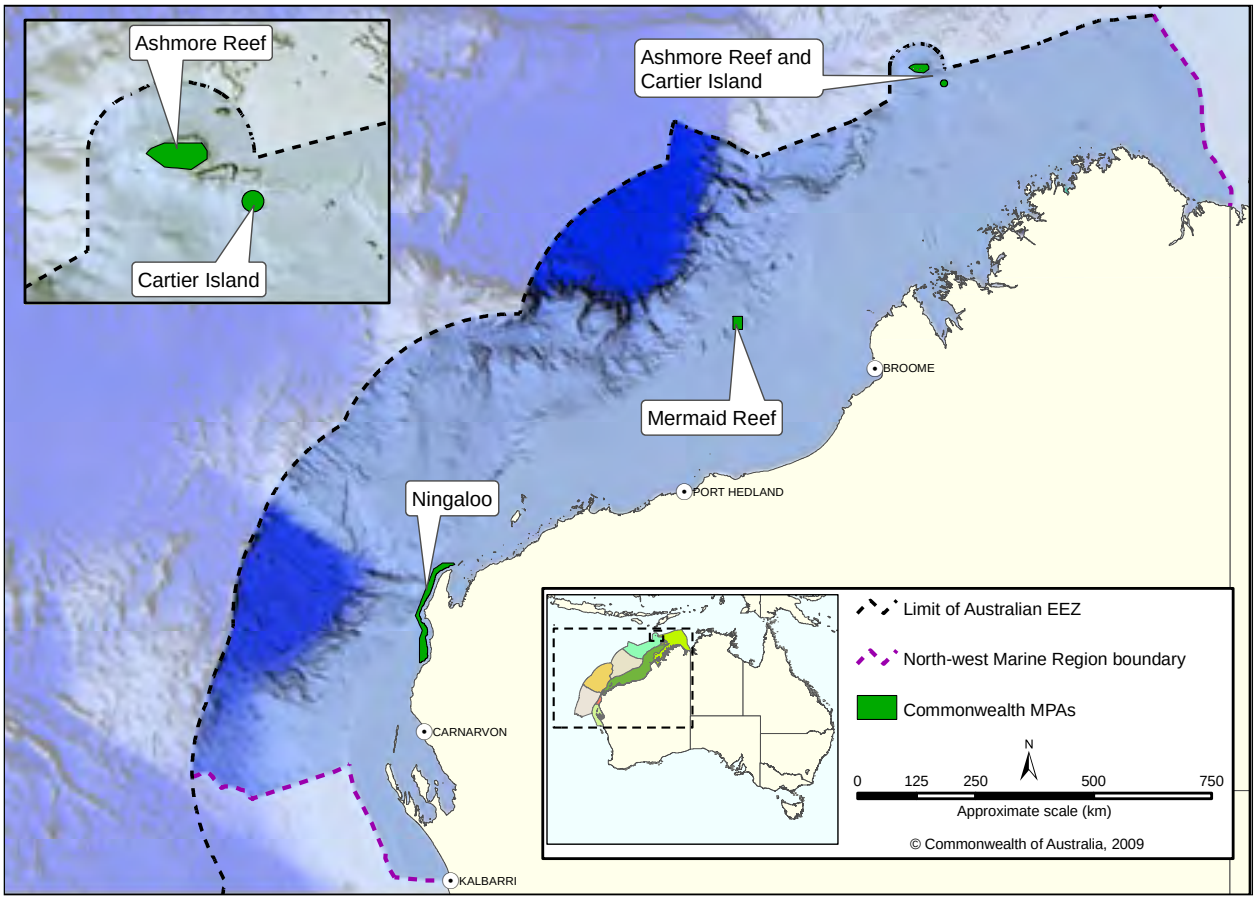
Performance results 2010–11 (in cooperation with the SA Government)

- Renewed the annual service agreement covering research, management operations, visitor management, education, and compliance and enforcement
- Raised and discussed compliance issues with the Australian Fisheries Management Authority and industry sectors
- Liaised with stakeholders from all sectors through the steering and consultative committees

Ashmore Reef National Nature Reserve, located about 830 kilometres west of Darwin on the North-west Shelf, is home to abundant marine life and the breeding grounds for numerous seabirds. Photo: DSEWPAC Marine Division

North-west Marine Region

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



Special features

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

A unique combination of biophysical features and ecological processes differentiates the North-west Marine Region from other marine regions around Australia. The region comprises relatively shallow waters with more than 50 per cent of its waters 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

The North-west Marine Bioregional Profile was released in November 2008 and presents an overview of the natural assets and values, the ecological characteristics and human activities that take place in the region. The Profile also explains how new marine reserves will be identified.

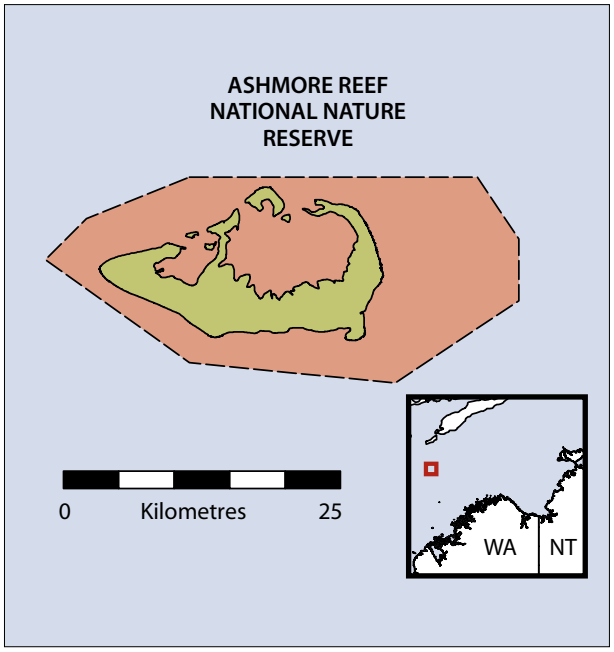
Existing Commonwealth marine reserves

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

Middle Island, part of the Ashmore Reef National Nature Reserve, is the site of a collaborative pilot program to trial treatments to eradicate tropical fire ants. Photo: DSEWPAC Marine Division

Ashmore Reef National Nature Reserve

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



Special features

Ashmore Reef National Nature Reserve is located approximately 830 kilometres north-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; a new plan will be developed as part of management arrangements for a proposed regional network of marine reserves being identified through the marine bioregional planning process in the North-west Marine Region	
Other significant management documents	Australian Government Memorandum of Understanding with Indonesia; Marine and Terrestrial Introduced Species Prevention and Management Strategy	
Financial	Operating	$8,200*
	Capital	$88,000
	Revenue	nil
Visitors/users	76 Indonesian vessels; departmental officers; recreational vessels (yachts, catamarans)	
Permits/Approvals	1 commercial journalism; 9 scientific: 3 commercial tourism permits	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded[(a)]					
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**	**Plants**
1	93	19	810	1,371	44

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

Management arrangements

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

The reserve's management plan expired on 25 June 2009. 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 reserve is being managed through interim arrangements under the EPBC Act.

The Australian Customs and Border Protection Service carry out on-site management of the reserve and has maintained a permanent enforcement presence since April 2008. Regular surveillance flights over Ashmore Reef National Nature Reserve were conducted, and departmental staff visited the reserve in March, May and June 2011 to implement and assess reserve management activities, including the control program for the introduced tropical fire ant or ginger ant (*Solenopsis geminata*).

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. During 2010–11 six scientific monitoring study reports on shoreline assessments, wildlife, coral reef and offshore bank surveys and oil and dispersant trajectory modelling were released. Wildlife necropsy reports were also released under the operational component of the program. Results indicate that a small number of seabirds and sea snakes were affected by the spill and that a small quantity of oil entered Indonesian waters, which was reported to Indonesian authorities at the time. Reports from the monitoring program will continue to be released on the department's website as they become available. More information is available at **www.environment.gov.au/coasts/oilspill.html**.

The department worked closely with the Australian Government Department of Resources, Energy and Tourism and other relevant agencies to develop and finalise the Government's response to the report of the Montara Commission of Inquiry which was released on 25 May 2011. More information is available at **www.ret.gov.au/montarainquiryresponse**.

A tropical fire ant control program was commenced in 2011 in conjunction with Monash University and CSIRO. Monitoring will inform the future implementation of the control program (see case study on page 106).

Future challenges

Major challenges are:

- identifying the reasons for the apparent decline in sea snake abundance and diversity
- managing potential introduced species
- ensuring voluntary compliance with park management requirements
- ensuring adequate aerial surveillance coverage
- understanding the impact of climate change on natural values
- maintaining a permanent compliance presence at the reserve.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

- Illegal fishing
- Coral bleaching and species loss
- Introduction of pest species

Actions

- Work with Border Protection Control to support and maintain permanent compliance capacity
- Collaborate with other Australian Government agencies in working with Indonesian officials and fishers to improve management of the MoU Box fishery
- Encourage and facilitate research and monitoring of the reef and island environments eg assessment of sea cucumbers and trochus shell fisheries
- Manage threats identified in the Marine and Terrestrial Introduced Species Prevention and Management Strategy (2004)
- Implement tropical fire ant control program

Performance results 2010–11

- The Australian Customs and Border Protection Service vessel Ashmore Guardian continued its near-permanent compliance and management presence at the reserve
- Customs officers implemented quarantine, bilge and ballast water protocols
- Continued collection and analysis of marine debris
- Tropical fire ant control program initiated with assistance from CSIRO and Customs

KRA4: Use and appreciation of protected areas

Major issue

- Impacts to the reef and island avifauna from high visitor numbers

Actions

- Maintain three moorings
- Monitor visitation and ensure visitation protocols are adhered to

Performance results 2010–11

- Installed, monitored and maintained moorings
- Monitored visitation using aerial surveillance and vessel patrol information

KRA5: Stakeholders and partnerships

Major issues

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

Actions

- Collaborate with Australian Government agencies involved in revising and implementing an integrated management approach for Indonesian fishing in the MoU Box
- Maintain the close working relationship with Australian Customs and Border Protection Service, Australian Fisheries Management Authority, and Australian Defence Forces for patrol and surveillance purposes through Border Protection Command and for enforcement and other management actions

Performance results 2010–11

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

Case study: A collaborative effort to control tropical fire ants on Ashmore Reef

A collaborative project is underway to eradicate tropical fire ants on the Ashmore Reef National Nature Reserve, home to abundant marine life and the breeding grounds for numerous seabirds.

Located about 830 kilometres north-west of Darwin on the North-west Shelf — closer to Indonesia than Australia — Ashmore Reef contains a wealth of marine habitats including an extensive coral reef, lagoons, abundant seagrass beds and vast tidal sand flats. The reserve, which includes four vegetated sand islands, was declared to protect its outstanding marine biodiversity as well as rookeries for seabirds such as the lesser frigate bird, sooty and crested terns, boobies and red-tailed tropic birds.

The introduced tropical fire ant (*Solenopsis geminata*), also known as 'ginger ant', was first recorded on the islands of Ashmore Reef in 1992. In 2004, a strategy for managing and preventing the introduction of marine and land species was developed which recognised the threat that tropical fire ants posed to ground-nesting birds.

In 2006 a study found a significant relationship between the density of tropical fire ants and dead seabird chicks — noting that the impact of the ants may not be limited to seabirds, and that nesting turtles and native insects might also be affected. The impact on turtles was confirmed in May 2008 during a turtle nest survey when a nest was discovered with all hatchlings killed by tropical fire ants.

The Marine Division of the department and the Director of National Parks began a program in 2011 to eradicate tropical fire ants from the reserve based on control measures developed by CSIRO Ecosystem Sciences and used in Kakadu National Park, the Tiwi Islands, and internationally.

In the short-term the program aims to reduce tropical fire ant populations to a level that significantly reduces their impact on vertebrates — through repetitive application of ant poisons over two to three years. Australian Customs and Border Protection Service staff are providing logistical support.

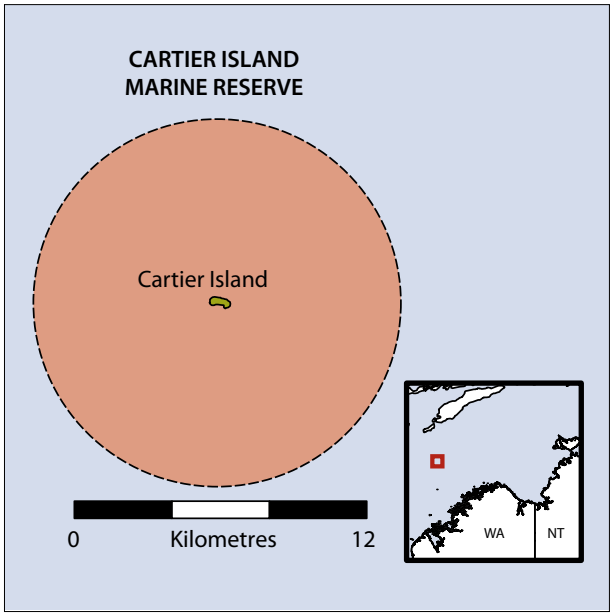
A pilot started in May 2011 on the 13-hectare Middle Island to test the success of the treatments and identify any impact on non-target invertebrate species. The success of this trial is being evaluated by Monash University which is also examining the effects of human disturbance on the nesting success of birds on East and Middle islands.

This long-term project highlights the willingness of the Director of National Parks, the Marine Division, Australian Customs and Border Protection Service, CSIRO and academic researchers to work together under very difficult logistical situations in remote areas to protect Australia's natural wildlife.

Left: Tropical fire ant control. Photo: DSEWPAC Marine Division. Right: Tropical fire ants. Photo: DSEWPAC Marine Division

Cartier Island Marine Reserve

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



Special features

Cartier Island Marine Reserve is located in the Indian Ocean approximately 790 kilometres north-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 Ia	
Biogeographic context	IMCRA 4.0 provincial bioregion: Timor Province	
Management plan	First plan expired 25 June 2009; a new plan will be developed as part of management arrangements for a proposed regional network of marine reserves being identified through the marine bioregional planning process in the North-west Marine Region	
Other significant management documents	Australian Government Memorandum of Understanding with Indonesia applies to Cartier Island (access is limited to emergency use only); Standard Operating Procedures (included in an operations manual) for Australian Customs and Border Protection Service officers operating at the reserve	
Financial	Operating	nil*
	Capital	nil
	Revenue	nil
Visitors/users	commercial tourists, Customs officers (routine patrols)	
Permits/Approvals	1 commercial journalism; 9 scientific; 3 commercial tourism	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded[a]					
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**	**Plants**
1	Unknown	17	810	1,371	0

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

Management arrangements

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

The reserve's management plan expired on 25 June 2009. 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 reserve is being managed through interim arrangements under the EPBC Act.

Cartier Island and Ashmore Reef reserves are approximately 45 kilometres apart and are managed together. The Australian Customs and Border Protection Service has a permanently stationed enforcement vessel at Ashmore Reef that assists with on-site management. Compliance and enforcement activities were supported by regular surveillance flights over the Cartier Island Marine Reserve by Border Protection Command.

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. Results of this monitoring are released on the department's website when available.

Future challenges

Major challenges are:

- ensuring 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

- Illegal access

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 Australian Customs and Border Protection Service, Australian Fisheries Management Authority, and Australian Defence Forces for patrol and surveillance purposes through Border Protection Command and for enforcement and other management actions

Performance results 2010–11

- The Australian Customs and Border Protection Service vessel Ashmore Guardian continued to protect the reserve by implementing compliance and enforcement measures and on-site management

KRA5: Stakeholders and partnerships

Major issues

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

Actions

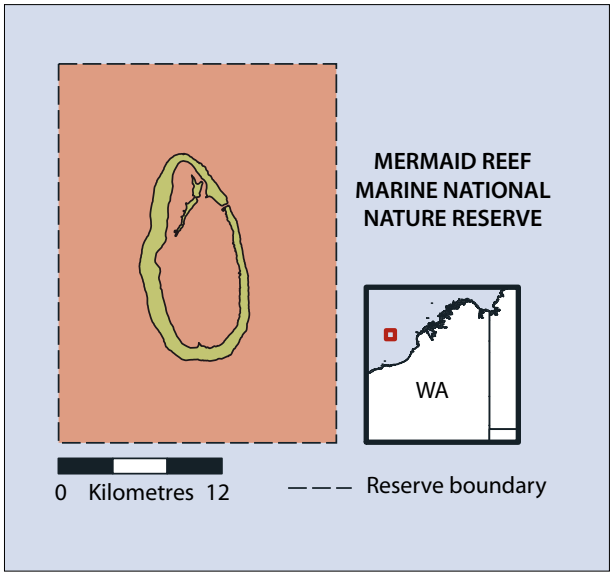
- Collaborate with Australian Government agencies involved in revising and implementing an integrated management approach for Indonesian fishing in the MoU Box
- Maintain a close working relationship with Australian Customs and Border Protection Service, Australian Fisheries Management Authority, and Australian Defence Forces for patrol and surveillance purposes through Border Protection Command and for enforcement and other management actions

Performance results 2010–11

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

Mermaid Reef Marine National Nature Reserve

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



Special features

Mermaid Reef is the most north-easterly of three shelf-edge reefs in the Rowley Shoals, located approximately 300 kilometres north-west of Broome, Western Australia.

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 Ia	
Biogeographic context	IMCRA 4.0 provincial bioregion: Northwest Transition	
Management plan	First management plan expired 16 May 2007; a new plan will be developed as part of management arrangements for a proposed regional network of marine reserves being identified through the marine bioregional planning process in the North-west Marine Region	
Other significant management documents	Service level agreement and annual business agreements with the WA Department of Fisheries and the WA Department of Environment and Conservation	
Financial	Operating	$87,000*
	Capital	nil
	Revenue	nil
Visitors/users	Not Available	
Permits /Approvals	6 commercial tour operators, 2 scientific research, 1 commercial journalism	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded[(a)]					
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**	**Plants**
13	19	18	Over 390	Over 633	No land plants

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

Management arrangements

The reserve is managed by the department's Marine Division under delegation from the Director of National Parks. Management of the reserve is supported by a service level agreement with the WA Department of Environment and Conservation and the WA Department of Fisheries. The Australian Customs and Border Protection Service provides regular aerial surveillance of the reserve.

The first management plan expired on 16 May 2007. 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 reserve is being managed through interim arrangements under the EPBC Act.

Monitoring

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

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

Future challenges

Major challenges are:

- improving visitors' understanding of the reserve's conservation values and management requirements and ensuring voluntary compliance with park requirements
- ensuring adequate aerial surveillance coverage
- understanding the impact of climate change on natural values.

Report on performance by key result areas

KRA 1: Natural heritage management

Major issues

- Preventing anchor damage
- Monitoring and compliance issues related to illegal fishing

Actions

- Maintain moorings
- Maintain aerial surveillance
- Encourage and facilitate research and monitoring at the reserve
- Maintain the close working relationship with Australian Customs and Border Protection Service, Australian Fisheries Management Authority, and Australian Defence Forces for patrol and surveillance purposes through Border Protection Command and for enforcement and other management actions.

Performance results 2010–11

- Mooring maintained
- Ongoing aerial surveillance by Border Protection Command

KRA4: Use and appreciation of protected areas

Major issues

- Need for visitors to understand and comply with reserve values and uses
- Unapproved moorings
- Reporting of commercial use

Action

- Progress work related to visitor management in the reserve

Performance results 2010–11

- Continued liaison with WA partner agencies and users regarding management of reserve values and moorings use

KRA5: Stakeholders and partnerships

Major issues

- Effective day-to-day management of the reserve
- Industry stewardship of the reserve to support effective management

Actions

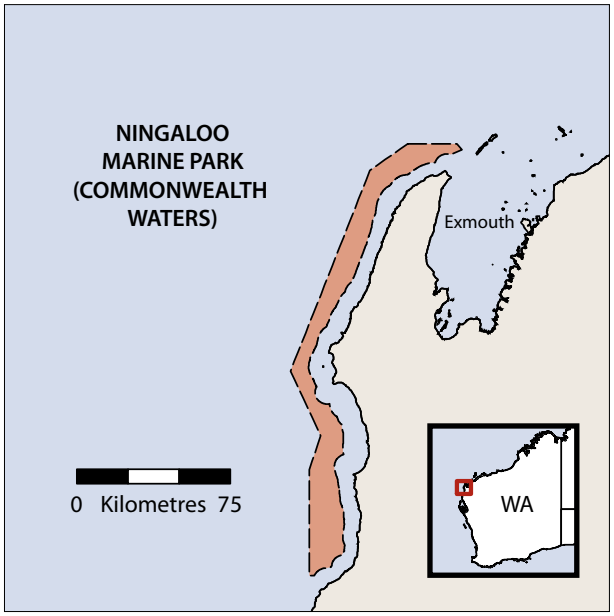
- Manage and maintain an effective relationship with the WA Department of Environment and Conservation and the WA Department of Fisheries

Performance results 2010–11

- Implemented annual business agreements with WA partner agencies

Ningaloo Marine Park (Commonwealth Waters)

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



Special features

The Ningaloo Reef is a tropical reef system adjacent to an arid part of the continental land mass of Western Australia. In places it is as close as 20 metres to the coastline. These 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.

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.

Ningaloo Marine Park (Commonwealth Waters) is included in an area that was inscribed on the World Heritage List in June 2011. The area is listed for Criteria (vii) and (x). Criterion (vii) relates to containing superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance. Criterion (x) relates to containing the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Location	Latitude 21°51′ South, Longitude 113°52′ East	
Area	243,513 hectares	
Proclamation dates	7 May 1987, 21 July 1992, 14 August 2003	
IUCN category	Category II	
Biogeographic context	IMCRA 4.0 provincial bioregions: Northwest Province, Central Western Transition, Central Western Shelf and Northwest Shelf Province	
Management plan	Second plan expired on 2 July 2009; a new plan will be developed as part of management arrangements for a proposed regional network of marine reserves being identified through the marine bioregional planning process in the North-west Marine Region	
Other significant management documents	Service level agreement and annual business agreements with the WA Department of Fisheries and the WA Department of Environment and Conservation	
Financial	Operating	$81,000*
	Capital	nil
	Revenue	nil
Visitors/users	Not available	
Permits /Approvals	13 commercial tourism, 1 research	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

International conventions and agreements	
World Heritage Convention	The Ningaloo Coast which includes the Commonwealth waters of the park was listed as a World Heritage Area in 2011.
Migratory Species (Bonn) Convention	3 of 105 listed Australian species
China–Australia Migratory Birds Agreement	4 of 81 listed species
Japan–Australia Migratory Birds Agreement	4 of 77 listed species
Korea–Australia Migratory Birds Agreement	1 of 59 listed species

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

Numbers of native species recorded[(a)]				
Mammals	**Birds**	**Reptiles**	**Fish**	**Plants**
Unknown	22	Unknown	54	0

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

Management arrangements

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

Management of Ningaloo Marine Park (Commonwealth Waters) is supported by the WA Department of Environment and Conservation and the WA Department of Fisheries through service agreements with the Australian Government. Border Protection Command provides regular aerial surveillance of the park.

The second management plan expired on 2 July 2009. 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 reserve is being managed through interim arrangements under the EPBC Act.

Monitoring

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 organizations, has maintained a satellite tracking program on the range and behaviour of whale sharks since 2004.

Future challenges

Major challenges are:

- ensuring 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

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

Actions

- Engage in the National Heritage and World Heritage listing processes
- Maintain the close working relationship with Australian Customs and Border Protection Service, Australian Fisheries Management Authority, and Australian Defence Forces for patrol and surveillance purposes through Border Protection Command and for enforcement and other management actions

Performance results 2010–11

- The Ningaloo Coast, which includes the Commonwealth waters of the park, was inscribed on the World Heritage List in June 2011
- Continued a study of the behaviour and migration habits of whale sharks travelling to Ningaloo Marine Park
- Continued a volunteer monitoring program that monitors marine turtles in the park

KRA4: Use and appreciation of protected areas

Major issues

- Illegal commercial fishers
- Effective management of commercial tours

Actions

- Monitor illegal entry to Commonwealth waters via aerial surveillance and satellite tracking using a Vessel Monitoring System
- Ensure commercial tour operators comply with permits and conditions
- Maintain the close working relationship with Australian Customs and Border Protection Service, Australian Fisheries Management Authority through Border Protection Command for aerial surveillance purposes

Performance results 2010–11

- Continued engagement with state partners, 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
- Issued approvals for commercial tour operators
- Conducted regular surveillance by air and sea

KRA5: Stakeholders and partnerships

Major issues

- Ensuring effective and efficient management supported by state and Australian government agencies

Actions

- Implement service agreements to support compliance and enforcement
- Keep stakeholders informed of and involved in management activities

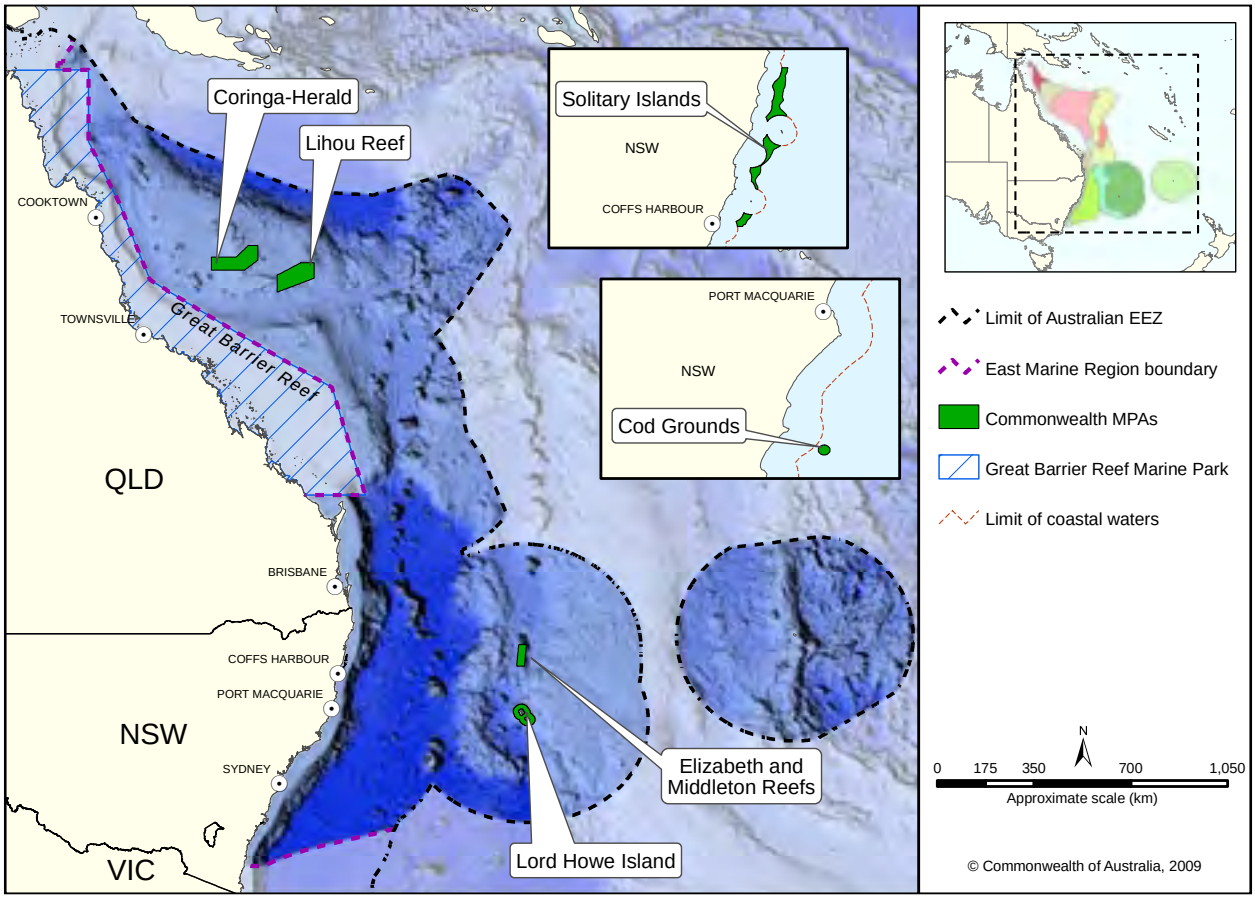
Performance results 2010–11

- Implemented service level agreements with WA partner agencies

The dugong, or sea cow as they are sometimes called, is threatened on a worldwide scale. Australia has a large proportion of the remaining population, making our waters an important refuge for these sea mammals. Photo: Parks Australia

East Marine Region

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



Special features

The East Marine Region covers 2.4 million square kilometres of Commonwealth waters from the top of the eastern coast of Cape York to just north of the border between New South Wales and Victoria. The region includes the Coral Sea and Tasman Sea and the waters surrounding Lord Howe and Norfolk Islands. The Great Barrier Reef Marine Park and the Torres Strait lie outside the East Marine Region and therefore are not included in the marine bioregional planning process.

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.

Marine bioregional planning

The East Marine Bioregional Profile 2009 describes the region's natural assets and ecological characteristics. It identifies conservation values and human activities typically conducted in the region. Areas for further assessment identified in the East Marine Region in March 2010 are being used to assist in the design of a network of marine reserves.

Existing Commonwealth marine reserves

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

Five of the reserves are currently managed under interim management arrangements: the Solitary Islands Marine Reserve (Commonwealth Waters) Management Plan expired on 4 April 2008; the Lord Howe Island Marine Park (Commonwealth Waters) Management Plan expired on 24 September 2009, the Coringa-Herald National Nature Reserve and Lihou Reef National Nature Reserve Management Plan expired on 4 September 2008 and the Cod Grounds Commonwealth Marine Reserve. The reserves will be managed under interim arrangements which 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. It covers approximately 972,000 square kilometres of Australian waters and seabed east of the Great Barrier Reef Marine Park to the edge of Australia's Exclusive Economic Zone. The existing reserves in the Coral Sea—Coringa-Herald and Lihou Reef National Nature Reserves —and the Great Barrier Reef Marine Park are not included in the Conservation Zone.

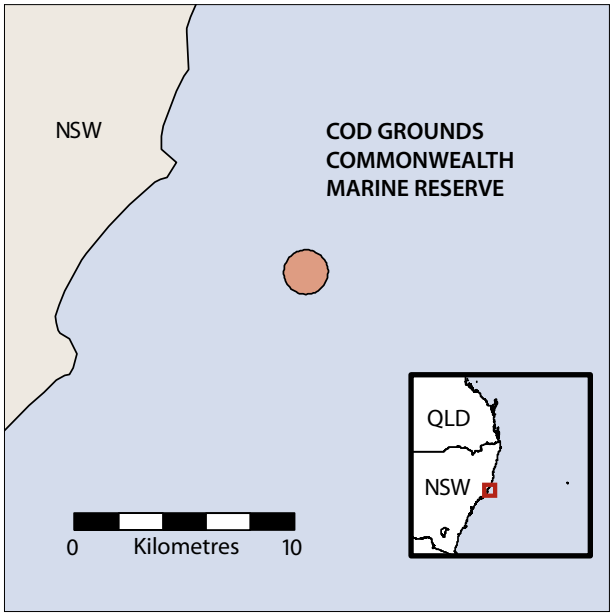
The Coral Sea Conservation Zone is an interim measure to protect this environmentally significant area while it is assessed under the marine bioregional planning process. The Coral Sea is environmentally significant because of the diverse array of coral reefs, atolls, deep sea plains and canyons it supports and the extent to which the region's natural and heritage values have remained relatively undisturbed by direct human impact.

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**

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, with over 80 sharks 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 Ia (Sanctuary Zone)	
Biogeographic context	IMCRA 4.0 provincial bioregion: Central Eastern Shelf Transition	
Management plan	Interim management arrangements are in place until a new management plan is developed under the Marine Bioregional Planning process	
Other significant management documents	Annual business agreement between the Australian and NSW governments (Industry and Investment NSW) to deliver compliance and enforcement	
Financial	Operating	$126,000*
	Capital	nil
	Revenue	nil
Visitors	20 commercial recreational dive trips and 4 research trips recorded	
Permits/ approvals	1 commercial dive operator approval	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

Management arrangements

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

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

NSW undertakes compliance and enforcement under an annual service agreement.

Interim management arrangements will remain in force until a new management plan for the reserve is developed under the marine bioregional planning process.

Monitoring

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

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

Future challenges

Major challenges are:

- educating the public on the reserve's values and why these particular management arrangements have been implemented
- understanding the impact of climate change on natural values
- ensuring voluntary compliance with park management requirements
- ensuring adequate aerial surveillance coverage.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

- Recovery of grey nurse shark

Actions

- Implement interim management arrangements to manage use impacts on grey nurse shark habitat

Performance results 2010–11

- Collaborated with researchers for the monitoring of grey nurse sharks

KRA4: Use and appreciation of protected areas

Major issues

- Ensuring visitors are informed of management arrangements
- Enforcement of illegal fishing controls

Actions

- Assess applications for access and research approvals
- Regular compliance and monitoring patrols

Performance results 2010–11

- Service arrangements implemented
- NSW officers gave information and advice to fishers operating close to and within the reserve
- New signs informing users of the rules of the reserve were installed at eleven boat ramps servicing the reserve
- Revised management information brochure was printed and distributed
- NSW officers detected one recreational fishing vessel fishing inside the reserve and the department undertook follow-up enforcement action
- The department received reports on activities undertaken in the reserve (required under the approval) from the reserve's only approved commercial dive tour operator

KRA5: Stakeholders and partnerships

Major issues

- Ensuring effective engagement with the community, commercial users and government agencies

Actions

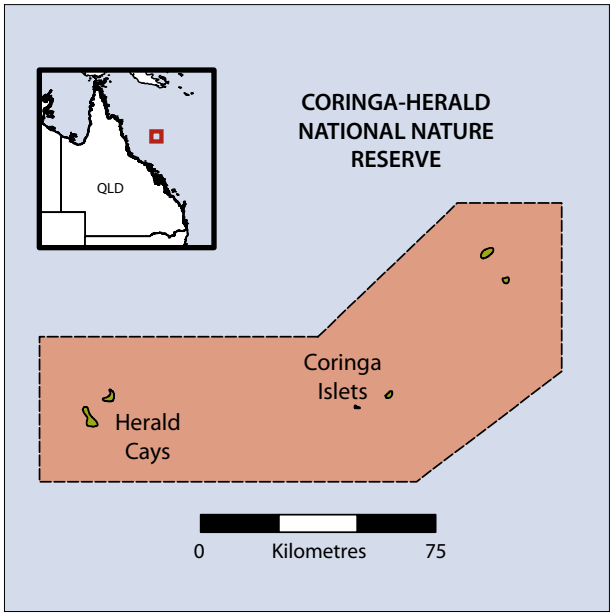
- Implement agreed service arrangements with NSW to undertake compliance activities in the reserve
- Consult key stakeholders

Performance results 2010–11

- Implemented service agreement with Industry and Investment NSW to undertake vessel-based patrols within the reserve
- Advised the local dive operator, researchers and NSW state agencies on the status of reserve values under the interim management arrangements

Coringa–Herald National Nature Reserve

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



Special features

Coringa-Herald National Nature Reserve has six islets and cays of which all except one are vegetated. The 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 Ia	
Biogeographic context	IMCRA 4.0 provincial bioregion: Northeast Province	
Management plan	Second plan expired 4 September 2008	
Financial	Operating	nil*
	Capital	nil
	Revenue	nil
Visitors/users	Not known	
Permits/approvals	Nil	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded[(a)]					
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**	**Plants**
30	27	5	Over 342	Over 1,000	16

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

Management arrangements

The reserve is managed by the department's Marine Division under delegation from the Director of National Parks. On-site management and aerial surveillance is provided with the support of Border Protection Command.

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

Monitoring

Current projects include remote monitoring 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. This technology is also being used to help investigate impacts on the reserve from severe Tropical Cyclone Yasi which passed over the Coral Sea before making landfall in north Queensland in February 2011.

Sub-surface sea temperature loggers operate as part of a large ongoing temperature monitoring program. Seabird monitoring activities are no longer being undertaken due to funding constraints and lack of operational support.

Future challenges

Major challenges are:

- logistics associated with managing an isolated reserve
- conserving Pisonia forest ecosystem health including controlling pest insects
- understanding the impact of climate change on natural values
- ensuring voluntary compliance with park management requirements
- ensuring adequate aerial surveillance coverage.

Report on performance by key result areas

KRA1: Natural heritage management

Major issues

- Assessing frequency and potential impacts associated with human use including illegal fishing and the introduction of pest species
- Measuring reef health including coral bleaching
- Assessing impacts of pest insects and climate change on the *Pisonia* forest and coral reef ecosystems
- Assessing impacts of Tropical Cyclone Yasi on the reserve's values

Actions

- Continue the reef monitoring program
- Continue to monitor insect pests and respond as necessary
- Acquire aerial images to monitor vegetation and near shore reef assemblages

Performance results 2010–11

- Analysed vegetation health and sea temperature data as part of ongoing monitoring in the reserve
- Initiated a project to acquire specific satellite imagery to identify damage from Cyclone Yasi and conducted a preliminary damage assessment which suggested defoliation has occurred

KRA4: Use and appreciation of protected areas

Major issues

- Managing visitor access and activities

Actions

- Targeted distribution of information brochures
- Maintain the website
- Issuing of permits for visitor access

Performance results 2010–11

- No illegal activity was reported by Border Protection Command
- Responded to enquiries regarding information about the Reserve or permits for visitor access

KRA5: Stakeholders and partnerships

Major issues

- Improving visitors awareness of reserve management prescriptions

Actions

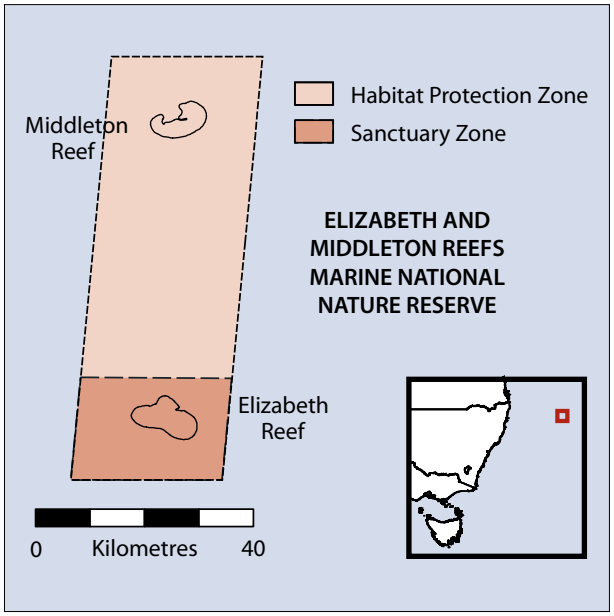
- Distribute the reserve information brochure and other electronic information to stakeholders about reserve management arrangements

Performance results 2010–11

- Liaised with Border Protection Command regarding aerial monitoring and satellite imagery
- Distributed written and electronic information on management issues to stakeholders, including researchers and tour operators

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 is rapidly breaking 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 Ia overall comprising: Category Ia 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 22 March 2013	
Financial	Operating	$140,700*
	Capital	nil
	Revenue	nil
Visitors	Not recorded, numbers low	
Permits/Approvals	21 recreational access, 1 research	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded[(a)]					
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**	**Flora**
2	10	2	407	586	19

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

Management arrangements

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

Monitoring

Reef systems in the reserve have been regularly surveyed since 1987 with a comprehensive marine ecological survey undertaken in April 2011. Activities undertaken as part of the survey included estimates of live coral cover and condition; abundance of small endemic reef fish, black cod, Galapagos shark and invertebrates; and replacement of temperature data loggers installed in 2006.

The 2011 survey found that coral cover has been increasing in the reserve since 1994 and that the reserve is generally in good health with little coral bleaching and very little evidence of coral predators such as crown-of-thorns starfish (*Acanthaster planci*) and *Drupella* snails. Densities of Galapagos sharks were very high however black cod numbers were lower than expected. The survey concluded that Elizabeth and Middleton Reefs are fairly typical of tropical coral-dominated ecosystems (see case study on page 128).

Future challenges

Major challenges are:

- implementing regular monitoring
- ensuring 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 issue

- Understanding ecology of large vertebrates as potential indicator of effective management
- Reef health and impacts of climate change

Actions

- Compliance with management requirements
- Develop standardised/long-term monitoring survey program

Performance results 2010–11

- Comprehensive marine ecological survey undertaken April 2011
- Replacement of temperature data loggers installed in 2006

KRA2: Cultural heritage management

Major issue

- Potential interference with shipwrecks

Actions

- Regular monitoring to assess the condition of shipwrecks

Performance results 2010–11

- Border Protection Command flights detected no interference with shipwrecks
- Visual survey of shipwrecks carried out in April 2011

KRA4: Use and appreciation of protected areas

Major issues

- Keeping visitors informed of management arrangements
- Potential illegal fishing

Actions

- Enforce compliance of fishing restrictions through service agreement with NSW
- Issue permits for visitor access and recreational fishing

Performance results 2010–11

- Border Protection Command flights detected a commercial fishing vessel in the reserve. The vessel was found to be sheltering from inclement weather, which is permissible under the management plan
- Issued 21 permits for visitor access and recreational fishing and commercial journalism

KRA5: Stakeholders and partnerships

Major issue

- Maintaining relationships with Border Protection Command, researchers, the Lord Howe Island community who visit the reserve, and NSW Government

Action

- Active participation on Lord Howe Steering Group and implement service agreement with NSW

Performance results 2010–11

Implemented service agreement with NSW for Lord Howe Island and Elizabeth and Middleton reefs

Case study: Survey shows current monitoring should continue for Elizabeth and Middleton reefs

A team of scientists from the Marine Division and James Cook University took to the high seas during March 2011 to monitor marine life on the Elizabeth and Middleton reefs about 600 kilometres off the New South Wales Coast and 200 kilometres north of Lord Howe Island.

The two-week survey showed that protection currently provided for the Elizabeth and Middleton Reefs Marine National Nature Reserve is adequate and should be maintained.

The survey estimated live coral cover and condition and the abundance of small endemic reef fishes, black cod, Galapagos sharks and invertebrates. The scientists also replaced temperature data loggers installed in 2006 and completed a shipwreck census — visiting seven wrecks and recording two distant wrecks which had not been previously documented — for inclusion in the National Shipwreck database.

The Elizabeth and Middleton Reefs Marine National Nature Reserve covering some 188,000 hectares was declared on 23 December 1987. The reserve contains the world's southern-most open ocean platform reefs, providing habitat for the tropical, sub-tropical and warm temperate species close to their southern-most and northern-most geographic limits. Divided into two zones, the reserve includes the northern 'no-take' sanctuary zone around Middleton Reef and a southern habitat protection zone that allows limited recreational fishing around Elizabeth Reef.

The reserve supports a number of endemic and rare species including black cod which, while overfished elsewhere in the south-western Pacific, occur in relatively high abundances at the reefs. Ongoing monitoring of marine resources to understand changes in community structure over time is important for managing the reserve and protecting this significant area.

Transect-based surveys were used to maximise resolution and precision so that temporal and spatial changes in coral reef ecosystems could be detected. The results of this work were compared, where possible, to baseline information collected in previous surveys so trends in the reserve's condition could be detected.

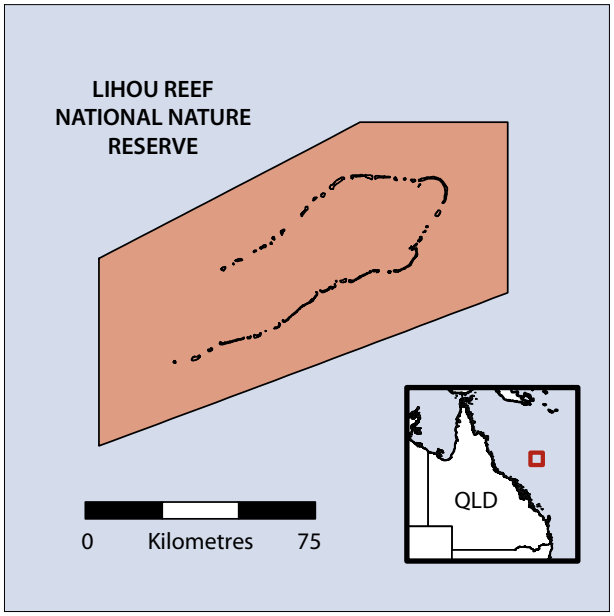
The survey found that coral cover has been increasing in the reserve since 1994 and that the reserve is generally in good health, with little coral bleaching and very little evidence of coral predators such as crown-of-thorns starfish and *Drupella* snails. Galapagos sharks were observed to be in very high densities but, while still relatively abundant, there were fewer black cod than expected for reasons that are as yet unclear.

The report recommended that monitoring should continue to assess the impact of any threats to the reserve, including climate change and crown-of-thorns starfish outbreaks.

Galapagos shark, Middleton Reef. Photo: DSEWPAC Marine Division

Lihou Reef National Nature Reserve

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



Special features

Lihou Reef National Nature Reserve and its associated sandy coral cays and islets comprise the largest reef structure in the Coral Sea. The reef habitats support benthic (bottom-dwelling) flora and fauna that are distinct from those of the Great Barrier Reef. A diverse range of marine organisms has been recorded in the reserve. The green turtle (*Chelonia mydas*) breeds in the reserve and 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	843,670 hectares	
Proclamation date	16 August 1982	
IUCN category	Category Ia	
Biogeographic context	IMCRA 4.0 provincial bioregion: Northeast Province	
Management plan	Second plan expired 4 September 2008	
Financial	Operating	nil*
	Capital	nil
	Revenue	nil
Visitors/users	Bureau of Meteorology; recreational yachts	
Permits/Approvals	none	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded					
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**	**Plants**
30	24	5	Over 340	Over 1,000	7

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

Management arrangements

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

The Australian Customs and Border Protection Service provides aerial surveillance of the reserve. The Bureau of Meteorology collects and replaces temperature data loggers during their annual visits, and also provides storage for an emergency helicopter fuel cache to cover emergency evacuation from the reserve.

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

Monitoring

Monitoring of use within the reserve is provided by Australian Customs and Border Protection Service aerial surveillance. Other monitoring projects include the use of satellite imagery to map vegetation and shallow reef habitats. High resolution satellite images will be compared through time to assess habitat changes.

Future challenges

Major challenges are:

- logistics associated with managing this isolated reserve
- ensuring 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

- Compliance and enforcement
- Controlling and managing pest species
- Understanding reef health including the effects of climate change

Actions

- Provision of routine aerial surveillance
- Enforce the fishing prohibition
- Establish satellite monitoring program of shallow reef and flora habitat condition

Performance results 2010–11

- No monitoring undertaken this year

KRA4: Use and appreciation of protected areas

Major issues

- Managing visitor access and permitting of activities
- Improving awareness among stakeholders of reserve management prescriptions
- 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

Performance results 2010–11

- No illegal activity was reported by Australian Customs and Border Protection Service

KRA5: Stakeholders and partnerships

Major issues

- Awareness among stakeholders of reserve management prescriptions

Actions

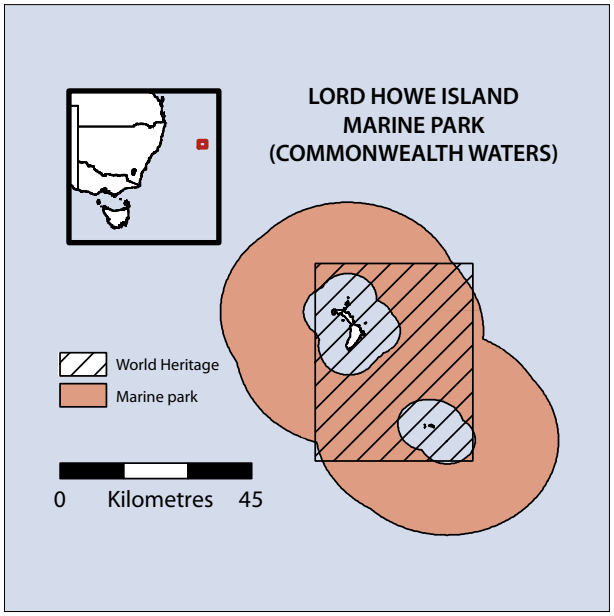
- Consult key stakeholders and partners and provide information on important issues
- Distribute the department's reserve information brochure
- Maintain partnerships with other Commonwealth agencies to assist with monitoring

Performance results 2010–11

- Ongoing discussions with the Bureau of Meteorology to establish arrangements for use of and access to the reserve

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 Ia 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	The first plan expired on 24 September 2009	
Other significant management documents	Service level agreement and subsidiary annual business agreement between the Australian and NSW governments	
Financial	Operating	$66,900*
	Capital	nil
	Revenue	nil
Visitors/users	Not known	
Permits/approvals	commercial approvals	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded [(a)]				
Mammals	**Birds**	**Reptiles**	**Fish**	**Plants**
Unknown	11	Unknown	42	Unknown

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

Management arrangements

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

The Australian Customs and Border Protection Service periodically conducts flights over the Lord Howe Island area and reports on vessel activity. Surface surveillance is undertaken by the NSW Marine Parks Authority in accordance with a negotiated services agreement.

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

The NSW Marine Park Lord Howe Island Steering Committee provides a forum for cooperative planning and management for both state and Commonwealth parks. The local advisory committee also enables stakeholders to provide advice on the management of both parks to the managing agencies.

Monitoring

Data on fish catch effort by charter fishing vessels operating under permit in the marine park is recorded.

Future challenges

Major challenges are:

- ensuring 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

- improving awareness and compliance of marine park requirements
- developing second management plan under the Marine Bioregional Planning program

Actions

- Implementing management program supporting voluntary compliance

Performance results 2010–11

- Shore-based and vessel-based surveillance reported no illegal fishing activity in the park

KRA5: Stakeholders and partnerships

Major issues

- Maintaining cooperation with the Lord Howe Island community and NSW Marine Parks Authority for effective day-to-day management of the park

Action

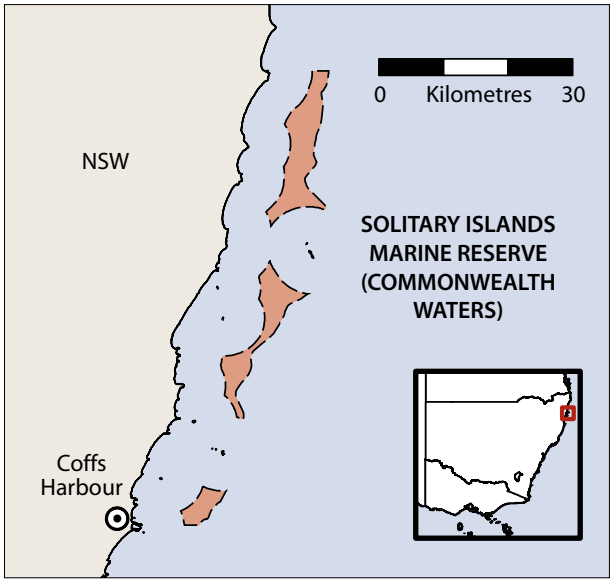
- Take an active role on the advisory and steering committees for the state and Commonwealth marine parks

Performance results 2010–11

- Attended two steering committee and advisory committee meetings

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 novaengliae*), 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 Ia 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	The first plan expired 3 April 2008. Interim management arrangements are in place	
Other significant management documents	Service level agreement between the Australian and NSW governments	
Financial	Operating	$100,000*
	Capital	nil
	Revenue	nil
Visitors	Not known	
Permits/Approvals	3 recreational diving, 69 commercial fishing, 6 commercial tour operator	

* In addition to the operating costs for each individual reserve (eg on annual service delivery contracts, travel, research and monitoring projects) a total of $2,306,000 was spent across the 25 reserves managed by Marine Division on professional services, performance assessment, training, communications, workshops, conference attendance, surveillance and enforcement activities.

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

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

Numbers of native species recorded[a]				
Mammals	**Birds**	**Reptiles**	**Fish**	**Invertebrates**
25	37	6	Over 263[b]	90

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

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

Management arrangements

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

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

The NSW Solitary Islands Marine Park Advisory Committee, established by the NSW Marine Parks Authority, provides advice on management and enables stakeholders to contribute to planning for both the adjacent state park and the Commonwealth reserve.

The next management plan will be developed following the conclusion of the bioregional planning process for the East Marine Region. In the meantime, the reserve is being managed under interim arrangements under the EPBC Act.

Monitoring

The NSW Marine Parks Authority and CSIRO continued to monitor grey nurse shark movements between aggregation sites in the reserve including Pimpernel Rock.

Ongoing research was conducted to identify fish biodiversity patterns in deep reef habitats and to explore the representation of fish assemblages.

The NSW Marine Parks Authority continued to remove and monitor debris at Pimpernel Rock.

Future challenges

Major challenges are:

- ensuring voluntary compliance with park management requirements particularly in the vicinity of Pimpernel Rock
- 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 issue

- Potential illegal activities threatening conservation values in the vicinity of Pimpernel Rock

Actions

- Implement compliance program including routine patrols to Pimpernel Rock
- Monitor anchor sites at Pimpernel Rock

Performance results 2010–11 (in cooperation with NSW Government)

- The NSW Marine Parks Authority and NSW Fisheries conducted nine vessel-based patrols

KRA4: Use and appreciation of protected areas

Major issues

- Managing impacts from visitor activities in the Sanctuary Zone

Actions

- Conduct vessel based patrols and manage commercial fishing approvals
- Communicate reserve values and provide information to users
- Administer permits and approvals for recreational and commercial activities

Performance results 2010–11 (in cooperation with NSW Government)

- The NSW Marine Parks Authority provided surveillance support through regular patrols
- Issued three recreational permits for access to Pimpernel Rock

KRA5: Stakeholders and partnerships

Major issue

- Ongoing effective engagement with the community and government agency representatives

Actions

- Develop an annual service agreement with NSW agencies to support on site management and compliance in the reserve
- Participate on Solitary Islands Marine Park Advisory Committee

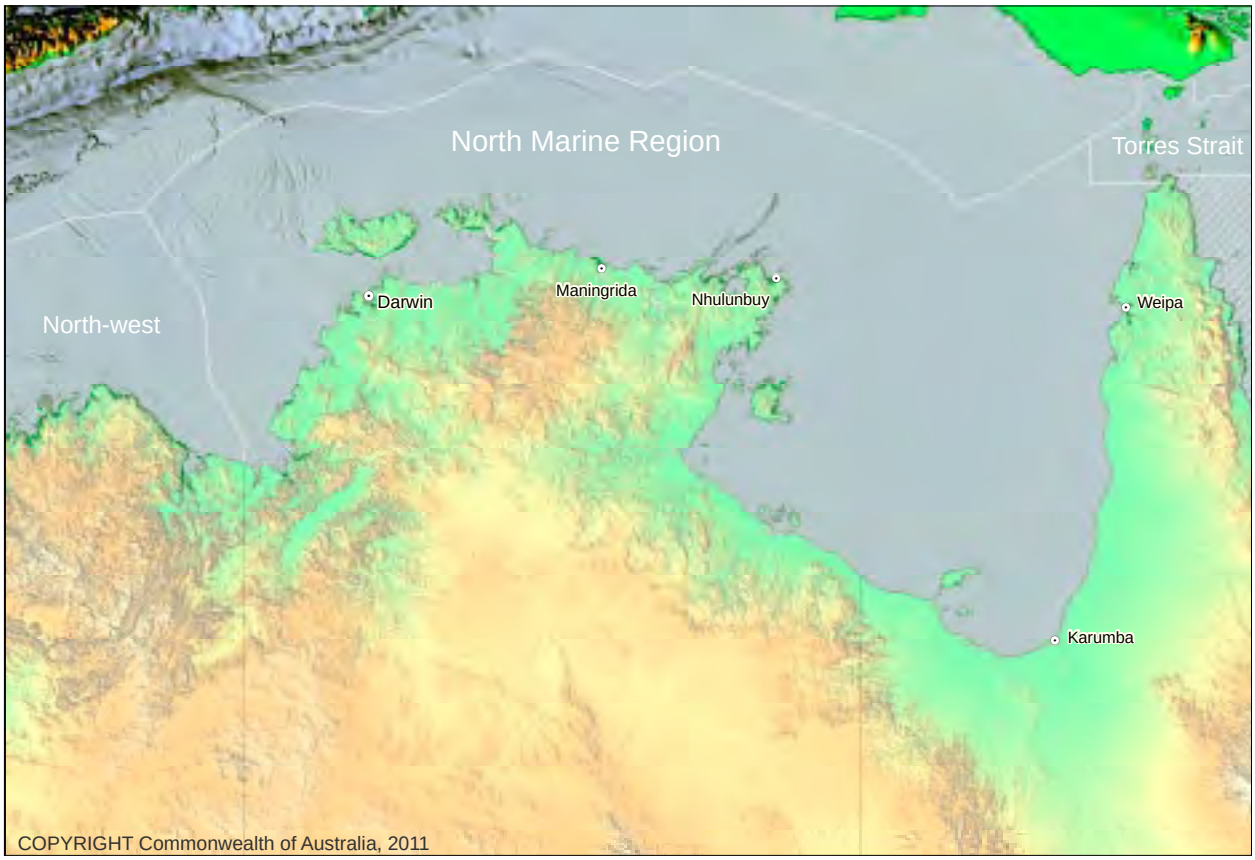
Performance results 2010–11 (in cooperation with NSW Government)

- Implemented the annual service arrangements
- Conducted management, compliance and research activities
- Participated in advisory committee meetings

Wreck of the meat freighter Runic at Middleton Reef. During March 2011 scientists from the Marine Division and James Cook University surveyed the marine life on Elizabeth and Middleton reefs and also undertook a census of shipwrecks in the area. Photo: DSEWPAC Marine Division

North Marine Region

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



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

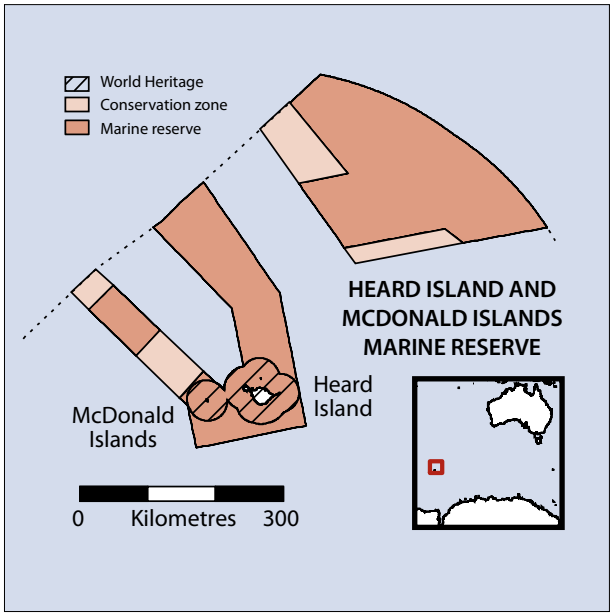
The North Marine Bioregional Profile was released in November 2008. The profile describes the natural assets of the region and its ecological characteristics and conservation values, and outlines the human activities carried out there. The profile explains how new marine reserves will be identified. As part of that process, areas for further assessment were identified for the North Marine Region in September 2009.

Existing Commonwealth marine reserves

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

Heard Island and McDonald Islands Marine Reserve

www.heardisland.aq



Special features

The Heard Island and McDonald Islands Marine Reserve includes the Territory of Heard Island and McDonald Islands, which extends to 12 nautical miles from shore, plus an additional marine area which extends in parts to the 200 nautical mile boundary of Australia's Exclusive Economic Zone. The reserve is approximately 4,099 kilometres south-west of Perth.

Heard Island and McDonald Islands 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 mountain (Mawson Peak 2,750 metres) outside the Australian Antarctic Territory. Heard Island contains significant cultural relics and heritage sites from 19th and early 20th century sealing activities and from the first Australian Antarctic research expeditions.

The marine environment surrounding the islands features diverse and distinctive benthic habitats that support a range of slow growing and vulnerable species including corals, sponges, barnacles and echinoderms. The waters of the reserve also include prime foraging areas for a number of land-based marine predators, and provide nursery areas for fish, including commercially harvested species. Areas of highly productive nutrient-rich waters in the reserve, created by the confluence of key oceanographic fronts such as the Antarctic Polar Front, are believed to provide feeding grounds for cetaceans.

Location	53°05′ South, 73°30′ East	
Area	6,465,845 hectares	
Proclamation date	16 October 2002	
IUCN category	Category Ia	
Biogeographic context	Subantarctic area IMCRA 4.0 provincial bioregion: Kerguelen Province	
Management plan	First plan expires 10 August 2012	
Financial	Operating	$81,200
	Capital	nil
	Revenue	nil
Visitors	0[(a)]	
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[a]	1 endangered 10 vulnerable 14 migratory 51 marine
	Recovery plan	1 being implemented: albatross (*Diomeda* spp. and *Thalassarche* spp.) and giant petrels (*Macronectes* spp.)
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[a]	47[b]	0	34[c]	169[d]	262[e]

(a) 3 breeding, 4 non-breeding seal species

(b) 19 breeding, 28 non-breeding

(c) Recorded from nearshore waters (less than 12 nautical miles)

(d) Terrestrial and freshwater

(e) 12 vascular plants, 62 bryophytes, 71 lichens, 100 terrestrial algae, 17 marine macro-algae

Management arrangements

The reserve is managed by the department's Australian Antarctic Division under delegation from the Director of National Parks.

Monitoring

Research and monitoring priorities are:

- research that increases understanding of the reserve's values and provides for ongoing reporting on the condition of the reserve's values, as required under legislation and national and international agreements
- research to determine whether the current reserve area sufficiently represents the region's marine habitats and is effective in achieving the purposes for which the reserve was declared
- research and monitoring to further understanding of the impacts of human activities in and around the reserve on the reserve's values, and to contribute to developing management strategies
- research and monitoring that will help address emerging management issues consistent with the provisions of the management plan.

Future challenges

The major challenge continues to be funding and mounting expeditions to the reserve for research and monitoring, maintaining field huts and removing waste.

Report on performance by key result areas

Major issues

- Monitoring changes to the landscape and the status of populations of species breeding in the reserve
- Preventing introductions and controlling or eradicating non-native species
- Ensuring the reserve provides sufficient protection for the region's biodiversity

Actions

- Use remotely sensed data to assess environmental change
- Verify visitors' compliance with quarantine requirements
- Obtain specialist assistance in quarantine management, and the potential control or eradication of species of concern

Performance results 2010–11

- 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 and is expected to be completed in 2011–12
- Installed 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 2010–11

- 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 2010–11

- 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 2010–11

- 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

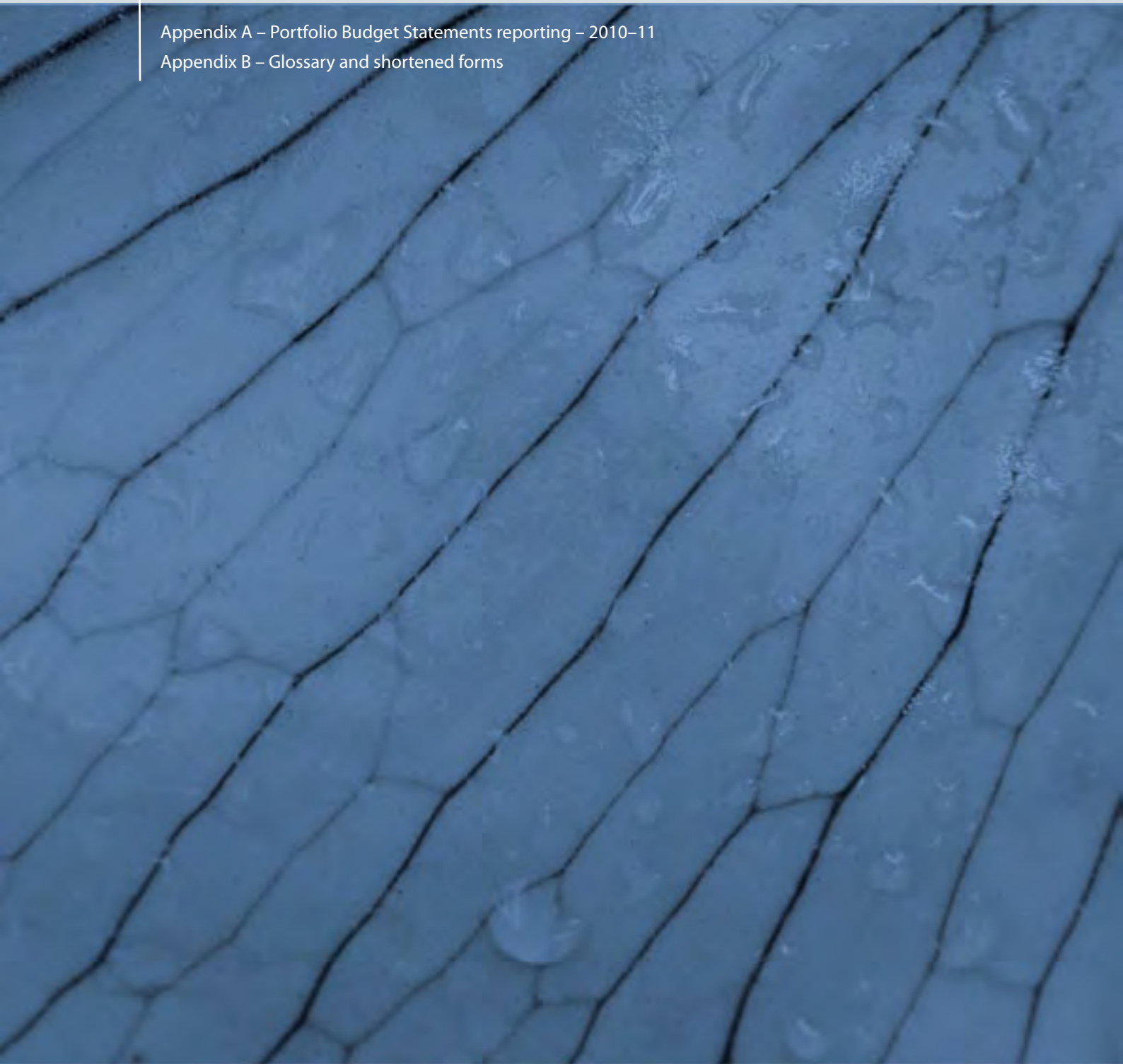
Actions

- Encourage compliance through education and self-regulation
- Identify management plan implementation priorities and allocate resources accordingly

Performance results 2010–11

- Commenced review of the Heard Island and McDonald Islands Marine Reserve Management Plan due in late 2012

3 Appendices



Appendix A: Portfolio Budget Statement Reporting – 2010–11

Key Result Area 1 – Natural Heritage Management

PBS Target – Viable populations of selected significant species maintained

- Park managers have nominated 36 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 4 species are increasing; 13 species are remaining steady; 7 species are decreasing; 1 species is likely to be extinct; 2 species may be locally extinct; and for 9 species population data are deficient.

Booderee National Park

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
Eastern bristlebird *Dasyornis brachypterus*	Endangered	Monitoring program for distribution and abundance in place since 2004.	Controlling fox populations and preserving suitable bristlebird habitat.	Numbers have been steadily increasing since the last major wildfire in 2003 in burnt sites but steady in unburnt sites.	↑ Numbers rising
Sooty oystercatcher *Haemotopus fuliginosus*	No	Monitoring program for distribution and abundance in place since 2004.	Controlling fox populations and 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.	→ Numbers steady
Pied oystercatcher *Haematopus longirostris*	No	Monitoring program for distribution and abundance in place since 2004.	Controlling fox populations. 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.	→ Numbers steady
Little penguin *Eudyptula minor*	Marine	Irregular counts of beach landings. Irregular monitoring of chick mortality.	Maintained native plantings to re-establish penguin nesting habitat on Bowen Island.	This is a stable and very healthy population displaying exceptionally high breeding success.	→ Numbers steady
Long-nosed bandicoot *Perameles nasuta*	No	Monitoring program for bandicoots and primary food source (invertebrates) in place since 2003.	Controlling fox populations.	Populations peaked in 2005–2006 before declining in 2008–2009. Numbers increased in 2010 and are steady in 2011. This is representative of trends in recovering bandicoot populations.	→ Numbers steady
Green and golden bell frog *Litoria aurea*	Vulnerable	Call back monitoring of breeding sites since 1996. PhD research project of all frogs has been underway since 2007.	No action being undertaken.	Not positively detected in the park for six years. Likely to be locally extinct, despite little change to habitat or hydrology.	↓ Presumed to be locally extinct
Giant burrowing frog *Heleioporus australiacus*	Vulnerable	Call back monitoring of breeding sites since 1996. PhD research project of all frogs has been underway since 2007.	No action being undertaken.	Numbers have been stable for the life of the monitoring program.	→ Numbers steady

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
Common brushtail possum *Trichosurus vulpecula*	No	Monitoring programs for distribution and abundance in place since 2003.	Controlling fox populations.	Populations have increased since intensive fox baiting started but have now started to decline.	↓ Numbers falling
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 have been stable for the life of the monitoring program.	→ Numbers steady
Greater glider *Petauroides volans*	No	Monitoring program in place since 2003 via ANU researchers.	Targeted research into reasons for decline and possible re-introduction.	Numbers declined strongly in early 2000s and the species has not been detected in the park since 2007.	↓ May be locally extinct

Christmas Island National Park

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
Christmas Island pipistrelle *Pipistrellus murrayi*	Critically Endangered	Monitoring of pipistrelle call activity as part of broader island wide biodiversity monitoring.	Monitoring of pipistrelle call activity as part of broader island wide biodiversity monitoring.	The pipistrelle is likely to be extinct.	↓ Likely to be extinct
Native reptiles (blue-tailed skink *Cryptoblepharus egeriae,* Lister's gecko *Lepidodactylus listeri* and forest skink *Emoia nativitatis*)	No (except for Lister's gecko listed as Vulnerable)	Surveys of native reptile fauna conducted as part of broader island wide biodiversity monitoring 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) commenced.	Reptile species are undergoing a rapid population decline in the wild. However, the trend for Lister's gecko and blue-tailed skinks bred in captivity is increasing. Forest skinks have not bred in captivity.	↓ Numbers falling

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
Red crab *Gecarcoidea natalis*	No	Biennial monitoring (Island Wide Survey – IWS) of burrow counts to determine distribution and density. Survey has used consistent methodology since 2001 and another IWS is being conducted in 2011. An independent scientific study monitoring the off-target impacts of using Fipronil bait was conducted. The results of this study showed that Fipronil did not have off-target impacts.	Continued crazy ant management program including commencement of an IWS in 2011 and continuation of an indirect biological control research project. Australian Government announcement of $4m of funds to continue crazy ant, as well as other invasive species, management. Continued red crab management program including traffic management, road infrastructure development and education. The Crazy Ant Scientific Advisory Panel continued to provide advice for the management of crazy ants.	Population numbers appear to have remained steady from 2001 to 2009 but a re-analysis of data collected since 2001 is occurring and may indicate a slight decline.	→ Numbers steady (possible slight decline)
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 are inconclusive. Mapping through the IWS in 2011 will also occur, making it more possible to assess trends. External researcher currently investigating some aspects of population ecology, particularly population demographics.	Continuation of the Christmas Island Mine-site to Forest Rehabilitation Programme (CIMFR) which focuses on the rehabilitation of Abbott's booby nesting habitat.	Trend is currently unknown.	Data deficient

Kakadu National Park

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
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.	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 and monitoring of survival rates.	Significant population decline occurred following the arrival of cane toads. The remaining population is low but stable. A number of captive bred 'toad-smart' quolls are surviving and reproducing.	→ Numbers steady
Northern brown bandicoot *Isoodon macrourus*	No	Biodiversity Hotspot Surveys. Incidental sighting database records any sightings or road kills.	Landscape unit-based fire management to improve habitat quality.	Population declining consistent with pattern of small mammal decline across northern Australia.	↓ Numbers falling
Northern brushtail possum *Trichosurus arnhemensis*	No	Biodiversity Hotspot Surveys. Incidental sighting database records any sightings or road kills.	Landscape unit-based fire management to improve habitat quality.	Population declining consistent with pattern of small mammal decline across northern Australia.	↓ Numbers falling
Brush-tailed rabbit-rat *Conilurus penicillatus*	Vulnerable	Biodiversity Hotspot Surveys and targeted monitoring at the Mardugal Campground. Incidental sighting database records any sightings or road kills.	Landscape unit-based fire management to improve habitat quality. Sightings in new areas are followed up with targeted surveys.	Population declining consistent with pattern of small mammal decline across northern Australia.	↓ Numbers falling
Black-footed tree-rat *Mesembriomys gouldii*	No	Biodiversity Hotspot Surveys. Incidental sighting database records any sightings or road kills.	Landscape unit-based fire management to improve habitat quality.	Population declining consistent with pattern of small mammal decline across northern Australia.	↓ Numbers falling
Pale field rat *Rattus tunnneyi*	No	Biodiversity Hotspot Surveys. Incidental sighting database records any sightings or road kills.	Landscape unit-based fire management to improve habitat quality.	Population declining consistent with pattern of small mammal decline across northern Australia.	↓ Numbers falling
Flatback turtle *Natator depressus*	Vulnerable; Marine; Migratory	Continuation of 16-year survey and capture program (annual survey).	–	Monitoring shows population is steady.	→ Numbers steady
Estuarine crocodile *Crocodylus porosus*	Marine; Migratory	Continuation of 16-year survey and capture program. Satellite tracking project has been underway for 6 years.	–	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.	→ Numbers steady

Norfolk Island National Park

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
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. Data suggest artificial nest sites are being used less frequently. 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 management of 20 green parrot nesting sites. Active feral animal control (rats, cats, crimson rosellas). Gas powered self resetting rat traps and cat traps located near active breeding sites during breeding season.	Current population estimate of 240 individuals (Dutson, 2010). 300% increase over the past decade (approx).	↑ Numbers rising
Norfolk Island morepork (boobook) owl *Ninox novaeseelandiae undulata*	Endangered; Migratory	Artificial nesting boxes are monitored annually to record breeding activity (October to January). These boxes have not been used in the preceding 12 months. 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.	Current population estimate of 40 individuals. No change over past year. Although not well documented, there has been an increase over the past decade. First introduced from NZ in mid 1980s. Steady population numbers may indicate that carrying capacity of existing habitat has been reached.	→ Numbers steady
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.	Current population estimate of 2,200 mature individuals (Dutson, 2010). Insufficient data to estimate trend.	Data deficient
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. Gas powered self resetting rat traps located near known robin breeding areas.	May be gradual decline which 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).	Data deficient
Wedge-tailed shearwater *Ardenna pacifica*	Marine; Migratory	No monitoring program at present.	Weed and feral animal control.	Unable to determine. No trends at present.	Data deficient

Pulu Keeling National Park

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
Red-footed booby *Sula sula*	Marine; Migratory	Annual fauna survey conducted since 1985. However, monitoring was not undertaken in 2010 due to access issues.	Community education and compliance activities.	Analysis of data indicates population remains steady at around 30,000 breeding pairs.	→ Numbers steady
Cocos buff-banded rail *Gallirallus philippensis andrewsi*	Endangered	Monitoring commenced in late 1999. Monitoring continued opportunistically when staff visit the park.	In collaboration with the Cocos Islands Shire and scientists, considered and progressed options identified in the re-introduction feasibility study to establish a second population outside the park.	In 2005, monitoring data was analysed and found that the current population is stable at 1,000 individuals.	Data deficient

Uluṟu–Kata Tjuṯa National Park

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
Tjakuṟa – great desert skink *Liopholis kintorei*	Vulnerable	14th annual *Tjakuṟa* survey (Feb–Mar 2011) identified 357 active burrows (89 containing juveniles).	Continued fire management to improve habitat quality. Continued predator monitoring. Feral strategy finalised and acted upon.	Highest number of active burrows since inception of monitoring (14 years).	↑ Numbers rising
Mala – rufous hare-wallaby *Lagorchestes hirsutus*	Endangered	Next annual *mala* survey scheduled for September 2011. Last full survey captured 51 individuals including 23 new animals.	Continued active management within predator-proof enclosure such as mosaic burning (20% regeneration to 80% mature spinifex) and supplementary feeding. Daily inspection of enclosure fence.	Although mark-recapture estimates have indicated a population increase since January 2009, similar numbers of trapped animals suggest that populations within current trap locations may have reached saturation. Future trapping will consist of two separate surveys concentrating on the original trap locations as well as the broader enclosure.	↑ Numbers rising
Murtja – brush-tailed mulgara *Dasycercus blythi*	No[1]	Trapping for mulgara captured six animals over 2,000 trap hours. In addition, following on from new survey methodology begun in 2010, surveys conducted in 2011 found widespread mulgara signs throughout 20 survey areas.	Continued fire management to improve habitat quality. Collared feral cats to determine whether they are main predator. Feral strategy finalised and acted upon.	Numbers of mulgara trapped remain too low to determine trends. Data collected in 2010 indicate an apparent habitat preference for old spinifex. Much mulgara habitat is still recovering from 2002 wildfires that burnt 50% of the park.	Data deficient

1 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.

Species	EPBC Act status	Monitoring	Actions	Trend	Flag
Itjariitjari – southern marsupial mole *Notoryctes typhlops*	Endangered	12 month project involving monthly monitoring across 8 different areas of spinifex habitat completed.	Currently determining habitat preferences and distribution across the park. Future studies will involve trench surveying.	Marsupial mole sign (tracks/pop holes) found in all 8 spinifex habitat types – surface habitat preferences apparent but unable to conclude from the data how those sites differed statistically in respect to the number of signs which occurred at each site. The study also found there was no correlation between surfacing and temperature, although surfacing was more likely to occur between 3–10 days after rainfall. No baseline data so unable yet to establish trends.	Data deficient
Common wallaroo or euro *Macropus robustus*	No	Initial survey began in May 2010 and is continuing utilising surveillance cameras at four waterholes at the base of Uluṟu. Two of the waterholes are accessible to tourists, whilst two are not.	Currently determining habitat preferences and visitor influences on existing populations.	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 (*Varanus giganteus*) will be very useful in guiding future management decisions.	Data deficient
Striated grasswren *Amytornis striatus*	No	Monitoring conducted in September 2010.	Continue 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.	Monitoring located 5 pairs in a small area of complex spinifex in a small area in the south of the park. This is the largest number recorded since initial surveys in 1992 however birds are unable to be located in any other sites on the park suggesting this part of the park provides key habitat elements.	Data deficient
Rare plant survey	No	3 year baseline study and annual monitoring of 15 prioritised plants completed.	Individual management actions for each species, including fire management regimes, erosion control and camel control.	Numbers stable for most species. Further monitoring will continue for *Acacia ammobia, Santalum acuminatum, Wurmbea centralis, Goodenia occidentalis, Juncus continuus, Ophioglossum lusitanicum, Nicotiana excelsior* and *Stylidium inaequipetalum.*	→ Numbers steady

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 9 species are increasing; 3 species are remaining steady; 4 species are decreasing; and for 8 species population data are deficient.

Booderee National Park

Species	Monitoring	Actions	Trend	Flag
European red fox *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.	An increase in numbers was recorded in 2011, 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.	↑ Numbers rising
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.	Approximately 4 ha sprayed using splatter guns and approximately 4 ha of dead bitou burnt using spot burning. 300 ha of bitou bush aerially sprayed in June 2011. Ground application of herbicide followed by spot burning is increasing and aerial application decreasing as bitou density reduces.	90% reduction in the area of high density infestation and 75% reduction in the area of medium density infestation between 2004 and 2011. Post treatment recovery slow due to high levels of preferential grazing by native species.	↓ Numbers falling

Christmas Island National Park

Species	Monitoring	Actions	Trend	Flag
Yellow crazy ant *Anoplolepis gracilipes*	Biennial biodiversity Island Wide Survey (IWS) to determine supercolony distribution. The survey has used consistent methodology since 2001. The last survey was completed in 2009 and a further survey commenced (and will be completed) in 2011.	Commenced 2011 IWS which underpins control program and prepared for hand-baiting program to be conducted later in 2011. Continued to fund research by La Trobe University into biological control. Completed a study on the off-target species impacts of Fipronil bait.	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, 784 ha supercolonies baited. Ongoing monitoring indicates aerial baiting has been successful in reducing ant numbers in former supercolonies. However, based on the initial results from the 2011 IWS, new supercolonies are emerging.	↑ Numbers rising
False curry bush *Clausena excavata*	Survey to be conducted as part of 2011 IWS.	No specific control work has been undertaken.	No baseline data to date so no trend can be detected. Increasing numbers and distribution under intact rainforest canopy is of significant concern.	Data deficient

Species	Monitoring	Actions	Trend	Flag
Siam weed *Chromolaena odorata*	Siam weed was first detected on Christmas Island in 2010 but it is only known to be in one small location. Monitoring of roadsides commenced and has continued and it is being surveyed as part of 2011 IWS.	Control of the only known infestation continues (as seeds stored in the soil 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.	↓ Numbers falling (for known infestation)
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 the control of cats in settled areas. This work is supported by Australian Government agencies, the Shire and Phosphate Resources Ltd.	Little baseline data to date so no trend can be accurately detected. Anecdotal evidence suggests that numbers appear to be rising.	Data deficient (likely to be increasing)

Kakadu National Park

Species	Monitoring	Actions	Trend	Flag
Mimosa *Mimosa pigra*	Mimosa stands have been mapped and there is an annual monitoring program.	Integrated eradication program conducted.	Under control, virtually absent from the park.	→ Numbers steady
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.	The range of this species is increasing.	↑ Numbers rising
Gamba grass *Andropogon gayanus*	Ongoing monitoring as part of integrated weed program.	Eradication program conducted.	Under control within the park. A large infestation is however advancing toward the park's southern boundary and presents a high risk to the park.	→ Numbers steady
Mission grass *Pennisetum polystachion*	Ongoing monitoring as part of integrated weed program.	Treated in a number of strategic areas, opportunistic control elsewhere.	The range of this species is increasing.	↑ Numbers rising
Olive hymenachne *Hymenachne amplexicaulis*	Ongoing monitoring as part of integrated weed program.	Systematic control at a number of key locations, opportunistic control elsewhere.	The range of this species is increasing.	↑ Numbers rising
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.	Extent of infestations varies greatly between locations and over time.	→ Numbers steady
Water buffalo *Bubalus bubalis*	Incidental sightings database maintained.	Opportunistic control. Participatory planning process begun to develop an agreed control plan between key stakeholders.	Numbers are increasing.	↑ Numbers rising
Feral pig *Sus scrofa*	Incidental sightings database maintained.	Opportunistic control. Participatory planning process begun to develop an agreed control plan between key stakeholders.	Numbers are increasing.	↑ Numbers rising

Norfolk Island National Park

Species	Monitoring	Actions	Trend	Flag
Black rat *Rattus rattus*	Monthly survey of presence/absence of rats. Trapping and baiting program provides an indication of presence/absence.	Commenced change over to new bait type. Upgraded snap traps and introduced 10 gas powered self resetting traps. 714 kg of bait taken by rats and 329 rats caught in traps. Predation by rodents is listed as a priority threatening process under the Norfolk Island Region Threatened Species Recovery Plan.	Numbers of rodents trapped and bait take indicates an increase in rodent numbers and possible resistance to previous bait regime (Racumin had been in place for 15 years).	Data deficient
Feral cat *Felis catus*	Trapping program provides a presence/absence indication. Continued gut analysis to determine prey composition (eg rats, native birds).	13 wild cats controlled in the park. New trap types including soft hold leg traps and a felid attracting phonic included in trapping program. Predation by feral cats is listed as a priority threatening process under the Norfolk Island Region Threatened Species Recovery Plan.	Unable to quantify population size. Uncertain whether rodent control program on park is impacting on feral cat numbers in the park.	Data deficient
Red guava *Psidium cattleianum*	No monitoring program at present.	Completed weed control in 6.5 of the 19 coups identified in the rehabilitation strategy. 6 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.	Unable to determine. No trends at present.	Data deficient
African olive *Olea europaea africana*	No monitoring program at present.	Completed weed control in 6.5 of the 19 coups identified in the rehabilitation strategy. 6 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.	Unable to determine. No trends at present.	Data deficient

Pulu Keeling National Park

Species	Monitoring	Actions	Trend	Flag
Yellow crazy ant *Anoplolepis gracilipes*	Island-wide survey conducted in 2009. Survey methodology has been updated to include detection of scale insects.	Continued monitoring program and planning for control programs. A scale insect survey was conducted in conjunction with La Trobe University	Colonies fairly widespread, with some sites recorded at supercolony density. However, as the 2009 survey was the first island wide-survey it will establish a baseline that can be monitored in the future.	↑ Numbers rising
Coral berry *Rivina humilis*	Ongoing mapping activities and it will be included in the 2011 island-wide survey.	Coral berry was not specifically targeted. However, other species of weeds with smaller populations were controlled.	Increased distribution and density observed in western part of the park.	↑ Numbers rising

Uluṟu–Kata Tjuṯa National Park

Species	Monitoring	Actions	Trend	Flag
Buffel grass *Cenchrus ciliaris*	Monitoring of native biodiversity following buffel removal around Uluṟu. Trial study to determine the effects of fire and spraying on buffel conducted in 2011.	Prioritised buffel grass control activities including the Uluṟu base and areas of high conservation value. Buffel patches burnt and sprayed in varying quantities to determine the most effective method for large scale removal.	Distribution throughout the park decreased due to an increase in control activities.	↓ Numbers falling
Feral cat *Felis catus*	UKTNP Vertebrate Pest Monitoring Plan activated. This involves keeping data records of sightings and subsequent trapping efforts.	Continued feral cat trapping program.	Unable to establish trend with current monitoring approach.	Data deficient
European wild rabbit *Oryctolagus cuniculus*	Annual monitoring of active burrows has been undertaken since 1989.	Calicivirus released around resilient burrows. Phostoxin used to treat and re-treat warrens in the Mala Paddock, around Uluṟu and at Kata Tjuṯa. Over 300 active warrens have been treated, monitored and retreated again if necessary.	Rabbit numbers appeared to increase from 2009 as the result of a high rainfall year in 2010. It is expected that the ongoing treatments have since reduced numbers.	↓ Numbers falling
European red fox *Vulpes vulpes*	Alan Activity Index (AAI) for foxes carried out every three months in the sensitive borefields area. For the first time, in addition to the 31 original road sandpads which were monitored monthly in 2009–10, 71 random sandpads are also monitored. It is expected that the increase in pads will enable calculation of levels of fox activity with greater accuracy.	Continued monitoring through AAI. Opportune trapping as a result of images captured on surveillance cameras. Continue rabbit control in an effort to reduce available food resources.	AAI indicates low levels of fox activity. Early indications are that the random sandpads are more effective in recording fox activity than the road pads.	Data deficient

KEY RESULT AREA 2 – CULTURAL HERITAGE MANAGEMENT

PBS Target – 100 per cent of key sites, as agreed with traditional owners, inspected and treated as required (Jointly managed parks only)

- All key sites at Kakadu and Uluṟu–Kata Tjuṯa National Parks were inspected as agreed with traditional owners with various treatments undertaken as required. An inspection and treatment program is not yet in place at Booderee National Park.

KEY RESULT AREA 3 – JOINT MANAGEMENT AND WORKING WITH INDIGENOUS COMMUNITIES

PBS Target – Five per cent increase in numbers of Indigenous staff and/or contractors directly or indirectly providing park services (Jointly managed parks only)

- Overall the number of directly employed Indigenous staff throughout the year declined slightly in the jointly managed parks.
- The number of Indigenous staff (including intermittent and irregular employees) and contractors indirectly engaged to provide services at Kakadu and Uluṟu–Kata Tjuṯa National Parks remained steady. Aṉangu participation in flexible employment through the Muṯitjulu Community Ranger program has remained high with a number of *wati* (men) and *kungka* (women) regularly engaged in park activities. Aṉangu participating in the Muṯitjulu Community Ranger program are also attending the park's literacy and numeracy program which is run weekly at Nyangatjatjara College.
- Bininj were engaged as part of the Kakadu Indigenous Ranger Program, with eight and a half full-time equivalent positions filled for the entire year plus up to an additional six temporary positions at various times throughout the year.
- WBACC Contracting Services (the enterprise arm of the Wreck Bay Aboriginal Community Council) provided $1.9 million of cleaning, road maintenance, entry station, horticultural and infrastructure maintenance services to Booderee National Park. In its 2010 annual report, WBACC reported that it employed 15 permanent full-time, three permanent part-time and a number of casual staff to deliver these services.
- The Director and Wreck Bay Aboriginal Community Council completed draft service level agreements for the second round of outsourcing at Booderee, including infrastructure maintenance and horticultural services.

KEY RESULT AREA 4 – USE AND APPRECIATION OF PROTECTED AREAS

PBS Target – Greater than 90% of comments received from park users about their visit are positive

- Visitor surveys were undertaken in Kakadu, Uluṟu–Kata Tjuṯa, Booderee and Norfolk Island National Parks. All reserves recorded satisfaction from greater than 90% of park users (Kakadu – 91%; Uluru – 91%, Booderee – 97% Norfolk Island – 98%).

KEY RESULT AREA 5 – STAKEHOLDERS AND PARTNERSHIPS

PBS Target – Stakeholders and partners are actively involved during the year

- Stakeholders and partners were actively involved and contributed effectively to park management activities. Key stakeholder included national and regional tourism organisations (including the Transport and Tourism Forum and Tourism Australia), industry groups, universities, non-government organisations and community groups.
- Research partnerships continued with a range of organisations such as the Northern Territory Parks and Wildlife Service, CSIRO, Australian Institute of Marine Science, James Cook University, Australian National University, University of Canberra, Charles Darwin University and the Tasmanian Aquaculture and Fisheries Institute. Three projects were supported by Australian Research Council Linkage Grants.
- A partnership agreement with Taronga Zoo for conservation of Christmas Island's declining reptiles, including off-island captive breeding, was signed in May 2011.
- Constructive partnerships in managing Commonwealth reserves continued with: local government including Councils, state government parks agencies and other relevant agencies including schools and educational institutions and conservation and land management agencies, and Commonwealth agencies including the Department of Defence, the Department of Regional Australia, Regional Development and Local Government, the Department of Agriculture, Fisheries and Forestry and the Australian Customs and Border Protection Service.
- The Australian National Botanic Gardens and the Centre for Australian National Biodiversity Research continued their support for, and involvement, with the Council of Heads of Australian Botanic Gardens and the Council of Heads of Australian Herbaria.

KEY RESULT AREA 6 – BUSINESS MANAGEMENT

PBS Target – 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 and high risks in risk watch lists over 2010–11.
- The Director has participated in the Comcover Risk Management Benchmarking Scheme since 2002–03. In 2010–11 the Director scored 7.6 out of a possible 10 compared to an average score for all Australian Government agencies of 6.4. For the last six years the Director has consistently scored above the average for all agencies.

PBS Target – Eight management plans and six implementation schedules in place

- Three management plans covering four terrestrial reserves are in place (Norfolk Island National Park and Norfolk Island Botanic Gardens are two reserves covered by one management plan). Draft management plans are being finalised for Booderee, Christmas Island and Pulu Keeling National Parks and the Australian National Botanic Gardens.
- Three implementation schedules are in place. Implementation schedules are not in place for the reserves with expired management plans.

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

- Seven major injuries were sustained by parks staff and contractors including amputated fingers. Four park visitors died (two drownings and a death due to dehydration in Kakadu and one heart attack in Uluṟu-Kata Tjuṯa National Park) and there were 18 major injuries to visitors (mainly fractures from slips, trips and falls).

PBS Target – Eight parks with climate change strategies in place

- Five of the eight terrestrial reserves have climate change strategies in place. The Norfolk Island National Park and Botanic Garden Climate Change Strategy 2011–2016 was finalised and endorsed during the year and draft strategies were progressed for Uluṟu–Kata Tjuṯa, Christmas Island and Pulu Keeling National Parks. Policies related to climate change monitoring, mitigation and adaptation are also being incorporated into management plans as they are being drafted.
- Climate change strategies for each park identify actions to address five key objectives:
  - Understanding the implications of climate change
  - Implementing adaptation measures to maximise the resilience of our reserves
  - Reducing our carbon footprint
  - Working with communities, industries and stakeholders to mitigate and adapt to climate change
  - Communicating the implications of climate change and our management response.

PBS Target – Three new actions implemented which reduce greenhouse gas emissions

- Greenhouse gas emissions associated with stationary and transport energy use over the year were estimated to be 4,718 tonnes of carbon dioxide. This is a reduction of around 12 % compared with the average emissions over the past three years.
- Kakadu and the Australian National Botanic Gardens have undertaken carbon emissions audits (consistent with ISO14064-1) that considers energy use (including lighting, heating and cooling), waste, water and support infrastructure (e.g. insulation) across all buildings, vehicles and equipment used in the park and at the Gardens. At the Gardens the recommendations have been reviewed and as appropriate will be implemented as funding permits.
- As part of the department's ICT Refresh Program, Booderee National Park received an upgrade to its computers and printers. As a result, the park anticipates a reduction in desktop energy consumption.
- The ANBG is limited in its ability to reduce energy consumption, due to its business requirements for maintaining plant and herbarium specimens at very specific conditions. The ANBG continues to aim for a 10 per cent offset in its energy usage and in 2010–11 increased its purchase of GreenPower to 126,883 kilowatt hours (approximately 10.8 per cent of purchased electricity).
- Parks staff continue to make a conscious effort to minimise business-related travel, while recognising that face-to-face contact and visits to remote locations are sometimes necessary, particularly for the three parks that are managed jointly with their Indigenous owners. Parks Australia regularly uses alternatives to air travel such as tele-and videoconferencing.
- Obtaining accurate measurements of greenhouse emissions related to waste remains challenging and estimates were not available for all reserves. Ongoing efforts are focused on providing web-based visitor and interpretative materials, which will further reduce printing and paper consumption.
- Access to regional recycling facilities is gradually improving for remote locations such as Kakadu and Uluṟu–Kata Tjuṯa National Parks and external territories. Basic recycling facilities are now available on Norfolk Island and office paper is being sourced from renewable sources when available. Kakadu National Park is participating in a regional recycling and resource recovery program and is continuing its recycling programs in and around offices for paper, glass and aluminum. Where recycling facilities are cost effective and available, for example at the ANBG, improvements in recycling have lead to the diversion of approximately 39 tonnes of waste from landfill.

KEY RESULT AREA 7 – BIODIVERSITY KNOWLEDGE MANAGEMENT

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

- The Parks Australia websites (parksaustralia.gov.au and kakadu.com.au) received an almost 10 percent increase in visitation in 2011 with 593, 038 visits (an average of 1,624 per day). Use of online PDF publications decreased by almost 30 percent to 76,158 downloads as more and more publications are provided in html and smart phone friendly alternatives in line with Government Web Content Accessibility Guidelines 2.0 requirements.

Appendix B: Glossary and shortened forms

Anangu	Western Desert Aboriginal person or people (generally those Aboriginal people with traditional affiliations to the Uluru–Kata Tjuta 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)

Index

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

Y

Z

Street address
5 Farrell Place
Canberra City ACT 2601

Postal address
GPO Box 787
Canberra ACT 2601

Enquiries
Phone: (02) 6274 2220
Fax: (02) 6274 2349

environment.gov.au/parks

The web address for this annual report is:
environment.gov.au/parks/publications/annual/10-11