



# Department of Environment and Conservation 2009 – 10 Yearbook



Department of  
Environment and Conservation





## ACKNOWLEDGMENTS

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The tracks featured in the artwork of this publication represent those of two Western Australian animals: crossing the bottom right-hand page is the bandicoot (*Isodon* sp.), and crossing the top of the pages is the western brush wallaby (*Macropus irma*).



## FOREWORD

Welcome to the inaugural *DEC Yearbook*.

The idea for a yearbook emerged in response to the department's decision to adopt a new approach in preparing our annual report, which has traditionally documented the agency's workings in considerable detail. The 2009–10 statutory annual report is a leaner document than before, with a focus on financial reporting and the broader requirements of meeting public sector standards, while the *DEC Yearbook* allows for the considerable scope of DEC's operations to be recorded and made available to an enquiring public who have an interest in their environment and how it is managed. From defining and managing conservation significance of natural areas to enforcing industry regulation around the state, the Western Australian environment is a major asset and a theatre of complex activity. So it is that you will here find information on enforcement, prosecutions, flora and fauna translocations, licensing, and other data that, while going well beyond official public sector reporting requirements, still merit documentation for future reference.

A brief review of past series of yearbooks that have been produced chronicling the life and times of Western Australia finds that this type of publication has had somewhat of a stop-start history. *The Official Year Book of Western Australia* published in 1957 is number 1 of a new series, the earlier series having run from 1886 until 1905. After the new series was launched in 1957, annual statistical reviews appeared in one form or another until 1998, the year a *Western Australian Year Book* was produced, detailing political, legal, economic, social and environmental circumstances of the state. By that time, of course, the internet had become established as the information resource of choice. The explosion of information technology and the transformation of the publishing industry around the world over the past 15 years has further challenged the maintaining of yearbooks, and none has appeared since then.

But the ready availability of statistical data on the internet is not the same as having access to an annual compilation where all the information is contained in one reference. In this respect, the *DEC Yearbook* will pick up where the *2009–10 Annual report* left off. This product is designed with the digital age in mind, is set up to be primarily an electronic, online resource (although a limited print run will provide a set of hard copies each year), and, as a companion document to the statutory annual report, will serve the Western Australian public for many years to come.

On behalf of the 2,000 people who make up the DEC workforce, I invite readers to sample the remarkable diversity and reach of the department's operations in 2009–10.



Keiran McNamara  
Director General



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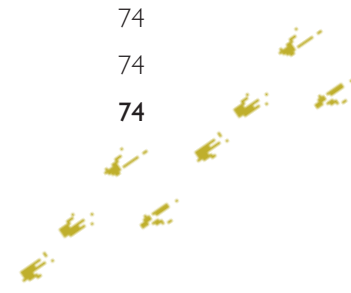
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# Part I: OVERVIEW

## Key events and issues 2009–10

### Gorgon go-ahead

In July 2009 the Western Australian Government announced the final approval of the Gorgon gas project—the biggest industrial development in Australia's history, and one of the largest such ventures in the world—with onshore facilities to be developed on Barrow Island off the north-west coast.

Barrow Island is also one of Western Australia's most significant nature reserves, home to 23 threatened and four priority animal species. Surrounding islands Double, Middle, Pasco and Boodie, also nature reserves, and nearby Barrow Island Marine Park and Barrow Island Marine Management Area, support a range of marine habitats and



DEC staff near Barrow Island. Photo: Tom Holmes/DEC



A golden bandicoot captured on Barrow Island for translocation.

species including coral reefs, mangroves, algal and seagrass habitats, dugongs, whales and other cetaceans, marine turtles, fish and invertebrates.

DEC has the responsibility of managing the Gorgon project's impact on these fragile and valuable island and marine areas, including monitoring the effectiveness of quarantine systems on both the island and the mainland, and ensuring the protection of island and marine environments. To this end, DEC began a recruitment process for the Western Australian public sector's first fly-in fly-out workforce to maintain a regulating presence on the island.

DEC is also managing a range of new conservation programs funded by Gorgon Joint Venture partners Chevron Australia and Australian subsidiaries of Shell and Exxon Mobil, as part of the conditions of the environmental approval. These programs include:

- research programs to extend the ecological knowledge base of the area
- translocation of two mammal and two bird species from Barrow Island to Hermite Island in the Montebellos, where introduced predators feral cats and rats have been eradicated



DEC staff carry cage traps with animals for release on Hermite Island. Photo: Ann Biaso/DEC

- the reintroduction of boodies and golden bandicoots from the island to a fenced enclosure at Lorna Glen where foxes and feral cats have been eradicated, and the reintroduction of brush-tail possums to Cape Range National Park where fox control has been in place for several years
- auditing and surveillance of dredging to assess the impacts of marine construction on the marine biodiversity of the area
- survey, monitoring and research into flatback turtle populations on the north-west shelf.



DEC has appointed permanent fly-in fly-out staff to maintain a monitoring and regulatory presence on Barrow Island. Project coordinator Fran Stanley (centre) is pictured with (from left) Paul Connolly, Kim Onton, Peter Kendrick, Wes Manson, Misty Shipway and Brad Daw.

### Further information:

Gorgon project coordinator Fran Stanley, email [fran.stanley@dec.wa.gov.au](mailto:fran.stanley@dec.wa.gov.au)

Barrow Island and Montebellos Islands.

DEC website <http://www.dec.wa.gov.au/q=#1>

Lorna Glen.

DEC website <http://www.dec.wa.gov.au/q=#2>

Marine turtles.

DEC website <http://www.dec.wa.gov.au/q=#3>

## Marine park to protect humpback whale breeding areas

Western Australian Premier Colin Barnett and Environment Minister Donna Faragher made a joint announcement in October 2009 that a marine park is to be established at Camden Sound, 400 kilometres north of Broome.

The park will protect a pristine marine environment which includes a key nursery of the world's largest humpback whale population.

The announcement was part of the state government's election commitment to develop a conservation strategy to cover the whole of the unique Kimberley region.

Camden Sound is the biggest calving area for humpback whales in the southern hemisphere—more than 1,000 whales can be found in the area's 'maternity ward' during the calving season—as well as a rich trove of other marine life, from coral reefs and mangrove forests to turtles and dugongs.

The announcement began the department's standard procedure of management planning and public consultation for a proposed new marine park.



*Aerial view of Camden Sound.*



*More than 1,000 humpback whales use the sound as a breeding ground each year.*

### **Further information:**

DEC website *Camden Sound Marine Park indicative management plan*

<http://dec.wa.gov.au/q=#4>

Kimberley Science and Conservation Strategy

<http://dec.wa.gov.au/q=#5>

## Western Australia's 98th national park announced

In November 2009 a new national park was announced on Dirk Hartog Island, Western Australia's largest island and part of the Shark Bay World Heritage area.

The national park will cover almost the entire area of the 63,000-hectare island and will protect its unique environmental, cultural and historical assets while creating a drawcard for nature-based tourism.

The island is rich in biodiversity, being home to more than 250 native plant species, three endemic threatened bird species and a number of threatened reptiles, as well as holding national historic significance as the landing place of Dutch sea captain Dirk Hartog on 25 October 1616, the earliest documented European arrival in Australia.



The announcement of Dirk Hartog Island National Park is celebrated by (from left) DEC Director General Keiran McNamara, Project Officer World Heritage and Shark Bay Shire President Cheryl Cowell, local Malgana man and owner of Wula Guda Nyinda Tours Darren "Capes" Capewell, Environment Minister Donna Faragher and Dutch Consul-General for Western Australia Arnold Stroobach.

### Further information:

DEC website <http://www.dec.wa.gov.au/q=#6>

## Boorabbin bushfire inquest findings

On Friday 20 November 2009 the Western Australian Coroner handed down his findings from the inquest held into the tragic Boorabbin bushfire of December 2007, where three lives were lost after a decision was made by DEC to allow members of the public to travel through the fire-affected area.

The Coroner found that the deaths arose by way of accident, but made a number of recommendations.



DEC Director General Keiran McNamara addresses the media following the release of the Coroner's findings.

Addressing the media, DEC's Director General Keiran McNamara expressed his condolences to the families and friends of the deceased and reassured the public that while a tragic mistake had been made in the Boorabbin incident, he maintained every confidence in DEC's fire expertise.

"The tragedy has clearly had a profound impact on the families and friends of the men who lost their lives," he said.

"It has also had an impact on the many hundreds of DEC staff in fire roles who selflessly contribute so much time and energy to the protection of the community, and indeed on the department as a whole.

"The department has an outstanding record over decades of providing protection to the community of Western Australia and to firefighters in fighting many hundreds of fires every year...I do have confidence in the staff of the department in carrying out that role. Clearly on this occasion mistakes were made and we will learn from those and we will incorporate those lessons in future fire management."

The Director General also emphasised that the department took full responsibility for the tragedy and would comply with the Coroner's recommendations, which included an external review of DEC's ability to manage major fires.

**Further information:**

Boorabbin bushfires inquest—DEC reports.  
DEC website <http://www.dec.wa.gov.au/q=#7>

## World heritage nomination for Ningaloo coast

An area of 710,000 hectares of the state's north-west cape, taking in Ningaloo Reef, the Cape Range peninsula, a coastal strip extending about 260 kilometres south to Red Bluff, and adjacent dunefields, marine areas and islands, was nominated for World Heritage listing, in recognition of outstanding natural beauty, biological richness and international geological significance.

The announcement was made by Federal Minister for the Environment Peter Garrett in January 2010, with the support of the state government.

Ningaloo Reef is part of a marine ecosystem that ranks seventh on the world's list of coral reef biodiversity 'hot spots' and is second in terms of the number of species to be found within a limited range. Cape Range is an evolutionary laboratory that emerged from the sea over 26 million years, built from the skeletons of marine creatures. The area represents the best opportunity in the world to encounter whale sharks, the world's largest fish, together with globally significant populations of manta rays, dugongs, marine turtles, humpback whales, other cetaceans, rays and sharks.

Under World Heritage listing, the state government will remain principally responsible for management and decision-making in the area, in consultation with local governments, pastoralists, landholders and the community.

The nomination has been referred to the World Heritage Centre in Paris, who will make an assessment over the next year before making a decision.

**Further information:**

Ningaloo Coast World Heritage Boundary and Associated Land Tenure, DEC website  
<http://www.dec.wa.gov.au/q=#8>

Ningaloo Coast World Heritage Nomination Fact Sheet, DEC website  
<http://www.dec.wa.gov.au/q=#9>



*Exmouth-based DEC whale shark project officer Jutta Wildforster knows first-hand that Ningaloo Marine Park is world-class.*

## Other organisation-wide highlights 2009–10

### Fire Management Services

As a land management agency DEC has comprehensive fire management services supporting more than 700 staff of the department involved in both suppressing bushfires, and planning and using fire to meet conservation and asset protection objectives across the state.

DEC staff attend and manage several hundred bushfires a year as well as carry out prescribed burning for strategic biodiversity conservation, forest regeneration and protection through fuel reduction.

In 2009–10, staff responded to more than 600 bushfires across the state. Thirty six per cent of these were deliberately lit; the second most frequent known cause was lightning (27 per cent), followed by accident (11 per cent) and escapes from private planned burns (six per cent). Eighteen per cent were of unknown origin and two per cent were the result of escapes from DEC prescribed burns.



DEC staff from the Walpole office who received national medals for fire service included (rear) George Doust and Ray Flanagan with Environment Minister Donna Faragher and (front) Alan Hatfield, Eric Donovan, Merv Smith, Alan Hoxter and Peter Bidwell.

The department achieved its target area for prescribed burning in the south-west of 200,000 hectares for the first time since 2004–05, realising a total burn area of 212,017 hectares. In addition, prescribed burning was carried out over a further 1.06 million hectares on DEC-managed lands in the Kimberley, Pilbara, Goldfields, Midwest, Wheatbelt and South Coast regions as well as unallocated Crown land and unmanaged reserves.

In July 2009, 32 DEC and Forest Products Commission staff from the Warren and Frankland regions received national medals and clasps recognising more than 970 combined years of fire service.

DEC staff were also among fire crews who answered an international call for help, travelling to Canada in July to help bring some 670 fires under control in a severe bushfire season in and around Lillooet, British Columbia.

#### Further information:

DEC website <http://www.dec.wa.gov.au/q=#10>



DEC achieved its prescribed burning target in 2009–10. Environment Minister Donna Faragher attends a burn with (from left) Perth Hills District Manager Stephan de Haan, Fire Management Services Branch Manager Murray Carter and Perth Hills District Fire Coordinator Kevin Pollock.

## 2009 Environment Awards

More than 100 entries were received across 11 categories in the Western Australian Environment Awards, held annually to recognise and reward organisations for their efforts towards ensuring a sustainable, well-managed environment.

Top honours in the 2009 awards went to the Kalgoorlie-Boulder Urban Landcare Group (KBULG), who also won in the 'Community Achievement Regional' category, through its public awareness, education and action programs which engage the entire Kalgoorlie-Boulder community, including residents, businesses, industry, schools, community groups and visitors, in meaningful, worthwhile community projects that rehabilitate and enhance the environment in and around the city.

An overall High Commendation was awarded to Seadragonz environmentally friendly swim school, which received the 'Small Business Leading by Example' award.



*Winners of the 2009 Western Australian Environment Awards*

### **Other category winners were:**

Corporate Business Leading by Example: Wesfarmers Premier Coal—the Ngalang Boodja Mine Lake Aquaculture Project.

Government Leading by Example: City of Stirling—Water Smart Parks.

Biodiversity Conservation: Australian Wildlife Conservancy—Karakamia Woylie Project, providing a long-term haven for critically endangered species in Western Australia.

Bush, Land and Waterways: Greening Australia, Alcoa of Australia and Harvey River Restoration Taskforce—Nell's Block, restoring a landscape for wildlife on the Swan Coastal Plain Damplands.

Coastal Marine and Estuarine: Conservation Volunteers and Woodside—Perth Coastal Conservation Program.

Environmental Education and Communication: Perth Region NRM—improving the Environmental Performance of Small Business.

Resource and Waste: Care for Hedland Environmental Association—Cash for Trash.

Community Energy Efficiency: Environment House—Our \$WaP (Saving Water and Power) Project.

The awards were sponsored by Edith Cowan University, Packaging Stewardship Forum, Publishers National Environment Bureau, Royalties for Regions, Sustainable Energy Development Office, Western Power, the Waste Authority and Whiteman Park.

### **Further information:**

DEC website <http://www.dec.wa.gov.au/q=#11>

## Staff receive Australian Honours

Three employees—one retired and two current—received Australian Honours in 2009–10.

In August, National Park Ranger Paul Udinga was presented with an Australian Bravery Medal for his heroic rescue of an injured tourist from torrential waters in a flooded Hancock Gorge in Karijini National Park in April 2004.

Former Landscape Architect and Recreation Planner Wayne Schmidt, now retired, was awarded the prestigious Public Service Medal on Australia Day, in recognition of the leadership, innovation and vision he brought to the department in a career spanning 27 years.

On receiving the award, a typically humble Mr Schmidt said he felt it deserved to be shared by the whole department.

“I consider myself extremely fortunate to have been employed in positions that have enabled me to explore and work in some of the most beautiful and biologically diverse landscapes on the planet, and to get paid for the privilege,” he said. “However, nothing has been more rewarding or memorable profession-wise than spending the majority of my career working alongside such a talented, affable and result-oriented group of colleagues that share a ‘can-do’ attitude.”

Senior Wildlife Officer Doug Coughran was announced as a recipient of the Order of Australia on the Queen’s Birthday Honours list in June, acknowledging a 31-year career that has seen him become nationally and internationally regarded as a foremost expert in whale rescue. Mr Coughran’s achievements include playing a key role in establishing a nationally accredited training course in whale disentanglements.



Wayne Schmidt, Paul Udinga and (inset) Doug Coughran all received Australian Honours in 2009–10.



## Embracing Aboriginal heritage

DEC's land management activities involve the department in close partnerships with traditional owners. Aboriginal custodians and communities are recognised as major stakeholders in decisions about DEC-managed lands.

A significant example of this relationship in 2009–10 has been the Ord Final Agreement in the East Kimberley. The agreement was negotiated by the state government and the Miriuwung Gajerrong peoples as the result of a native title claim. Key to the negotiations has been the establishment of the Yawoorroong Miriuwung Gajerrong Yirrggeb Noon Dawang Aboriginal Corporation (MG Corporation), which will hold freehold title over six new conservation parks in the region, and will lease the parks back to the state for joint management between the owners and DEC. They will be the first Aboriginal-owned jointly managed conservation parks in Western Australia.



*Gilbert Riley fishing at Nihgerrin Barrben Park and DEC Miriuwung Gajerrong Rangers Andy Reid and Jerrimiah Hester with Miriuwung Elder (Garrayiling) Button Jones (inset).*

Meanwhile, further south, DEC's Aboriginal Heritage Unit (AHU) undertakes ongoing support and promotion of traditional Nyoongar knowledge about conservation and the land. The AHU provides programs based on Nyoongar culture to schools across all learning areas in the classroom, local bush and river/wetland settings. Notably in 2009–10, the AHU helped design and plant a 'six-season garden' at Culunga Aboriginal Community School in West Swan. The garden, based on the six seasons of the Nyoongar calendar, is part of a 'learning circle' at the front of the school—a space in which students can learn about their culture.



*AHU Cultural and Community Coordinator Koodah Cornwall (back row, fifth from right), Aboriginal Heritage Officer Thomas Dimer (back row, second from left), Danny Penny from the Aboriginal Alcohol and Drug Service (back row, fourth from right) and Culunga Principal Darryl Eade (back row, second from right), with the Green Corps team who helped create a six-season garden at Culunga School.*

### Further information:

Yoorrooyang Dawang Regional Park Council and Ord Final Agreement, DEC website <http://www.dec.wa.gov.au/q=#12>

Miriuwung Gajerrong cultural planning framework, DEC website <http://www.dec.wa.gov.au/q=#13>

Aboriginal Heritage Unit, DEC website <http://www.dec.wa.gov.au/q=#14>

## A quarter of a million eco-learners

DEC's EcoEducation program fulfils a major part of the department's strategic role in community education, by providing programs on a range of environmental topics, including threatened species, biodiversity and Aboriginal culture.

In April 2010 EcoEducation celebrated a major milestone in acknowledging its 250,000th learner.

EcoEducation provides resources, professional learning and networking opportunities for teachers as well as high-quality educational opportunities to students and is recognised as one of Australia's most comprehensive, continuous and reliable environmental and science education programs.

### Further information:

DEC website <http://www.dec.wa.gov.au/q=#15>



*The milestone of 250,000 Eco Ed learners is celebrated by (from left) EcoEducation Officer Trevor Walley, Planning, Culture and the Arts Minister John Day, Strategic Development and Corporate Affairs Director Ron Kawallak, and Senior Project Officer EcoEducation Elaine Horne.*

## Graduation and awards 2010

A graduation and awards ceremony in April 2010 recognised the ongoing learning and development of staff throughout the organisation. DEC is a registered training organisation, enabling staff to complete state and nationally accredited qualifications while on the job.

### Graduate Development Program

Twenty graduates who entered the department through this annual intake program in 2009 completed their training, which includes 10 weeks of formal training alongside their work placement. They were Ben Ansell, Lenny Bloomfield, Bel Catcheside, Lynnda Church, Brett Crabtree, Rebecca Hayes, Michael Higgins, Helen Holzheuer, Clinton Hull, Kyle Hulls, Rowan Inglis, Renee Leaver, Bridgitte Long, Rebecca MacDonald, Michael Pasotti, Emma Richardson, Tracy Sonneman, Clarissa Van Schie, Michel Whitelaw and Kyle Wilson.

Two awards were presented, the Keynes Memorial Award and the Director General's Merit Award, to Walpole Marine Park Ranger Rebecca MacDonald and Office of Climate Change Policy Officer Brett Crabtree respectively.

The Graduate Development Program underwent a review during the year and consequently there was no graduate intake for 2010.

## MATES

The Mentored Aboriginal Training and Employment Scheme, which aims to increase the number of Aboriginal people working for DEC, has engaged more than 70 trainees. Three employees graduated with Certificate III and Certificate IV in Conservation and Land Management qualifications in 2010. They were Lawrence Harris, Shannon Dixon and Nigel Johnston. In addition, awards were presented to Nigel Johnston, Aboriginal Trainee of the Year; Lawrence Harris, 'Kwabalitch' ('Excellence') Award; and Mark Virgo, Aboriginal Trainee Supervisor of the Year.

## Indigenous Cadetship Program

Three people completed this program which supports Aboriginal students studying at tertiary level. They were Emma-Jane Hunt, Melissa Passarelli and Julie Ward.

## Government Investigation Program

This program is a nationally recognised qualification in regulatory activities and is important to equip staff with the skills to enforce environmental regulations and conservation laws in the field. The inaugural 17 employees to be recognised for completing this qualification were Luke Bentley, James Best, Alex Bite, Alex Bowlay, Mathew Broadbent, Chris Goodsell, Arthur Jones, Allan Madgwick, Wayne Moroney, Craig Olejnik, Anna Oxford, Cameron Oxford, Tony Panicciari, Julie Print, Adam Rayner, Matt Swan and James Widenbar. (See also **Investigators graduate**, below.)

## Pathways Program

Ron Perry was the first employee to graduate from this program which recognises the skills and knowledge of conservation employees and expands their professional experience.

## Scholarships

DEC awards scholarships every year to encourage staff to expand their skills and qualifications through higher education. This year the Science Scholarship in memory of Dr George Malajczuk was presented to Renee Hartley, Meghan Porter and Lilia Tysoe. The Leadership Scholarship in memory of Seamus Mulholland was awarded to Anne Mathews, Richard Mcalinden and Fiona Westcott. The Women's Scholarship in memory of June Craig was presented to Zoe Clarke, Judy Dunlop, Jennifer Jackson, Champa Kulasekera, Ana Negreiros and Robyn Weir. The Director General's Career Development and Study Assistance Scholarship, providing support for undergraduate and postgraduate study, was presented to Amanda Fairs, Lauren Fox, Jelena May, Mark Neilson, Gail Ritchie and Alan Wright.

## Investigators graduate

The first Authorised Officer's Training Course (AOTC) was conducted at the Western Australian Police Academy, with DEC staff in both environmental regulation and conservation areas of the department undergoing 11 days of rigorous instruction in law enforcement and legislation.

Investigation and enforcement are both critical functions under the *Environmental Protection Act 1986*, the *Conservation and Land Management Act 1984*, the *Wildlife Conservation Act 1950* and the *Litter Act 1979*.



DEC staff enforcing both Environment and Conservation legislation completed the inaugural Authorised Officer Training Course.

### Further information:

Working at DEC,  
DEC website <http://www.dec.wa.gov.au/q=#16>

Graduate Development program,  
DEC website <http://www.dec.wa.gov.au/q=#17>, or email [orglearning@dec.wa.gov.au](mailto:orglearning@dec.wa.gov.au)

MATES scheme,  
DEC website <http://www.dec.wa.gov.au/q=#18>

## Community support: DEC volunteers

Thousands of Western Australians contribute to DEC's conservation programs around the state. In 2009–10, the number of DEC-registered volunteers increased to 3,038 people who contributed more than 400,000 hours to projects including the clean-up of Lake Mason station, seagrass monitoring at Broome, foreshore rehabilitation on the Swan and Canning rivers and flora and fauna translocations, as well as supporting the Western Australian Herbarium, helping with wildlife care and acting as campground hosts. In addition to this, 4,000 registered litter reporters, 150 Adopt-a-Spot groups and hundreds of entrants in the Sustainable Communities awards



*More than 220 volunteer campground hosts attended a two-day training workshop at DEC's Kensington headquarters.*



*Curtin University student Josey Stewart is an after-hours Wildcare Helpline volunteer.*

volunteered their time to activities to reduce litter and protect the environment through Keep Australia Beautiful programs.

### Further information:

Volunteer projects  
DEC website <http://www.dec.wa.gov.au/q=#19>

Volunteer programs  
DEC website <http://www.dec.wa.gov.au/q=#20>



## Part 2: SERVICE AREAS

### Nature Conservation

Conservation of Western Australia's rich biodiversity is strategically coordinated through DEC's Nature Conservation Division, overseeing a range of programs and activities. These services are built on scientific and technical knowledge, accumulated over many decades, which continues to develop and grow strategically. Ongoing processes of biological surveying, specimen collection and classification are complemented by developing and implementing recovery plans for species and ecological communities under threat, identifying and acquiring land which supports representative ecosystems, managing areas for their conservation values, and promoting public awareness of the value and vulnerability of Western Australia's natural areas.

### Building biodiversity knowledge

#### Biological inventory

The Pilbara Bioregion Biological Survey revealed numerous taxa new to science, with several scientific papers published and/or in preparation.

Fieldwork was completed for the Kimberley Islands Biological Survey, with wet and dry season sampling on nine islands, jointly funded by DEC and the federal government's Natural Heritage Trust. A further two islands were surveyed in June, bringing the total number of islands sampled to 24 since work began in 2007. Care was taken to involve traditional owners and the Kimberley Land Council in the survey, to build capacity in Aboriginal communities for better biodiversity management.

Analysis was carried out on data collected during vegetation surveys of the banded iron formations of the Yilgarn Craton from 2005–09, revealing a high changeover in species composition between ranges, and identifying two hot spots of specialist taxa along the arid zone boundary. These discoveries carry significant implications for conservation management.

Assessment of flora species from the Ravensthorpe Range, which was surveyed from 2007–09, resulted in nine additions, two deletions and five changes to the priority flora list, and confirmed the area as a centre for *Lepidosperma* diversity.

In collaboration with Martu traditional owners, an extensive survey and monitoring program was carried out of indigenous fauna and introduced animals in the western desert, identifying threatened fauna and widespread pest animals such as camel, fox and cat.

A previously unsurveyed area of the Great Victoria Desert was studied by regional staff, Victoria Museum, the non-government organisation Tread Lightly and traditional owners of the Spinifex lands. Traditional language names of species collected were recorded. A diversity of wildlife was identified, including the Central Ranges taipan (*Oxyuranus temporalis*), Australia's rarest snake. Some 400–500 predator scats will be analysed for marsupial mole remains, which were confirmed in dingo, fox and cat scats from the Neale Junction area.

In collaboration with the South African National Biodiversity Institute, research continued to support climate change adaptation strategies, including investigation of the impact of climate change on selected invasive and native species, investigation of the vulnerability and resilience to climate change of plant species and communities in shrublands of the Midwest Region, and identification of safe haven areas that will act as refuges for species and communities threatened by climate change. DEC staff also contributed to federal government-funded assessment of the vulnerability of Australia's biodiversity and to activities of the National Climate Change Adaptation Research Facility.

Five new species of *Phytophthora* were described by the Vegetation Health Services, and in partnership with the Centre for *Phytophthora* Science and Management nine previously described and nine undescribed species were identified using DNA sequencing from over 340 samples.

Marine Science continued to focus on determining the status and trends in the condition of the key biodiversity assets in Western Australia's system of marine parks and reserves, human pressures and management responses, with particular respect to large threatened marine fauna, through the Western Australian Marine Monitoring Program.

DEC is the lead agency for the research stream of the Western Australian Marine Science Institution (WAMSI) program Managing and Conserving the Marine State, focused on Ningaloo Marine Park, complementing the CSIRO Wealth from Oceans flagship program: Ningaloo Collaboration Cluster. This includes coordinating science and management within the department to ensure effective management of the Ningaloo Marine Park and other

coral reef marine parks and reserves in Western Australia. A preliminary assessment identified the prevalence and types of coral diseases occurring along the Ningaloo reef and the potential threat to the coral communities. Histological examination of diseased corals is currently under way. This project will improve our capacity to identify and manage threats to coral communities which may originate and proliferate due to human activity and climate change.

This collaborative research effort has built on an initial \$5 million investment by the state government into the Ningaloo Research Program, to approximately \$40 million through co-investment and collaboration, comprising over 30 research projects undertaken by more than 100 scientists from state government agencies, national research organisations and a number of Western Australian universities. Further collaborations exist with a number of national and state research organisations such as the Australian Institute for Marine Science, CSIRO, various state tertiary institutions and the newly formed Oceans Institute.

Studies have also been undertaken into the interaction of fishing and climate change on reef fish populations. Information has been collected on the reliance of fish on habitats sensitive to the effects of climate change, and the prevalence and diet of medium-sized predators and species targeted by fishers.

An underwater biotic survey was undertaken jointly with the University of Tasmania at 42 sites in Jurien Bay Marine Park. This is the eighth survey since 1999, which is currently being written up. This program forms the benchmark for future changes in the park's fish, algal, and invertebrate communities. Other baseline studies include investigations of the benthic invertebrate community of the estuarine Walpole and Nornalup Inlets Marine Park; the initiation of a three-year study on the intertidal reef communities of Marmion and Shoalwater Islands Marine Parks; and a seagrass survey of Shark Bay Marine Park including the resurvey of long-term monitoring sites.

A collaborative survey of seabirds of Shark Bay was undertaken with Birds Australia members. One hundred and fourteen terrestrial and aquatic species were recorded, with a total of 35,464 shorebirds being counted. Approximately 22,000 pied cormorants were counted, maintaining Shark Bay as a location of significance for this species.

### **Taxonomy and biotic collection management**

A total of 15,109 specimens was added to the Western Australian Herbarium collection, which now stands at 722,574, an increase of 2.1 per cent during the year. Many specimens were contributed from surveys of the Pilbara and Ravensthorpe Ranges.

During the year, 3,042 specimens were loaned to other institutions and 872 specimens were received on loan from other herbaria. The Western Australian Herbarium received 103 exchange specimens and distributed 3,622 exchange specimens to other Australian and international herbaria.

## **NatureMap**

The online portal NatureMap is a key provider of biodiversity data for DEC. NatureMap user feedback has guided many enhancements and data additions including improved querying and display capabilities and compliance with state government web standards. In 2009 NatureMap was awarded the Western Australian Spatial Excellence Award in the Environment category, and was a finalist in the National Spatial Excellence Awards.



*Principal Research Scientist Paul Gioia, creator of NatureMap, received the WA Spatial Excellence Award in the Environment category.*

NatureMap now provides access to nearly a million records of information for over 18,000 taxa, from both vouchered and unvouchered sources, including the main collections of the Western Australian Herbarium and Museum, as well as major DEC species databases. The DEC Fauna Survey database was linked to NatureMap providing an additional 33,696 records (1,006 spp.) with 6,159 records (93 spp.) for taxa of conservation significance visible to the public. Other new datasets added to NatureMap include the Banded Iron Formation and Greenstone surveys and an agreement with Birds Australia to publish over a million WA bird records through NatureMap. NatureMap is located online at <http://naturemap.dec.wa.gov.au>

The Reference Herbarium of vascular plants, which has over 14,000 specimens representing more than 11,000 taxa, was used by more than 3,000 visitors during the year:

At June 2010, the collection at the Western Australian Herbarium comprised the following specimens, from all major groups of plants, algae and fungi (Table 1).

**Table 1: Specimens held at the Western Australian Herbarium**

Taxonomic group	Number of specimens (June 2010)	Increase since June 2009	
		number	percentage
Myxomycetes	754	102	15.6
Fungi	27,787	2037	10.0
Lichens	16,190	646	4.1
Algae	22,798	316	1.4
Liverwort and hornworts	1,959	62	3.3
Mosses	6,633	183	2.8
Ferns and fern allies	3,591	77	2.1
Gymnosperms	1,996	22	1.1
Flowering plants	645,866	11,663	1.8
Total number	722,574	15,109	2.1

#### *Western Australian Herbarium Specimen Database*

Records of all specimens incorporated in the Western Australian Herbarium are entered into the Western Australian Herbarium Specimen Database (WAHERB). During the year, 15,109 specimen records were added to WAHERB, including 1,456 priority flora and 254 threatened flora. The total collection of priority and threatened flora comprises 44,036 specimens.

#### *Flora data for Western Australia*

Western Australia's vascular flora (flowering plants, ferns, cycads and conifers) now comprises 13,381 species, subspecies and varieties (12,172 native and 1,209 alien). The Census of Western Australian Plants maintained by the Western Australian Herbarium as the authoritative reference for all plants of the state, contained 22,046 names at the end of the year, representing 16,490 currently recognised species, subspecies and varieties of plants, algae and fungi (14,081 native and 1,213 alien). The figures include names for the vascular flora as well as the bryophytes, algae and fungi. Additions in 2009–10 comprised 274 published names and 199 unpublished new phrase names.

The Western Australian Herbarium image collection database continued to grow through the assistance of volunteers. At the end of 2009–10, 37,885 photographs had been scanned, and composite images illustrating habitat, habit and detail of 6,970 species were available online via FloraBase, the Western Australian Herbarium's web information system for Western Australia's flora and fungi.

#### *Herbarium volunteers*

An extensive volunteer program at the Western Australian Herbarium sees volunteers provide critically important skills and assist in many curation activities. During the year, volunteer participation was significant, totalling more than 7,000 hours (equivalent to four full-time positions). This is reduced compared with previous years because of the closure of the volunteer program in preparation for the move of the Herbarium to its new premises.

### **Resource condition monitoring**

The Native Vegetation Integrity Project, part funded through the Natural Heritage Trust (NHT), prepared a manual for the assessment and monitoring of native vegetation condition.

The Significant Native Species and Ecological Communities Project, part funded through NHT, completed 24 standard operating procedures and seven monitoring protocols which assisted the department and community in undertaking consistent monitoring programs. A range of related documents is available on the DEC website: <http://www.dec.wa.gov.au/q=#21>

The Inland Aquatic Monitoring Project (part funded through the National Action Plan for Salinity and Water Quality) developed standard monitoring protocols and established permanent monitoring points at significant wetlands around the state.



**Further information:** <http://www.dec.wa.gov.au/q=#22>

Under contract to Wheatbelt Natural Resource Management (NRM), DEC continued the condition monitoring component of the previous 'Baselining' project to collate, interpret and present biodiversity data in the wheatbelt.

The 1977–2008 annual report on depth, salinity and pH trends of 101 South West Wetlands Monitoring Program (SWWMP) wetlands was completed, with continuous water level recorders and rain gauges installed on several high conservation value wetlands under threat, as a precursor to salt and water balance modelling, and high resolution aerial oblique photography obtained for SWWMP wetlands of the central wheatbelt and west coast. A preliminary report on multi-decadal changes in waterbird use and habitat condition of several SWWMP wetlands was completed and further field assessments of current usage were undertaken.

A research project continued on the ecological condition of wetlands of the agricultural zone, arising from the State Salinity Strategy, including monitoring groundwater, wetland water levels and water quality, and flora and fauna for 25 wetlands in relation to threats, such as secondary salinisation, climate change and 12 years of catchment land-use practices.

## Establishment of the terrestrial and marine conservation reserve system

The formal conservation reserve system comprises national parks, nature reserves, conservation parks, miscellaneous conservation reserves, marine parks, marine nature reserves and marine management areas under the *Conservation and Land Management Act 1984* (CALM Act).

Full information about DEC-managed lands and waters is available in DEC's Annual Report 2009–10: <http://www.dec.wa.gov.au/q=#23>

## Effective management of the conservation reserve system

### Management planning for conservation reserves

During 2009–10, the Minister for Environment approved the management plan for the Walpole Wilderness and adjacent parks and reserves, Walpole and Nornalup Inlets Marine Park, and Woodman Point Regional Park. This brings the total number of current management plans prepared under the CALM Act to 58. An indicative management plan to support the establishment of the proposed Camden Sound Marine Park in the Kimberley Region was in preparation.

During 2009–10, the Lane Poole Reserve and Proposed Reserve Additions, and Parks and Reserves of Yanchep and Neerabup draft management plans, were released for public comment.

A list of approved management plans is available on the DEC website:

*Terrestrial:* <http://www.dec.wa.gov.au/q=#24>

*Marine:* <http://www.dec.wa.gov.au/q=#25> and <http://www.dec.wa.gov.au/q=#26>

A 10-year assessment of the implementation of the *Shark Bay Marine Reserves Management Plan* was undertaken by the Marine Parks and Reserves Authority Audit Committee.

### Good neighbour policy

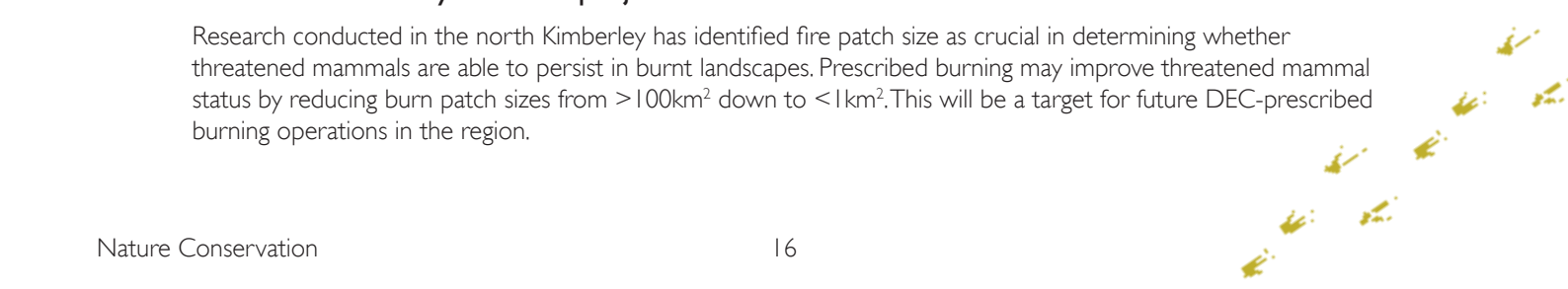
The implementation of the department's *Good Neighbour Policy* continued during 2009–10, including weed control, introduced animal control programs and fire management. Fire management operations were increased at the interface between DEC-managed conservation and forest lands or unallocated Crown lands and private property. Staff training and induction programs were also implemented to help with the effective rollout of the policy.

The department received a 'Caring for our Country' grant of \$993,000 over three years for rabbit control to encourage regeneration and recovery of threatened flora. Engagement with DEC neighbours facilitated strategic rabbit baiting on private property and adjacent to DEC-managed lands.

A number of joint nature conservation programs was also undertaken with local Indigenous groups, including involvement in biological survey, fire management, predator control and other fauna management programs.

### Fire and biodiversity research projects

Research conducted in the north Kimberley has identified fire patch size as crucial in determining whether threatened mammals are able to persist in burnt landscapes. Prescribed burning may improve threatened mammal status by reducing burn patch sizes from >100km<sup>2</sup> down to <1km<sup>2</sup>. This will be a target for future DEC-prescribed burning operations in the region.





Collaborative research with the Bushfire Cooperative Research Centre was finalised, investigating how fire regimes during the past 50 years have influenced the current distribution and abundance of plants and animals in forests and shrublands, with several articles submitted for publication. This research has shown that ecosystems in the south-west of Western Australia are resilient to a range of fire regimes and that occasional short intervals between fires do not necessarily have adverse effects. The department supported a post-graduate study investigating fire regimes in semi-arid woodlands around Lake Johnson (Goldfields Region) which has demonstrated that spatial patterns of fire in the landscape and fire return intervals are strongly influenced by vegetation type. Fires tend to be less frequent in vegetation adjoining large salt lakes because these act as barriers.

Research in collaboration with Melbourne and Murdoch universities on a fire and biodiversity research study over two seasons in the kwongan areas demonstrated that medium-sized mammals and lizards were responsive to the size and spatial pattern of burnt patches in the landscape.

A fine-grain mosaic fire science project continued to be implemented in the Walpole Wilderness Area as an adaptive management strategy for this area. Fire ecology monitoring sites were established in a number of regions in the south-west, and a fire ecology report *Fire sensitive ecosystems and species of the South Coast Region* was completed.

A science program on fire and biodiversity in the wheatbelt was completed and the findings presented for incorporation into management strategies. An adaptive management project, 'Conserving the Biodiversity of the Tutanning Nature Reserve', was developed and commenced implementation during the year, including establishing and monitoring pre- and post-burn reference plots.

### Fire management for biodiversity

The creation and maintenance of a spatial and temporal mosaic of vegetation structures, fuel ages and habitat niches is essential to conserving biodiversity. This is achieved through the application of fire at a range of frequencies and intensities at different seasons, times and scales according to the life cycles, histories and fire responses of native plants and animals. To achieve these outcomes a comprehensive and robust planning process has been developed by DEC.

After extensive collaboration between DEC scientists, land managers and fire practitioners, a five-year regional fire management plan was finalised for the South Coast Region. This plan expands the coverage of similar plans completed in the previous year. In 2009–10, several other regional fire management plans were progressed for other DEC regions.

Master Burn Planning ensures rigour, consistency and accountability in burn planning for biodiversity and other outcomes. The process engages leaders and specialists from DEC's Regional Services, Nature Conservation, Parks and Visitor Services, Sustainable Forest Management and Science divisions, and is supported by a computer-based fire planning tool based on Geographic Information System technology. The tool draws on a wide range of corporate datasets to ensure decisions concerning the location, extent, seasonality, frequency and intensity of prescribed fire consider both biodiversity conservation and strategic asset protection issues. In 2009–10, a survey of users was conducted and tailored training was delivered in a number of regions as a result.

### Understanding fire

DEC Principal Research Scientist Lachie McCaw was awarded the top prize in the inaugural Bushfire Cooperative Research Centre (CRC) Awards for Excellence in 2009.

Dr McCaw was the fire behaviour leader on the Bushfire CRC's Research Response Taskforce to the 2009 Victorian bushfires and he has also played a key role in incident management during fires around Western Australia and in the United States.




His research into the ecological impact of fire on the landscape is critical in planning the way bushfires are managed by DEC and across Australia.

DEC's range of fire management and operations guidelines, developed by scientists, nature conservation specialists and fire practitioners to assist managers and fire operations, are subject to ongoing review to ensure compatibility with contemporary fire management practices and environmental standards.

In 2009–10, the department continued to engage with traditional owners in remote areas for planning fire programs. Pilbara Region undertook its first formal burning program in collaboration with traditional owners, in the Martu lands of the western desert, and Goldfields Region undertook patch burning programs with four Indigenous land councils.

**Further information** on fire and the environment is available on DEC's website: <http://www.dec.wa.gov.au/q=#27>



# Recovery of threatened species and ecological communities, and management of other significant species and ecosystems

## Threatened Species Council

The Minister for Environment established a Threatened Species Council in December 2009 to deliver a more coordinated, targeted approach to threatened species conservation in Western Australia. The council is a collaboration between DEC, Perth Zoo, Botanic Gardens and Parks Authority, the Western Australian Museum and the state's Chief Scientist.

The council's aims include taking stock of current activities to identify gaps and opportunities in threatened species conservation and establishing expert threatened species working groups to fast-track the existing formal recovery plan development process to enable swift identification of key conservation actions.

The council met twice during 2009–10 and began preparations for a threatened species research forum, and development of an awareness campaign to increase community understanding about threats facing native species, as well as nature conservation efforts and opportunities for people to become involved.

## Recovery of threatened species and ecological communities

The Threatened Species Scientific Committee's recommendations for changes to the lists of threatened flora and fauna under the *Wildlife Conservation Act 1950* (WC Act) were endorsed by the Minister for Environment and gazetted on 23 February 2010. DEC continued a joint project with the federal government to prepare information sheets as the first stage in nominating changes to the list of threatened species under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This will bring those lists in line with the state lists under the WC Act.

Ten species of flora—*Keraudrenia exastia*, *Synaphea* sp. Fairbridge Farm (D. Papenfus 696), *Synaphea* sp. Pinjarra (R. Davis 6578), *Synaphea stenoloba*, *Banksia fuscobracteata*, *Caladenia barbarella*, *Eremophila rostrata* (subsp. *rostrata* in Western Australia), *Gastrolobium luteifolium*, *Guichenotia seorsiflora* ms and *Hybanthus cymulosus*—were listed under the EPBC Act. Information sharing between DEC and the federal government has so far resulted in 72 changes to the list of nationally threatened species under the EPBC Act.

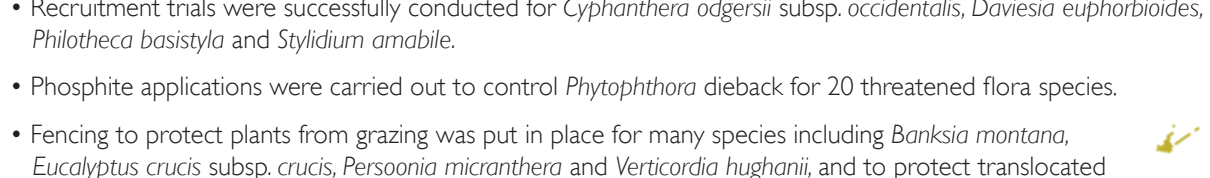
### Flora

Six species of flora—*Caladenia lodgeana*, *Diplolaena andrewsii*, *Grevillea corrugata*, *Hibbertia abyssa*, *Kunzea acicularis*, *Typhonium* sp. Kununurra (A.N. Start ANS 1467)—were added to the list of threatened flora. Four species—*Acacia trulliformis*, *Eucalyptus blaxellii*, *Hydatella leptogyne* and *Orthrosanthus muelleri*—were deleted from the list as they were no longer considered to be threatened but were retained on the priority 4 list for monitoring purposes. *Acacia rhamnophylla* and *Hydatella dioica* (name changed to *Trithuria occidentalis*) were upgraded from vulnerable to critically endangered. Seventeen nomenclature changes were also endorsed.

A further 233 taxa were added to DEC's priority flora list, and 63 taxa were deleted from the list on the basis of further survey and taxonomic review. At 30 June 2010, there were a total of 393 extant threatened flora and 13 listed as presumed to be extinct, and 2,702 taxa were listed as priority flora.

The number of priority flora listed in the Kimberley Region more than doubled through a joint project with Western Australian taxonomists who are recording new taxa and reviewing existing records of taxa that are restricted to or predominantly distributed in the Kimberley Region. Over 150 monocotyledons and ferns were added to the list, with the dicotyledons still to be assessed.

Recovery actions were implemented for a suite of threatened flora. Highlights include:

- A total of 125 species of threatened and priority flora were surveyed or monitored and 30 new populations or sub-populations of threatened flora and 26 populations of priority flora were located (of note was the discovery of new populations of the critically endangered *Banksia brownii*, *Calectasia cyanea*, *Myoporum turbinatum* and *Persoonia micranthera*). In addition, numerous new populations of the vulnerable species, *Conospermum toddii* were located.
  - Populations of *Acacia leptoneura*, *Acacia torticarpa* and *Scholtzia eatoniana* were located during surveys, last collected 160, 60 and 30 years ago respectively.
  - Recruitment trials were successfully conducted for *Cyphanthera odgersii* subsp. *occidentalis*, *Daviesia euphorbioides*, *Philothea basistyla* and *Stylidium amabile*.
  - Phosphite applications were carried out to control *Phytophthora* dieback for 20 threatened flora species.
  - Fencing to protect plants from grazing was put in place for many species including *Banksia montana*, *Eucalyptus crucis* subsp. *crucis*, *Persoonia micranthera* and *Verticordia hughanii*, and to protect translocated
- 

populations of *Acacia unguicula*, *Acacia imitans* and *Grevillea acropogon*.

- Weed control was undertaken for many species including *Acacia sciophanes*, *Acacia volubilis*, *Apium prostratum* subsp. *phillipsii*, *Conospermum undulatum*, *Darwinia foetida*, *Daviesia cunderdin*, *Grevillea curviloba* subsp. *incurva*, *Macarthuria keigheryi*, *Tetraria australiensis* and *Verticordia plumosa* var. *pleiobotrya*; and rabbit control for species including *Acacia volubilis*, *Banksia montana*, *Daviesia cunderdin*, *Persoonia micranthera* and *Leucopogon gnaphalioides*.
- Dieback interpretation at sites containing *Chamelaucium* sp. *Gingin*, *Andersonia gracilis*, *Verticordia plumosa* var. *pleiobotrya*, *Caladenia huegelii*, *Calytrix breviseta* subsp. *breviseta*, *Darwinia foetida* and *Grevillea curviloba* subsp. *incurva*.
- Publications *Threatened flora of the Western Central Wheatbelt* and *Declared rare flora in the southern Wheatbelt and eastern jarrah forest* were produced and distributed.
- Posters and postal fliers *Have you seen this plant* were developed for a number of threatened flora species to promote awareness and encourage the reporting of new populations.
- Fire ecology plots were set up to collect fire response and ecological data to improve future management for a range of species, including *Acacia anomala* and *Verticordia fimbriolepis* subsp. *fimbriolepis*.

**Table 2: Flora translocations undertaken as part of the implementation of recovery and interim recovery plans in 2009–10.**

Species	Translocated to
<i>Acacia awestoniana</i>	A new translocation site was established in Stirling Range National Park.
<i>Acacia aprica</i>	Enhancement of existing translocation site, and a new (second) translocation site was established on private property east of Coorow.
<i>Acacia cochlocarpa</i> subsp. <i>cochlocarpa</i>	Enhancement of existing translocation site, and a new (second) translocation site was established near Gunyidi.
<i>Acacia imitans</i>	A new translocation site was established on the Australian Wildlife Conservancy's Mt Gibson Station.
<i>Acacia subflexuosa</i> subsp. <i>capillata</i>	Enhancement of existing translocation sites.
<i>Acacia unguicula</i>	A new translocation site was established on the Australian Wildlife Conservancy's Mt Gibson Station.
<i>Banksia ionthocarpa</i> subsp. <i>ionthocarpa</i>	Seedlings were added to an existing translocation site in Kalgan Plains Nature Reserve.
<i>Banksia montana</i>	Enhancement of existing translocation sites.
<i>Calytrix breviseta</i> subsp. <i>breviseta</i>	Enhancement of existing translocation sites at Kenwick.
<i>Chorizema humile</i>	Enhancement of existing translocation sites.
<i>Daviesia cunderdin</i>	Enhancement of existing translocation sites
<i>Daviesia euphorbioides</i>	Enhancement of existing translocation sites.
<i>Daviesia glossosema</i>	Plants derived from seed and cutting material were introduced to an existing seed orchard site on recently acquired DEC-managed land east of Kamballup.
<i>Daviesia pseudaphylla</i>	Seedlings were introduced to an existing seed orchard site on recently acquired DEC-managed land east of Kamballup.
<i>Eremophila nivea</i>	Seedlings were added to an existing translocation site in West Perenjori Nature Reserve
<i>Eremophila resinosa</i>	Two new translocation sites at Westonia.
<i>Grevillea acropogon</i>	Seedlings were added to the existing translocation site at Tone-Perup Nature Reserve east of Manjimup.
<i>Grevillea calliantha</i>	A new (second) translocation site was established at Minyulo Nature Reserve.
<i>Grevillea humifusa</i>	A new (second) translocation site was established at Hill River Nature Reserve
<i>Lambertia echinata</i> subsp. <i>echinata</i>	Two new translocations sites were established at Coolinup Nature Reserve and Alexander Bay Nature Reserve (east of Esperance) using plants derived from seed collected from existing DEC seed orchards.
<i>Lambertia orbifolia</i> subsp. <i>orbifolia</i>	A new (second) translocation site was established in timber reserve I87/25 near Redmond.
<i>Persoonia micranthera</i>	Plants derived from cuttings were added to an existing seed orchard site on private property west of Kamballup and also introduced to an existing seed orchard site on recently acquired DEC-managed land east of Kamballup.

Species	Translocated to
<i>Symonanthus bancroftii</i>	Enhancement of existing translocation site at Ardath.
<i>Wheatbelt orchid rescue project:</i>	
<i>Caladenia graniticola</i>	Dragon Rocks Nature Reserve
<i>Caladenia melanema</i>	Lake Altham Nature Reserve
<i>Caladenia williamsiae</i>	Weam Nature Reserve

#### Threatened Flora Seed Centre

A total of 181 new seed collections was banked at the Threatened Flora Seed Centre during the year; the majority collected under state Natural Resource Management (NRM) program funding, of which 128 were from threatened flora and 23 from priority listed flora. Banked or newly collected seeds of 15 critically endangered species were provided for DEC translocation projects (see above), including seeds of two species collected from seed orchard sites established in order to support the survival of the species and to reduce pressure of collection on natural populations.

The successful completion of project targets for the Millennium Seed Bank Project partnership saw 1,192 seed collections of significant flora duplicated for safekeeping in Western Australia and at the Royal Botanic Gardens, Kew, United Kingdom since 2001. Research into the effectiveness of seed storage conditions and germination protocols continued through the year, as did work on the temperature profiling of obligate seeding *Banksia* species from south-west Western Australia.

#### Fauna

Five previously un-named threatened subterranean invertebrates were named: *Draculoides mesozeirus*, *Paradraculoides anachoretus*, *Paradraculoides bythius*, *Paradraculoides gnophicola* and *Paradraculoides kryptus*. There were 210 extant threatened fauna and 18 presumed to be extinct, and the priority list included 193 taxa at 30 June 2010.

Recovery actions were implemented for many threatened fauna. Highlights include:

- Key conservation projects funded by the state NRM program included projects for the conservation of Carnaby's cockatoo; integrated cat and fox baiting of critical habitat and establishment of a captive colony of western ground parrots; translocation of Gilbert's potoroo to a new enclosure on the mainland at Waychinicup; the commencement of design and construction of a 1,100-hectare fenced 'island' north of Big Lagoon, Shark Bay to support mala and banded hare-wallabies; site engineering works to improve habitat quality for western swamp tortoises at Mogumber Nature Reserve; and translocations of threatened and priority fauna species such as tammar wallabies, woylies, red-tailed phascogales, Gilbert's potoroos and bilbies to new sites in the south-west.

## Banking on the future

DEC's Threatened Flora Seed Centre and Kings Park and Botanic Garden completed a nine-year program of contributing seeds to the Millennium Seed Bank at Kew Gardens in the UK.

The two agencies contributed seeds from a total of 2,280 species to the global project, as a biological insurance policy to ensure stored seed is available for use in rebuilding damaged or lost plant communities.



DEC's participation also provided support for seed research and staff training while raising the profile of seed conservation and seed use.

Pictured are Threatened Flora Seed Centre Curators Anne Monaghan and Simone Dudley preparing the final seed consignment for the project, which included, among others, a sample of seeds from the critically endangered spreading grevillea (*Grevillea humifusa*), which is only known to exist at one location in the state's south-west.

A new state-funded seed bank designed to safeguard seeds of Western Australia's threatened and poorly known plant species is due to open in mid 2010 and will be the largest native seed bank in Australia.

- The recovery program for Gilbert's potoroo (*Potorous gilbertii*), the world's rarest marsupial, progressed during the year, mainly as a result of the success of the Bald Island translocation, where trapping proved that in less than five years, the population had grown from 10 founders to at least 29 animals by November 2009, despite the removal of seven individuals from the island in 2008 and early 2009. These were released into the 380-hectare predator-free enclosure on the mainland at Waychinicup.
- Review of the *Draft Quokka recovery plan* was undertaken by recovery team members.
- Reintroduction of dibblers (*Parantechinus apicalis*) to Peniup proposed nature reserve continued with the release of 34 dibblers from Perth Zoo in October and November 2009. Monitoring in December 2009 resulted in the capture of six of those animals and a new dibbler; all in good condition.
- The Woylie Conservation Research Project continued to investigate the causes of an 80 per cent population decline in woylies (*Bettongia penicillata*) since 2001, in collaboration with Murdoch University, Perth Zoo, Australian Wildlife Conservancy and South Australia's Department for Environment and Heritage, focusing principally on the upper Warren populations. The continuing decline was largely mortality-driven, with predation (principally by feral cats and some foxes), in combination with disease, as a possible factor. Significant predation by cats has also been demonstrated at Dryandra and Tutanning.
- Fauna surveys of Bernier and Dorre Island nature reserves were undertaken to determine population estimates for boodies, banded hare-wallabies and rufous hare-wallabies.
- Work progressed on the Western Ringtail Possum Recovery Program to minimise habitat loss due to land development. Surveys on the Swan Coastal Plain found that the distribution of the possums differed from that previously known and new populations were identified in isolated patches of remnant vegetation. Translocation of western ringtail possums displaced from development sites met with varying degrees of success.
- Numbat translocations continued, with 13 numbats bred at Perth Zoo being released to supplement three previous releases. Monitoring showed that eight numbats from previous releases to Cocanarup Timber Reserve, near Ravensthorpe, plus one young born post-release, were still alive. Monitoring of the numbat population at Dryandra in 2009 produced the lowest sighting rate since the early 1980s, providing evidence that predation by cats is increasing and having a significant effect on this important numbat population.
- Cat and fox baiting continued around the Calvert Range black-flanked rock wallaby population, which continues to thrive.
- A census of Muir's corella (*Cacatua pastinator pastinator*) found that the population is continuing to increase, from around 100 in 1920 to 13,000 in 2009. An advisory kit on damage control was made available to landholders, and DEC's Warren Region made three gas guns available for loan to farmers to use for non-lethal crop protection.
- Progress continued with the conservation of south coast threatened bird species. Noisy scrub-bird (*Atrichornis clamosus*) censuses were completed for the Mt Gardner, Waychinicup, Mermaid and Bald Island sub-populations. The number of territories recorded on Mt Gardner continued to decline, and for the first time a plateau appears to have been reached in the Bald Island sub-population.
- Further hydrological modifications were completed at Moore River Nature Reserve to facilitate translocations, and 30 western swamp tortoises bred at Perth Zoo were released (including the release of the 500th captive bred tortoise).

## Heading for a fresh start


Seven specimens of the world's rarest marsupial—Gilbert's potoroo (*Potorous gilbertii*) have been released into a fenced reserve in a remote part of Waychinicup National Park, on the state's south coast.

The potoroos will be radio-tracked and monitored to learn about their use of different vegetation types.

Principal Research Scientist Tony Friend, pictured here with one of the animals, says the information will help in future work to establish new populations of the species in the wild.

Fewer than 100 potoroos are known to exist and are found at only two other locations, Two Peoples Bay Nature Reserve and Bald Island, both near Albany.



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- Through the marine turtle recovery team, commitments were made to facilitate data sharing for environmental impact assessment purposes. Monitoring of nesting activity and satellite tracking continued at key locations on the north-west coast and a standard operating procedure for tagging of turtles was released.
  - The annual monitoring program for the orange-bellied frog (*Geocrinia vitellina*) and white-bellied frog (*G. alba*) was completed and field assistance was provided to the Perth Zoo's captive frog breeding program for collection of source animals and egg masses. A translocation proposal for release of captive bred *G. alba* metamorphs and young animals was approved for the 2010 season.
  - Perth Zoo and DEC repeated a census of sunset frogs at select sites in 2009, following a wet winter, to confirm low census results in 2008. The 2009 census was encouraging as it showed the number of calling males was higher and more consistent with pre-2008 records.
  - A draft recovery plan for the Stirling Range rhytidid snail [Undescribed Rhytidid species (WAM 2295-69)] and Stirling Range trapdoor spider [*Moggridgea* sp. S (BY Main 1990/24, 25)] was produced.
  - Surveys for the endangered graceful sun-moth (*Synemon gratiosa*) were carried out by DEC staff and volunteers across the Swan Coastal Plain and southern Midwest regions. The data collected will be used to create a sun-moth distribution model, which will greatly assist conservation of the species and minimise potential conflict with proposed urban developments.
  - DEC, in conjunction with the Perth Zoo and The University of Western Australia, was successful in obtaining an Australian Research Council Linkage Project Grant 'Animals on the Move—an integrated response to selecting conservation reserves under climate change'.

There was increased focus on the conservation of Carnaby's cockatoo following a number of development proposals impacting on the species. Funding was provided through state and federal offset requirements, and additional funding through the state NRM and federal threatened species funding. The recovery team endorsed the strategic framework arising from a symposium and workshop held in December 2008, which identified priority recovery actions for the species, and has been used as a framework for the re-writing of the 2003 recovery plan. Projects undertaken during the year included:

- drafting a new recovery plan for Carnaby's cockatoo with funding from the federal Department of the Environment, Water, Heritage and the Arts
- remote identification and mapping of habitat on the Swan Coastal Plain in conjunction with the Department of Planning, and a field survey of critical habitat for Carnaby's cockatoo in the wheatbelt and Swan Coastal Plain, in conjunction with Birds Australia WA
- survey of artificial hollows (nest boxes)
- with Birds Australia, and over 350 volunteers, repeating the 2006 'Great Cocky Count' in the greater Perth region, which showed a reduction in the estimated number of birds between the two survey periods
- ongoing monthly roost counts with volunteers, and commencement of an Edith Cowan University masters research project to define night roost sites that are regularly used by Carnaby's cockatoos
- development of a revegetation flora species selection tool
- a pilot revegetation project on Swan Coastal Plain to create a four-hectare demonstration site to show that restored habitat will provide food for Carnaby's cockatoo
- provision of assistance to private landowners for nesting habitat conservation, including restoration and site fencing, working through *Land for Wildlife*
- strategic land purchases of habitat areas on the Swan Coastal Plain.

**Table 3: Fauna translocations undertaken as part of the implementation of recovery and interim recovery plans in 2009–10.**

Species	Translocated from	Translocated to
Gilbert's potoroo	Bald Island via captive facility at Two Peoples Bay	Normans Beach Enclosure, Waychinicup National Park
Bilby	Return to Dryandra and Francois Peron National Park breeding facilities	Lorna Glen (ex pastoral lease purchased by the government for conservation)
Boodie	Barrow Island and Return to Dryandra Breeding Facility	Lorna Glen (ex pastoral lease purchased by the government for conservation)
Barrow Island golden bandicoot	Barrow Island	Lorna Glen and Hermite Island, Montebellos
Barrow Island spectacled hare-wallaby	Barrow Island	Hermite Island, Montebellos
Barrow Island fairy wren	Barrow Island	Hermite Island, Montebellos
Spinifexbird	Barrow Island	Hermite Island, Montebellos
Dibbler	Perth Zoo	Proposed Peniup Nature Reserve
Red-tailed phascogale	Dryandra Woodland and various wheatbelt nature reserves	Kojonup Reserve (Bush Heritage Australia)
Woylie	Kanyana Wildlife Rehabilitation Centre	Land for Wildlife property, Margaret River
Black-flanked rock-wallaby	Querekin Rock (private property)	Paruna Sanctuary (managed by Australian Wildlife Conservancy)
Western swamp tortoise	Perth Zoo	Moore River Nature Reserve
Quenda	Sites on the Swan Coastal Plain	Julimar State forest and Lake Magenta Nature Reserve
Tammar wallaby	Tone Perup Nature Reserve Tutanning Nature Reserve	Palgarup State forest Kalbarri National Park
Brush-tail possum	Barrow Island	Cape Range National Park

#### Recovery planning

Thirteen interim recovery plans for flora species were approved. The interim recovery plans were completed with funding assistance from the federal government.

Four new fauna recovery plans (covering 11 species) were approved to guide efforts to conserve six species of south coast birds; three species of Shark Bay marsupials; the rufous hare-wallaby and the western trout minnow. The recovery plans for the south coast birds and Shark Bay marsupials were submitted to the federal Department of the Environment, Water, Heritage and the Arts for endorsement under the EPBC Act.

South Coast Region completed an integrated recovery plan, the South Coast Threatened Species Strategic Management Plan, for all threatened species in the region as a pilot project funded by the federal government. The federal government also provided funding for the development of a more refined regional recovery plan for threatened species and ecological communities in the Fitzgerald Biosphere. The draft plan was completed and distributed for comment.

Interim flora recovery plans were completed and approved for:

- velvety spiral pod wattle, *Acacia cochlocarpa* subsp. *velutinosa*
- Gibson wattle, *Acacia imitans*
- Ninghan wattle, *Acacia unguicula*
- pungent Jacksonia, *Jacksonia pungens*
- Ninghan violet, *Hybanthus cymulosus*
- *Marianthus paralius*

## Translocation a new lease on life

DEC Technical Officer Amy Mutton had the honour of releasing one of 20 red-tailed phascogales which now have the chance to re-establish their species in their former south-west habitat, after being translocated into the Kojonup Reserve in May 2010.

The species, which is now restricted to isolated fragments of vegetation in the southern wheatbelt, is at serious threat due to habitat loss, altered fire regimes, predation and reduced rainfall.

The translocated animals were radio-tracked for the first two weeks after being released, and nesting boxes were being checked for activity in springtime. Long-term monitoring will be undertaken by Bush Heritage Australia.



- Bodallin poison, *Gastrolobium diabolophyllum*
- *Guichenotia seorsiflora*
- *Cryptandra congesta*
- *Stylidium amabile*
- broad-leaf daviesia, *Daviesia ovata*
- *Eremophila ciliata*
- *Grevillea fuscolutea*.

**Further information** on recovery planning is available on the DEC website:  
<http://www.dec.wa.gov.au/q=#28>

### Threatened ecological communities

Highlights of actions implemented for threatened ecological communities (TECs) and priority ecological communities (PECs) include:

- The status of 103 Priority 1 Stygofaunal assemblages of calcrete aquifers in the Yilgarn, eight Priority 1 communities in the Whicher Scarp, and nine PECs in other parts of the state was resolved through collation of biological data, and boundary mapping.
- The PEC 'Yate dominated alluvial claypans of the Jingalup Soil System' was surveyed in spring post-fire to determine effects of fire on the community. Quadrats established during the 'Biodiversity survey of the Western Australian agricultural zone' were re-surveyed.
- Investigations into the introduced species of black bream in the lake that contains the TEC 'Stromatolite community of stratified hypersaline coastal lake—Lake Thetis' commenced. Water quality monitoring was initiated and will help guide future management of the lake.
- A rehabilitation trial of a samphire (*Halosarcia* sp.) was successfully implemented in the TEC at Lake Thetis, testing a range of rehabilitation techniques. The most successful techniques will be employed in a broader rehabilitation area during 2010–11.
- Monitoring continued in the TEC 'Unwooded freshwater wetlands of the southern Wheatbelt dominated by *Muehlenbeckia horrida* subsp. *abdita* and *Tecticornia verrucosa*' as part of extensive regional catchment drainage and rehabilitation work, and will assist in the future management of these species and the community. A new population of the *Muehlenbeckia* was located on DEC-managed land and may represent a new occurrence of the TEC.
- Work continued on controlling major weeds in four parks that contain significant occurrences of the 'Sedgeland in Holocene dune swales' TEC. Significant works were completed to help control vehicle access into the park that contains the most significant areas of the TEC.



- Rabbit baiting (1080 oats) was initiated to help protect the 'Montane Thicket of the eastern Stirling Range' TEC and component threatened flora.
- A complex burn was undertaken in 'Mt Lindesay-Little Lindesay vegetation complex' TEC according to a pre-determined strategic plan. A post-burn survey of the TEC was initiated to help determine its response to the burn.
- The re-watering of Crystal Cave and Carpark Cave within Yanchep National Park, as part of the recovery plan for the aquatic root mat of caves of the Swan Coastal Plain TEC, is being conducted with standing water established within both caves.
- A field survey was undertaken in occurrences of the TEC 'Vine thickets on coastal sand dunes of Dampier Peninsula' with the permission and assistance of the traditional owners (Indigenous rangers), and local volunteer botanists. Condition and threat data will assist in the preparation of a recovery plan for this TEC.
- A two-day TEC monitoring course was run, attended by NRM groups, DEC and local government. Monitoring design, data analysis, and field studies were discussed.

**Further information** on threatened flora, fauna and ecological communities is available on the DEC website: <http://www.dec.wa.gov.au/q=#29>

#### *Western Shield*

During 2009–10, more than 3.9 million hectares of conservation lands and State forest were baited to control foxes and feral cats, using nearly 1.1 million poison baits under the *Western Shield* program. Corporate sponsorship was provided by ongoing sponsors Alcoa Australia Limited, Tiwest Pty Ltd, BHP Billiton, Worsley Alumina Pty Ltd, Tectonic Resources NL and Western Areas NL.

Operational research into feral cat control on Peron Peninsula (Project Eden) continued. Development of a new toxin and bait delivery mechanism for cat control also continued in collaboration with the Victorian Department of Sustainability and Environment and the federal Department of the Environment, Water, Heritage and the Arts.

Research into the effectiveness of fox and cat baiting regimes and the role of feral cats and native predators on native mammals continued this year, showing complex relationships between the abundance of native fauna, introduced predators and bait availability in baited areas.

**Further information** on *Western Shield* is available on the DEC website: <http://www.dec.wa.gov.au/q=#30>

#### *Mesopredator research*

A series of collaborative mesopredator research programs examining the effectiveness of fox control techniques in the northern jarrah forest, at Lake Magenta and Tutanning nature reserves, in Dryandra Woodland and the rangelands, has now been completed. Analysis was conducted on predator abundance, fox DNA, survivorship and mortality of prey species, and the effectiveness of timing, reliability and coordination of aerial and ground bait delivery. DNA evidence suggested that most foxes were not persisting in baited areas and feral cats were the major predators of monitored fauna. Results also suggested that there has been a mesopredator release of feral cats and chuditch, but not carpet pythons, in the baited study sites. In the rangelands, feral cat baits were shown to be effective in controlling both foxes and feral cats and trials were undertaken to test the risk to non-target animals (such as chuditch, varanids and quendas).

#### *Rangelands Restoration Project*

The Rangelands Restoration Project completed its third year of a collaborative adaptive management program between DEC Science Division and Goldfields Region. This has included biannual long-term monitoring of small mammal, reptile and amphibian populations as well as medium-sized mammal releases on the proposed Lorna Glen Conservation Park, near Wiluna. Greater bilbies and brushtail possums appear to be establishing successfully.

Significant feral cat control was done on Lorna Glen through ongoing research and development of methods. Cat numbers remained very low and the construction of the 1,100-hectare predator-proof enclosure was completed. Boodies (*Bettongia lesueur*) and golden bandicoots (*Isodon auratus*) were translocated from Barrow Island and released into the enclosure in early 2010. Boodies were also translocated from the Return to Dryandra breeding facility. Monitoring has indicated that the enclosure has been successful in eliminating predation from feral cats and facilitating acclimatisation and breeding. Translocations and monitoring will continue.



## South Coast Integrated Predator Control Project

Surveys of western ground parrot (*Pezoporus wallicus flaviventrus*) populations in recent years indicate that this species is now restricted to Fitzgerald River and Cape Arid national parks and may be threatened by feral cats. An experimental cat baiting program was undertaken in Fitzgerald River National Park in autumn 2010 with federal funding support, and included monitoring of radio-collared cats and selected non-target fauna as well as abundance surveys before and after baiting. While the observed mortality rate of cats was low, no mortality or detrimental impacts on non-target species were observed. As well as seeking to protect surviving populations of the western ground parrot, this work will help to assess the feasibility of cat control in the south-west. This project will continue into 2011.

## Management of marine fauna

DEC attended 78 reported whale and dolphin strandings throughout the year, involving 82 live and dead animals of eight species – humpback whale, pygmy right whale, Cuvier's beaked whale, Gray's beaked whale, sperm whale, dwarf sperm whale, common dolphin and bottlenose dolphin. Two bottlenose dolphins stranded in August and another two stranded in October, and all animals were returned to deep water. Three Gray's beaked whales stranded; however, all animals died shortly after beaching.

Two humpback whales were reported entangled in fishing gear; one was totally disentangled and the fate of the second is unknown. A private recreational vessel collided with a humpback whale off Exmouth, causing injuries to the two occupants and substantial damage to the vessel. The fate of the humpback is unknown. A second collision involving a Royal Australian Navy vessel and a humpback whale occurred off Fremantle in October. The fate of the whale was not confirmed but it is likely to have suffered life-threatening injury.

A substantial increase in humpbacks ashore was recorded in 2009–10. Forty-eight humpbacks beached, with 13 in poor body condition but alive at the time of beaching. Nine of these died during palliative care and four were successfully euthanased.

The Minister for Environment requested the Chief Scientist of Western Australia to investigate dolphin deaths in the Swan Canning River park and the Bunbury inner waters. The findings and recommendations were reported to the Minister in April 2010.

There were 18 reported pinniped incidents. One Australian sea lion had fish hooks and line removed from its face and another was killed by a shark. Two New Zealand fur seals were found dead and three were in an emaciated condition but rested and returned to the sea. There were nine sub-Antarctic fur seal incidents recorded, two rested and returned to sea, one was found dead, one was disentangled from a net then released, and the remainder were euthanased due to their debilitated condition. One itinerant leopard seal and one itinerant southern elephant seal were found hauled out, but rested and returned to sea.

The department conducted a census of sea lion pups in all three breeding colonies on the Turquoise Coast. Preliminary results indicate a decline in the number of pups produced on one of the breeding island sites. The department also supported external sea lion research programs by assisting with genetic surveys on the Turquoise Coast population.

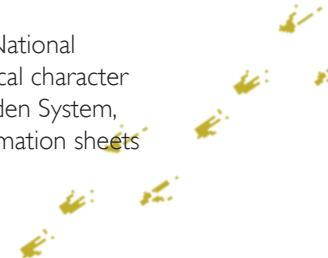
DEC staff conducted large whale disentanglement national accreditation training courses at Bateman Marine Park (New South Wales) and Marmion Marine Park (Western Australia) during the year.

## Wetland conservation

### Ramsar wetlands

Twelve Western Australian wetlands are listed under the International Convention on Wetlands (Ramsar Convention). DEC continued to be the lead agency in coordination of proposals for possible nomination of nine wetlands for listing under the Ramsar Convention. Candidate areas are Lake MacLeod, Lake Gregory, the Cape Range Subterranean Waterways, Lake Ballard, the Millstream Pools, Shark Bay East – Hamelin Pool, the Ellen Brook Swamps System, tributaries of the Lower Blackwood River (formerly Spearwood Creek) and Fortescue Marshes. DEC undertook work to progress ecological character descriptions, information sheets and management plans for these wetlands.

In 2009–10, funding under the NHT and contributions from federal and state governments to the National Action Plan for Salinity and Water Quality were allocated for the development of five more ecological character descriptions for Ramsar wetlands, and the descriptions were completed for Roebuck Bay, Lake Warden System, Muir-Byenup System, Becher Point Wetlands, and Forrestdale and Thomsons lakes. The Ramsar information sheets for these wetlands were also revised.





Management plans exist for the following Ramsar wetlands: Toolibin Lake (*Toolibin Lake recovery plan 1994*), Forrestdale and Thomsons lakes (*Forrestdale Lake management plan 2005* and *Thomsons Lake management plan 2005*), Lake Warden System (*Esperance Lakes Nature Reserves 1999–2009*), and Lake McLarty (a part of the Peel Yalgorup System Ramsar site; *Lake McLarty Nature Reserve management plan 2005*).

The implementation of key management actions continued at each Ramsar site with the support of NHT/ National Action Plan for Salinity and Water Quality funding. These management actions have been determined in consultation with site managers and as a result of priorities identified through ecological character descriptions.

The Vasse-Wonnerup wetland system at Busselton supports approximately 35,000 waterbirds each year and on this basis is listed as a Ramsar wetland. There is a long history of mass fish deaths during summer in the lowest reaches of the system. The frequency and severity of these incidents can be reduced by timely openings of the Wonnerup Inlet sandbar and two sets of Water Corporation floodgates on the estuary's exit channels. Careful management of seawater inflows and estuary water levels is needed to prevent adverse impacts on fringing vegetation, waterbirds and adjoining low-lying properties.

Following a mass fish kill in 1997, the department formed an inter-agency technical working group to coordinate the activities of relevant agencies. The history of management of the system was reviewed, agency roles were clarified, operational refinements introduced, monitoring programs established, and various investigations initiated. Each year since, the Vasse Estuary Technical Working Group has made arrangements for summer opening of the sandbar at the wetland system mouth; for water level, water quality and fish monitoring; and for floodgate openings to release fish and manage water levels. In February 2010, a mass fish kill occurred following malfunction of an electronically-controlled fish gate. In 2010–11, measures will be undertaken to reduce the likelihood of, and risks associated with, malfunctions during critical periods.

DEC has been an active partner with other states and the federal government in development of national wetlands policy regarding the implementation of international agreements. Significant work has been progressed in developing Ramsar management guidelines and finalisation of three modules—for guiding the mapping of Ramsar wetlands, reporting on change in the ecological character of wetlands listed under the Ramsar Convention, and guiding the development of ecological character descriptions of wetlands listed under the Ramsar Convention.

**Further information** on Ramsar wetlands is available on the DEC website:

<http://www.dec.wa.gov.au/q=#31>

#### *Wetlands mapping and evaluation projects*

During the year, the department continued to maintain and update the state-wide wetlands database – *WetlandBase*. This database enables DEC to distribute wetland mapping and management information to assist in improving the management of privately owned wetlands.

The department continued to learn about the conservation requirements of the wetlands of the south-west through the continuing project Wetland Mapping, Classification and Evaluation Program for Priority Areas, South West Western Australia. The aim of the project was to document the wetland resources of priority areas in the south-west and ultimately inform wetland protection and management strategies.

The department completed mapping and classification of wetlands in the Darkan Duranillin region in the south-west wheatbelt (endorsement by the Wetlands Coordinating Committee as a Stage 2 product) with funding through the South West Catchments Council. This dataset is publicly available on *WetlandBase*, along with the existing datasets for wetlands in the Margaret River, Leeuwin-Naturaliste Ridge, Donnybrook-Nannup and Manjimup-Northcliffe areas.

Wetland inventory was also conducted in the Midwest Region in a joint project with the Department of Water and funded by the federal government's National Water Commission. This mapping was a component of a larger project looking at potential groundwater-dependent ecosystems in the region, and, once endorsed, will extend available wetland inventory from the Swan Coastal Plain dataset north to Eneabba.

The department continued to review the wetland evaluation methodologies for the Swan Coastal Plain to enhance existing endorsed methods. Progress also was made on a wetland restoration and management manual.

**Further information** on wetland management is available on the DEC website:

<http://www.dec.wa.gov.au/q=#32>



## Priority nature conservation projects

In 2009–10, DEC allocated funding totalling \$4.75 million to 44 priority projects across the key themes of invasive animal control, environmental weed control, threatened species and ecological communities' recovery, *Phytophthora* dieback management, biological survey and research, rangelands management and the State Cane Toad Initiative. Highlights for the year were:

### *Invasive animal control:*

- 6,707 lorikeets were culled in the Perth metropolitan area
- 2,486 goats and 110 sheep were removed from Dirk Hartog Island National Park
- 889 wild cattle were removed from Mitchell River National Park
- 689 goats and 27 pigs were removed from Kalbarri National Park
- 95 pigs were removed, 4,942 kilometres of on-ground surveying was completed within the Warren Region, and support continued for three established community groups (Muir-Denbarker, Nannup and Northcliffe).

### *Environmental weed control:*

- 219 hectares were treated for weed control or eradication targeting nine weed species, including blackberry (*Rubus ulmifolius*) and arum lily (*Zantedeschia aethiopica*)
- 73 information flyers on weed species were published on Florabase website and another 73 information flyers were drafted.

### *Threatened species and ecological communities' recovery:*

- 380 hectares were baited for fox control to protect Gilbert's potoroo habitat
- flora monitoring/surveying was conducted over an area of 1,300 hectares
- 38 kilometres of fencing was maintained
- seven recovery plans were written for critically endangered flora species
- 239 animals were translocated and 75 sites were recommended for translocation
- 114 sand pads were installed for monitoring of the western ground parrot.

### *Phytophthora dieback management:*

- 705 soil samples were collected and 100 hectares surveyed for dieback interpretation
- survey of all linear infrastructure (850 kilometres) was interpreted within the Fitzgerald River National Park for *Phytophthora* dieback infestations
- the Pabelup dieback infestation boundary was surveyed and mapped, and the boundary re-surveyed and mapped at the Bell Track infestation in the Fitzgerald River National Park
- digital multi-spectral image data were collected in the Bell Track sub-catchments to determine disease occurrence and monitor possible disease outbreaks
- phosphite was applied to 120 hectares of vegetation in the Bell Track infestation and 14 hectares of the new infection near Pabelup Drive in the Fitzgerald River National Park
- fumigant (metham sodium) was applied and the root barrier system upgraded at the Bell Track infestation in the Fitzgerald River National Park
- a hygiene management plan was developed for the south coast
- a washdown bay was installed at the Murray Road Ranger Station in the Fitzgerald River National Park
- access, hygiene and drainage controls were upgraded
- aerial phosphite treatment was applied to plant populations at Cape Arid, Cape Le Grand, Gull Rock, Torndirrup and Waychinicup national parks, Mount Lindesay and Millbrook nature reserves
- ongoing monitoring was conducted of the research trials into the efficacy of the high-intensity phosphite application at three field sites in the South Coast Region.

#### Biological survey and research:

- 150 quadrats were surveyed and two undescribed flora taxa collected from six ranges within the Yilgarn banded ironstone formation (BIF)
- 1,217 quadrat fact sheets were produced for web-based access to BIF data
- plot-based records from 24 BIF ranges and the Ravensthorpe Range were updated and made available via DEC's NatureMap
- 15 quadrats were surveyed in wheatbelt nature reserves
- 339 specimens of flora taxa were collected
- 96 flora voucher specimens were lodged with the Western Australian Herbarium
- 14 new populations of priority flora taxa were collected
- 11 new recommendations were made for listing as priority flora
- taxonomic resolution was improved for 1,605 taxa
- 28 new flora taxa were described
- six taxonomic papers were published in *Nuytsia*—Western Australia's Journal of Systematic Botany, and four further papers on flora and vegetation of individual BIF ranges were published in *Conservation Science WA*
- nine papers were submitted for publication and three papers were in press.

#### Rangelands management:

- 42,700 baits (1080) for wild dog control were distributed within the Midwest rangelands (Doolgunna, Mooloogool, Dalgaringa and Burnerbinmah and Peak Hill Common) and 14,000 within the Goldfields rangelands (Credo, Lake Mason, Lorna Glen)
- improved renewable power systems were installed for the management facilities on DEC-managed former pastoral properties
- 10 Indigenous community members were trained and authorised to use 1080, and injected and laid 5,000 of the baits within the Goldfields rangelands
- six dams were filled in and prepared for rehabilitation at Muggon
- biological survey work was completed at Muggon
- 47 kilometres of boundary fencing were erected in partnership with neighbours on DEC-managed former pastoral properties

## Wheatbelt flora rediscovered

Two acacia species have been rediscovered in the central wheatbelt after 170 years.

DEC Conservation Officer Joel Collins, Dowerin Shire CEO Dacre Alcock, Dowerin Works Supervisor Steve Geerdink and Natural Resource Management Officer Kezia Pontifex are pictured here with the rediscovered population of *Acacia leptoneura*, which was initially identified in December 2008 but which required a flowering specimen to assign to the Herbarium collection.

The species was previously known only from the type specimen collected by James Drummond during his botanical work from 1837–1848.

The second discovery was *Acacia torticarpa*, previously known only from a small handful of collections by Charles Gardner between 1945 and 1949.

The finds thrilled staff from the WA Herbarium and Species and Communities Branch. Staff from Yilgarn District will carry out surveys in an attempt to locate additional populations, and seed collection is also planned.



- 170 boundary identification signs were made and installed on former pastoral properties Muggon, Karara, Lochada, Kadji Kadji, Barnong, Warriedar, Woolgorong, Nyoongal, Lakeside, Thundelarra, Burnerbinmah, Dagaranga and Kennedy Range National Park.

#### State Cane Toad Initiative

Cane toads are a declared pest under the *Agriculture and Related Resources Protection Act 1976*. The Cane Toad Strategy for Western Australia was released by the Minister for Environment in October 2009, with DEC as the lead agency responsible for cane toad management, supported by the Department of Agriculture and Food and the Agriculture Protection Board in the areas of quarantine and biosecurity.

The Regional Cane Toad Team was maintained during 2009–10 with five positions comprising a program coordinator, team leader and three technical officers. The team achieved the following:

- contributing to a reduction in the number of toads at the frontline (moving from the Northern Territory) through cooperative fieldwork with the community groups Kimberley Toad Busters and Stop the Toad Foundation
- gathering increased knowledge about cane toad behaviour
- identifying high-risk freight and establishment zones
- supporting the Cane Toad Stakeholder Reference Group
- providing cane toad presentations to schools and community groups
- assisting with cane toad-related research projects, including University of Sydney projects looking at freshwater crocodiles in Lake Argyle and taste aversion projects on monitors and crocodiles
- maintaining databases to record sightings and distribution of cane toads
- quarterly state cane toad newsletters
- continued distribution of cane toad identification information and ways of managing cane toads in backyards in the east Kimberley
- maintaining live cane toad drop-off points in Kununurra
- finalising the Cane Toad Strategy for Western Australia
- carrying out east Kimberley biodiversity surveys in conjunction with the Miriuwung Gajerrong program, Science Division and regional nature conservation officers.


In accordance with a government election policy commitment, funding was provided to the Kimberley Toad Busters to continue their cane toad control program for the second year of the four-year funding commitment.

## A cane toad strategy for Western Australia



The Cane Toad Strategy for Western Australia 2009–2019 was released in October 2009. The streamlined, 'action-oriented' strategy is readily updatable as new information comes to hand, focusing on a number of objectives including surveillance work, working with community groups to implement action plans for priority areas and promoting cane toad awareness in local communities.

Another weapon in the fight is Nifty, Australia's first cane toad detector dog. The five-year-old Belgian malinois spent three months at Moreton Island off the Queensland coast learning the scent of the pest invaders, in order to assess high-risk freight consignments entering the Kimberley region from the Northern Territory.



The presence of cane toads in Western Australia represents a significant biodiversity conservation challenge and experience gained over the past four years demonstrates the immense challenge of fighting this threat even with unprecedented government and community efforts.

Research investigating the potential impacts of cane toads on Kimberley fauna has been undertaken with scientific papers in the process of being published. A research agreement between DEC and the University of Sydney to evaluate the potential role of nematode lungworms in control of cane toads continued, along with new projects investigating opportunities to use taste aversion as a tool for minimising cane toad impacts on goannas, quolls and crocodiles.

**Further information** on cane toad management is available on the DEC website:  
<http://www.dec.wa.gov.au/q=#33>

## Management of commercial activities involving wildlife

DEC ensured that wildlife-based activities that occurred during the year were licensed and managed in accordance with the WC Act and were maintained and investigated to ensure compliance with legislation and the licences issued.

Management of the commercial harvesting of kangaroos continued with input from the Kangaroo Management Advisory Committee. Under the nationally approved kangaroo management plans, commercial harvest quotas were set for each species of commercially harvested kangaroo for the 2010 calendar year. During 2009, aerial population surveys were undertaken in the central survey zone as part of the triennial survey program. The south-west forest areas were also surveyed to provide a population estimate for western grey kangaroos. These surveys and submissions endorsed by the Kangaroo Management Advisory Committee resulted in the following commercial harvest quotas being approved for 2010:

- western grey kangaroos—200,000 (up from 172,500 in 2009)
- red kangaroos—105,000 (up from 103,000 in 2009)
- euros—nil (no commercial harvest of euros was approved for 2010).

Under the management plan for the commercial harvest and farming of crocodiles in Western Australia, the following maximum annual quotas apply (though these are seldom filled, especially for freshwater crocodiles):

- estuarine crocodiles (*Crocodylus porosus*)—520 eggs/hatchlings, 50 non-hatchlings
- Australian freshwater crocodiles (*Crocodylus johnstoni*)—1,900 eggs/hatchlings, 200 non-hatchlings.

The harvest is primarily restricted to the Glenelg River in the west Kimberley and the Cambridge Gulf area in the east Kimberley. While annual monitoring of crocodile populations in the Cambridge Gulf area ensured that wild crocodile populations were conserved, during the year additional surveys of freshwater and saltwater crocodile habitat in the east Kimberley were conducted to provide baseline data on the possible impact of cane toads on these two species.

The commercial harvesting of native flora continued under the approved management plan *Commercial harvesting of protected flora in WA 1 July 2008–30 June 2013*. This plan facilitated the export of native flora harvested in Western Australia.

Intensive management of sandalwood harvesting continued with pre-harvest operations being conducted on Crown land, and individual property inspections and quota assessments being undertaken for all sandalwood harvest applications for alienated land.

## Regulation

### *Flora and fauna licensing*

There were 8,228 fauna licences (other than damage, but including non-commercial) issued during the year, a decrease of less than half a per cent from the previous year. Continued interest in pet herpetofauna (reptiles and frogs) resulted in a modest increase in licences issued with more than 3,562 people licensed to keep reptiles as pets. There was an eight per cent decrease in avian fauna licences. Overall there was a modest decrease in the number of licences issued. The total number of flora licences and permits issued was 1,868, a decrease of five per cent from the previous year. DEC issued 318 commercial purposes licences and 265 commercial producer licences and nurseryman licences in 2009–10.

### Damage and dangerous fauna licences

The department received reports of problem crocodiles in several parts of the Kimberley Region. Eight licences to remove saltwater crocodiles from the wild were issued because they threatened public safety. Twenty-nine dangerous fauna licences were issued for aggressive magpies (an increase of 26 per cent); seven dangerous fauna licences were issued for aggressive western grey kangaroos; three dangerous fauna licences were issued for western grey kangaroos to mitigate the risk of aircraft strike at Albany, Pearce and Jandakot airports, and one licence was issued for euros at Monkey Mia; and seven dangerous fauna licences were issued for a range of bird species to mitigate the risk of aircraft strike at Perth, Jandakot, Busselton, Albany, Karratha and Kununurra airports.

Licences issued for the control of fauna causing damage included 14 licences for emus; 363 licences for western grey kangaroos (a seven per cent decrease); 21 licences for little corellas (an increase of 91 per cent); 39 licences for western long-billed corellas (an increase of 200 per cent); 15 licences for twenty-eight parrots; six licences for galahs; and 15 licences for Australian ravens.

One licence was issued to trap and relocate a western quoll that was taking chickens at Jandabup. One hundred and fifty six damage licences were issued for birds, an increase of 62 per cent from 2008–09.

**Further information** is available on the DEC website:

*Fauna licensing:* <http://www.dec.wa.gov.au/q=#34>

*Flora licensing:* <http://www.dec.wa.gov.au/q=#35>

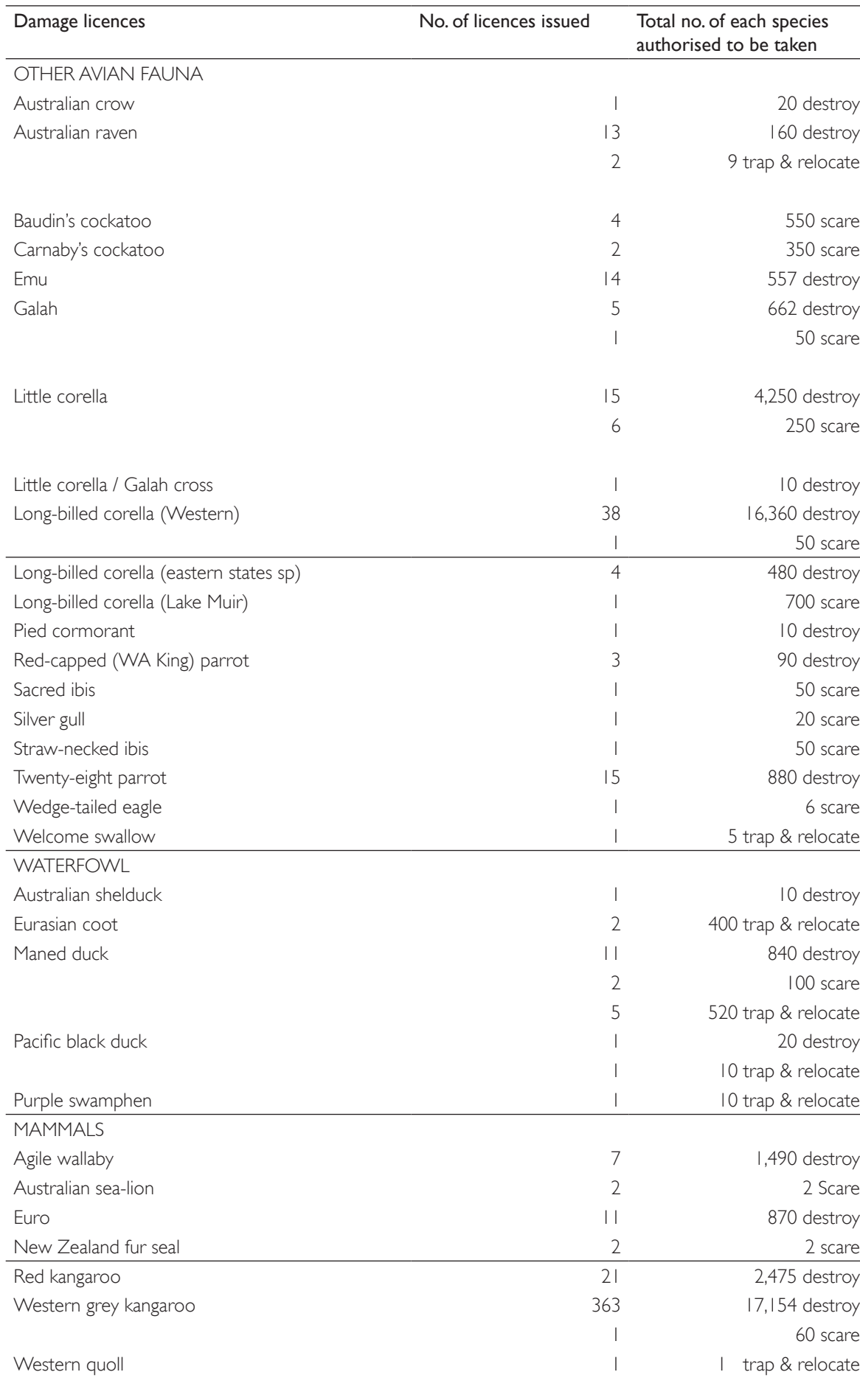
**Table 4: Wildlife licences issues in 2009–10**

Fauna licences	Licences issued
<b>SCIENTIFIC</b>	
Scientific collection (Reg 17)	546
Bird/Bat banding (Reg 23)	136
<b>EDUCATION AND PUBLIC</b>	
To take (Reg 15)	
Marine interaction	275
Other	706
<b>EDUCATION AND PUBLIC</b>	
To hold (Reg 16)	129
<b>AVIAN FAUNA</b>	
Keep and breed in captivity (Reg 12)	2,818
Deal (Reg 13)	38
Breed for commercial purposes (Reg 14)	0
Trap (Reg 11)	2
<b>Species trapped commercially</b>	<b>Number</b>
Twenty-eight parrot	291
Red-capped parrot	89
Western rosella	81
Galah	60
Little corella	44
Long-billed corella (Eastern sp)	20
<b>FAUNA</b>	
Keep in captivity (Reg 12A)	81





Fauna licences	Licences issued
<b>HERPETOFAUNA (Reptiles and Amphibians)</b>	
Keeping	1,990
Dealing	23
Farming	2
Taking	6
Removing	46
<b>EMUS</b>	
Emu farming (Reg 14)	7
Dealing (Reg 8)	2
Dealing (Emu eggshells Reg 13)	3
Processing (Emu eggshells Reg 7)	3
<b>CROCODILES</b>	
Crocodile farming (Reg 14)	2
Skin dealing (Reg 10)	0
Processing (Reg 7)	2
<b>KANGAROO</b>	
Take kangaroos for sale (Reg 6)	426
Deal in carcasses (Reg 8)	23
Skin dealing (Reg 10)	15
Processing (Reg 7)	23
<b>EXPORTS INTERSTATE</b>	
Skins of fauna (or other dead fauna)	41
Fauna (live)	367
Herpetofauna (reptiles and amphibians)	37
<b>EXPORT OVERSEAS</b>	
Skins of fauna (or other dead fauna) from WA	16
Emu eggs or products (personal items) from WA	0
Fauna (avian) from WA (live)	1
	17
<b>IMPORTS INTERSTATE</b>	
Skins of fauna (or other dead fauna) into WA	5
Australian fauna (live)	270
Live exotic birds and other animals	175
Herpetofauna (reptiles and amphibians)	12
<b>Total fauna licences</b>	<b>8,228</b>
<b>Flora licences</b>	
Commercial purposes	318
Sandalwood (from Crown land)	0
Forest produce (from Crown land)	1
Commercial producers	265
Sandalwood (from private land)	29
Scientific/prescribed purposes	1,059
Permits to take declared rare flora	196
<b>Total flora licences</b>	<b>1,868</b>



Damage licences	No. of licences issued	Total no. of each species authorised to be taken
<b>OTHER AVIAN FAUNA</b>		
Australian crow	1	20 destroy
Australian raven	13	160 destroy
	2	9 trap & relocate
Baudin's cockatoo	4	550 scare
Carnaby's cockatoo	2	350 scare
Emu	14	557 destroy
Galah	5	662 destroy
	1	50 scare
Little corella	15	4,250 destroy
	6	250 scare
Little corella / Galah cross	1	10 destroy
Long-billed corella (Western)	38	16,360 destroy
	1	50 scare
Long-billed corella (eastern states sp)	4	480 destroy
Long-billed corella (Lake Muir)	1	700 scare
Pied cormorant	1	10 destroy
Red-capped (WA King) parrot	3	90 destroy
Sacred ibis	1	50 scare
Silver gull	1	20 scare
Straw-necked ibis	1	50 scare
Twenty-eight parrot	15	880 destroy
Wedge-tailed eagle	1	6 scare
Welcome swallow	1	5 trap & relocate
<b>WATERFOWL</b>		
Australian shelduck	1	10 destroy
Eurasian coot	2	400 trap & relocate
Maned duck	11	840 destroy
	2	100 scare
	5	520 trap & relocate
Pacific black duck	1	20 destroy
	1	10 trap & relocate
Purple swamphen	1	10 trap & relocate
<b>MAMMALS</b>		
Agile wallaby	7	1,490 destroy
Australian sea-lion	2	2 Scare
Euro	11	870 destroy
New Zealand fur seal	2	2 scare
Red kangaroo	21	2,475 destroy
Western grey kangaroo	363	17,154 destroy
	1	60 scare
Western quoll	1	1 trap & relocate



Dangerous fauna licences	No. of licences issued	Total no. of each species authorised to be taken
Australian kestrel	1	10 scare
Australian magpie	29	70 destroy
	1	20 scare
	1	1 trap & relocate
Australian pelican	1	10 scare
Australian raven	3	130 destroy
Australian shelduck	1	20 destroy
Banded lapwing (banded plover)	3	40 destroy
Black kite	1	3 destroy
Carnaby's cockatoo	1	50 scare
Estuarine (saltwater) crocodile	3	5 destroy
	5	10 trap
Euro	1	8 destroy
Freshwater (Johnston) crocodile	1	1 trap & relocate
Galah	1	100 destroy
Little corella	1	50 destroy
	1	250 scare
Little eagle	1	5 trap & relocate
Long-billed corella (ES sp)	1	100 destroy
Maned duck	1	300 destroy
Magpie lark	1	10 scare
	1	2 trap & relocate
Pacific black duck	1	200 destroy
Purple swamphen	1	10 trap & relocate
Richard's pipit	1	20 scare
Sacred ibis	1	50 destroy
Straw-necked ibis	1	50 destroy
Tree martin	1	50 scare
	1	50 trap & relocate
Wedge-tailed eagle	1	5 trap & relocate
Welcome swallow	1	50 scare
	1	50 trap & relocate
Western grey kangaroo	11	171 destroy
Whistling kite	1	3 destroy
	1	15 scare
White-faced heron	1	10 scare
Willie wagtail	1	10 scare

#### *Wildlife interaction licences*

At 30 June 2010, 126 whale-watching boat tour operators were licensed in Western Australia. While these tours were primarily based on humpback whales, southern right whales were also a focus of whale watching activity in the lower south-west areas, particularly at Albany, Augusta and Esperance.

DEC issued 99 boat-based and one beach-based dolphin interaction licences, five in-water dolphin interaction licences (four boat-based and one beach-based) and two boat-based dugong interaction licences. Forty-three

boat-based Australian sea lion and New Zealand fur seal interaction licences were issued. Two licences were issued to film humpback whales for a documentary.

Fourteen whale shark interaction licences were current for the year.

#### Offences

During the year, DEC staff provided guidance regarding the legal requirements of parks and conservation legislation. There were 634 caution notices for minor offences and 690 infringement notices issued during the year (Table 5). Written reports were prepared for 114 offences under the WC Act and its regulations, and the CALM Act and its regulations. Action in 95 matters under both statutes was completed.

The unlawful taking of black cockatoos from the wild continued to be of concern. In July 2009 an aviculturist was fined \$4,500 for unlawful possession of three Carnaby's cockatoos and several red-tailed black cockatoos. There are indications that the threatened Baudin's and Carnaby's cockatoos are frequently shot on private property. During the year over 250 Carnaby's cockatoos died as a result of extreme weather and a further 17 from unknown causes. The unlawful taking, possession and keeping of reptiles continued to be an issue.

**Table 5: Number of reported offences in 2008–09 and 2009–10**

	2008–09 reported offences		2009–10 reported offences <sup>1</sup>
	As at 30.06.09	Revised <sup>1</sup>	As at 30.06.10
Total offences reported	1151	1395	1438
Court convictions	60	80	54
Court dismissals	0	0	0
Infringement notices	380	386	690
Letters of warning	56	65	12
Caution notices	590	824	634
No further action	25	31	25
Pending	40	0	19
Withdrawn		9	4
Restitution		\$5034	0
Total court fines	\$27,750	\$39,250	\$16,875
Total court costs	\$2,689.80	\$3795.80	\$3,801.90
Infringement penalties	\$30,370	\$31,070	\$53,440

<sup>1</sup>Figures in this column are updated from those included in the 2008–09 annual report.

Table 6: Offences under the Wildlife Conservation Act 1950 and Regulations and Agriculture and Related Resources Protection Act 1976 that occurred in 2009–10

Charges	Reported offences	Convictions	Fines \$	Costs \$	Dismissed	Letter of warning	Caution notice	No further action	Pending
<i>Wildlife Conservation Act 1950</i>									
Illegal taking or possession of protected fauna	57	31	\$8,300.00	\$1,882.40		3	10	9	4
Illegal importation, selling or taking for sale of fauna	23	2	\$800.00	\$110.20			20		1
Use of illegal devices in taking fauna	2							2	
Illegal taking of protected flora	2							1	1
Offences relating to the sale of protected flora	2						2		
Taking declared rare flora without the Minister's consent	1							1	
Offences against wildlife officers									
Failing to comply with licence conditions	156	4	\$2,100.00	\$110.20		7	139	3	3
Wildlife Conservation Regulations									
Offences relating to the acquisition, possession, control and disposal of fauna	173	13	\$4,075.00	\$1,469.70		4	144	2	10
Wildlife Conservation Reptile and Amphibian Regulations									
Offences relating to reptiles and amphibians	6	1	\$400.00				5		
Agriculture and Related Resources Protection Act									
Illegal keeping/import of declared animals	4	2	\$200.00	\$119.20			1	1	
<b>Totals</b>	<b>426</b>	<b>53</b>	<b>\$15,875.00</b>	<b>\$3,691.70</b>	<b>0</b>	<b>14</b>	<b>321</b>	<b>19</b>	<b>19</b>

Table 7: Offences under the Conservation and Land Management Act 1984 and Regulations that occurred in 2009–10

Charges	Reported offences	Convictions	Fines \$	Costs \$	Dismissed	Infringement notice	Letter of warning	Caution notice	No further action	Pending
<i>Conservation and Land Management Act 1984</i>										
Illegal taking or possession of forest produce	22	1	\$3,200.00	\$110.20		11		8	2	
Offences relating to the occupation of CALM land	1								1	
Offences relating to Marine Parks and Reserves										
Offences against officers										
Offences relating to disease risk areas	14							14		
Offences relating to activities on State forests, Nature Reserves and National Parks	973		\$51,240.00			679	1	291	2	
Sandalwood Act										
Illegal taking sandalwood	2						1		1	
<b>Totals</b>	<b>1012</b>	<b>1</b>	<b>\$54,440.00</b>	<b>\$110.20</b>	<b>0</b>	<b>690</b>	<b>2</b>	<b>313</b>	<b>6</b>	



## Conserving landscapes and seascapes; integrating off- and on-reserve conservation and managing threatening processes

### Biodiversity conservation strategy

The department continued to participate in developing an updated national biodiversity conservation strategy. The national strategy is scheduled to be completed in 2010–11, through the Natural Resource Management Ministerial Council. It is anticipated that a state biodiversity conservation strategy will be progressed once the national strategy is finalised.

### Biodiversity conservation legislation

The department continued to provide advice to the government on the proposed Biodiversity Conservation Bill.

### Native Vegetation Framework

The *National Framework for the Management and Monitoring of Australia's Native Vegetation* (the Native Vegetation Framework or NVF) was published in 1999 to guide policies, programs, legislation and activities related to native vegetation conservation throughout Australia. The NVF is the national policy document for achieving a reversal in the long-term decline of Australia's native vegetation and an improvement in the condition of existing native vegetation. The Natural Resource Management Ministerial Council directed that the NVF be reviewed and revised.

The department continued to participate in revising the NVF. A draft revised NVF was released for public comment during the year, and further drafting of the document and development of targets have been undertaken. The revised NVF is scheduled to be completed in 2010–11, through the Natural Resource Management Ministerial Council.

### Regional nature conservation plans

Each DEC region has prepared a five-year *Nature conservation service regional plan* that collectively provides the basis for greater integration and coherence of departmental activities and functions towards achieving the goal of conserving Western Australia's biodiversity at a regional scale. These plans allow resources to be better focused to address major biophysical and socioeconomic threats to biodiversity, enabling funding opportunities to be more targeted. The regional plans are intended to be five-year 'rolling' plans, which are annually reviewed and updated.

In developing the plans, candidate actions were selected on the basis of making a direct and measurable improvement in meeting the five-year conservation target outcomes. The Nature Conservation Service plans represent a major movement within the department towards outcome-based management, providing integrated, active adaptive management programs across the state. This will significantly advance the quality of biodiversity management within DEC and place the department at the forefront of biodiversity conservation in Australia.

### Regional marine planning

DEC is the lead agency for regional marine planning for the state's south coast (Cape Leeuwin to the South Australian border). Through a partnership of government, community and stakeholder groups, the regional marine planning process for the south coast aims to establish and promote a scientifically robust framework that enhances cooperation and integration between sectors; recognises the importance of social, cultural and economic values that the marine environment can provide for current and future generations; and protects and maintains ecological integrity and biodiversity.

The process was coordinated by a working group comprising representatives of state government agencies with marine responsibilities and the natural resource management sector. Development of the documents included extensive stakeholder input through a cross-sectoral stakeholder advisory group and community and specialist workshops. A draft regional marine strategic plan for the state's south coast as well as a more detailed companion report *Oceans of Opportunity: a new vision for marine waters of Western Australia's South Coast* have been prepared for consideration by government.

**Further information** about regional marine planning is available on the DEC website:

<http://www.dec.wa.gov.au/q=#37>

### Managing system-wide threats



### Salinity management

During 2009–10, DEC continued its collaboration with the Future Farm Industries Cooperative Research Centre. Work with this organisation on the ecophysiology of sheoaks (*Casuarina obesa*) and paperbarks (*Melaleuca strobophylla*) growing on the Toolibin Lake floor is beginning to explain the variability in recovery and ecology of these plants, and this is vital information for adapting management. In addition, publication of work on revegetation trials established in 1995 has shown the contribution of revegetation to groundwater control, and underlines the importance of long-term trials and monitoring.

**Further information** on salinity management is available on the DEC website:

<http://www.dec.wa.gov.au/q=#38>

### Natural diversity recovery catchments

The Natural Diversity Recovery Catchments program continued to slow degradation and recover high-value biodiversity assets in the south-west that were at further risk from altered hydrology, particularly salinity. Key activities for 2009–10 included completion of the next phase of major surface water management works at Lake Bryde and Toolibin Lake. At Toolibin, this included increased capacity to discharge poor quality surface water from the lake by pumping water from a low point and replacement of the old diversion structure. These works significantly improve the capacity to harvest inflow. The works also contribute to improved water management upstream on farmland, and a component of future works will be aimed at encouraging work on private property for public and private benefit.

Activities at Buntine-Marchagee Natural Diversity Recovery Catchment continue to be centred on large scale integrated water management works on farmland, including revegetation. This multi-year project is aimed at decreasing salt, nutrient and sediment export to the naturally saline braided wetland channel and the gypsum wetland complex. In 2009–10, a total of \$230,000 of externally funded on-ground works was expended on a sub-catchment covering 3,800 hectares. An intra-seasonal aquatic invertebrate survey confirmed the status of 'highest diversity' at a newly identified fresh-brackish wetland complex.

At the Lake Warden Natural Diversity Recovery Catchment, the gravity pipeline helping to remove excess water from Lake Wheatfield continues to function well, and environmental impact assessment is under way for the larger project involving Lake Warden.

The recovery plan for Drummond Natural Diversity Recovery Catchment has been completed to final draft, and should be released during 2010–11.

Analysis of data continued as a pre-cursor for recovery planning in the Muir-Unicup Natural Diversity Recovery Catchment which includes a highly complex suite of wetlands, some of which are listed under the Ramsar Convention. In particular, work on the bird fauna has shown that 52 waterbird species use the wetland complex, of these 10 are migratory species protected under international treaties, and at least 22 species breed in the area. One species (the Australasian bittern) is listed as Endangered. Funding of \$100,000 was obtained from Caring for Our Country to undertake weed control and rehabilitation in the Muir-Unicup Recovery Catchment and Ramsar wetland.

The department contributed to a range of committees during the year, including those relating to the Engineering Evaluation Initiative, the Review of the State Salinity Strategy and Saline Reserves East of the Darling Scarp. The department was involved in running a postgraduate course in hydrogeology at The University of Western Australia which provided an opportunity for increased research of hydrogeological and hydrological issues affecting important biodiversity assets. Additional research work through this course is already benefiting recovery catchments. DEC also established the Hydstra database as a repository for all recovery catchment hydrological information, and has begun to provide data to the Bureau of Meteorology.

**Further information** on natural diversity recovery catchments is available on the DEC website:

<http://www.dec.wa.gov.au/q=#39>

### Invasive species control

#### Feral pigs

Throughout the year, DEC took part in cooperative management of feral pigs in the south-west. DEC conducted feral pig control activities, including monitoring, trapping and poisoning, in the forests of the south-west and in the Midwest. A feral pig control program was initiated in the Lesueur National Park with ground baiting occurring during the summer months of 2010. This program proved successful with good bait uptake and decreasing signs of pig activity.

DEC's Warren Region continued to support three community groups to address feral pig control. A \$150,000 South West Feral Pig Control Project was funded.





The effectiveness of feral pig control efforts continued to be hindered by illegal hunting, transport and release of pigs by recreational shooters.

#### *Feral goats*

Feral goat control activities continued with the aim of minimising the impacts of these animals on vegetation communities and fauna habitat. An aerial control program on Dirk Hartog Island National Park destroyed 2,503 feral goats, and 154 goats were culled in Cape Range National Park through opportunistic shooting efforts. A feral goat trapping program was also undertaken within the Capamauro and Pinjarrega nature reserves and Watheroo National Park with the assistance of local volunteers.

#### *Donkeys, camels and invasive birds*

Feral donkey and camel control operations in the Pilbara and northern Meekatharra Shire continued in partnership with the Department of Agriculture and Food under the Judas Collar Program. DEC collaborated with the Department of Agriculture and Food and the Martu traditional owners to destroy 5,145 camels and 906 donkeys in aerial shoots in desert country along the pastoral fringe.

A program for the control of invasive rainbow lorikeets continued in the Perth metropolitan region to reduce competition with native species for nest spaces and food resources and to prevent the risk of disease to native

## Weed invaders hit with information technology

An estimated 1,350 species of environmental weeds in Western Australia pose a serious threat to biodiversity, particularly in remote bushland and wetlands in the south-west and on the south coast.

Management notes for a selection of the most problematic weeds on the Swan Coastal Plain and jarrah forest region are now available on Florabase, the state's premier online flora database.

DEC Project Manager Kate Brown says access to current biological and best practice management is important to getting the upper hand with problem species.

"Invasive grasses, many of which originate from similar environments in South Africa, can form dense monocultures, produce prolific seed that can readily be dispersed, are able to survive fire, displace native plants and animals, and suppress growth or regeneration of other plants," she said. Florabase is located at <http://florabase.dec.wa.gov.au>




bird species. The program was implemented by the department, with assistance from fruit growers and other affected land managers. During the year, 7,111 birds were taken, 6,707 by departmental staff, bringing the total for the program to 23,190 birds. Little and long-billed corellas (not native to the Perth metropolitan area) were also controlled through the program, with 46 birds taken during the year, and a program total of 964 birds.

#### *Management of environmental weeds*

Weed management actions on DEC-managed lands were prioritised in each region according to the policy outlined in the Environmental Weed Strategy of WA (1999). During 2009–10, work continued on a weed risk management project that aimed to prioritise weeds in each of Western Australia's 26 Interim Biogeographical Regionalisation of Australia (IBRA) bioregions. The project enables weeds to be assessed for their invasiveness, impacts, potential and current distribution and feasibility of control across each of the bioregions.

In addition to the IBRA-based weed risk assessments, a database of 300 of the most serious environmental weeds in the Swan Region has been developed and is available online via the department's Florabase website. Funding for this project has come from DEC, Perth NRM and the state NRM program.

The use of a state-wide asset-protection-based process to determine the values at risk from environmental weeds is being further investigated. This process ultimately aims to maximise efficiency and effectiveness of weed control through consideration of biodiversity values at risk from environmental weeds, and availability of resources, so that appropriate management actions can be applied by each of the DEC regions.



A weed prioritisation process is being progressed in the Pilbara Region, including liaison with mining companies to prioritise the weeds on mine sites. Rio Tinto (Pilbara Iron) and the Department of Corrective Services also collaborated with the department in a ruby dock control program in the Millstream Chichester National Park using an outcomes-based reporting and data management system developed for this purpose.

The main environmental weeds targeted for management by DEC in 2009–10 included: *Acacia dealbata* (silver wattle); *Acetosa vesicarius* (ruby dock); *Asparagus asparagoides* (bridal creeper); *Chamaecytisus palmensis* (tagasaste); *Cryptostegia grandiflora* (rubber vine); *Cyathea cooperi* (rough tree fern); *Echium plantagineum* (Paterson's curse); *Eragrostis curvula* (African lovegrass); *Euphorbia terracina* (Geraldton carnation weed); *Hesperantha falcata* (hesperantha); *Leptospermum laevigatum* (Victorian tea tree); *Lycium ferocissimum* (African boxthorn); *Moraea flaccida* (Cape tulip); *Phoenix dactylifera* (date palm); *Rubus* sp. (blackberry); *Sparaxis bulbifera* (Harlequin flower); *Tamarix* species; *Typha* species; *Verbesina encelioides* (verbesina); *Watsonia* species; *Zantedeschia aethiopica* (arum lily); and *Xanthium spinosum* (Bathurst burr).

DEC Swan Region has conducted a series of research projects on environmental weeds which are invading native plant communities. The focus of the research ranges from understanding plant biology and system ecology through to selection of appropriate management actions in order to minimise the threat of environmental weeds to flora and ecosystem values. The species of environmental weeds subject to research include *Euphorbia terracina*, *Watsonia meriana*, *Watsonia borbonica*, *Ferraria crispa*, *Lachenalia reflexa* and *Sparaxis bulbifera*.

During 2009–10, DEC continued work in an effort to eradicate rubber vine, a weed of national significance, in the West Kimberley. A key focus of the work by DEC for this task has been analysis of spatial data to assist with the strategic management of the rubber vine infestation. Work completed in this financial year was funded by a number of organisations including DEC, Department of Agriculture and Food (in-kind), the Zone Control Authority, Rangelands NRM and Ord Land and Water.

**Further information** on control of invasive plant species is available on the DEC website:

<http://www.dec.wa.gov.au/q=#40>

### **Phytophthora dieback management**

The following achievements were made in 2009–10 in the management of *Phytophthora* dieback (also refer to the *Priority Nature Conservation Projects* section):

- The Vegetation Health Service (VHS) has processed over 1,300 diagnostic samples collected by the department's disease interpreters and private contractors from across the south-west of Western Australia. The results identified five described *Phytophthora* species and 16 unidentified or undescribed species. The VHS has continued to work in partnership with the Centre for *Phytophthora* Science and Management to DNA sequence over 340 isolates from their culture collection. This has identified nine previously described *Phytophthora* species and nine undescribed *Phytophthora* species isolated from native plant communities in Western Australia.
- A 'green card' hygiene system was introduced in the South Coast Region to ensure all operations happening on DEC-managed lands are conducted using appropriate hygiene procedures to prevent accidental introduction or further spread of *Phytophthora* dieback.
- Facilities were upgraded in a number of national parks in South Coast Region to improve dieback hygiene standards.
- Interpretation consisting of 19 hectares of native vegetation and 14 kilometres of linear infrastructure was conducted in the South Coast Region around the Cape Arid and Fitzgerald River national parks.
- Aerial application of phosphite continued to a total of 516 hectares of vegetation in the south-west of Western Australia to protect threatened flora and ecological communities, including the Montane heath and thicket threatened ecological communities in the Stirling Range National Park.
- Seed was collected from populations of a number of threatened flora under threat from *Phytophthora* dieback.

### **Fire management on unallocated Crown land and unmanaged reserves**

DEC continued its targeted fire preparedness works on 89 million hectares of non-metropolitan and non-townsite unallocated Crown land and unmanaged reserves. Table 8 shows the distance of firebreak access installed and maintained, the level of vegetation modification in strategic buffers, and the area of wind-driven open edge prescribed burning and large-scale block ignition using aircraft. The large achievements in block burning in the Kimberley, Pilbara and Goldfields regions continued due to increased fire management funding in DEC's remote regions, and the use of planned fire for developing landscape-scale mosaics for mitigating the impacts of large damaging summer bushfires, protecting biodiversity values and achieving designated nature conservation outcomes. Some of these achievements included engagement with Indigenous communities.

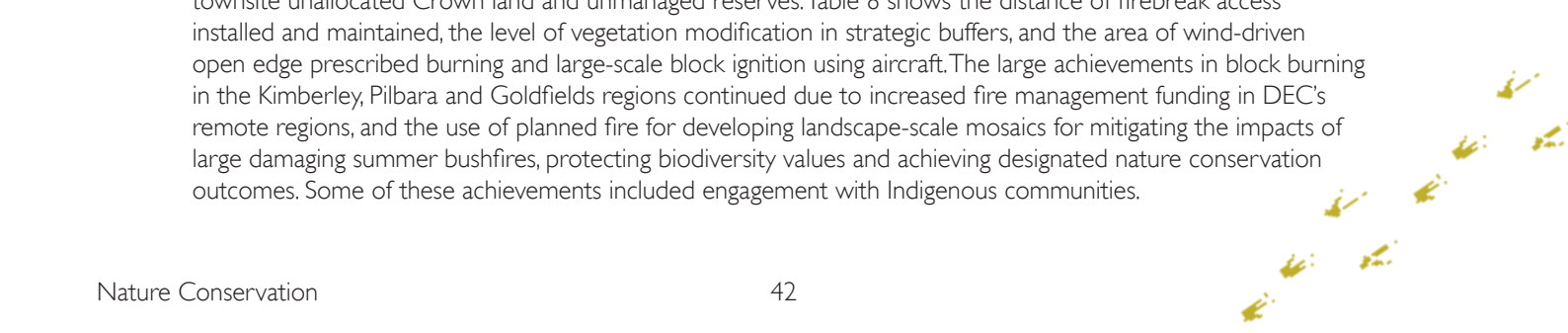


Table 8: Fire prevention works completed on unallocated Crown land and unmanaged reserves in 2009–10

DEC region	Firebreak access and maintenance (km)			Scrub rolling/slashing and vegetation modification (km)			Open-edge burning (km)			Block burning (ha)		
	2007–08	2008–09	2009–10	2007–08	2008–09	2009–10	2007–08	2008–09	2009–10	2007–08	2008–09	2009–10
Kimberley	30	42	50	0	0	0	300	370	400	663,254	340,000	305,811
Pilbara	-	-	0	-	-	0	0	0	0	3 areas burnt	37,340	67,412
Goldfields	314	205	245	43	72	0	10	72	41	495,090	1,220,252	450,000
Midwest	264	756	771	0	0	0	36	28	15	480	655	3662
Wheatbelt	544	325	250	0	60	0	8	15	21	0	0	0
South West	4	0	10	6	6	0	0	0	0	12	0	424
Warren	37	18		21	0	0	0	0	0	389	0	72
South Coast	53	261	252	19	108	187	158	90	10	267	953	809
Swan	-	-	0	-	-	0	-	-	0	-	-	979
<b>TOTAL</b>	<b>1,246</b>	<b>1,607</b>	<b>1,599</b>	<b>68</b>	<b>246</b>	<b>187</b>	<b>512</b>	<b>575</b>	<b>487</b>	<b>1,159,492</b>	<b>1,561,860</b>	<b>829,169</b>



## Invasive animal control on unallocated Crown land and unmanaged reserves

DEC carried out aerial baiting for wild dog control throughout the Pilbara Region on DEC-managed land and unallocated Crown land (UCL) in conjunction with the annual program run by the Department of Agriculture and Food and the Pilbara Zone Control Authority (ZCA). The locations and levels of activity were negotiated with neighbouring landholders managing large stock units adjacent to DEC-managed lands. Liaison and planning for the annual aerial dog baiting program in the northern portion of the Meekatharra ZCA was also undertaken.

Wild dog control in the Goldfields used aerial and ground baiting (including the provision of baits to the ZCA), and the services of a contract dogger. The primary focus was on wild dog control adjacent to properties carrying small stock units and where active control of dogs was occurring within their leases. Dog control also occurred in the western parts of the wheatbelt.

DEC also resourced and assisted the Department of Agriculture and Food and the Pilbara ZCA with aerial control of feral donkeys and camels on DEC-managed lands and UCL in the Pilbara Region, and donkeys in the Kimberley. Control works were undertaken on UCL in the Nunyerry and Nullagine areas as well as buffers along the border between pastoral leases and the desert.

Wildlife officers in DEC's Kimberley Region monitored the import and movement of species crossing the Western Australian–Northern Territory borders, including quarantining of birds and reptiles.

## Kimberley Science and Conservation Strategy

The state government has committed \$9 million over four years to develop and implement an integrated science and conservation strategy for the Kimberley, to ensure the region's natural and cultural values are protected as the region fulfils its economic potential. A comprehensive public consultation process was undertaken in 2009 to inform the development of the strategy. The process involved public forums in the region and in Perth, as well as stakeholder meetings and the opportunity to make written submissions. The report on consultation was released and is available on DEC's website. The key themes raised through the consultation process will be reflected in the strategy. DEC will have a key role in implementing the strategy.

As a first step in broader conservation measures for the Kimberley, the government announced that a marine park will be established at Camden Sound. An indicative management plan to support the establishment of the proposed Camden Sound Marine Park has been prepared and is undergoing the statutory approval process.

**Further information** on the Kimberley Science and Conservation Strategy is available on the DEC website: <http://dec.wa.gov.au/q=#5>

## Great Western Woodlands

The state government has committed to better manage and protect the Great Western Woodlands (a continuous band of woodland vegetation spanning the edge of the wheatbelt to the mulga country in the north, the inland deserts to the north-east and the Nullarbor Plain to the east) and to ensure the long-term conservation of the unique natural and cultural values of the area. This includes the development of a conservation strategy, led by DEC and involving other key state government agencies.

The stakeholder reference group met three times to provide input into a draft *Biodiversity and cultural conservation strategy for the Great Western Woodlands* for consideration by the Minister for Environment. The strategy will ensure that the economic, social and cultural activities and values of the area are recognised and fully considered.

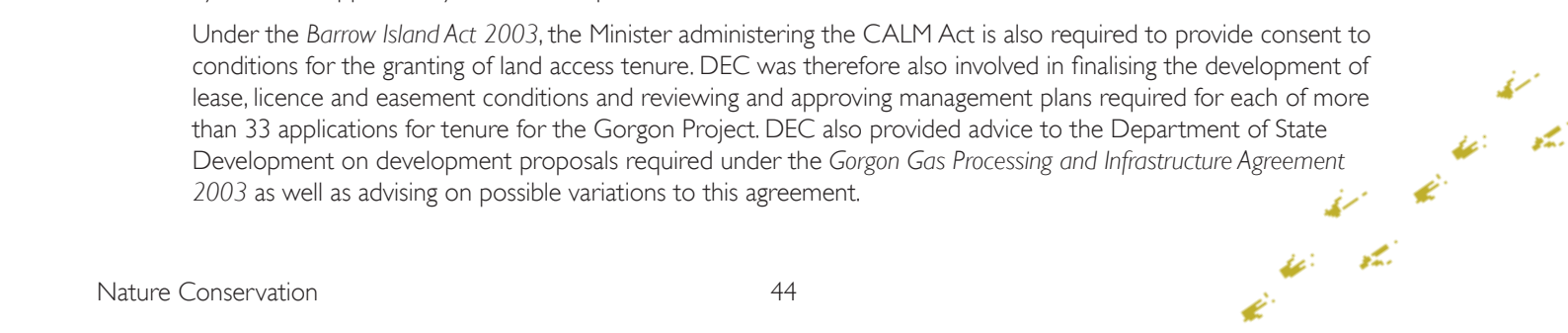
## Tuart woodlands

Ongoing research and management support for tuart biodiversity restoration was provided by the Centre of Excellence for Climate Change Woodland and Forest Health.

## Assessment of land resource use impacts on biodiversity conservation

DEC was heavily involved in the review and approval of management plans and other environmental documentation required under state approvals for the Gorgon Gas Field development on Barrow Island. Under the Ministerial conditions for the Gorgon Project, 21 management plans and 12 revisions to plans were reviewed by DEC and approved by either the department or the Minister for Environment.

Under the *Barrow Island Act 2003*, the Minister administering the CALM Act is also required to provide consent to conditions for the granting of land access tenure. DEC was therefore also involved in finalising the development of lease, licence and easement conditions and reviewing and approving management plans required for each of more than 33 applications for tenure for the Gorgon Project. DEC also provided advice to the Department of State Development on development proposals required under the *Gorgon Gas Processing and Infrastructure Agreement 2003* as well as advising on possible variations to this agreement.



DEC undertook a recruitment and training process for additional departmental personnel to provide an operational and regulatory presence on Barrow Island during the construction and operation of the Gorgon Project.

During 2009–10, the department had a significant role in providing advice to proponents and decision-making authorities on a range of other major development proposals affecting DEC-managed lands that were undergoing or proposed for management for conservation purposes. These included Iluka's Eneabba and Bemax's Happy Valley Mineral Sands Projects, the Central West Coal/Coolimba Power Project, Latent Energy's Warro 3D Seismic Survey, the Marandoo Expansion Project, the Roy Hill Iron Ore Project, the Macedon Gas Project, the Karara Iron Ore Project, the Oakajee Port and Rail Project, the Koolanooka-Blue Hills DSO Project, and the Polaris Resources Carina project. Advice was also provided on other major projects affecting significant conservation values including the AngloGold Ashanti Tropicana project, API's West Pilbara Iron Ore Project, Cape Lambert Port Stage B mining projects at Cape Preston and various other mineral or petroleum projects and operations in the Pilbara.

Further advice was provided on the assessment and ongoing management of a large number of development projects, including a number of new projects in the Kimberley, Midwest, Pilbara, Goldfields and South West regions. This involvement included contributing to the development and implementation of environmental conditions for several of the mining and port development proposals, and expansions of rail and other infrastructure by mining companies in the Pilbara.

In addition to providing formal advice on major development projects, DEC staff provided a range of advice and other services to development proponents and approval agencies on resource and other development projects. This aimed to protect the conservation and other values of DEC-managed lands and conserve biodiversity while assisting in the timely assessment of proposed developments. DEC also assisted the Conservation Commission and the Minister for Environment by providing advice on mining tenement applications over reserved lands under Section 24 of the *Mining Act 1978*.

DEC is required to report on its performance in providing conservation-related advice at key stages in the approvals process. Each year the department responds to a large number of requests but the performance reporting applies specifically to advice on development proposals that fall within the State Development portfolio (chiefly mining, petroleum and major industrial projects) that are subject to agreed time limits. The summary of performance for 2009–10 reported in tables 9 and 10 therefore represents a relatively small proportion of DEC's overall advice workload.

**Table 9: Performance in relation to provision of Parks and Conservation Services advice for tasks subject to formal Integrated Project Approvals System time limits for the 2009–10 reporting year**

Approval process	Stage	Number of advice tasks completed within period	Average number of days taken to provide advice	Number of advice tasks completed within time limit	Percentage of advice tasks completed within time limit	Average number of days within (-) or outside (+) time limit
Environmental Protection Act Part IV – PER/ERMP	Advice/comment on environmental scoping document (Time limit = 15 days)	11	13.7	10	91	-1
Environmental Protection Act Part IV – PER/ERMP	Advice/comment on draft environmental review document (Time limit = 20 days)	14	13.5	12	85	-2
Environmental Protection Act Part IV – PER/ERMP	Advice during public review period (Time limit = within review period)	9	30	7	78	2.4
Environmental Protection Act Part IV – ARI/ EPS	Advice to EPA on project proposal (Time limit = 20 days)	5	10	5	100	-10

Approval process	Stage	Number of advice tasks completed within period	Average number of days taken to provide advice	Number of advice tasks completed within time limit	Percentage of advice tasks completed within time limit	Average number of days within (-) or outside (+) time limit
Environmental Protection Act Part IV	Post approval environmental management plan/ issue management plan (Time limit = 15 days)	9	11	9	100	-3
Mining Act	Advice on mining proposal (Time limit = 20 days)	0	0	0	NA	NA
Petroleum Act	Advice on petroleum development proposal (Time limit = 20 days)	0	0	0	NA	NA
Mean/total		Total 48	Mean 16	Total 43	Mean 91	Mean -3
Based on data for advice provided between 1 July 2009 and 30 June 2010.						
Table includes only tasks that were subject to time limits agreed by the state government in 2005 as a consequence of the implementation of the Keating Review. Tasks relating to exploration, planning, implementation or utility projects not falling under the State Development portfolio are not included. Overall, DEC responded, in respect of its CALM and WC Act responsibilities, to an estimated 500 requests for advice relating to State Development portfolio development projects and activities.						

**Table 10: Contributory factors in cases where formal time limits were not met for the 2009–10 reporting year**

Reason	Number of cases	Percentage of cases
Non-availability of documentation	0	0
Non-availability of expert advice in available timeframe	1	20
Non-availability of staff/time resources	4	80
Administrative error	0	0
TOTAL	5	100
Based on data on advice requests received between 1 July 2009 and 30 June 2010.		

#### *Banded Iron Formation Ranges Strategic Review*

The Strategic Review of the Conservation and Resource Values of the Banded Iron Formation of the Yilgarn Craton continues to provide guidance for government agencies and the EPA when undertaking assessments. The Karara Mining proposal, on the Karara/Blue Hills/Mungada Ridge banded iron formation (BIF) system, was approved in July 2009. This proposal was approved subject to 995 hectares of the Mungada Ridge being reserved for conservation purposes and protected from any future development.

The distribution of flora of conservation significance on the BIF ranges is continuing to be demonstrated through further survey effort of BIF and non-BIF habitat associated with development proposals. Further botanical surveys have confirmed that the Mount Manning cluster of BIF ranges has the highest biodiversity conservation significance and landscape complexity of all the BIF ranges within the Yilgarn Craton.

Currently, there are four developments under consideration as part of the formal assessment and approvals process that are located on BIFs within the Yilgarn Craton, two of which are located within the Mount Manning cluster (J1 on the Mount Jackson Range and Carina on the Yendilbern Hills).

### Applications to clear native vegetation: assessment and activity

Under the *Environmental Protection Act 1986* (EP Act) clearing of native vegetation is an offence unless it is done under the authority of a clearing permit or subject to an exemption.

DEC's Clearing Permit System database recorded details of all clearing permit applications and decisions made during the year for both DEC and the Department of Mines and Petroleum, and forms the basis of the published records available on DEC's website. DEC received 463 applications to clear native vegetation in 2009–10 and made 471 decisions. Under the delegation from DEC, the Department of Mines and Petroleum received 226 applications and made 223 decisions. Tables 11 and 12 provide details on clearing application decisions for 2009–10.

**Table 11: Permit areas granted to clear under section 51C of the *Environmental Protection Act 1986***

Purpose	Area (ha)
Mineral production	5,300
State agreement	1,624
Mineral exploration	1,505
Plantation	1,100
Railway construction or maintenance	743
Infrastructure maintenance	740
Pastoral diversification	720
Grazing and pasture	647
Road construction or maintenance	546
Miscellaneous	409
Building or structure	213
Timber harvesting	192
Cropping	177
Extractive industry	158
Petroleum production	53
Hazard reduction or fire control	69
Horticulture	42
Firewood collection	28
Dam construction or maintenance	25
Petroleum exploration	24
Industrial	23
Geotechnical Investigations	22
Drainage	16
Water/gas pipeline installation	13
Fence line maintenance	10
Recreation	11
Stockpile	6
Bore construction	<1
Landscaping	<1
Restoration	<1
<b>Total</b>	<b>14,416</b>

Table 12: Areas refused a permit to clear under section 51C of the *Environmental Protection Act 1986*

Purpose	Area (ha)
Horticulture	872
Cropping	510
Extractive industry	333
Plantation	278
Pastoral diversification	200
Grazing and pasture	82
Building or structure	79
Drainage	17
Miscellaneous	15
Hazard reduction or fire control	12
Flora harvesting	10
Mineral production	9
Industrial	8
Dam construction or maintenance	3
Road construction or maintenance	<1
<b>Total</b>	<b>2,428</b>

Clearing permit application numbers have remained relatively stable at around 600 per year since the introduction of the clearing provisions into the EP Act in July 2004. DEC has progressively reduced the backlog in processing applications since 2007, and as of December 2009, had no applications older than 90 days.

The reduction of the target timeframes in the beginning of 2009 to 80 per cent of decisions made in 60 calendar days and 100 per cent of decisions in 90 calendar days reflects the ongoing improved performance in dealing with applications. The timeframes specifically recognise a risk-based approach to assessments that is based on sensitivity of the environment, magnitude of impact/s and urgency of the clearing. DEC publishes quarterly reports of its performance in achieving timeframes for all decisions.

**Further information** on approvals performance can be reviewed on the DEC website:  
<http://www.dec.wa.gov.au/q=#41>

Table 13 shows the number of decisions made by DEC for each quarter in 2009–10 and includes the percentage of applications that were decided within target timeframes. Statistics are also provided on how many decisions were subject to ‘stop the clock’ and the mean time (in days) that applications were in ‘stop the clock’.

‘Stop the clock’ may only be used where there is legislative power or a requirement to do so, such as where the CEO requires further information from the applicant before making a final decision; where the CEO has been notified by the EPA that a proposal has been referred and that the CEO is constrained in making a decision on the application; or the applicant has requested in writing that the process be put on hold.



**Table 13: Timeframes for DEC decisions on clearing permit applications/decisions**

	3rd Quarter 2009	4th Quarter 2009	1st Quarter 2010	2nd Quarter 2010
No. of applications carried over from previous periods	99	87	81	73
No. of applications received	114	136	109	104
No. of decisions that were subject to 'stop the clock'	63	62	45	23
Average time in 'stop the clock' for decisions in days	151	159	52	46
Average time for decision in days (excluding time in 'stop the clock')	62	57	43	39
No. decisions on applications	126	143	117	85
No. of outstanding applications at end of quarter	87	81	73	92
Percentage of applications that were finalised within benchmark timeframe				
60 days (80% of applications finalised)	68%	79%	78%	88%
90 days (20% of applications finalised)	15%	12%	22%	12%
>90 days	17%	9%	0%	0%

During 2009–10, DEC published several new fact sheets relating to the clearing provisions under the EP Act, including *Risk-based assessment of clearing permit applications*; *vegetation conservation notices*; and *Section 51F and the meaning of 'related'*.

A number of existing factsheets and guides were also updated. Significant amendments were made to the *Guide to the exemptions and regulations for clearing native vegetation* and *Guide to the assessment of application to clear native vegetation*.


#### *Monitoring and compliance of native vegetation clearing*

During 2009–10, DEC used remote sensing imagery to identify vegetation change and, based on the analysis of this imagery and inspection of the land, determined whether unauthorised clearing was likely to have occurred. Clearing incidents identified as a result of the monitoring program, or complaints received, were investigated and progressed according to DEC's *Enforcement and Prosecution Policy*.

The program focused compliance resources on selected geographic areas. Native vegetation at 404 sites was analysed using imagery to assess compliance with the clearing legislation, which also included an analysis of 94 refused applications. Ground truthing of vegetation change indicated by satellite imagery was undertaken in the Northern Sandplains, the Swan Coastal Plain and Avon Wheatbelt bioregions.

In 2009–10, there were 158 new clearing complaints, 38 investigations were completed and 120 were under investigation. Clearing incidents were given priority for investigation according to the environmental impact and the circumstances of the clearing.

DEC conducted analysis of the Clearing Permit System database to identify high-risk clearing applications (those with potential to have the greatest impact on the environment, such as clearing of sensitive or large areas) that were resolved, including granted, withdrawn and refused proposals. Inspections included audits against permit conditions and also decisions that refused the proposal. A total of 38 inspections of clearing permit decisions was conducted during 2009–10.



## Vegetation conservation notices

Vegetation conservation notices may be given under section 70 of the EP Act if the CEO suspects on reasonable grounds that unlawful clearing is likely to take place, is taking place or has taken place on any land. In 2009–10, 10 vegetation conservation notices were given, which required the person bound by the notice to ensure that no unlawful clearing or further unlawful clearing took place on the land. A further five vegetation conservation notices for private land were given, which required the person bound by the notice to undertake specified measures to repair or mitigate the environmental harm caused by clearing.

## Native tree crops/revegetation

Development continued of new, broadscale flora industries based on native plants. A key aim of this work is to better protect important state assets, including biodiversity, from secondary salinisation in the wheatbelt. This initiative also contributes to managing climate change and variability, and to directly increasing habitat for biodiversity.

DEC is the major contributor to the Future Farm Industries Cooperative Research Centre's Woody Crops Program, which aims to overcome the remaining impediments to commercial uptake of woody crops in the low-rainfall wheatbelt regions of southern Australia. The major areas of activity during the year were:

- The supply chain project completed and launched its first prototype mallee harvester under a grant from the state's Low Emissions Energy Development (LEED) Fund. This machine is now subject to intensive operational testing to lead up to design of a large capacity commercial prototype.
- A new project was initiated to investigate the conversion of mallee biomass to biofuels using a thermo-chemical process called pyrolysis. The project was sponsored by the federal Department of Resources, Energy and Tourism, and the major local partner is the Curtin Centre for Advanced Energy Science and Engineering. The inputs of DEC and other CRC partners to this project will involve optimising quantity attributes of mallee feedstocks for this form of processing.
- The biomass supply assessment project has invested in upgrading its financial models while potential project developers await more definite indications of likely obligations for reduction in carbon emissions.

Uncertainty in carbon markets and regulation has reduced interest in tree planting as a carbon sequestration option. Despite this, mallee plantings have continued. The established mallee breeding and seed production program within DEC continued to breed mainly Western Australian species. Some 13.7 million seeds were sold during the year, mostly through regional NRM groups to support farmers involved in regional conservation programs.

## Encouraging public understanding and support of biodiversity conservation and other DEC programs and activities

### Southwest Australia Ecoregion Initiative

The department continued to be a member and co-chair (with WWF-Australia) of a consortium of government agencies, non-government organisations, and community representatives seeking to develop a biodiversity conservation strategy for Western Australia's south-west. The consortium (the Southwest Australia Ecoregion Initiative) continued to work with James Cook University, Gaia Resources and local scientists to ensure that the conservation planning process has a sound scientific basis.

The data capture and initial conservation planning outputs were completed under a federal government Caring for Our Country program grant. A second Caring for Our Country program grant of \$1.5 million over three years was obtained by the initiative during the year to refine the conservation planning output and begin demonstration. Expert workshops were held to refine the targets for the systematic conservation planning process and identify land management options for implementation. The demonstration project requires that 1,000 hectares of land has conservation works undertaken on it, 250 hectares of bushland is protected under conservation covenants, and 40 land managers are engaged in conservation action through a conservation management network. This project is centred on the Shire of Chittering.

### Public participation programs

#### *Environmental Community Grants Program*

DEC provided the administrative support for the Minister's Environmental Community Grants Program.



The first grants under this four-year program, introduced by the state government in February 2009, were distributed in 2009–10. A total of \$1.53 million was available across seven categories, with 142 projects submitted by community groups and individuals being supported.

Applications for the second round of funding were invited in February 2010, with \$1.53 million in grants available across eight categories. Nearly 250 applications were received by the April deadline, submitting funding proposals with a total value of approximately \$3.4 million.

## Funding boosts community groups

The Friends of Yellagonga Regional Park were among dozens of community groups and individuals who successfully applied for funding through the state government's Environmental Community Grants program.

The 2009 round of grants totalling more than \$1.5 million were awarded across seven categories:

biodiversity conservation; rescue and rehabilitation of injured or incapacitated fauna; protection of high-value areas by landholders on private lands; regional parks and Bush Forever sites; sustainable catchment management; nature appreciation in natural areas; and support for major conservation and environment organisations.

**Further information** is available on the DEC website: <http://www.dec.wa.gov.au/content/view/5135/2274/>



**Further information** on the Environmental Community Grants Program is available on the DEC website: <http://www.dec.wa.gov.au/q=#42>

### *Healthy Wetland Habitats*

The department's Healthy Wetland Habitats program is a voluntary program that provides technical and financial assistance to private land managers for wetlands of high conservation value on the Swan Coastal Plain. Landowners of conservation category wetlands were invited to submit an expression of interest in the program, and a technical advisory committee reviewed the expressions of interest and provided advice on management priorities required to achieve conservation outcomes.

Management action planning and funding to \$10,000 was offered to landholders with eligible priority wetlands to assist them in managing their wetland habitats under a voluntary management agreement. Information seminars aimed at private landholders and other groups with an interest in wetlands were also run as part of the program.

During the year, four management action plans and funding agreements were developed for properties in association with the landowners. This represented a combined total wetland area of 8.2 hectares, and an additional 5.9 hectares of associated remnant vegetation. A total of \$36,699 was awarded for conservation management works. A further four properties are progressing to management agreements.


**Further information** about Healthy Wetland Habitats is available on the DEC website: <http://www.dec.wa.gov.au/q=#43>

### *Roadside conservation*

The Roadside Conservation Committee (RCC) met four times during the year. The RCC sought to facilitate best practice management of remnant vegetation in transport corridors through awareness raising, liaison and cooperation. The RCC worked to ensure that the need for a safe and efficient road system was achieved in a balanced way for the sustainability of the many values in road reserves. The RCC also advised DEC on roadside vegetation clearing issues.

During the year, RCC staff coordinated a workshop with DEC and Main Roads WA on threatened flora and other environmental issues within road reserves for Main Roads WA contractors in Geraldton. The RCC also coordinated workshops on roadside vegetation values for the shires of Plantagenet and Woodanilling. RCC staff delivered training to DEC Native Vegetation Conservation Branch staff on effective decision-making on applications to clear roadside vegetation.

Through the RCC, DEC provides roadside conservation value maps with accompanying reports to local governments. Mapping commenced for the shires of Capel, Merredin and Moora. The Shire of Boddington



completed roadside surveys and the information is being processed. The results for the shires of Kellerberrin, Geraldton-Greenough, Dandaragan, Busselton and Gnowangerup have been presented to the councils, and information is being collated for the shires of Narrogin and Plantagenet. The RCC is also working with DEC and the Department of Agriculture and Food on making the roadside conservation value maps and reports available through the Shared Land Information Platform. Additionally the RCC is working with DEC and the Western Australian Local Government Association (WALGA) to support project plans to assist local governments in managing roadside corridors strategically.

The RCC published articles in *LANDSCOPE* Magazine and EcoNews (WALGA newsletter), conducted an interview with ABC radio on the roadside conservation value mapping program, updated the *RCC Handbook of environmental practice for road construction and maintenance works* and continues to work on the development of a Fire Guideline and Gravel Pit Rehabilitation Guideline for roadsides.

The RCC conducted a workshop for the development of a strategic plan, and has developed a program of works for roadside value mapping and re-mapping shire roadsides to provide direction to the program over the next five years.

**Further information** about the RCC is available on the DEC website:

<http://www.dec.wa.gov.au/q=#44>

#### *Wetlands Coordinating Committee*

DEC continued to chair the state's Wetlands Coordinating Committee and was actively involved in the implementation of the *Wetlands Conservation Policy for Western Australia (1997)*. The committee continued to review the policy during the year. The committee also coordinated the development of key state initiatives to improve the protection of wetlands. These included continuing work on a framework for evaluation of biological impacts of drainage projects, a guideline for the determination of wetland buffer requirements, a framework for mapping, classification and evaluation of wetlands, and a guide to management and restoration of wetlands.

#### *Urban Nature*

The Urban Nature program continued to work with land managers from more than 47 stakeholder groups during 2009–10 to provide technical advice and support, and to facilitate best practice bushland management.

More than 100 on-ground activities were conducted with stakeholder groups, including community groups, DEC land managers and private landholders. Much of the work involved adaptive management and research trials, and liaison with land managers to implement the results of those trials across 15 high-priority sites. This included work towards the development of techniques to manage *Euphorbia terracina* where it is invading woodlands and coastal heathlands, controlling *Watsonia borbonica* where it invades populations of the declared rare *Tetraria australiensis*, and completion of work on *Ferraria crispa* where it invades banksia/tuart woodlands. Results were disseminated through 21 presentations, 20 newsletter articles and two scientific publications.

Work has also involved facilitating regeneration of the threatened plant communities at Brixton St Wetlands and Talbot Rd, Watkins Rd, Meelon and Burnside nature reserves. Restoration plans were developed for the coastal heathlands on Penguin Island and for Bullsbrook Nature Reserve. External funding has been acquired for the implementation of these plans.

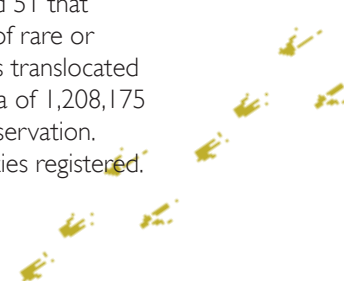
Program staff continued to provide training to both DEC and community land managers, and 14 field days and workshops were held and attended by more than 200 participants during the year. Each issue of the quarterly newsletter *Bushland News* was distributed to over 1,800 people supporting community involvement in bushland conservation.


The Urban Nature program completed detailed weed management notes on 330 species of environmental weeds. These were collated and made publicly available on *FloraBase*.

## **Provision of private land biodiversity conservation support and advice**

### *Land for Wildlife*

During the year, 89 new properties were registered with *Land for Wildlife* (LFW). LFW staff visited 154 properties – 103 new ones totalling 23,012 hectares (including 4,798 hectares of dedicated wildlife habitat) and 51 that they formally revisited for stewardship purposes. During these visits, staff recorded 98 occurrences of rare or threatened fauna, flora or ecological communities. In addition, the threatened flora *Acacia aprica* was translocated onto a LFW property. Over the life of the program, LFW staff had visited 1,682 properties—an area of 1,208,175 hectares, including 309,622 hectares of land where the primary management purpose is nature conservation. Fifteen landholders resigned from LFW during the year due to property sales, leaving 1,836 properties registered.





The LFW scheme acts as a non-binding voluntary management agreement, and supported 35 funding applications by landholders. Support included provision of voluntary management agreements, GIS maps, project development and letters of support.

Four editions of *Western Wildlife* were produced and LFW staff wrote 29 articles for print media, gave two radio interviews, organised 23 displays at agricultural shows or similar, and gave 66 talks at workshops, seminars or to schools or other groups. This included 27 events which specifically used the LFW brand.

During 2009–2010, all new LFW sites were added to DEC's spatial database available throughout the department, and outside the department on request.

Two staff worked in collaboration with the Carnaby's cockatoo program to identify suitable habitat throughout the wheatbelt and ascertain what management assistance is required by landholders.

**Further information** about LFW is available on the DEC website:

<http://www.dec.wa.gov.au/q=#45>

#### *Nature Conservation Covenant Program*

The Nature Conservation Covenant Program assisted private landowners with the conservation of bushland of high nature conservation value by placing a protective covenant on the land's title, and by providing management advice and assistance through incentives and a stewardship program. During the year, the program entered into covenants in perpetuity over 14 titles, and protected 1,493 hectares of native vegetation. At 30 June 2010, covenants had been cumulatively established over 135 titles and 11,174 hectares of land, containing a number of threatened species and ecological communities. A further 38 covenants to protect another 5,301 hectares of native vegetation were in negotiation at 30 June 2010.

Covenants that are entered into as a condition of subdivision continue to increase steadily. These covenants are usually commented on by the program before the conditions for subdivision approval are set, ensuring that the bushland accepted into the program is significant and in good or better condition.

The covenant program seeks to establish partnership projects to promote covenants as a conservation tool. The program was involved in the *Healthy Ecosystems* project, in partnership with WWF-Australia. When the *Healthy Ecosystems* project finished during the year, in total, 1,725 hectares of bushland on private land was covenanted in the Avon region.

The covenant program has been successful in obtaining funding from *Caring for our Country* for a *Protected Areas on Private Lands* project. This project is operating cooperatively with similar projects being undertaken by Wheatbelt NRM and WWF-Australia. This project will have a focus on increasing the number of covenants in poorly reserved bioregions in the south-west, with specific focus on the Wongan Hills Ecoscape Area. Covenant negotiations have started with some landholders through this project. The project will also review existing covenants for their inclusion in the National Reserve System and develop a framework for undertaking covenants on pastoral leases in the rangelands.

Work is currently under way as part of Stage 2 of the National Conservation Lands Database project in association with the federal Department of the Environment, Water, Heritage and the Arts. This involves gathering spatial and textual information on each covenant site which will be a part of a national covenant database. The database will be updated every year, with the data used to prepare reporting products to show the extent and size of covenant sites around Australia.

The department ceased to be involved in the operation of the state's revolving fund program *BushBank*, which is now solely operated by the National Trust of Australia (WA). DEC chaired the technical advisory committee, provided biodiversity advice on prospective properties and made its covenanting program available for protection of properties during the period of involvement since 2001.

**Further information** about the Covenant Program is available on the DEC website:

<http://www.dec.wa.gov.au/q=#46>

#### **Animal ethics**

Under the *Animal Welfare Act 2002*, the department operates as a scientific institution pursuant to a corporate licence issued by the Department of Local Government. DEC is required to carry out all activities involving the use of vertebrate animals in accordance with the seventh edition of the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*.

Applications and annual reports were assessed by the Animals Ethics Committee at six meetings during 2009–10. For the 2009 calendar year, 125 projects were continuing and active. There were no serious cases of non-compliance with the code during the year, although 10 chief investigators failed to meet deadlines for submission of annual reports for a total of 26 projects.

The Animal Ethics Committee maintained a register of projects in accordance with the conditions of its licence to use animals for scientific purposes. A comprehensive database of applications stores details of projects, staff affiliations and competencies.

In order to ensure conditions of the licence were being adhered to, the executive officer and members of the Animal Ethics Committee conducted annual inspections of animal-housing facilities. Committee members visited two of the 13 facilities during formal meetings or as part of trips by individual members to regional areas. Both facilities inspected were found to be in order.

In assessing applications, the Animal Ethics Committee ensures that activities that involve native fauna are undertaken to a consistent standard. Standard operating procedures have been developed to assist in the preparation of applications for use of animals. Standard operating procedures are updated and reviewed as new techniques arise and/or old procedures are improved. As at 30 June 2010, 15 standard operating procedures were endorsed by the Animal Ethics Committee.

During the year, the Animal Ethics Committee raised concerns about the risk to wildlife of carrying failed radio-transmitters relative to the potential value gained from using this technology. In response to this concern, a fourth-year Curtin University project is commencing that will survey and analyse radio-transmitter use/failure rates within DEC and other groups for which the Animal Ethics Committee assesses applications (such as Australian Wildlife Conservancy, Centre for Whale Research, Department of Fisheries and Western Australian Museum). Premature failure of radio-transmitters is a problem frequently encountered by DEC researchers, and it is hoped that this project will provide valuable insight into the issue.

**Table 14: Conservation and sustainable utilisation of biodiversity**

	2009–10 Target	2009–10 Actual	Variation
Total number of listed threatened taxa and ecological communities	703	703	(0)
Number of threatened taxa and ecological communities with improved conservation status (a)	0	4	4
Number of threatened taxa and ecological communities with declining conservation status	2	2	(0)
Proportion of critically endangered and endangered taxa and ecological communities that have a recovery plan (b)	62.2%	66%	3.8%
Proportion of terrestrial sub-bioregions with greater than 15% reservation	20.4%	20.4%	(0%)
Proportion of marine bioregions with marine conservation reserves	42.1%	42.1%	(0%)

**Note:** (a) four species of threatened flora were removed from the threatened flora list and hence had an improved conservation status in 2009–10; and (b) more threatened taxa and ecological communities had recovery plans prepared and approved during the report period than was anticipated.



## Sustainable Forest Management

Sustainable Forest Management ensures the provision of economic, social and cultural benefits from State forest and timber reserves while conserving biodiversity, maintaining soil and water values and sustaining health, vitality and productive capacity of the forest for current and future generations.

Consistent with the statutory purpose of State forest and timber reserves as defined in the CALM Act, under this service DEC provides for forest management on an ecologically sustainable basis. This includes implementing government policies, and providing for the harvesting, regeneration and growth of forest products in accordance with the *Forest Management Plan 2004–2013* (FMP).

In 2009–10 this service:

- provided further information to the Minister for Environment, Environmental Protection Authority and Conservation Commission in relation to the mid-term audit of the FMP
- completed a guideline for the management of informal reserves and fauna habitat zones, several protocols for key performance indicators of the FMP, a planning checklist for disturbance activities, and released for public comment a guideline for selection of fauna habitat zones
- completed a guideline, two manuals, a field guide and a technical report that support the management of soil and water values
- undertook the evaluation, approval and monitoring of over 100 disturbance operations totalling 8,000–10,000 hectares within State forest and timber reserves to ensure compliance with the environmental outcomes sought in the FMP
- implemented effective fire management for the protection of values on State forest and timber reserves within the south-west
- designed and established the final locations of 23 fauna habitat zones associated with planned disturbance
- finalised the three-year rolling *Timber harvest plan 2010–12*
- undertook the detection and mapping of *Phytophthora* dieback disease on DEC-managed land to inform the planning and management of disturbance operations and the prioritisation of disease treatments
- initiated work to improve modelling of the rate of spread of *Phytophthora* disease in south-west landscapes.

**Further information** about the *2004–2013 Forest management plan* is available on the DEC website: <http://www.dec.wa.gov.au/q=#47>

## Implementation of approved forest management plans and government policies and programs

### *Forest Management Plan 2004–2013*

Action continued on the implementation of the remaining land category changes that are proposed in the FMP. Consultation on fine-scale boundary definition for the proposed reserves continued during the year. Once the consultation process is complete, it is proposed to create the new reserves through legislation.

The FMP sets times for the development of a number of guideline documents. A guideline for the management of informal reserves and fauna habitat zones was completed, as was a planning checklist for disturbance activities. A guideline for selection of fauna habitat zones was released for public comment.

Several documents that support the management of soil and water values were completed: a guideline for soil and water conservation; a manual of procedures for management of soils associated with timber harvesting in native forests; a manual for the management of surface water; a field guide of tables and formulae for the management of surface water; and a technical report on reference material for the conservation of soil and water values.

DEC continued to develop protocols for collecting data and reporting on key performance indicators of the FMP with several protocols completed during the year.

The mid-term audit of the FMP was completed by the Conservation Commission and reported to the Environmental Protection Authority in December 2008. The audit examined the extent to which management of land had been undertaken in accordance with the FMP, including progress with implementation of actions proposed in the FMP, results of compliance monitoring, identification of implementation issues, consideration of information on key performance indicators, and issues to be addressed from 2009. The report was released at the end of March 2009 for public comment until the end of June 2009. During 2009–10, DEC provided responses to

the Conservation Commission and Environmental Protection Authority in respect of public comments made on the mid-term audit of the FMP, and provided additional information to the Conservation Commission and Minister for Environment in relation to key performance indicators as identified in the mid-term audit.

DEC continued to maintain the spatial and measurement data sets required to sustainably manage State forest and timber reserves.

An annual strategic overview assessment of forest health using remote sensing technology was introduced. Monitoring of utilisation standards, as an input to comparison of the forecast strategic timber yield versus actual timber yield, was undertaken. A risk-based framework of monitoring and reporting of disturbance activities on State forest and timber reserve was developed. The move to a web-based support for a more systematic approach to forest management continued.

DEC continued to facilitate the implementation of the Wungong Catchment Environment and Water Management Project for the Water Corporation.

### Community forest inspection program

#### The ebb and flow of surface water management

Surface water management is vital to sustainable land management, a fact not lost on 54 DEC staff members who received training from the Forest Policy and Practices Branch of the Sustainable Forest Management Division in autumn 2010.

Two-day courses were run in Pemberton, Kirup and Dwellingup, introducing a range of structures and tools to assist in the management of erosion and turbidity associated with roads, tracks, burn boundaries and timber harvesting extraction tracks.



Staff participated from across DEC's range of applied land management service areas including Parks and Visitor Services, Fire Management Services, Sustainable Forest Management and the Forest Products Commission (FPC) and various contractors, many of whom will gain Certificate III qualifications in erosion and sediment control.

The training worked two ways, according to Senior Land Management Officer Tony Smith.

"A good deal of information sharing occurred between participants," he said, "and SFM Division received valuable feedback on the practical challenges and issues encountered by field staff in their daily work."

Community forest inspections provide community representatives with the opportunity to inspect first-hand the systems and processes that are in place to manage the harvest of native forest trees from State forest, and to note compliance with existing management systems and processes.

Members of the voluntary conservation movement, representatives from local government, staff from the FPC, the Conservation Commission and DEC inspected harvesting in the Warren Region in December 2009.

The South West and Swan regions' resources have been applied to address community concerns associated with harvesting at Yabberup, south-west of Collie and Mundlimup, near Jarrahdale.

### Inventory, assessment and modelling of natural resources

A wide range of technical services related to the inventory, assessment and modelling of natural resources were provided within DEC and to the Forest Products Commission, Conservation Commission and external clients. Major areas of activity were:

- the acquisition and analysis of timber inventory data to assist the FPC, DEC and the Conservation Commission in the planning, management and monitoring of timber production in State forest and timber reserves. Digital images were acquired across a further 200,000 hectares of State forest to map forest characteristics and stratify areas for timber inventory. The existing jarrah inventory was updated with measurement of a selection of inventory plots





- undertaking vegetation mapping to inform silvicultural decisions, old-growth forest assessments, disease impact predictions and the protection of poorly represented vegetation complexes
- field measurement programs to monitor the yields and silvicultural standards realised in timber harvest operations. Data processing systems were enhanced to increase the detail available from the data collected
- specialist services to DEC divisions, the FPC, other government agencies, natural resource management groups and external clients. Services included aerial photography, photo-interpretation, photogrammetry, vegetation and disease mapping surveys, and database design and development.

## Maintenance and enhancement of biodiversity and other values of forests

This service undertakes measures to sustain, or where possible enhance, biodiversity and other forest values. Staff delivered information services and the mapping of *Phytophthora* dieback occurrence to enable operations to be undertaken with the lowest risk of spreading *Phytophthora*. Staff were also responsible for establishing and implementing an approvals, monitoring and compliance management system and setting standards for the management of a range of forest values.

DEC's Regional Services Division delivers other sustainable forest management outcomes and the Science Division undertakes research to enhance management of biodiversity, ecosystem health and vitality and soil and water values.

### Health and vitality in natural landscapes

Mapping the presence of symptoms of the plant disease caused by *Phytophthora cinnamomi* was carried out by accredited interpreters to determine areas suitable for protection. Hygiene requirements were specified for activities likely to result in the movement of soil (and as a consequence, *Phytophthora cinnamomi*) on lands managed by DEC. A total area of 15,864 hectares was mapped to assist the planning of roads and timber harvesting operations undertaken by the FPC. This included 7,552 hectares of previous mapping that was checked for further spread. Mapping and hygiene planning were undertaken on a further 1,707 hectares for DEC's purposes, and 3,319 hectares for external parties. Training programs were carried out in disease mapping and hygiene management.

Work was progressed on evaluating the effectiveness of disease hygiene management associated with disturbance activities on DEC-managed lands. This project will provide the basis for reporting on key performance indicator 18 of the FMP.

## Understanding dieback

Sustainable Forest Management continues its work to provide DEC with the best available information and understanding of the behaviour of and impacts from one of the major threats to Western Australia's unique biological diversity in the south-west: dieback.

Research on dieback—more precisely referred to as *Phytophthora* dieback as it is caused by *Phytophthora* spp, microscopic fungus-like organisms—has been carried out in Western Australia's jarrah forest since 1979. Nowadays, mapping areas of dieback spread often includes DEC-managed lands including national parks and nature reserves, and is monitored through the framework of the Forest Management Plan.

Dieback mapping progressively identifies those areas that are not infested with *Phytophthora* and can be protected. Access to these areas can then be carefully managed, so that the risk of human activity creating new centres of dieback infestation is reduced to the lowest possible level.

A team of trained and accredited dieback assessors (interpreters) work to an annual program of mapping areas ahead of such activities as harvesting, burning and mining. They observe dead and dying indicator species, such as banksias, grass trees and snottygobblers, in order to distinguish infested areas from uninfested areas. Soil and tissue samples are taken to aid in field diagnosis. Previously mapped areas are visited and scrutinised for possible hygiene breaches and resultant disease spread.

Maps of dieback infested areas are produced and updated, providing the basis for disease management decisions to guide any proposed activities on DEC's estate.

DEC is currently developing a dieback rate of spread experiment. The aim is to establish several hundred plots in the field over two years (completed before the next FMP) which will provide data to accurately predict the rate of disease spread in various bioregions. These data will provide the best averages for rate of spread of *Phytophthora* in separate bioregions, which will then help managers more effectively determine whether or not areas are truly protectable.



## Integrated planning support

The maintenance and enhancement of biodiversity and other values across landscapes requires a high level of integrated planning within DEC. This outcome was supported through:

- planning support to the Regional Services Division to guide the selection and management of public firewood and flora harvesting areas
- monitoring and collation of the areas burnt by wild and prescribed fires across the forest to support integrated fire planning and reporting
- assistance to the Regional Services Division to evaluate the biodiversity assets at risk from disturbance associated with proposals for the construction of roads, utilities and other infrastructure.

## Management of soil disturbance in timber harvesting

The FMP provides for increased protection of soils during timber harvesting by introducing soil damage risk periods based on a trafficability index and prescribing measures to be applied in each risk period to protect soil during timber harvesting. The department continued to manage an approvals process for access during moist soil conditions. Access to harvest areas was authorised during winter and spring based on consideration of risk associated with soil attributes. Access was not granted to areas with an inherently high risk of soil disturbance. During the 2009 wet season, continued attention was placed on the management of hygiene associated with access into protectable areas.



## Implementation of fauna habitat zones

A major initiative of the FMP is the introduction of approximately 280 indicative fauna habitat zones of a minimum of 200 hectares each in State forest and timber reserves. Design, analysis, survey and/or liaison work was undertaken for 33 indicative fauna habitat zones adjacent to proposed disturbance activities and the location of 23 indicative fauna habitat zones was finalised. The *Draft guidelines for selection of fauna habitat zones* were released for public comment, and maps depicting the status of all fauna habitat zones as at December 2009 were published on DEC's website: <http://www.dec.wa.gov.au/q=#48>

## Management system for approvals, monitoring and compliance

All operations on State forest require consideration and approval from DEC. During the year, a revised form and process for pre-operational planning using Form *DECSFM019 – Planning checklist for disturbance activities* was approved for use.

In addition, departmental staff monitored the compliance of operations with the conditions of approval and with environmental management standards. Where non-compliance in timber harvesting operations is identified, DEC may issue the proponent with an incident report (IR) for minor issues, a works improvement notice (WIN) if the non-compliance can be rectified by further field operations, or a management letter (ML) if it cannot. In 2009–10, staff issued 11 WINs and six MLs, each of which covered one or two issues. Five of the WINs and MLs related to soil and water issues, four to ecosystem health and vitality issues, three to systems and process issues, two related to productive capacity issues and two to biodiversity issues. Of the 17 WINs and MLs issued in 2009–10, two have been closed with satisfactory outcomes, and 14 are yet to be closed. Of the WINs and MLs issued in 2008–09, all those that remained open at the end of 2008–09 still remain open.

## Forest monitoring

Eight ForestCheck monitoring grids in Perth Hills District were re-assessed in spring 2009 and autumn 2010 to provide information about the response of biodiversity to timber harvesting in the jarrah forest. Results from the first five years of ForestCheck monitoring were prepared for publication as a series of scientific papers, and briefings on the project were provided to the Environmental Protection Authority, the Conservation Commission, FPC staff and the Warren Region community forest inspection.

Trapping and spotlight surveys continued in the Kingston study area to monitor the response of vertebrate fauna populations to timber harvesting and regeneration. A workshop involving DEC staff and representatives from CSIRO and several universities reviewed current knowledge of the fauna in south-west forests, and identified future information requirements for fauna management within the framework of ecologically sustainable forest management. A scientific paper was published describing the response of bird communities over a 25-year period following clearfelling of mature karri forest.

Several important silvicultural experiments were re-measured during the year including a thinning experiment in high quality jarrah forest, a thinning experiment in mixed karri-marri regrowth forest, and a planting trial testing the effect of initial spacing on the survival, growth and form of karri. Data provided by these experiments add significantly to the understanding of long-term stand dynamics in south-west forests. DEC continued to support a PhD study investigating factors affecting regeneration of jarrah in stands harvested by the shelterwood method. As part of this study, the survival and initial growth of seedlings in eastern jarrah forest was measured following an autumn prescribed burn. Sites were established in dieback-infested jarrah forest subject to timber harvesting under the current silvicultural guideline to provide a baseline for examining the future spread of disease and its impacts on trees and understorey plants.

Results from a study of streamflow and groundwater response to timber harvesting in experimental catchments in the intermediate rainfall zone of the jarrah forest were prepared for publication.

## Forest auditing

There was one audit completed during 2009–10 that related directly to the management of disturbance associated with timber harvesting. This was an audit titled *Identification and Management of Habitat Elements During Native Forest Harvesting*, and included the following seven elements.

### *Fauna Distribution Information System (FDIS)*

There is a requirement that all areas planned for harvesting are assessed in a desktop study against a matrix which determines the probability of occurrence of habitat for threatened fauna.

Completed and approved DECSFM019s—*Planning checklist for disturbance activities* and FDIS printouts were available for all of the harvesting coupes assessed.

*Identification and retention of habitat trees*

To ensure the sustained availability of suitable refuge hollows for fauna following timber harvesting, two types of habitat trees are retained:

- primary habitat trees, which are trees that have a moderate to high probability of bearing hollows, are retained at the rate of five per hectare
- secondary habitat trees, which have a lower probability of bearing hollows at the time of tree marking, but provide for the sustained availability of hollows through time. These trees also contribute to the structural diversity in the coupe and are retained at the rate of six to eight per hectare.

Nine coupes were assessed to determine habitat tree numbers.

**Table 15: Audit of habitat trees numbers**

Coupe	Area sampled (ha)	Number of primary habitat trees in sample	Number of secondary habitat trees in sample	Average number of primary habitat trees per hectare	Average number of secondary habitat trees per hectare	Average number of all habitat trees per hectare
Wells	6	47	58	8	10	18
Hillman	6	61	37	10	6	16
Leach	6	50	53	8	9	17
Clare	6	67	50	11	8	19
Fleays	6	41	47	7	8	15
Chandler	6	34	40	6	7	13
Sussex	6	78	32	13	5	18
Yornup	6	72	54	12	9	21
Thornton	4	35	45	9	11	20
<b>Totals</b>	<b>52</b>	<b>485</b>	<b>416</b>	<b>9</b>	<b>8</b>	<b>17</b>

Primary habitat trees retained were in excess of the required number in all of the coupes assessed. Quality of the trees retained was good with nearly all being above the specified minimum size and showing signs of crown deterioration and hollows in the crown.

Numbers of secondary habitat trees were generally at or above the range with only one coupe being slightly below. Quality of secondary habitat trees generally fell within the range of 30–70 centimetres diameter but some sub-dominant trees below this size were marked in some coupes.

Retained habitat tree and log numbers and the retention of other habitat are required to be recorded on form FPC 393 —*Tree markers daily monitoring checklist* by the relevant FPC staff conducting the tree marking. Records of this form were available for all coupes assessed.

*Protection of habitat trees*

It is required that no more than five per cent of habitat trees be damaged during harvesting operations. Habitat tree damage is defined as physical damage resulting in one or more of the following:

- broken, fallen or uprooted
- >30 per cent of the crown removed.

A minimum number of 100 habitat trees in each of the eight coupes were assessed for damage.

**Table 16: Audit of habitat tree protection**

Coupe	Number of habitat trees assessed	Number of habitat trees undamaged	Number of habitat trees damaged	Per cent of damaged habitat trees
Wells	111	109	2	2
Hillman	103	103	0	0
Leach	107	107	0	0
Clare	103	99	4	4
Fleays	121	120	1	1
Sussex	104	102	2	2
Yornup	101	99	2	2
Thornton	102	102	0	0
<b>Totals</b>	<b>852</b>	<b>841</b>	<b>11</b>	<b>1</b>

Damage to retained habitat trees was below the specified limit in all of the coupes assessed with the total average damage at one per cent.

*Tops disposal*

Tops disposal is required for all habitat trees. Tops disposal is assessed as being required when the long-term survival of the tree is threatened. This is defined as heaps of harvesting debris beneath the crowns of habitat trees.

**Table 17: Audit of tops disposal of habitat trees**

Coupe	Number of habitat trees assessed	Number of habitat trees tops disposed	Number of habitat trees not tops disposed	Per cent compliance
Wells	111	100	11	90
Hillman	103	97	6	94
Leach	107	104	3	97
Clare	103	93	10	90
Fleays	121	112	9	92
Sussex	104	99	5	95
Yornup	101	95	6	94
Thornton	102	99	3	97
<b>Totals</b>	<b>852</b>	<b>799</b>	<b>53</b>	<b>94</b>

None of the coupes assessed in the audit achieved the required standard of completed tops disposal around marked habitat trees. Some tops disposal work had been done in all of the coupes assessed but the work was incomplete and not uniform across the coupe.

*Identification and retention of ground habitat*

Ground habitat in the form of hollow logs, stumps and leaning trees is important as a refuge site for forest fauna. If they are available within the coupes, at least one suitable log or stump per hectare is required to be retained, even if it shows no obvious sign of use. All natural hollow logs with a pipe greater than 10 centimetre diameter and length greater than three metres are also required to be retained.

Table 18: Audit of habitat logs

Coupe	Area sampled (hectares)	Number of habitat logs in sample	Average number of habitat logs per hectare
Wells	6	13	2.2
Hillman	6	19	3.2
Leach	6	8	1.3
Clare	6	4	0.6
Fleays	6	5	0.8
Chandler	6	1	0.2
Sussex	6	7	1.2
Yornup	6	2	0.3
Thornton	4	0	0
<b>Totals</b>	<b>52</b>	<b>59</b>	<b>1.1</b>

Four of the nine coupes assessed had marked habitat logs in excess of the requirement in the sample plots. The remaining five were below the required retention rate and no marked habitat logs could be located in one coupe.

Protection of habitat logs was adequate with only one log in one of the coupes being damaged by machinery.

*Retention of balga*

It is a requirement that at least four large multi-headed balga per hectare are retained in a coupe, if they occur. Thickets should also be retained provided they do not compromise the silvicultural objective for the area.

Large multi-headed balga were consistently marked for retention in the coupes assessed if they occurred within the coupe. Smaller single-headed examples of varying size classes were also being retained to provide diversity.

The majority had been adequately protected during the harvesting operation with only an occasional isolated balga damaged.





### *Retention of other middle storey species*

There is a requirement in the guidelines to retain scattered mature individuals of less common species such as *Xylomelum*, *Persoonia* and *Nuytsia* to provide for some habitat diversity. There is no retention rate specified for these species in the guidelines.

During the coupe assessments specific examples were noted where these species had been marked for retention.

### **Adaptive management**

DEC continued to contribute to the coordination and implementation by the Water Corporation of the Wungong Catchment Environment and Water Management project. This adaptive management trial in the 12,845-hectare Wungong Catchment aims to increase water availability by managing vegetation density.

The project has re-treated some sections of native forest to more stringently reflect silvicultural management objectives in the two sub-catchments of Cobiac and Chandler; an area of approximately 1,000 hectares of State forest.

Twenty-five hectares of clear fall has been conducted in areas of minesite rehabilitation planted with exotic eucalypts, with the objective of converting these areas back to a native species mix of overstorey and understorey within three years.

Two hundred hectares of thinning treatment in exotic/native mixed eucalypt stands of minesite rehabilitation within the Chandler sub-catchment to selectively remove the exotic component has been completed. An additional 250 hectares have been tree marked in anticipation of continued work.

Information sessions were presented to a range of stakeholders and community groups.

CSIRO is continuing to monitor 31 Mile Brook and Cobiac sub-catchments as part of a project on 'Vegetation dynamics and water yield under changing climate and management'. Work to thin 30 hectares of forest close to two groundwater bore transects in 31 Mile Brook catchment, following the completion of tree marking and dieback demarcation, was completed.

An adaptive management trial was implemented to investigate the operational feasibility of retaining mature habitat trees in clearfelled areas of karri forest, and the ongoing survival of these habitat trees.

## **Provision for harvesting, regeneration and growth of forest products in accordance with approved management plans and guided by the principles of ecologically sustainable forest management**

### **Silviculture guidelines**

Review of the silviculture guidelines has continued at a number of levels. Preparation of reference material for the karri guideline has commenced to provide a clearer understanding of silvicultural practices. Monitoring procedures to assess protection levels for growing stock and habitat trees and for the assessment of tree marking were implemented and improved following feedback from field operational staff. The review of the regeneration survey procedure to ensure the data collected lead to the correct application of silviculture at the patch level was completed.

Training has continued through the delivery of briefings and through informal coaching in the application of silvicultural practices and the implementation of monitoring procedures.

### **Monitoring of areas subject to timber harvesting and associated treatments**

Monitoring was undertaken of areas subject to commercial timber harvesting, silvicultural treatments and forest disturbance activities carried out under the direction of the FPC. In the 12 months to December 2009, 11,650 hectares of native forest were harvested with the following silvicultural or management objectives.

Table 19: Silvicultural objectives

Forest type	Silvicultural objective	Area cutover (hectares)
Jarrah	Release of regeneration (gap)	750
	Establishment of regeneration – eastern jarrah (shelterwood)	880
	Establishment of regeneration – western jarrah (shelterwood)	2,830
	Promote growth on retained trees (thinning)	610
	Single tree selection (retention in Phytophthora dieback areas)	2,050
	Selective	1,870
	Subtotal	8,990
Karri	Establish jarrah/karri regeneration	90
	Establish regeneration (clearfall karri)	650
	Establish regeneration (partial karri clearfall)	0
	Promote growth on retained trees (thinning)	920
	Subtotal	1,660
Wandoo	Establishment of regeneration	0
	Promote growth on retained trees (thinning)	10
	Subtotal	10
Other/any forest type	Other (mining and clearing for utilities)	990
<b>Total</b>		<b>11,650</b>

Jarrah silvicultural objectives for 1,910 hectares harvested in this or previous years were achieved by follow-up treatment during the year. Karri regeneration was completed on 630 hectares harvested in either this or previous years.

### Regional harvest plans

DEC reviewed the *2010 Indicative timber harvest plan* submitted by the FPC to ensure consistency with the settings adopted in the FMP. The *Three-year timber harvest plan* (2010–2012) required by the FMP to be produced by DEC was completed, following a period of public availability.



## Partnerships

Throughout the year effective communication and interaction continued with the community and stakeholders (including volunteer projects on vegetation condition and multi-resource inventory), other state agencies and authorities, and federal agencies.

Through the Sustainable Forest Management Division, DEC contributed to the work of the Dieback Working Group, Primary Industries Ministerial Council, Natural Resource Management Ministerial Council, the National Forest Inventory and to other national forums on ecologically sustainable forest management.

Collaboration with research teams located at CSIRO and various local and interstate universities included projects on forest disease, native forest silviculture, modelling of the hydrological consequences of changes in vegetation extent or condition, and forest growth.

**Table 20: Trends in the area of native forest harvested**

	Jarrah forest	Jarrah/wandoo forest	Karri forest	
	(hectares)	(hectares)	Clearfelled or cut to seed trees (hectares)	Thinned (hectares)
1976–77	32,320	1,170	2,610	-
1977–78	26,020	740	4,450	-
1978–79	25,540	530	2,710	-
1979–80	25,150	860	2,110	60
1980–81	22,930	1,440	2,080	180
1981–82	24,680	610	2,180	320
1982–83	23,740	330	990	190
1983–84	21,540	580	1,490	260
1984–85	20,010	1,440	2,360	500
1985–86	22,640	650	1,590	340
1986	19,340	1,150	1,090	490
1987	17,180	1,380	1,310	700
1988	23,400	490	1,180	840
1989	15,130	200	1,510	910
1990	12,960	100	1,560	340
1991	10,910	-	1,920	230
1992	13,990	30	1,540	310
1993	14,250	40	1,630	80
1994	14,050	50	1,440	-
1995	17,830	30	2,410	-
1996	22,320	50	1,300	60
1997	18,240	60	1,870	60
1998	19,250	60	1,970	320
1999	14,200	50	1,890	360
2000	20,570	10	1,310	70
2001	15,760	*	1,380	120
2002	13,260	30	700	350
2003	8,520	-	720	485
2004	8,860	-	330	920
2005	6,220	30	460	1,070
2006	8,440	300	400	1,130
2007	8,120	60	560	1,000
2008	7,280	0	390	660
2009	8,990	10	740	920

\*Total includes small areas of other forest types cleared for mining or landings.



## Parks and Visitor Services

Public involvement, visitation and appreciation of the natural environment on lands and waters managed is a major responsibility of the department. This includes:

- preparing and implementing management plans in accordance with the CALM Act
- preparing and implementing recreation site development plans
- providing, managing and maintaining appropriate access, recreation opportunities and visitor facilities
- protecting natural areas, visitors and facilities from bushfire
- training departmental staff and volunteers
- working with local visitor centres and commercial tour operators
- involving Indigenous people in park management
- involving Indigenous people in the provision of visitor facilities and services
- providing visitor information and designing and initiating educational and interpretive activity programs that enrich visitor experience and help develop greater community awareness and support for parks, natural areas, astronomy, nature-based tourism and recreation services and policies
- undertaking scientific, visitor and social research, in cooperation with other research institutions
- providing support to the Conservation Commission of Western Australia.

This work is carried out by staff working around the state, with the support of hundreds of volunteers as well as local visitor centres, tourism operators, and local community organisations.

### Planning for management

During 2009–10, the Minister for Environment approved the management plans for the Walpole Wilderness and Adjacent Parks and Reserves, Walpole and Normalup Inlets Marine Park, and Woodman Point Regional Park. This brings the total number of current management plans prepared under the CALM Act to 58.

A further nine terrestrial management plans are currently being prepared for Cape Range National Park, Shannon and D'Entrecasteaux national parks, Shark Bay terrestrial reserves and proposed reserve additions, Dryandra Woodland, Millstream Chichester National Park and Mungaroo Range Nature Reserve, Lane Poole Reserve and proposed reserve additions, Murujuga (Burrup Peninsula) National Park, Rockingham Lakes Regional Park, and Jandakot Regional Park. An indicative management plan to support the establishment of the proposed Camden Sound Marine Park in the Kimberley region is also being prepared.

During 2009–10, draft management plans for Lane Poole Reserve and proposed reserve additions, and parks and reserves of Yanchep and Neerabup were released for public comment. A further six planning areas have draft plans almost ready to be released, namely Leeuwin-Naturaliste Capes Area, Perup, Tuart Forest National Park, Ord River and Parry Lagoons nature reserves, and Yoorrooyang Dawang conservation reserves. A further five terrestrial draft management plans are in various stages of preparation.

The public contributed to the content of these management plans through public and stakeholder workshops and meetings, formal advisory committees, newsletters, and invitations to comment on draft plans. Aboriginal people were also engaged through the involvement of Aboriginal native title representative bodies and Aboriginal park councils.

DEC's website continued to enable people to make submissions electronically as well as download information about management planning including issues papers, 'Have Your Say' brochures, final and draft management plans, analysis of public submission reports and copies of the *Planning diary* newsletter. This newsletter aims to keep stakeholders up to date with progress on each management plan in preparation. Three issues of the *Planning diary* were produced during 2009–10 and sent to around 950 stakeholders.



As at 30 June 2010, there are:

- 58 final statutory management plans
- 13 final management plans in preparation
- 14 draft management plans in preparation
- one indicative marine park management plan in preparation.

**Further information** about management planning is available on the DEC website:

*Terrestrial:* <http://www.dec.wa.gov.au/q=#49>

*Marine:* <http://www.dec.wa.gov.au/q=#50>

## Acquisition and administration of protected areas

### Reserve acquisition

The formal process of adding land to the state's system of protected areas continued throughout the year.

DEC's program of buying land for addition to the conservation reserve system resulted in the finalisation of purchases of 16 freehold properties.

Details of these acquisitions are available in the department's *2009–10 annual report*:

<http://www.dec.wa.gov.au/q=#51>

Negotiations were commenced during the year for the acquisition of five further properties which are anticipated to be finalised in the next financial year.

Other programs and processes led to the acquisition of lands (such as land ceded to the state as a condition of subdivision, land acquired from negotiated exchanges and reserves no longer required by other agencies and organisations) that are suitable for inclusion in the conservation reserve system.

Work continued on the implementation of tenure changes proposed in the *Forest Management Plan 2004–2013* and towards the implementation of outstanding tenure recommendations in other management plans.

DEC continued to work with Main Roads WA to formalise the status of main roads that traverse conservation estate, including Cascades Road at Frank Hann National Park and George Gray Drive at Kalbarri National Park.

DEC also continued its role of providing advice on land proposals referred from other organisations, such as the Department of Regional Development and Lands, and advised on issues including the use or disposal of unallocated Crown land and surplus Crown reserves.

### Leasing activities

DEC has lease arrangements for a wide range of purposes. At the end of the financial year there were 206 current formal arrangements for uses on lands managed by DEC including recreation, tourism accommodation, utilities and sawmills. The formal arrangements comprise 150 leases, 31 written agreements, seven licences, 14 memoranda of understanding and four sawmill site permits.

DEC entered into 68 formal agreements in 2009–10, which mainly involved the renewal of agreements for existing uses.

Major achievements were:

- finalising the renewal of the master lease with Telstra for 20 locations
- developing a new lease for an ecotourism resort on Dirk Hartog Island National Park
- developing a new lease for the use of Gloucester Lodge within Yanchep National Park for education and accommodation purposes
- developing a new lease to the National Trust of Australia (WA) for the repair and operation of a hydro power station in Wellington National Park.

During the year, a number of other formal arrangements expired and by 30 June were at various stages of being renewed.

### Apiary site management

As of 30 June 2010, there were 3,280 current apiary site permits issued on Crown land in the state. Of these, 1,594 (48 per cent) were on lands managed by DEC, with 866 located on State forest, 106 on timber reserves, 360 on national parks, 174 on nature reserves, 62 on conservation parks and 26 on other lands vested in the Conservation Commission.

During the year, 582 apiary site permits were issued, comprising:

- 112 permits transferred between beekeepers
- 64 permits from applications to occupy new or previously cancelled sites
- 406 permit renewals.

The Beekeeping Consultative Committee met twice during the year to discuss issues including the granting of apiary sites in the Kimberley, the management of the small hive beetle and proposed amendments to subsidiary legislation regulating the management of apiary site permits. The committee is convened by DEC and comprises industry, government and beekeeping groups.

**Further information** about apiary management and permits is available on the DEC website:

<http://www.dec.wa.gov.au/q=#52>

## Tree Top Walk celebrates multi-million milestone

Melbourne resident Liz Fletcher, pictured left with partner Ben Bonollo and Environment Minister Donna Faragher, made WA national park history in July 2009 when she clocked in as the 2.5 millionth visitor to the unique Valley of the Giants Tree Top Walk.



Built in 1996, the Tree Top Walk gives visitors the unique experience of walking through the canopy of the tingle forest.

Described as one of the most sustainable forest tourism facilities in the world, the walk is a feat of engineering, occupying just three square metres of forest floor; its series of 60-metre light-weight steel trusses fixed on steel pylons forming a secure ramp which is wheelchair accessible.

Visitors walk 600 metres through the forest, reaching a height of 45 metres, without damaging the fragile ground below.

## Park presentation and resource protection

DEC aims to achieve high-quality visitor services and facilities that are planned, designed, developed and managed in a sustainable way.

### Capital works

The capital works program for Parks and Visitor Services aims to improve and maintain recreation and tourism assets located in national parks, conservation parks, State forests and other reserves across the state. Works are typically associated with construction, upgrading and maintenance of roads, day-use and camping facilities and with work required to ensure visitor safety. In addition to maintaining and improving visitor experiences, the program also seeks to protect environmental, social and landscape values at these sites.

During the year, capital works funding was spent on park improvements and roads. A more detailed description of capital works projects undertaken within each region is provided under **Regional activities (page 85)**.

### Roads

DEC has continued to progress the development of a road management system to manage its road network of around 38,000 kilometres. DEC is working closely with other agencies, such as Landgate, Main Roads WA, WALGA and the FPC, in developing policies and inter-agency agreements to ensure that appropriate standards and user requirements are met and the road information flow is logical and efficient.

DEC has now completed the task of collecting all inventory-related information and condition assessments for all strategic roads and bridges, as the initial stage to develop a comprehensive corporate road asset management system. This project will assist DEC to identify high priority road improvement works, plan its strategic road requirements, manage identified road hazards and better identify present and future funding requirements. DEC will continue its collaborative work with local government authorities and Main Roads WA on inter-regional road construction and maintenance work across agency boundaries.



In December 2009, consulting engineers from the Australian Road Research Board (ARRB) undertook a review of DEC's Policy Statement 40 – *Roads*. This consultancy requested ARRB to develop operational guidelines for the management of the DEC road network which incorporated a revision of the current road classification system. The operational guidelines will be trialled over six months in the Warren and Kimberley regions and will then be submitted to the DEC Corporate Executive for endorsement with the revised policy.

DEC is now investigating both internal and external software applications that will facilitate the required asset management functionality for the road network but most importantly, provide a system that is useful on a day-to-day basis at a district level for work prioritisation and programming. During this exercise, it has been important to consider other areas within DEC with similar requirements for this type of system to be efficient and avoid duplication.

## **Recreation planning and design**

DEC prepared visitor services plans, master plans, concept plans and site development plans for many projects around the state. These plans assist with strategic planning decisions and funding applications, and enable capital works projects to be built to a high standard. Some examples include plans for upgrading visitor access and facilities at Mirima and Mt Augustus national parks, and Coalseam Conservation Park. Detailed design was also prepared for Lennard Gorge in King Leopold Range Conservation Park and an upgraded parking area in John Forrest National Park. Design continued on upgrading visitor facilities at Hangover Bay in Nambung National Park, Donnelly Boat Landing, Lake Jasper and Black Point in D'Entrecasteaux National Park and Yardie Creek in Cape Range National Park. Planning for visitors commenced for the Albany Coastal Reserves and continued for Kalbarri National Park.

Master planning and site development planning commenced on the Fitzgerald River National Park Improvement Project on the south coast.

Design and/or construction documentation drawings were prepared for many small structures such as boardwalks, toilets, steps and lookouts including a new boardwalk and lookout at Penguin Island, a new lookout at Lennard Gorge in King Leopold Range Conservation Park, camping huts and toilets for the Munda Bididi Trail and upgrading of camping structures on the Bibbulmun Track.

Planning, training and design advice for recreation was provided as needed. Informal training in recreation and tourism planning and design was provided to DEC staff on a project-by-project basis throughout the year and the Recreation Planning and Management Course was delivered in November 2009. Advice was given on numerous projects associated with DEC and staff represented the department on working groups including the Coastwest Technical Assessment Group.

Visual impact assessment, recommendations, guidelines and specialist advice were provided for a number of proposals throughout the year. In particular, expert advice continued to be provided on visual landscape planning matters related to the development proposals for Location 413, Smiths Beach, Yallingup.

## **Visitor communication and management**

### **Interpretive planning**

DEC provided strategic communication directives into the preparation of management plans, visitor services plans, recreation site development plans and interpretive projects. Interpretation project plans were prepared for all major site developments with interpretive facilities. Of particular note are contributions to visitor services planning for the Kimberley Region and the Fitzgerald River National Park Improvement Program.

### **Interpretive design**

DEC continued to meet regional needs for signs and displays in managing visitors to DEC-managed areas. Designs were prepared for 389 projects producing 7,526 sign products with the majority now installed in parks and reserves throughout the state.

Interpretive projects of particular note were Purnululu World Heritage Area trailside interpretive signs for the camping areas including the tour operator visitor accommodation lease areas; Penguin Island boardwalk trailside signs; Perth Observatory visitor centre display; the Lake Ballard shelter display; and the Tuart Forest National Park shelter panels.

The studio produced park orientation signs, interpretation panels, trailhead and trailside signs for various sites throughout the state including revision of panels at Wolfe Creek Crater and additional bird signs at Parry Lagoons in the Kimberley; various identification and management signs for Walpole-Nornalup Marine Park; Fred Jacoby Park heritage trail signs in Beelu National Park in the Perth hills; cycling signs for the Goat Farm in the Perth Hills as well

as in Wellington National Park and on the Munda Biddi Trail; and the revision and replacement of Ellen's Diary at Ellensbrook in the Leeuwin-Naturaliste National Park.

The DEC Sign System was launched on DEC's intranet to inform and assist all staff with sign planning and orders. The planning and design for a new parks sign system was endorsed for Walpole Wilderness and the west Kimberley parks and is in progress with colour trials for the karri forest (Warren Region), Swan Coastal Plain and the Darling Range (Swan and South West regions), the Shark Bay World Heritage Area (Midwest Region) and the Bibbulmun Track.

The studio also produced signs detailing visitor risk management, wildlife management, site rehabilitation and signs for the dieback sign system which is being implemented across the state's south-west. New risk signs were designed for whale carcass decomposition at Wedge Island, crocodile risk for Cable Beach in Broome, Walpole coast risk, Penguin Island access risk, Kalbarri slip risk, snake risk, shark risk, flood risk and fire risk for the Goldfields, South Coast and Dryandra Woodland.

### Community liaison, consultation and advisory services

Consultation with special interest groups, agencies, individuals and Aboriginal communities is a key aspect of site developments and their interpretation on and off DEC-managed areas.

DEC supported the design and development of an interpretation trail at Mogumber Mission Settlement and worked with the South West Aboriginal Land and Sea Council with an interpretive shelter at Wedge Island. DEC also worked with the Heritage Council of Western Australia, the Western Australian Museum, the Forum Advocating Cultural and Ecotourism and the Interpretation Australia Association in networking, conference and workshop planning and the facilitating of training and professional development opportunities in heritage interpretation.

Advice was also given to local authorities and various 'Friends' groups across the state on the planning, design and production of signs. Support was provided to the Shire of Waroona with the Hamel Historic Precinct and to the City of Nedlands with the Swanbourne dunes signs.

### Tourism trainee receives award

Indigenous Tourism Trainee James Spurgeon, a first-year tour guide at Yanchep National Park, was named Young Tourism Ambassador by the Department of Training in 2010.

Nominated for the award by Tourism WA and FutureNow, and supported by Tourism WA's Aboriginal Employment Program, James has been pleased to obtain full-time employment at Yanchep since completing his traineeship.

"I get to work out in the open with animals and experience interesting things that not many people have the opportunity to experience on a day-to-day basis," he said.



### Guided interpretive programs

Guided interpretive programs continue to be provided regularly in major areas throughout the state. These include the Nearer to Nature program, which is provided in Perth's regional parks and at the Perth Hills National Parks Centre near Mundaring, at Yanchep National Park, Penguin Island Conservation Park and the Perth Observatory. Regional guided experiences are provided at Geikie Gorge National Park, Monkey Mia Reserve in Shark Bay, Valley of the Giants and Coalmine Beach near Walpole, Barna Mia in Dryandra Woodland, Perup 'Nature's Guest House' near Manjimup and at Leeuwin-Naturaliste National Park. DEC staff also continue to respond where appropriate and available to requests for specific presentations and guided experiences in local areas.

**Further information** about park presentation, facilities and activities is available on the DEC website: <http://www.dec.wa.gov.au/q=#53>



## Aboriginal liaison, consultation and heritage

DEC places a high priority on liaising, consulting and working with traditional owners, elders and other interested stakeholders to enhance management of DEC-managed lands and waters. It has established an Aboriginal Heritage Unit (AHU) to support such activities. During the year DEC liaised or worked with:

- elders and the wider community from Quairading on a range of different projects including salinity and on rare plants on DEC-managed areas, including Badjaling Nature Reserve
- local Indigenous people and communities through a joint management meeting at Boyagin Rock, focusing on reserve management issues
- the Balladong and Njaki Njaki Groups at Kokerbin Rock Nature Reserve in the Bruce Rock Shire, where local DEC staff and Bruce Rock Shire staff met the traditional custodians and discussed developments and the content of interpretation material
- the Goldfields Land and Sea Council, the Esperance Nyungar native title claimant group and Ngadju native title claimant group over a range of Aboriginal and environmental issues within the DEC Esperance District
- the South West Aboriginal Land and Sea Council, about proposed developments at Lake Cronin Nature Reserve and Gathercole Nature Reserve in the Central Wheatbelt District
- the South West Aboriginal Land and Sea Council, during nine site visits within the Warren Region
- the Nudgu Clan Group from Norseman and the Department of Corrective Services, where men from the AHU were invited to the Norseman Aboriginal community court
- the Aboriginal community in Cue
- the Kojonup Aboriginal Corporation and elders at Koja Place, Kojonup to establish community programs with DEC
- the Kondinin community and elders on sites of interest for Aboriginal people on DEC-managed land
- elders in the local Aboriginal community, regarding traditional land use and protocols
- the Narrogin community, including Narrogin Primary School, local elders and the shire president. Ongoing discussions are being held to explore cultural issues as well as cooperative land management, education and training opportunities in this area
- RAW 100 (an Aboriginal youth group) to help establish a relationship with DEC that could potentially lead to a training and mentoring partnership.

### Planning and relationship building

DEC places a high priority on building external and internal relationships with Aboriginal and non-Aboriginal groups, individuals and organisations. This included:

- providing ongoing cultural advice and assistance to DEC staff regarding Aboriginal consultation and involvement on DEC-managed lands and waters
- providing links between DEC regional and district staff and Aboriginal communities
- developing relationships with other state and local government agencies such as Department of Agriculture and Food, cities of South Perth and Canning as well as other organisations such as National Green Jobs Corps, SMYL and Clontarf Aboriginal College regarding potential training and employment partnerships for Aboriginal people
- providing cultural advice, mentoring and support to community groups and schools such as Culunga Aboriginal Community School and the Miller Beeliar Aboriginal Corporation
- continuing to build on a positive working relationship with the South West Aboriginal Land and Sea Council through its memorandum of understanding with DEC
- coordinating the planning and organisation of the second DEC Aboriginal staff conference which will be held in the 2010–11 financial year
- operation of the DEC Aboriginal Employee Reference Group
- representation on a reference group coordinated by Curtin University to produce a new unit of study entitled Indigenous Australian Land and Environment
- ongoing work with the Department of Corrective Services to deliver Aboriginal programs at Acacia, Bunbury and Albany prisons

- 
- continuing liaison with the Gnulla Maaman Moort Boodjah men's group to progress joint land management initiatives with DEC.

## Education and training

DEC continues to deliver quality Aboriginal educational programs to schools (day-care to secondary), community groups and special interest groups. During 2009–10 DEC provided:

- 48 visits to schools, community and special interest groups with a total of 4,270 participants
- five cultural protocol workshops at Walyunga National Park for 71 DEC staff and 23 Campground Hosts
- mentoring to Aboriginal trainees through the Mentored Aboriginal Training and Employment Scheme (MATES) program and support to other Aboriginal staff in DEC where required
- supervision and training of a school-based trainee as a contribution to DEC's overall Aboriginal employment target
- a central point of information, assistance and advice on professional development opportunities available to DEC's Aboriginal staff (such as scholarships and leadership programs)
- ongoing assistance to DEC staff in organising 'Welcome to Country' ceremonies for events
- the facilitation a two-day Cross Cultural Awareness training courses for senior managers
- exploration of further learning and training opportunities for DEC staff in the areas of heritage site training, native title as well as further cross-cultural awareness courses
- training for 98 DEC staff on the correct protocol for Nyoongar acknowledgment at meetings.

## Business management

Providing accurate park information, promoting responsible behaviour by visitors and providing services to the tourism industry are important functions of DEC.

## Communication and promotion

During 2009–10, DEC revised the brochure *National, marine and regional parks in Western Australia—A visitor's guide to the state* for distribution throughout the state and interstate. The brochure outlines the features, facilities and activities available at more than 100 DEC-managed parks and reserves.

In November 2009, DEC attended the Perth 4WD and Adventure Show and presented information about parks and visitor facilities and *Phytophthora* dieback.

In March 2010, DEC provided a display at the 2010 Perth Caravan and Camping Show promoting visitation to protected areas of Western Australia. Wildlife rehabilitation, Keep Australia Beautiful programs and the Tree Top Walk broadened the focus of the display.

DEC continued to be involved in tourism industry activities by providing information and services, including:

- production and distribution of the bi-monthly Touring Western Australia e-newsletter to more than 5,000 stakeholders in the tourism and travel industry, DEC staff, other government agencies and local government authorities
- quarterly meetings of DEC's Tourism Industry Reference Group to assist with communication between DEC and the nature-based tourism industry
- the redesign and upgrade of static display resources for use at promotional and educational events
- provision of editorial assistance to Tourism WA regional staff as well as various independent organisations in the park-related content of their publications to ensure accuracy and provision of a wider range of information
- advice and assistance to Tourism WA with a major promotional campaign and Tourism Development Priority documents.

## Park passes and fees

Park passes are distributed at 92 points around the state including DEC offices, selected national parks and 46 independent retail outlets.

While there has been an overall decrease in the distribution of passes, this is consistent with the trends in the tourism industry due to the downturn in the world economy. Also, with regard to annual local park passes,



in September 2009, the eligibility for these passes changed to include only residents and ratepayers in a local 'catchment area' who recreate in their local parks. Tourists from other areas now have the option of purchasing one of the other extended passes which could account for the increase in distribution of the Holiday Park Pass.

**Table 21: Breakdown of pass distribution 2009–10**

Type of park pass	Number distributed	Change from 2008–09
Holiday	9,177	Increased 13 per cent
Annual local	7,586	Decreased 31 per cent
Annual all	4,544	Decreased 14 per cent
Annual all concession	2,343	Decreased 13 per cent
Goldstar	462	Decreased 64 per cent

Note: includes sales and passes sent to DEC offices but not yet sold.

In 2009–10, DEC approved 236 requests for entry fee waivers. The value of foregone revenue is approximately \$69,917 based on estimated visitor numbers of 15,808 (see Table 22). DEC approves fee waivers to support aged and infirm visitors, disabled groups, carers, educational groups, community service groups and not-for-profit organisations.

**Table 22: Fees waived 2009–10 – visits by region**

Region	Swan	Midwest	Pilbara	Kimberley	Warren	South Coast
Number of visitors	10,649	1,378	1,055	116	337	2,273

**Further information** about park passes and fees is available on the DEC website:

<http://www.dec.wa.gov.au/q=#54>

## Commercial operations and events

DEC licenses commercial operations to monitor and manage the commercial use of DEC-managed lands and waters pursuant to the Conservation and Land Management Regulations 2002 (CALM Regulations). The *Tour operator handbook* details licence conditions applicable to commercial operators conducting such activities. In June 2009, updates to the *Tour operator handbook – Terrestrial* were printed and distributed to commercial operators. The *Tour Operator Handbook – Marine* was updated in December 2009.

As at 30 June 2010, 337 commercial operations licences were current for activities in marine and terrestrial reserves, comprising 295 general 'T' class licences and 42 'E' class licences for operations that must be restricted. The number of commercial operations licences decreased from 370 at the end of 2008–09.

Two tour operator accreditation programs are currently recognised and strongly encouraged by DEC to assist in raising standards in the tourism industry. There are 81 operators that have accreditation through Ecotourism Australia (Eco Certification with business and environmental components) which is an increase from 40 in 2008–09, and 144 operators that are accredited with Australian Tourism Accreditation Program (ATAP) (business certification), an increase from 104 in 2008–09.

In October 2009, the Ministers for Environment and Tourism announced the government's response to the *Review of Nature Based Tourism* accepting in part or whole 43 of the 49 recommendations of the review. These included the lengthening of the terms of commercial operations licences from up to 10 to up to 15 years and a requirement for all licence holders to achieve recognised tourism accreditation. Tourism concessions granted by way of a lease or a licence will also have key performance indicators that can be audited to demonstrate a commitment to best practice standards.

The Ministers also announced in October 2009 the launch of the Naturebank program, which involves the identification and preparation of sites within DEC-managed lands for appropriate sustainable tourism accommodation development. This program is a partnership between Tourism WA and DEC. The first *Naturebank* site at Kurradjong in Purnululu National Park was released for expressions of interest in December 2009 and submissions from proponents are under assessment. It is intended that this site will be in operation for the 2011 season. Other sites in parks across the state are currently under investigation and in the state budget in May 2010, the government announced *Royalties for Regions* funding to support the preparation of sites and the provision of infrastructure to assist in the development of commercial accommodation facilities.

**Further information** about commercial operation on DEC-managed lands and waters is available on the DEC website: <http://www.dec.wa.gov.au/q=#55>



## Legislation and policy for parks and visitor services

### Legislation

During the year, consultation continued with the beekeeping industry on the development of new regulations for the management of apiary sites.

DEC amended the parks and visitor services related fees and charges within the CALM Regulations in September 2009. Aside from adjusting for CPI increases, changes to fees included introducing discounted fees for families to the Geikie Gorge Boat Trip, concession fees for camping in Windjana Gorge and Purnululu national parks and King Leopold Range Conservation Park, a discounted entry fee for groups of vehicles entering Yanchep National Park for functions and weddings, and the introduction of entry fees for Monkey Mia Conservation Park similar to those levied under local laws before the area became a conservation park.

Resources are being allocated to ongoing legislation review and amendment to improve the operation and management of the parks and visitor services output. Amendments currently being sought or in development include a proposal to amend the CALM Act and the WC Act in order to allow for joint management of lands and waters and for Aboriginal people to conduct customary activities on DEC-managed reserves.

DEC has also been progressing the development of new regulations under the CALM Regulations to assist in the management of mooring and anchoring in marine reserves. Over the 2009–10 period, DEC has worked closely with the Department of Transport and the Swan River Trust in drafting the proposed regulations. In October 2009 DEC representatives joined other management agencies from across the nation at the National Moorings Forum held in Melbourne, with the aim of developing Australian guidelines and standards for moorings management.

### Policy

During 2009–10, DEC has been developing draft policies in relation to event management and applications for memorials in DEC-managed reserves, both of which are expected to be finalised in the coming year. Work also commenced on reviewing the current commercial filming and photography policy and the current moorings policy.

A draft policy on welcome to country and acknowledgment of traditional Aboriginal custodians for department events is in preparation, as well as work on designation of areas for dogs and horses and abseiling on DEC-managed lands.

**Further information** about legislation and policy is available on the DEC website:

<http://www.dec.wa.gov.au/q=#56>

## Recreation activities and trails

DEC coordinates the management of outdoor recreation activities consistent with the protection of natural and cultural values on the lands and waters it manages.

During 2009–10, DEC continued to work closely with the Department of Sport and Recreation and other key stakeholders on important recreation initiatives, including the development of the Murray/Serpentine paddling guide and the continued development and refinement of Adventure Activity Standards with Outdoors WA.

DEC continued to work with the Department of Corrective Services in the development and ongoing maintenance of various major trails. Specific projects involving Bunbury Regional Prison crews included development of the Munda Biddi Trail and a new campsite south of Nannup, and construction of a new storage shed at the Collie works centre.

DEC developed a weed identification booklet for trail maintenance volunteers, and updated existing Bibbulmun Track and Munda Biddi Trail maps.

### Bibbulmun Track

DEC continued its strong partnership with the Bibbulmun Track Foundation in 2009–10. DEC and the Bibbulmun Track Foundation co-produced a Bibbulmun Track volunteer maintenance handbook with funding provided by Western Power for printing. DEC held a successful volunteer maintenance day at Mt Clare campsite where a significant amount of work was completed by DEC staff and Bibbulmun Track Foundation volunteers.

The Bibbulmun Track Foundation received funding through the state government's 2009 Environmental Community Grants and Lotterywest to construct a spur trail in Wellington National Park and two group-use campsites.

DEC received funding of \$60,000 through Alcoa to build a group-use campsite in the Perth Hills District. The plans for this campsite have been produced and construction will commence in late 2010.

DEC continued with maintenance and improvements along the Bibbulmun Track as part of the capital works program. Some major accomplishments included:

- the refurbishment of 13 campsites
- replacement of canoes and paddles at the Bibbulmun Track Irwin Inlet crossing
- replacement of trail signage and gates
- prefabrication of six bridges of which three were installed, and upgrading of the Long Gully bridge
- major trail refurbishment in Albany, Collie, Donnelly, Denmark and Kalamunda
- tree treatment for visitor risk management in Perth Hills District
- toilet replacement at campsites
- purchase of timber for small crossings.

**Further information** about the Bibbulmun Track is available on the DEC website:

<http://www.dec.wa.gov.au/q=#57>

## Funding boost for Munda Biddi



Regional Development Minister Brendon Grylls and Environment Minister Donna Faragher were on their bikes to announce that the Munda Biddi Trail, a scenic cycle trail running through forest and bushland in the state's south-west and wheatbelt, would receive a \$3 million grant from the state government's Royalties for Regions scheme.

The funding, combined with a \$1 million capital contribution from DEC, will enable the completion of the trail from Nannup to Albany. The trail will be completed to its full length of 1,000 kilometres within the next three years.

## Munda Biddi Trail

The partnership between DEC and the Munda Biddi Trail Foundation continued to strengthen throughout the year. The Munda Biddi Trail Foundation was a finalist in the Adventure Tourism and Tourist Attraction categories of the 2009 Western Australian Tourism Awards. National Geographic listed The Munda Biddi Trail in the Top 10 Cycle Routes. The Munda Biddi Foundation received \$15,000 through the Environmental Community Grants to run their cycle events program.

DEC conducted a trial of trail counters along the Munda Biddi Trail to determine the most suitable locations for trail counters to minimise errors. Trail counters have been installed at 13 sites between Mundaring and Nannup.

Planning and development for the remaining length of the trail between Nannup and Albany has continued with an operations centre now established at Albany. Trail and campsite construction is well under way on the section south of Nannup. Construction at the Albany end will begin in spring with the drier weather. A community consultation program has been undertaken on the section between Walpole and Albany.

DEC continued maintenance and improvements along the Munda Biddi Trail which included a new bridge in the Nanga area and trail realignment in the Perth Hills District.

**Further information** about the Munda Biddi Trail is available on the DEC website:

<http://www.dec.wa.gov.au/q=#58>

## Western Australian 4WD Association and Track Care WA

During the year, DEC continued to work with the Western Australian 4WD Association and member clubs, Track Care WA and the Four-Wheel Drive Industry Association to promote the responsible use of public lands by four-wheel drivers and other motorised visitors. Track Care WA and the Western Australian 4WD Association actively supported DEC through track stabilisation and clean-up projects and other environmental care initiatives. The 'Adopt a Track' initiative has been embraced by clubs with numerous tracks being adopted and more clubs interested in joining the scheme.

**Further information** on four-wheel driving and DEC is available on the DEC website:

<http://www.dec.wa.gov.au/q=#59>

## Off-road vehicles

During the year, DEC continued to be involved in planning for better management of off-road vehicle use and took part in implementing the State Trail Bike Strategy with Motorcycling Western Australia, Recreational Trailbike Riders' Association of WA, the Department of Sport and Recreation, Department of Planning, WA Planning Commission, Department of Transport and Department of Local Government.

DEC developed and began implementation of recreation plans for two gazetted off-road vehicle areas on DEC-managed land at Gnangara and Pinjar. The plans will detail options for trail development, facilities, training, education and collaborative management at these sites.

DEC formed a working group and engaged a consultant to undertake a regional off-road vehicle land use study to assist the department and local government in identifying suitable areas for these vehicles along the Darling Scarp between the Shire of Swan in the north and the Shire of Collie in the south. Identified zones are currently being considered.

## Community involvement

DEC continued to provide an effective means of enlisting community support as well as meaningful and interesting opportunities for volunteers to take part in conservation and land management activities.


In 2009–10, a total of 3,038 volunteers contributed 451,040 hours of support to projects across Western Australia.

**Table 23: Community involvement volunteers**

Year	Number registered	New projects	Number of volunteers contributing	Number of hours
1999–00	3,800	12	1,400	121,000
2000–01	4,499	26	1,600	190,000
2001–02	5,683	20	2,500	217,000
2002–03	5,160	32	3,150	264,000
2003–04	6,100	30	2,700	355,000
2004–05	7,600	28	4,000	422,000
2005–06	8,230	6	3,882	470,600
2006–07	9,726	8	3,250	406,000
2007–08	7,784	9	3,439	424,500
2008–09	9,558	7	4,004	426,200
2009–10	11,082	23	3,038	451,040

## Volunteers

The annual Volunteer of the Year and Outstanding Service awards function to acknowledge the important support DEC receives from its volunteers was held in December 2009 at Matilda Bay. This celebration continues to reinforce the excellent contribution that DEC volunteers make to the management and delivery of projects on DEC-managed reserves.



Ongoing projects such as the Campground Host program, the Bibbulmun Track Foundation (office support and track maintenance), the wildlife rehabilitators program, the Wildcare Helpline, Honorary CALM Officers and projects at the Western Australian Herbarium, all contribute to protection and care of the environment in all its facets. In addition, volunteer activity in a 'green' setting contributes positively to the physical and mental health of participants. The overall community capacity generated by such activity also remains an understated benefit for Western Australian society.

Other major groups such as Conservation Volunteers Australia (CVA), the Department of Corrective Services and 4WD clubs continued to work closely with DEC field staff to provide training opportunities as well as to rehabilitate and enhance the natural environment. In particular, the CVA 'Earth Assist' project, sponsored by Rio Tinto and supported by DEC and the Department of Education, has demonstrated a remarkable collaborative effort, especially beneficial to young people.

Seven volunteer projects which commenced in 2009–10 were:

- Lake Mason Station clean-up
- Lorna Glen Station donga refurbishment
- monitoring of vertebrate fauna at Gngangara (Swan Coastal Plain)
- Aboriginal cultural training for women
- foreshore rehabilitation on the Swan and Canning Rivers
- seagrass monitoring at Broome
- flora translocation.

During 2009–10, DEC continued to provide training programs to DEC volunteers with support from specialist services in DEC and external agencies. Training included the Campground Host forum; Honorary CALM Officers program; safe work practices as part of DEC's corporate induction; risk management; basic fire awareness; first aid; cross cultural awareness; the basic wildlife rehabilitators' course (at regional and metropolitan locations); advanced and special topics for wildlife rehabilitation; and Wildcare Helpline evaluation and training. Approximately 600 volunteers attended training in Perth, Newman, Kununurra, Broome, Karratha and Albany.

The *Minimum Standards for Wildlife Rehabilitation in WA* (DEC 2008) has become the definitive resource which outlines the minimum standards for welfare of native animals in all stages of the wildlife rehabilitation process. The publication assists in realising the potential to return native animals into the wild. In addition, it is a key component for a revised strategy for wildlife rehabilitation in Western Australia which has been introduced in early 2010 and will be increasingly applied and formalised during 2010–11.

A 2009 combined initiative between DEC and Main Roads WA to have the Wildcare Helpline contact number added to signs at 'black spot' areas, together with general increased public awareness, has contributed to an increased incidence of calls to the Helpline. At busy times, some consideration has been given to having several operators available.

**Further information** about community volunteers and DEC is available on the DEC website:

<http://www.dec.wa.gov.au/q=#60>

## Healthy Parks, Healthy People

The Healthy Parks, Healthy People program remains a significant component of raising community awareness of the health benefits of parks and the broader relevance of the conservation estate to other sectors of society, public participation and community involvement strategies in DEC-managed lands. Cross-promotional opportunities with non-government health organisations continue to be consolidated including:

- The Healthy Parks, Healthy People program, in partnership with the Heart Foundation, launched the Park Walks program in November 2009 which consists of a monthly guided walk in a DEC-managed park. The walks are proving to be popular with the public as a means of increasing their daily level of activity while being stimulated and motivated by the natural environment.
- The Asthma Foundation's Triple E Challenge for Children was conducted in partnership with the Healthy Parks, Healthy People program at Herdsman Lake in 2009.
- The highly successful 2007 and 2008–09 Healthy Parks, Healthy People Seniors' Park-Based Activity Program, conducted in partnership with the Office of Seniors Interests (Department for Communities) was delivered at the Healthy Parks, Healthy People Congress in Melbourne in April 2010.

- In partnership with Mentally Healthy WA's Act-Belong-Commit campaign and Keep Australia Beautiful's Adopt-a-Spot program, the Grow a Healthy Outlook resource was launched in May 2010. The Healthy Parks, Healthy People program continues to provide the Mentally Healthy WA team with a 'Park of the Month' segment for their bi-monthly newsletter.
- A number of presentations on the Healthy Parks, Healthy People program have been delivered to a range of community groups in 2009–10, including Probus clubs, Rotary, Over 55 groups and the Peel Preservation Group.
- With funding assistance from the Department of Health's Fiona Stanley Hospital project, eight planting days with community groups have occurred in Beeliar Regional Park, financial assistance has been awarded to the Cockburn Wetlands Environment Education Centre for conducting school environmental education programs and a promotional flyer is being created to highlight the importance of the Spectacles wetlands in Beeliar Regional Park to local Aboriginal people. The Healthy Parks, Healthy People component of the Fiona Stanley Hospital Project was also featured in a presentation to the Healthy Parks, Healthy People Congress in Melbourne in April 2010.

## Regional parks

Major achievements in managing Perth's regional parks during 2009–10 were as follows.

### *Planning and estate management*

The *Woodman Point Regional Park management plan* was finalised and approved by the Minister for Environment. Work continued to finalise the Rockingham Lakes and Jandakot regional park management plans, which are undergoing approvals as required under the CALM Act.

DEC assisted the Department of Planning in planning for the establishment of the proposed Ocean to Preston River Regional Park in Bunbury.

The provision of advice on land use planning proposals affecting regional parks continued. Major projects included the proposed Roe Highway extension (Stage 8) affecting Beeliar Regional Park, the proposed Keane Road Strategic Link impacting Jandakot Regional Park and the proposed Rockingham Regional Hospital/Woodbridge Estate second access road affecting Rockingham Lakes Regional Park.

Preparation of transitional management arrangements for Araluen Botanic Park were finalised including:

- preparation of a management agreement with the Western Australian Planning Commission under section 16 of the CALM Act
- securing an exemption from tender to enable the Araluen Botanic Park Foundation (ABPF) to undertake contract work in the park
- negotiation of a management contract with ABPF.

DEC has management responsibility for the park effective from 1 July 2010 for a three-year period.

## Fellowship for DEC stalwart

Albany-based Parks and Visitor Services Policy and Project Officer Dr John Watson became a Fellow of the Australasian Cave and Karst Management Association (ACKMA) in 2010.

Dr Watson was presented with his Fellowship certificate by ACKMA President Steve Bourne, at the organisation's annual general meeting which followed a Global Geotourism conference at the Gunung Mulu National Park World Heritage Area in Sarawak, Malaysia.

It was the first time the ACKMA AGM was held outside Australia or New Zealand, and was marked by a record attendance of 90 people.

Dr Watson said his mostly self-funded attendance at both the conference and the AGM was extremely worthwhile.

"It was particularly valuable in providing additional insights into both the DEC Caves and Karst Policy and, to some degree, the DEC non-Indigenous cultural heritage policy work that I am also undertaking," he said.





### *Conservation works*

In conjunction with the Department of Health and Department of Treasury and Finance, DEC finalised an addendum to the original memorandum of understanding for the Fiona Stanley Hospital and Health Precinct to implement a range of environmental management and conservation initiatives. The addendum addressed a number of additional matters required to meet conditions of approval for the project under the EPBC Act. DEC also continued to implement on-ground works relating to the rehabilitation of land in Beeliar Regional Park and community-based conservation programs associated with the project.

Pedestrian access was improved at Port Kennedy Scientific Park in Rockingham Lakes Regional Park and major works were completed to restrict unauthorised vehicle access and protect the Ramsar-listed wetlands.

The water supplementation program at Thomsons Lake Nature Reserve in Beeliar Regional Park continued to be implemented in conjunction with the Water Corporation to maintain water in the lake for a longer period in early summer, thereby improving waterbird habitat.

Installation of the Gnangara Branch Sewer has commenced through Yellagonga Regional Park and work is occurring with the Water Corporation to minimise impacts on the park.

A new five-year midge management partnership for Yellagonga Regional Park was finalised in conjunction with the City of Joondalup and City of Wanneroo for 2010–15.

Numerous weed control and revegetation projects across the regional park network were undertaken, including:

- Beeliar Regional Park at North Lake, South Lake and Kogolup Lake
- Canning River Regional Park at the Greenfield Street Bridge, Masons Landing, Urban Forest and the Billabong
- Herdsman Lake Regional Park at Glendalough South
- Rockingham Lakes Regional Park at Port Kennedy Scientific Park, Paganoni Swamp, Lake Coo loongup, Lake Walyungup and Cape Peron
- coastal areas of Woodman Point Regional Park
- Yellagonga Regional Park at the Luisini Winery (in conjunction with the National Trust) and Drovers Place.

### *On-ground park improvements*

Significant capital improvements were undertaken to the recreation area at Lesmurdie Falls in Mundy Regional Park. The works completed included a major upgrade of the car park, improved pedestrian access and picnic facilities and the creation of new viewing platforms. The toilets were renovated to provide access for wheelchairs. A new interpretation shelter was installed near the car park to provide park information.

The existing bridge over Lesmurdie Brook was partially demolished and converted into a viewing platform and a second viewing platform was constructed further downslope from the falls providing panoramic views of the falls and the Perth metropolitan area. The cost of the works was approximately \$850,000.

The reticulation system was upgraded at John Graham Recreation Reserve in Woodman Point Regional Park and a more efficient refuse system was implemented. Further landscape improvements were completed to enhance the amenity at this popular visitor destination.

Extension of an existing sea wall was completed at Cape Peron in Rockingham Lakes Regional Park to stabilise the eroding coastline and retain emergency, management and public access along the adjoining pathway.

### *Community liaison and participation*

DEC continued to administer eight community advisory committees for regional parks which met on 41 occasions during the year. The regional park community advisory committee chairpersons also met with the Minister for Environment to discuss the management of regional parks.

The Regional Parks category of the state government's Environmental Community Grants Program was again successfully administered. In total \$105,000 was offered to volunteer groups to undertake works in regional parks with \$30,000 of this funding being provided by the Department of Health through the Fiona Stanley Hospital and Health Precinct project. Seventeen community groups were successful in securing funding for a variety of projects including rehabilitation and weed control works and enhancement of Carnaby's cockatoo habitat.

## New facilities at Lesmurdie Falls

Visitors to Lesmurdie Falls will be able to enjoy spectacular views across the Swan Coastal Plain from improved vantage points with the opening of new facilities at the popular recreation site.

Kalamunda MLA John Day, Environment Minister Donna Faragher, and Project Manager Jayson Puls are pictured here inspecting the \$850,000 upgrade, which involved partially demolishing the former bridge over Lesmurdie Brook and converting it into a viewing platform. A second cantilevered viewing platform further downslope has been installed to provide panoramic views of the coastal plain, city and falls.

The works also include a major upgrade of the car park; improved pedestrian access; picnic and toilet facilities, including wheelchair access; and a new interpretation shelter to help orientate visitors on the numerous park walks.

Lesmurdie Falls is one of few readily accessible waterfalls in the outer metropolitan area.

The site attracts about 54,000 visitors each year and is particularly popular during winter and spring when the falls are at their best and the wildflowers are in full bloom.



## Social and visitor research

DEC undertakes a coordinated and comprehensive approach to conducting social research on DEC-managed lands and waters and defines social research as “research that improves our understanding of how people respond to the environment and protected areas”.

During 2009–10, several projects were undertaken, through collaboration with tertiary institutions and other agencies. Projects included:

- ongoing study of the visitor and fishing experience at Montebello Islands Marine Park in collaboration with the Department of Fisheries
- continued involvement in a collaborative project with the Munda Biddi Trail Foundation to assess trail usage and trail user characteristics, expenditure, satisfaction and experience of the trail
- ongoing involvement in a study determining visit and visitor characteristics, satisfaction and reasons for visiting the Tree Top Walk
- continued involvement in a survey of visitor characteristics, experience and attitude to dog management in national parks at Lake Jasper and Black Point in D'Entrecasteaux National Park
- ongoing involvement in a survey to gain an understanding of public knowledge and expectations of management of saltwater crocodiles in the north-west of Western Australia
- continued involvement in the federal government's 'Wealth from Oceans' research program in Ningaloo Marine Park
- completion of monitoring of the penguin viewing experience and interaction with wildlife at Penguin Island.

DEC played an active role as a member of the Sustainable Tourism Cooperative Research Centre and was involved in the following projects which were completed in 2009–10:

- a framework to guide the sustainability of wildlife tourism operations
- systematic and strategic collection and use of visitor information in protected area management
- destination modelling of tourism at Ningaloo Reef
- Australian tourism in a water-constrained economy.

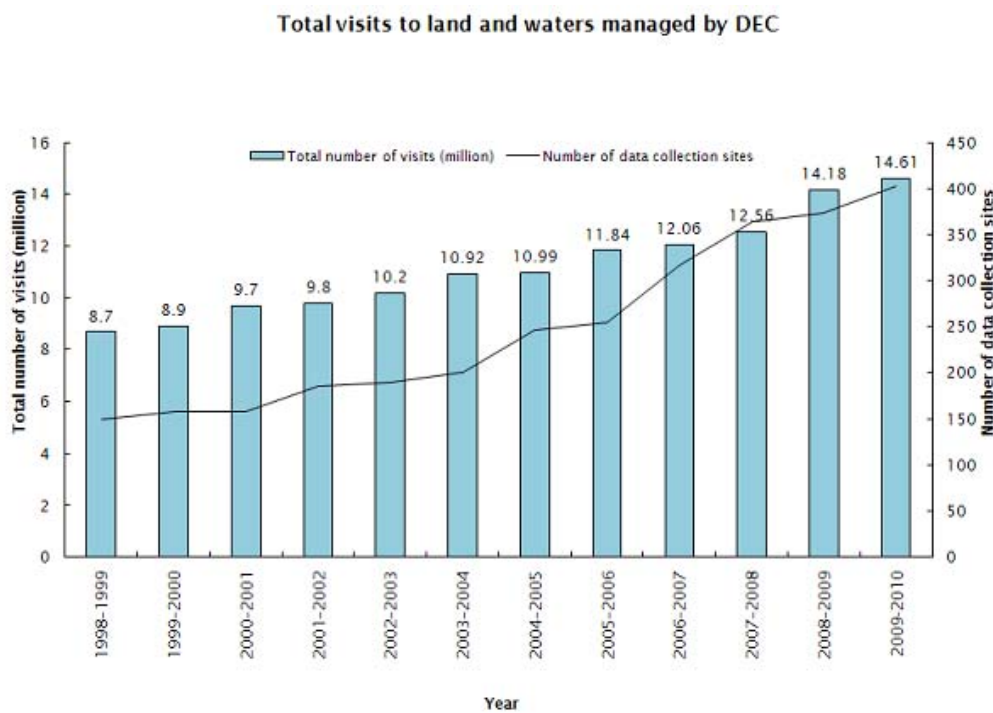


DEC continued to work closely with Western Australia's major tertiary institutions via the Nature Based Recreation and Tourism Research Reference Group, comprising academic staff from all five Western Australian universities as well as DEC staff and representatives from Tourism WA. This group provided funding to honours, masters and PhD students and projects included:

- determining the relationships between visitor services, satisfaction and loyalty at Purnululu National Park
- the influence of place attachment on the management of marine parks in the hinterland: Ningaloo as a case study
- Aboriginal history of the Fitzgerald River National Park.

### Visitor use monitoring

Visitor use was monitored at 402 sites using traffic classifiers and counters, pedestrian counters, observation surveys and ticket sales in national parks, State forest and other reserves throughout the state. The total number of visits to lands and waters managed by DEC during the year was 14.61 million, an increase from the 14.18 million visits recorded during 2008–09 (see Figure 1).



**Figure 1: Total visits to land and waters managed by DEC**

DEC also continued to upgrade the Visitor Information and Statistics and Visitor Survey databases contained within the Recreation and Tourism Information System database and the hardware required to monitor visitor use.

### Visitor survey program

DEC's Visitor Survey Program continued to provide visitor feedback that was used to assess visitor needs and expectations, as well as gauge visitor satisfaction with recreation and tourism facilities and services provided by DEC.

National parks and other recreation areas surveyed represent a broad range of recreation settings based on visitor use levels, access to the site and presence of facilities. The annual survey provides feedback from visitors regarding the management of these areas, the main purpose of their visit, the activities undertaken during the visit and their overall level of satisfaction. The collected information aids in the planning and management of these recreation areas and includes site planning and design, visitor communications, business and marketing plans and performance evaluation.

As part of the Visitor Survey Program, a survey form was distributed to visitors across the state during 2009–10. DEC staff, campground hosts and other volunteers distributed and collected the completed forms from respondents.

The survey was conducted across a broad range of parks, reserves and forest areas representative of the geographic variability of these areas and associated seasonal variation in visitor patterns across the state.

Respondents to the 2009–10 survey program (N=1202) displayed the following characteristics.

- Of the visitors originating from Australia (84.4 per cent), the majority of respondents were from Western Australia (58.7 per cent), with 42.3 per cent visiting from interstate. The majority of respondents originating from overseas (15.6 per cent) were visiting from the United Kingdom and Germany.
- The majority of respondents surveyed were visiting with family/partner (71.1 per cent) or friends (20.6 per cent) as opposed to travelling on their own (5.8 per cent), with an organised group (1.4 per cent) or on a tour (0.9 per cent), with an average group size of 3.17.
- The highest proportion of respondents was in the 55–64 year age bracket (29.3 per cent), followed by the 45–54 year age bracket (17.4 per cent), the 35–44 year age bracket (16.2 per cent), the 65 or older age bracket (16 per cent), the 25–34 year age bracket (14.5 per cent) and the 18–24 year age bracket (6.5 per cent).
- Overall, 91.7 per cent of respondents would strongly recommend their chosen destination to friends.

As part of the program, a benchmark visitor satisfaction index has been adopted to compare visitor satisfaction levels each year. This benchmark has been set at 85 per cent. The 2009–10 index, averaged from visitor responses to the survey at the selected parks, reserves and forest areas around the state, was 87.2 per cent. This outcome, with results from previous years of the survey program, is illustrated in Figure 2.

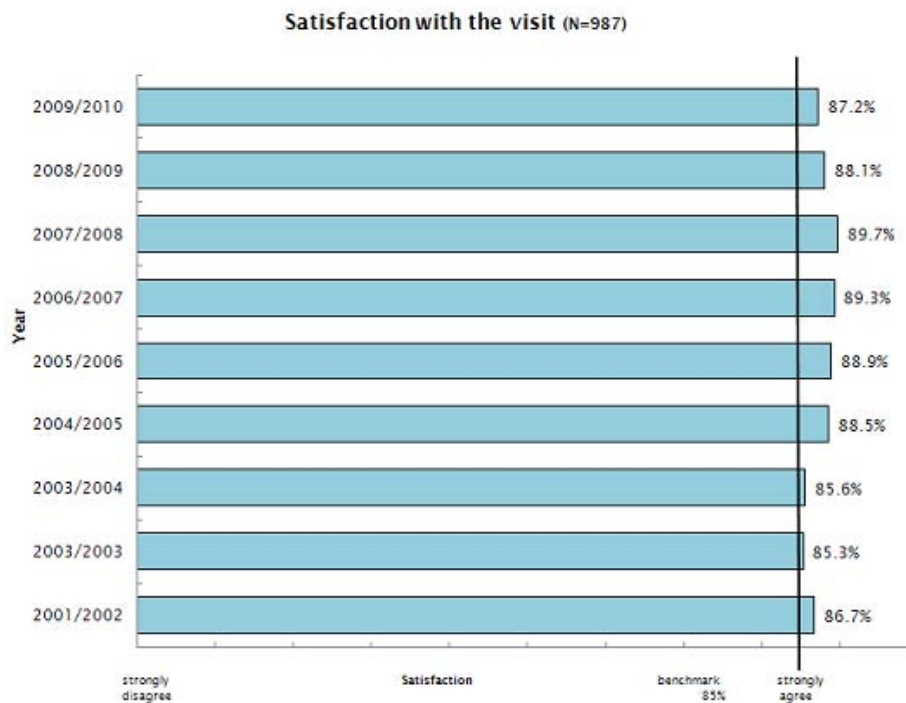


Figure 2: A comparison of annual visitor satisfaction levels within the DEC-managed estate


## Astronomy

Astronomy is conducted at DEC's Perth Observatory in Bickley. The Observatory provides a range of opportunities for public viewing and public participation. The Observatory also contributes to scientific research in astronomy by cooperating with national and international institutions in the acquisition, analysis, interpretation and dissemination of information.

### Public viewing and participation

Throughout the second half of 2009, the Perth Observatory continued to organise and take part in events that supported the 'International Year of Astronomy', a worldwide public outreach program that is sanctioned by the General Assembly of the United Nations and coordinated by the International Astronomical Union.

Until December 2009, an exhibition of astronomical photographs, produced by an Observatory staff member, toured rural cultural centres. These photographs are now on permanent display at Perth Observatory. The Observatory took part in the 'Astrofest', a festival run by the local astronomical community and held at Curtin University. The Observatory had a stand, staff members gave talks and staff participated in the star viewing session in the evening. An estimated 2,000 people attended the Astrofest. Other International Year of Astronomy activities



included a seven-day *LANDSCOPE* bus tour to points of astronomical interest in Western Australia and a public workshop at Kings Park that showed people how to use their own small astronomical telescope.

Public awareness of the Observatory remains high. The number of visitors who attended star viewing nights and daytime guided tours was 4,434 in 2009–10. Customer satisfaction showed 97 per cent were satisfied with their visit or the service provided by the Observatory and 99 per cent were satisfied with the educational quality of the services in which they participated. The number of people who attended talks or astronomy field nights in 2009–10 was 2,313.

Observatory staff informed the public of astronomical events in 105 newspaper articles, three radio interviews and answered 494 email queries. The Observatory also provided information via its website, which received more than 244,696 'page viewings'. Volunteers assisted staff in many activities, notably with star viewing nights and astronomical field nights.

Observatory staff also gave 21 lectures and presentations to 825 people. These presentations included a series of lectures for university undergraduates, as well as general talks to primary schools and community groups.

### Research activities

The Probing Lensing Anomalies NETwork (PLANET) collaboration continued throughout the year to observe changes in brightness caused by the gravitational focusing of light from a star. This lensing effect occurs when two stars are aligned, when viewed from the Earth. This year, five refereed papers have resulted from this collaboration. They included the discovery of a planet orbiting another star. The mass of this extra-solar planet is approximately that of Neptune. Two of the remaining papers describe the null detection of extra-solar planets. These papers are useful for the calculation of precise 'detection efficiencies' for planets and necessary for improved statistical estimates of the abundance of extra-solar planets. The remaining two papers dealt with the mathematical modelling of gravitational microlensing events and a description of new image processing and parameter fitting algorithms.

An additional paper presents evidence that the hot subdwarf (sdB) star He0218-3437 is losing gas to a companion star. This is the first time that photometric observations of hot subdwarf stars have identified them as possible members of interacting binary star systems. This paper will contribute to the debate about how sdB stars are formed.

During the year, a member of staff was involved in the development of software and electronics for the Murchison Widefield Array (MWA) radio telescope. This radio telescope is one of two pathfinder telescopes being built at the proposed Western Australian site for the Square Kilometre Array radio telescope. The MWA is being built by a worldwide consortium of universities, including The University of Western Australia and Curtin University. This consortium published their first paper describing the work they have done on the MWA telescope.

### New works

Research activities were given a major boost with an allocation of \$350,000 in 2006–07 for the construction of a building to house a one-metre telescope from the Lowell Observatory (USA's largest private astronomical observatory). In 2009–10 Building Management and Works was engaged to complete this building.

## Support to the Conservation Commission

DEC supports the Conservation Commission of Western Australia in accordance with the CALM Act and the 2006 Operational Relationship Agreement. During 2009–10, DEC assisted the Conservation Commission with:

- staffing of the Conservation Commission Service Unit, which supported the Conservation Commission in:
  - o establishing changes to the management planning process and overseeing a management plan research project
  - o providing ongoing guidance and comment on draft management plans
  - o assessing management plan performance, including drafting the Albany parks region pilot study performance assessment
  - o progressing an issue-based performance assessment of dieback management on lands vested in the Conservation Commission
  - o completing Stage 2 of the status-based performance assessment of biodiversity conservation on islands focussing on the Kimberley region islands
  - o assessing old-growth forest extent in Yornup, Iffley, Collins and Burnside forest blocks and reporting on community nominated old-growth forest in Warrup and Clarke forest blocks

- advice and information relating to the statutory functions of the Conservation Commission regarding leases, licences and permits, land tenure, mining proposals and ecologically sustainable forest management
- preparation of management plans for lands vested in the Conservation Commission.

As an independent statutory authority, the Conservation Commission reports on its activities in a separate annual report.

## Other initiatives

### Memoranda of understanding

DEC continues to maintain a number of significant partnerships which are formalised through memoranda of understanding (MOU). Long-term, significant MOU include one with the Department of Corrective Services where prisoners continue to provide a valued contribution to DEC projects and the community through maintenance and construction of walk trails and other facilities including the Bibbulmun Track, the Munda Biddi Trail and the Cape to Cape Track. Prisoners also assist with signage work, construction of picnic tables and benches, weed control, maintenance of firebreaks, and cleaning and repair of campground facilities in many parks and reserves around the state including Mirima, Millstream Chichester, Porongurup and Leeuwin-Naturaliste national parks and Coalseam Conservation Park.

The MOU between DEC and Leave No Trace Australia continued with further projects to promote minimal impact visitor behaviour. Leave No Trace messages have been included in DEC publications and signs and Leave No Trace continued its involvement in the completion of the Adventure Activity Standards and other government and community initiatives.

The successful partnership between DEC, CVA and Rio Tinto continued during 2009–10. The Department of Education as an additional partner in Rio Tinto's Earth Assist conservation program, allowed volunteering opportunities to be enjoyed by school children in Perth and regional Western Australia. The program promotes environment-based volunteering to secondary school students eligible to take part in the Community Service Program introduced to schools in 2009.

### World and national heritage

DEC progressed the World Heritage nomination for the Ningaloo Coast in collaboration with the federal government. The state government agreed to support the nomination and a joint announcement by the federal and state Environment Ministers was made on 6 January 2010.

Advice was also provided to the Australian Heritage Council on the assessment of the Ningaloo Coast and the Kimberley for inclusion on the National Heritage List.

### Formal management arrangements with Aboriginal people

#### *Miriuwung Gajerrong*

DEC and the Yawoorroong Miriuwung Gajerrong Yirngeb Noong Dawang Aboriginal Corporation (MG Corporation) are jointly responsible for developing management arrangements for six new conservation reserves totalling 150,000 hectares in the east Kimberley.

Following on from previous planning that produced a Cultural Planning Framework and Joint Planning Guidelines, progress was made with preparation of a draft management plan which is expected to be released for public comment in 2010–11.

Five MG trainee rangers have been employed to work on the new conservation reserves. In addition to continuing their training, major projects achieved in 2009–10 include an assessment of visitor sites for future development, research of flora and fauna, cultural connection to country visits by elders, fire planning and management.

The preliminary results of a formal research proposal undertaken by Tourism WA to investigate the tourism and recreation economic development potential of the reserves were presented to the MG Corporation in 2010.

#### *Yawuru*

On 25 February 2010, an Indigenous land use agreement was signed with Yawuru native title holders over 5,297 square kilometres of land in and around Broome. This will enable the creation of terrestrial and marine conservation reserves to be jointly managed by the Yawuru people, DEC and, within the Broome townsite, the Shire of Broome. These areas include a coastal park covering the inter-tidal area, terrestrial reserves around Broome and to the north of Broome, and a marine park from Gantheaume Point to Cape Villaret.

## MG Rangers help keep flu at bay

DEC Miriuwung Gajerrong Rangers stepped in to help the Australian Quarantine Inspection Service (AQIS) monitor for avian influenza in the Ord region near Kununurra in 2009.



MG Operations Officer Andy Reid (right) and AQIS vet Beth Cookson were among a team of officers who worked on the annual bird survey to support the bio-security of northern Australia.

More than 300 magpie geese and whistler ducks were captured using cannon nets. The birds were released after blood samples were taken by AQIS vets and analysed for influenza.

“You never know what you could be doing from one week to the next when you are an MG ranger,” Andy said. “Each day brings new challenges.”

In early 2010–11, coordinators and trainees will be employed to assist in the management of these lands and waters. A total of \$5.5 million over five years has been allocated to joint management of the conservation estate.

### *Burrup*

The state government entered into the Burrup and Maitland Industrial Estates Agreement Implementation Deed with three Aboriginal groups on 1 November 2002.

The agreement allows for industrial development to progress across southern parts of the Burrup Peninsula, provides for the development of a conservation estate and ensures the protection of Aboriginal heritage.

DEC continues to work towards having an approved management plan and a management agreement in place.

## Regional activities

### Goldfields Region

- Development of a visitor master plan was completed for Credo and Goongarrie stations, including recreation trails, road access, camping design and shelter construction.
- DEC continued to upgrade and improve visitor facilities at Credo station including installing rock walls, removal of asbestos buildings, closure of rubbish tips and removing visitor risks.
- An upgrade of research facilities was completed at Lorna Glen homestead including upgrading buildings, extending the compound fence, covering the homestead well and improving fencing around the old pool area.
- Development of the Lake Ballard Gormley Statues site for the Shire of Menzies was completed and included site design and supervision of works with the Menzies Aboriginal Corporation.
- DEC worked with volunteers including DEC Bush Rangers at Credo homestead to remove weeds and rubbish; with the Goldfields Specialty Timber Industry Group at Lorna Glen to upgrade the sheds and buildings; and with 4WD groups to install and upgrade toilet and building facilities at Wanjarri homestead.
- The ‘working together’ project was completed with the Wiluna native title claimants at Sydney Heads which included developing interpretation material about joint management projects, involving the local community in the management of Lorna Glen and Earraheedy, and developing a site plan and installing camping facilities at Lorna Glen for the local community to camp when visiting the former stations.
- Biological surveys were conducted at Neale Junction Nature Reserve and the surrounding area as a vehicle to continuing joint management efforts with the Spinifex Aboriginal community.
- Joint management efforts continued with the Patjarr Aboriginal community, which is surrounded by the Gibson Desert Nature Reserve, by facilitating a joint management meeting and implementing works with community members in the Gibson Desert Nature Reserve.

- Four local Indigenous trainees were employed as part of the \$350,000 per annum three-year joint land management project with Cliffs Asia Pacific Iron Ore Pty Ltd and the 'transition to work' program has been successfully completed and will be followed by ongoing training.
- DEC continued to upgrade the carpark in the Kalgoorlie Arboretum including line marking, one-way access and installation of parking bollards.
- DEC is developing a memorandum of understanding with the Shire of Menzies for a \$30,000 project to redesign the visitor site and upgrade facilities at Ullaring Rock.
- Planning for the development of a memorial site at Boorabbin townsite for the families who lost relatives in the Boorabbin fire was commenced with implementation planned for 2010–11.
- The Goldfields Region mag-paper was upgraded.
- DEC continued to develop a visitor services plan for all of the former pastoral stations that have been acquired for conservation in the region.

### Kimberley Region

- A recreation masterplan was prepared for Lennard Gorge recreation site in King Leopold Range Conservation Park, which will include developing a new car park, constructing a new lookout, re-routing of the walk trail and implementing new interpretative and associated risk signage.
- Culverts and floodways were installed on Domes Track in Purnululu National Park, as part of the federal government's Jobs Fund program.
- Two hybrid power systems were commissioned in the Kimberley Region at Mt Hart Wilderness Lodge, King Leopold Range Conservation Park and the rangers' headquarters in Purnululu National Park. This project completes the installation of remote area hybrid power systems in DEC's Kimberley Region.
- The Parry Lagoons Bird Hide at Marngu Billabong in Parry Lagoons Nature Reserve was refurbished including re-stumping of boardwalk, replacing decking on boardwalk and new interpretive panels.

### Midwest Region

- Operations of the Pinnacles Desert Discovery and Monkey Mia Visitor Centre were refined, focusing on improving operational efficiency and increasing revenue generation to advance toward cost neutral operations.
- The Pinnacles Desert Discovery was awarded a gold medal in the West Australian Tourism Awards for the category of 'Best New Tourism Development'. The Pinnacles Desert Discovery and Nambung National Park continue to demonstrate Western Australia's world-class parks system, contributing an estimated \$30 million each year to the state's tourism industry.
- DEC is undertaking extensive planning in response to the construction of Indian Ocean Drive and the expected increase in visitors and changes to visitor patterns in the parks and reserves of the Moora District, including the development of visitor facilities in Nilgen Nature Reserve, the redevelopment of the Hangover Bay day-use site in Nambung National Park, the review of management signage along the entire length of the Indian Ocean Drive, and the review and consideration of management implications for the squatter settlements at Wedge and Grey.
- DEC continued to upgrade visitor sites in the Shark Bay World Heritage Area as part of a \$593,000 federal government's Jobs Fund program, including refurbishment of the walk trail and associated facilities at the Peron Heritage Precinct, construction of a trailhead information shelter at Monkey Mia; and preparation of a visitor master plan for Little Lagoon with construction plans for toilets, shelters and parking.
- Within François Péron National Park, DEC improved visitor access and facilities by fabricating three toilets and two shade shelters to be installed at camp sites, upgrading four-wheel drive access at Bottle Bay using track stabilisation grating at intersections and preparing plans for construction of a tyre deflation station to address visitor risk issues associated with four-wheel driving.
- A new recycled plastic viewing platform was constructed at the Z Bend Lookout at Kalbarri National Park.
- DEC commenced redevelopment of the Coomallo Rest Area on Brand Highway in liaison with Main Roads WA with the construction of a new toilet, an interpretive shelter, and planning for an interpretive trail and for site rehabilitation.

- DEC continued to undertake extensive operations within coastal reserves and parks to address the increased use of unlicensed off-road vehicles.
- An architect was engaged to prepare a structural assessment of buildings in the Peron Heritage Precinct and implemented an extensive program of repair works consistent with maintaining the precinct's heritage values.
- A potential Naturebank site was identified in François Péron National Park and an engineer was engaged to prepare a geotechnical assessment of the potential site.
- A visitor risk management plan was prepared for the proposed Edel Land National Park and an engineer was engaged to prepare a geotechnical assessment of coastal cliffs in the area.
- Additional signage was developed and installed at Kalbarri National Park to emphasise the visitor risks of heat exhaustion and dehydration for walkers in the Murchison River gorge.
- An engineer was engaged to prepare a geotechnical assessment of visitor sites at the coastal cliffs and Nature's Window in Kalbarri National Park.
- An architect was engaged to prepare a structural assessment of three huts in the newly created Dirk Hartog Island National Park and repair works began.
- Recreation master plans were prepared for Coalseam Conservation Park and Mount Augustus National Park to guide future development of recreation sites and activities.
- On behalf of the Shire of Shark Bay, DEC prepared a final management plan for the reserves in the Cape Inscription area of Dirk Hartog Island.
- The Minister for Environment launched the book *Kalbarri* in March 2010.
- A \$27,000 Coastwest grant was implemented to construct 165 metres of recycled plastic boardwalk on the Bigurda Trail, with assistance from DEC's MATES program participants and Kalbarri District High School Bush Rangers.
- 350 routed timber signs were made and installed to identify entry points to DEC-managed rangeland properties and to communicate key management messages.
- DEC revised the camp site booking procedures for the newly-created Dirk Hartog Island National Park and nearby Edel Land.

## Pilbara Region

- An emergency satellite phone system was installed at Turquoise Bay in Cape Range National Park.
- Vehicle access and parking were improved at various sites within Cape Range National Park including sealing the car park at Yardie Creek, re-sealing the Turquoise Bay entry road, Drift Loop and Bay Loop car parks, upgrading the entry road into Sandy Bay, and upgrading and delineation of the car park at Shot Hole Canyon.
- The Coral Bay foreshore concept plan was finalised.
- The mooring and anchoring plan for the Montebello/Barrow Islands Marine Conservation Reserves continued to be implemented.
- Consultation progressed with the Dampier Archipelago Recreation Dwellers Association and Kingfisher Bay Fishing Club members and committee resulting in six-year licence terms for shacks with a range of conditions to enhance enjoyment and protection of Dampier Archipelago islands.
- Development works were carried out including toilets, car park and recreation facilities at Deep Reach in Millstream Chichester National Park.
- A brochure on the Dampier Archipelago was printed.
- A Karlamilyi Park Council joint management meeting was held in March 2010.
- Planning and stakeholder consultation were carried out for proposed developments at Hamersley Gorge.
- Handrails and steps were installed to promote visitor safety at two potentially dangerous points at Handrail Pool in Weano Gorge and at Fortescue Falls in Karijini National Park.
- Karijini Visitor Centre was upgraded, including new interpretation, displays and audio visual resources.
- A statement of mutual understanding between DEC and Rio Tinto/Pilbara Iron's Marandoo Mine was developed to maintain cooperative relationships and management links.

- Commercial tour operations were monitored and electronic log book returns using black box technology were pioneered on whaleshark tour operations.
- DEC contributed to the interpretation plan being developed for Ningaloo Marine Park (Commonwealth Waters) by the federal Department of Environment, Water, Heritage and the Arts.

## South Coast Region

- New staff accommodation was installed at Thomas River, Cape Arid National Park, and at Lucky Bay, Cape Le Grand National Park, after previous facilities were destroyed by fire in 2007 and a storm in 2008 respectively.
- Fitzgerald River National Park's \$40 million improvement project got under way with construction of the first section of the new roadworks from the ranger station to East Mt Barren car park. Planning is under way for the improvement of the recreation sites and a walk trail between Point Ann and Hamersley Inlet.
- Path restoration work was completed in Cape Le Grand National Park on a 4.5-kilometre section of the coastal walk trail involving a new footbridge, viewing platforms, drainage works, and resurfacing and re-alignment works between Hellfire Bay and Le Grand Beach. The coastal walk trail was reopened in April 2010 in its entirety from Lucky Bay to Le Grand Beach for the first time since it was closed by storm events in 2007 and a bushfire in 2008.
- Visitor facilities were replaced and upgraded at Cape Arid National Park after sites were closed to the public following bushfires in 2006 and 2007, including re-opening the Thomas River campground with new facilities such as camp kitchens, information shelters and toilets; installing new gas barbecues at the Thomas River site within Reserve 518 and Seal Creek sites; and re-establishing Len Otte Walk Trail.
- Redevelopment of Benwenerup Inlet campground and Stokes Inlet day use area in Stokes National Park continued, after facilities were destroyed in a 2006 bushfire. New facilities include camp kitchens, information shelters, toilets, interpretation shelters and park signage. Benwenerup campground reopened to the public in December 2009.
- Blowholes pathway in Torndirrup National Park was re-sealed.
- Damaged conveyor belts were replaced along the Dunskey four-wheel drive track, West Cape Howe National Park.
- The 96-kilometre section of the Bibbulmun Track within the Albany District underwent maintenance work, with a focus on vegetation slashing including protecting the West Cape Howe Hut from fire.
- New and maintained existing fuel hazard reduction firebreaks were established around recreation sites at Seal Creek, Jorndee Creek, Thomas River, Lucky Bay, Cape Le Grand, Fanny Cove and Skippy Rock campgrounds and the Cape Le Grand park headquarters.
- Brochures for Fitzgerald River, Stirling Range, Porongurup, Torndirrup and West Cape Howe national parks were reviewed and reprinted.
- Red Gum Pass Road and Stirling Range Drive, Stirling Range National Park were re-sealed.
- Restoration work began on two lighthouse keepers' houses, jetty and lighthouse on Breaksea Island as part of a Jobs Future funded project. A study of the tourism potential of Breaksea Island also began in conjunction with the Great Southern Development Commission.
- Planning of Munda Biddi Trail section from Albany to Denmark began.
- Upgrades to signage continued at Stirling Range National Park by installing new trailhead signs at Toolbrunup, Mt Trio, Mt Hassell, Mt Magog, Central Lookout and Western Lookout recreation sites.
- New trailhead signs were redesigned and installed for the Tree in the Rock picnic area in Porongurup National Park.
- Redevelopment continued at Castle Rock Lookout by providing two new upper and lower lookout structures.
- Maintenance was carried out on several walk trails in Mt Martin Botanical Reserve and Stirling Range National Park, and 1.5 kilometres of the Esperance Lakes Walk Trail at Lake Wheatfield were resurfaced.
- Road maintenance was completed in Woody Lake Nature Reserve and three national parks including Cape Arid National Park where six kilometres of Tagon Road were re-gravelled and Poison Creek Road underwent a major improvement.



- Public vehicle access was re-established in Peak Charles National Park following bushfires in 2008.
- A generator was replaced with a new alternative (wind and solar) power supply unit for seasonal staff at Lucky Bay in Cape Le Grand National Park, and re-cladding and extension commenced at the machinery shed/workshop at the headquarters in Stokes National Park.
- A section of the Four Mile Beach staircase was rebuilt following storm damage.
- The jointly funded Coast West project at Cape Le Grand Beach was completed, removing and upgrading the steps ascending the hill from the beach car park to a newly-constructed viewing platform.

## South West Region

- Formal annual inspections were conducted of all recreation sites to assess visitor risks, including quarterly and annual reviews to monitor progress on implementation of risk mitigation actions.
- Work was carried out with local fishing groups to encourage safe fishing practices and to install warning signs and anchor points at popular fishing sites along the Leeuwin-Naturaliste coast.
- A consultant geologist was engaged to conduct inspections at the high visitation cliff sites, Huzzas and Hamelin Bay, in Leeuwin-Naturaliste National Park.
- Tree pruning was carried out at several recreation sites to minimise the risk to visitors from falling branches, including Honeymoon Pool, Hoffman Mill, Leschenault Peninsula, Bibbulmun Track, St John Brook, Sue's Bridge, Chapman Pool, Karri Corner, Wellington Discovery Forest and Margaret River Eco Discovery Centre.
- EcoEducation programs continued to be delivered at Wellington Discovery Forest and Margaret River Eco Discovery Centre. A new program 'Caring for Places', teaching children about the importance and management of national parks, was introduced, and the program 'Fire – A Force of Life' was updated to match the new geography curriculum. A new tuart ecology program was introduced at Leschenault Peninsula Conservation Park and Tuart Forest National Park. EcoEducation programs were delivered to 2,700 children through 118 excursions. The total number of students and teachers who attended the Wellington Discovery Centre was 1,420 and 1,460 attended the Margaret River Eco Discovery Centre.
- Improvements to Rivers Edge Path at Honeymoon Pool in Wellington National Park continued, including the construction of two viewing platforms which are nearing completion and the installation of two river access stairways which are about to commence. As part of the trail improvement, interpretation is being developed by the local Nyoongar community with elders working with younger community members to develop their understanding and appreciation of this cultural site.
- Upgrading of roads in Wellington National Park continued in conjunction with the shires of Collie and Dardanup and included the surveying, engineering, construction and sealing of three kilometres of Pile Road, and preparation of a further one kilometre for sealing. Survey works and some gravelling were also completed along Falcon Road in preparation for future upgrading.
- Management continued of visitors to the increasingly popular Logue Brook Dam since its opening for recreational use in late 2008. Visitor management for the area has focused on restricting camping to managed areas, providing day-use facilities and controlling off-road vehicles. This has encouraged more family-oriented use of the area. Picnic facilities, information signs and two new toilet blocks have been built. Planning is under way for ongoing improvement to camping and boat launching areas.
- A lookout, stairs and universal access ramp were constructed at Buffalo Beach in Leschenault Peninsula Conservation Park. Dune rehabilitation was carried out by brushing, seeding and planting native species, with more than 6,000 seedlings planted by DEC, local schools, 4WD clubs, scouts and volunteers. Approximately one kilometre of rehabilitation fencing has been constructed and work carried out on weed and feral animal control.
- Improved access continued to be provided for people with disabilities through realignment and hard surfacing of the Cape to Cape Track between Cape Naturaliste and Sugarloaf Rock, with a further 250 metres completed, and a 100-metre section of boardwalk commenced.
- A lookout platform was constructed and the car park at Karri Corner was improved to enable visitors to safely view the majestic Boranup karri forest in Leeuwin-Naturaliste National Park.
- New universal access toilet facilities and footpaths were constructed at the historic Waterwheel near Cape Leeuwin in Leeuwin-Naturaliste National Park.
- Nyoongar heritage and the river environment were protected along with enhanced visitor access at Chapman Pool in Blackwood River National Park through bank stabilisation, installation of a canoe launch area and provision of a sandy beach.

- Mountain bike trails continued to be maintained and developed at Wellington National Park in conjunction with the South West Mountain Bike Club and West Australian Mountain Bike Association by planning and constructing the Boylan Trail.
- Working partnerships continued with the South West Mountain Bike Club at Wellington and Bramley national parks, and the Mitsubishi Four Wheel Drive Club at Leschenault Peninsula Conservation Park.

### Swan Region

- In partnership with the Perth mountain bike community, development continued on the Goat Farm Mountain Bike Park in Greenmount National Park to internationally recognised standards.
- Park Road and associated car parks were resurfaced, resealed and curbed to overcome drainage issues in John Forrest National Park.
- Internal walk trails were designed and constructed at Fred Jacoby Park and new interpretive signs were provided that tell the story of the park.
- A sign plan for Beelu National Park was developed in accordance with the new DEC sign system.
- Management guidelines were developed for Gngangara and Pinjar off-road vehicle areas and planning commenced for trails, car parks, toilets and additional facilities.
- A new boardwalk and additional lookouts were constructed on the southern side of Penguin Island including a series of new interpretive signs for the Island View Walk Trail.
- With the Department of Fisheries, the Shoalwater Islands Marine Park zone system was gazetted on 16 April 2010 under the CALM Act. A three-year education program aims to inform park users of the new legislation and the area's unique characteristics.
- Visitation increased by 10 per cent each year for Yanchep National Park with over 240,000 visitors in 2009–10. The park received the Bronze Award in the 2010 Tourism Awards – Category 2 – Significant Tourism Attraction. In addition, the Park's Visitor Services Officer, James Spurgeon, was announced as Western Australia's Young Tourism Professional.
- The Disability Services Commission 'You're Welcome' initiative continued to be implemented, with a disability access review conducted at key sites.
- Formal annual inspections were carried out at all recreation sites to assess visitor risks, including quarterly and annual reviews to monitor progress on implementation of risk mitigation actions. All visitor risk management (VRM) guidelines and forms were reviewed and the VRM database trial commenced. All VRM action items have now been completed from the 2007 audit report of 113 leases within Swan Region.

### Warren Region

- The visitor master plan was implemented for the Black Point and Lake Jasper precinct in the northern end of the D'Entrecasteaux National Park.
- The upgrade of Pneumonia Road access was completed in the northern end of the D'Entrecasteaux National Park. This is a jointly funded project with the Shire of Nannup and Main Roads WA.
- The extension of the car park at the Valley of the Giants Tree Top Walk was completed, adding 26 new bays to the original car park.
- The Donnelly Boat Landing access road and parking areas upgrade was completed.
- A small boat launch facility and revetment wall at Coalmine Beach were completed. This is a jointly funded project with the Department of Planning.
- Construction continued on the Walpole Wilderness lookout and site entry structure at Mt Frankland.
- A total of 250 kilometres of roads across the Donnelly and Frankland Districts were maintained.
- Structure and facility improvements at 100-Year Forest and Manjimup King Jarrah sites were completed.
- Over 63 days, 36 activities were delivered to 466 participants through the Valley of the Giants Tree Top Walk Interpretation program.
- Planning and construction of the Munda Biddi Trail section from Nannup to Denmark commenced.



## Wheatbelt Region

- The Congelin Campground project at Dryandra Woodland was completed to reduce environmental degradation and improve visitor facilities, access roads, car parks, interpretation panels, fencing, picnic tables, fire rings and toilets.
- Planning commenced for a new camping area at Dryandra Woodland.
- Barna Mia Nocturnal Visitor Centre, located in Dryandra Woodland, continued to provide a unique experience for visitors to Dryandra Woodland and the Wheatbelt Region.
- Assistance continued to the Toyota Land Cruiser Club of WA with volunteer maintenance work at Dryandra Woodland and Emu Rocks.
- Well covers were constructed and installed over historic wells at Emu Rocks, along the Holland Track.
- Redevelopment continued at Kokerbin Rock Nature Reserve and Kwolyin Townsite. In partnership with the Shire of Bruce Rock, two interpretation shelters were installed at Kokerbin Rock and one at Kwolyin townsite, interpretation signs were designed and trail markers were manufactured. Two viewing platforms will be installed at the wave formation at Kokerbin Rock in spring 2010 to finalise this project.
- Work has been carried out in collaboration with the Wongan Hills community to develop an interpreted walk trail and parking infrastructure at the Gathercole Nature Reserve and maintain the Mount Matilda walk trail, Wongan Hills Nature Reserve.
- Consultation continued with the Hyden-Kondinin communities to develop a plan for recreational facilities and access at Lake Cronin Nature Reserve.

## Environmental Regulation

DEC's responsibilities include protecting and conserving the state's environment on behalf of the people of Western Australia. Under the EP Act the department is empowered to do this through industry regulation including licensing and registration of prescribed premises, licensing of controlled waste transporters, and administration of the Environmental Protection Regulations, ensuring emissions and discharges meet acceptable criteria, and pollution incidents are responded to effectively. Under the *Contaminated Sites Act 2003*, the department has responsibility to ensure that contaminated sites are appropriately managed. Monitoring ambient air quality and developing air quality management plans for priority air sheds contributes to achieving these goals.

In 2009–10 the department implemented the state-wide Industry Regulation Compliance Strategy and supporting Compliance Program 2009–10, addressing a range of issues through educative industry sector reports and through the local environmental enforcement group process, and ensuring a consistent response in accordance with the department's *Enforcement and prosecution policy*. In an Australian first, a sequenced permeable reactive barrier groundwater treatment system was installed in Bellevue, to protect the Helena River from two migrating chlorinated hydrocarbon plumes. A project was established to ensure consistent, efficient and legally sound delivery of industry regulation work systems, and all State Development portfolio project approvals were processed within target timeframes.

## Controlled waste

Licensing of carriers, vehicles and drivers continued in 2010, and a program to verify the legal entity of each licensed company has been completed.

**Table 24: Number of controlled waste licences issued in 2009–10 and 2008–09**

Type	2009–10	2008–09
Carrier	327	341
Vehicle	475	474
Driver	1005	940

Driver training for metropolitan-based drivers continues, with 141 drivers attending in 2009–10.

The review of the Environmental Protection (Controlled Waste) Regulations 2004 is progressing. Industry consultation has been undertaken and gazettal of the amended regulations is anticipated in 2010-11.

The total volume of controlled waste tracked during 2009–10 was 719,931 kL (compared to 682,950 in 2008–09) in a total of 81,531 loads (compared to 74,815 in 2008–09). These comprised:

- 57.7 per cent biological
- 13.7 per cent alkalis
- 0.4 per cent acids
- 14.6 per cent waste oils
- 6.6 per cent low-strength waste waters
- 7.0 per cent other.

**Further information** on controlled waste is available on the DEC website:  
<http://www.dec.wa.gov.au/q=#62>

## Licensing milestone

In June 2010 DEC's Industry Regulation business achieved a milestone, clocking up 18 consecutive months of issuing works approvals for major resource projects within the Cabinet-endorsed 60-working-day timeframe.

DEC's Licensing and Permitting Branch Manager Peter Skitmore, pictured with colleague Alesha Hayward, said DEC had implemented a number of process reforms to improve turnaround times.

Approval reports are published quarterly on DEC's website:

<http://www.dec.wa.gov.au/content/view/5234/2196/>



## Approvals processing

DEC continued to improve its processing times in 2009–10. The department met the 60-working-day target for State Development portfolio project licence applications, achieving an average of 42 working days. In 2008–09 the average was 49 working days.

DEC issued 72 works approvals, twice the number granted in 2008–09 with all issued within the target timeframe. Reductions in processing time for works approvals have been achieved with the average approval time being 44 working days. In 2008–09 the average approval time was 59 working days.

Key achievements in implementing other processing time improvements during 2009–10 were:

- developing internal guidelines and policies improving efficiency and certainty for industry in the approval process
- developing internal 'regulatory maps' for 89 prescribed premises categories, identifying areas of regulatory duplication and reform opportunities between DEC and other decision-making authorities
- completing two business improvement projects addressing ambient air parameters applicable to Western Australia, for use in works approval and licence assessments
- agreeing on dangerous goods management and defining roles and responsibilities between DEC and the Department of Mines and Petroleum.

**Further information** on regulatory performance and reporting is available on the DEC website:  
<http://www.dec.wa.gov.au/q=#61>



## National Pollutant Inventory

Emissions from 746 Western Australian industrial facilities were submitted to the federal government during 2009–10 for publication on the National Pollutant Inventory website. A total of 85 per cent of facilities now use the online reporting system to submit their reports.

Further information on the National Pollutant Inventory is available on the DEC website:

<http://www.dec.wa.gov.au/q=#63>

## Industry regulation

### Regulation of prescribed premises

During 2009–10, 907 premises held licences under Part V of the EP Act. One hundred and forty-one works approvals were issued in 2009–10, compared with 85 in 2008–9. Fifty-five new licences were issued.

Table 25: Prescribed premises

Region	New works approvals issued 2009–10	New licences issued 2009–10	Active licences 2009–10
Goldfields	20	8	92
Kimberley	2	0	31
Midwest	17	6	98
Pilbara	34	13	125
South Coast	1	1	53
South West	23	3	135
Swan	43	15	313
Wheatbelt	1	9	60
Total	141	55	907

### Industry Regulation Compliance Strategy

Compliance inspection is one regulatory tool available to assess a licensee's compliance with its legal requirements, and to review achievable environmental standards.

DEC implemented a state-wide Industry Regulation Compliance Strategy during 2009–10, aligning inspection and compliance activities to meet performance targets. The program focused resources on risk-based prescribed premises inspections, industry sectors and monitoring compliance with environmental conditions set on projects assessed by the Environmental Protection Authority under Part IV of the EP Act.

In late 2009, the Part IV compliance monitoring function and associated staff were transferred to the newly created Office of the Environmental Protection Authority. At the time of transfer Part IV compliance monitoring was on track to meet program targets.

Compliance actions were managed in line with DEC's *Enforcement and prosecution policy* and through educative industry sector reports.

In implementing the program, performance targets were achieved for high priority, medium priority and special risk premises and eight industry sector programs: Alcoholic Beverage Manufacturing; Boat Building and Maintenance; Cattle Feedlots; Dredging Activities; Landfills; Metal Finishing (Galvanizing, Electroplating and Abrasive Blasting); Screening of Materials; and Sand Mining.

A program review is being conducted to identify opportunities to achieve all performance targets including medium/high and low priority premises targets.

**Table 26: Industry Regulation Compliance Program performance outcome**

Program Area	Inspection Target	Inspections Undertaken	Performance Outcome
Industry Sector (excluding Controlled Waste)	110	110	Achieved
Industry Sector Controlled Waste	430	386	Not Achieved Variance 10% of target
Special Risk	15	34	Achieved
Regional Locations (Risk based)			
High	15	15	Achieved
Medium High	98	55	Not Achieved Variance 44% of target
Medium	105	165	Achieved
Low	226	148	Not Achieved Variance 35% of target
Registered	Complaint based	53	N/A

**Further information** about industry regulation is available on the DEC website:  
<http://www.dec.wa.gov.au/q=#64>

### **Southern Metropolitan Regional Council's Canning Vale Waste Composting Facility**

The Southern Metropolitan Regional Council's (SMRC) Canning Vale Waste Composting Facility continued to be the subject of odour complaints from the community. Independent consultants were engaged to conduct a review of the operations and develop an improvement plan. SMRC has been implementing the improvement plan with the majority of works scheduled to be completed by July 2010.

DEC completed a review of SMRC's licence and has imposed additional conditions to ensure appropriate odour management.

### **Cockburn Cement Ltd, Munster**

DEC is progressing a review of the licence for Cockburn Cement Ltd's Munster plant, which is the largest cement and lime plant in Western Australia. A draft amended licence was released for public comment in April 2010, as part of a two stage non-statutory consultation process, with over 50 submissions received. These submissions are being reviewed. After further consultation on a revised draft licence, the amended licence will be issued in 2010-11 with conditions to address community concerns in relation to dust and odour.

### **Indian Ocean Territories**

DEC continued to provide environmental regulatory services for Christmas Island and Cocos (Keeling) Islands as part of a formal arrangement with the federal government. In March 2010 a new three-year service agreement commenced. In collaboration with the Fire and Emergency Services Authority of Western Australia (FESA), DEC responded to and removed potentially hazardous chemicals at a site on Cocos Island.


Arrangements between FESA and DEC for hazardous materials management on these Islands are being established.

### **Noise regulation**

DEC provides technical advice on noise to the Office of the EPA and to planning and local government authorities, as well as policy, technical, enforcement and training support for DEC, Police and local government officers.

During 2009-10, DEC provided environmental impact assessment advice on 59 projects and gazetted two variations of the noise emission standard under the Environmental Protection (Noise) Regulations 1997, for Kalgoorlie Consolidated Gold Mines Pty Ltd and the Port of Esperance.

A Consultative Regulatory Impact Statement has been prepared for proposed amendments to the Environmental Protection (Noise) Regulations 1997. Public consultation on the proposed amendments is planned for 2010-11.



DEC contributed to the State Planning Policy 5.4 *Road and rail transport noise and freight considerations in land use planning* gazetted in September 2009.

DEC provided input for the Environment Protection and Heritage Council's (EPHC's) *National windfarm guidelines*; AS 4236-2110 *Guide to noise and vibration control on construction, demolition and maintenance sites*; and the national Noise Labelling and Limit Scheme.

**Further information** about noise regulation is available on the DEC website:

<http://www.dec.wa.gov.au/q=#65>

## Pollution and complaint response

### Emergency Management

DEC continued to provide state-wide emergency response for pollution incidents as well as emergency advice and on-scene detection and monitoring of emissions at hazardous materials incidents managed by FESA under the State Emergency Plan for hazardous materials (WESTPLAN HAZMAT). DEC worked with FESA to develop a HAZMAT emergency management package for local governments, for roll out when the WESTPLAN HAZMAT review is completed in 2010.

Major incidents attended by DEC during 2009–10 included:

- responding to hazardous waste drum dumping in the Perth metropolitan area
- protecting the Halls Creek water supply from a significant diesel spill
- removal of potentially hazardous chemicals at a site on Cocos Islands
- monitoring impacts from fires at Armadale landfill, a commercial laundry in Hamilton Hill and a meat packing facility.

**Further information** on pollution incidents and pollution response is available on the DEC website:

<http://www.dec.wa.gov.au/q=#66>

### Environmental Health training

DEC contributed to the development of the national enHealth Environmental Health Officer's Skills and Knowledge Matrix setting out skills and knowledge requirements for local government environmental health officers to address environmental as well as health issues.

### AERO Project

DEC completed the first Airborne Environmental Risk Observation (AERO) project, which identified 60 sites where intervention was required to abate unauthorised discharges of pollutants to the environment. The project received a high commendation in the 2010 Safer Community Awards.

## Regulation of contaminated sites

### Implementation of the *Contaminated Sites Act 2003*

One hundred and ninety seven new reports of known or suspected contaminated sites were received under the *Contaminated Sites Act 2003* in 2009–10.

DEC classified 456 sites during the year, bringing the total number of sites classified under the Act to more than 1,402. Soil and groundwater investigations confirmed the presence of contamination at approximately 317 of these sites (made up of more than 2,260 individual lots), which are listed on the publicly available database on DEC's website. DEC continued systematic follow-up of sites requiring remediation or identified as a high priority for further investigation, with generally positive response to DEC's enquiries regarding investigation or clean-up works in progress or planned.

Between March and May 2010, a permeable reactive barrier (PRB) groundwater treatment system was installed in Bellevue, to protect the Helena River. The PRB will treat chlorinated hydrocarbons in two plumes which are migrating towards the river; one from the former waste control site and the second from an unrelated source area nearby. The PRB comprises two 76-metre-long parallel trenches which are a minimum of one metre wide and 11 metres deep. The upgradient trench is filled with a low-cost sawdust and sand mix to remove nitrate from the groundwater before it flows into the second trench, which is filled with an iron and sand mix to treat the chlorinated hydrocarbons. The project was funded from the Contaminated Sites Management Account, with project management assistance from LandCorp.



## Quick response secures public health

A fire at an industrial laundry facility in Hamilton Hill in Perth's south, which was blowing toxic smoke towards houses, called DEC's Environmental Hazard Branch into swift action to protect public health.

While the Fire and Emergency Services Authority was the agency in charge of the incident in May 2010, DEC was called on to carry out air monitoring to determine the threat to community health.

Environmental Hazards Branch Manager Ken Raine said the incident was classed as a Code 3, which

indicates an imminent threat to public health and the environment.

DEC responded with four officers and three pollution response vehicles, and as a result of their air monitoring, about 20 people were evacuated from a block of townhouses to address concern about the toxicity of the smoke from the fire. A pollution response officer wearing respiratory protection assisted police with the evacuation.

Mr Raine said in situations like these DEC had a number of priorities.

"Our first priority is protecting and securing public health," he said.

"Then we strive to protect the environment and provide assistance to ensure there is an adequate clean-up.

"Finally, we collect evidence, which can be important to determining the cause of the incident and can provide information that is often crucial in further action being taken in relation to the cause of the incident and enforcement under the *Environmental Protection Act*.

"In this case, it was determined the fire was accidentally caused due to spontaneous combustion of dishcloths."

In addition, almost \$1.3 million was provided from the Contaminated Sites Management Account for the investigation or remediation of state sites in Cullacabardee, Gnangara, Katanning, Northampton, Pemberton, Pinjar and Wittenoom.

DEC published updated versions of the following Contaminated Sites Management Series guidelines during the year:

- *Assessment Levels for Soil, Sediment and Water* (February 2010)
- *Contaminated Sites Auditors: Guidelines for Accreditation, Conduct and Reporting* (November 2009).

Specialist technical advice was provided to external parties such as community groups, land developers, industry and state and local government, in relation to the assessment and management of contaminated sites and areas affected by acid sulfate soils or water.

The department reviewed and provided advice on 841 technical reports relating to contaminated sites and 243 technical reports relating to acid sulfate soils and water. These reports were submitted to comply with planning and Ministerial conditions, dewatering licence requirements, or as part of the investigation or remediation of reported contaminated sites.

**Further information** on the management of contaminated sites is available on the DEC website: <http://www.dec.wa.gov.au/q=#67>

### Acid sulfate soils

DEC contributed to workshops on acid sulfate soil issues for the community, local government and environmental consultants at metropolitan and regional venues.

Under a second acid sulfate soil mapping program, a total of 236 sites were validated for acid sulfate soil occurrence in the Perth metropolitan area between 2007 and 2010. The information captured through field



assessment and laboratory analysis is intended to provide a broad overview on the extent and severity of acid sulfate soil occurrence. To assist with future detailed site-specific assessments, technical information for each location tested is now available via the Shared Land Information Platform (SLIP) hosted by Landgate.

In addition, a total of 95 monitoring wells were drilled and tested to assess the extent and severity of acidic groundwater conditions on the Swan Coastal Plain.

Collaborative research projects continued in 2009–10, to support the mapping program as well as through in-kind contributions of technical advice and logistical support. Projects included an assessment of the composition of pyrite in sandy podosols on the Swan Coastal Plain; assessment of the accumulation of monosulfidic sediments in the Peel-Harvey system; and investigation of geochemical acidification and acidity transport processes, with a view to developing an environmental risk assessment modelling approach to better predict areas at risk of soil and water acidification.

**Further information** on acid sulfate soils is available on the DEC website:

<http://www.dec.wa.gov.au/q=#68>



## An Australian first

Principal Environmental Scientist Dr Janet Macmillan and Contaminated Sites Branch Manager Kerry Laszig (left and right) escorted Environment Minister Donna Faragher on an inspection of the installation of Australia's first double-trench permeable reactive barrier (PRB).

The PRB was installed at Bellevue between March and May 2010 to prevent contaminated groundwater entering the Helena River.

The site, now managed by DEC on behalf of the state, is contaminated with petroleum hydrocarbons and chlorinated solvents which can be attributed to both historical site operations and a fire.

There are about 200 PRBs in operation around the

world but the one developed at Bellevue, consisting of two parallel trenches, was believed to be the first of its kind in Australia.

Trenches 11 metres deep and 76 metres long were dug and filled with treatment materials including sawdust and sand in one to treat nitrates and an iron and sand mix in the other to treat chlorinated solvents.

The PRB works by breaking down contaminants and rendering them harmless as the groundwater flows through the treatment materials.

Once installed, the PRB is not visible and causes no disruption to the local community because it operates passively, does not produce any emissions and requires no maintenance.

The \$3 million installation has been designed to last at least 15 years, during which time the groundwater and the Helena River water quality will be monitored to evaluate the PRB's performance.

## Perth air quality management plan

The Perth air quality management plan (AQMP) launched in 2000 is a 30-year government initiative aimed at maintaining Perth's air quality at a high standard by addressing the emission of air pollutants, in order to protect the environment and the health of the community. Within the context of the AQMP, DEC investigated and addressed vehicle emissions, haze from domestic wood heaters and environmental regulation related to air quality during 2009–10.

**Further information** on air quality management programs is available on the DEC website:

<http://www.dec.wa.gov.au/q=#69>



## Vehicle emissions

*CleanRun* is the key motor vehicle emissions management initiative by DEC aimed at meeting the objectives of the Perth AQMP and the National Environment Protection (Diesel Vehicle Emissions) Measure. During 2009–10, *CleanRun* continued to focus on vehicle emissions testing and driver behaviour, using a remote sensing device (RSD) at various sites across the Perth metropolitan area to monitor vehicle exhaust emissions and promote vehicle maintenance.

The RSD will be used in community education projects that will enable individuals and businesses to have their vehicle emissions checked.

The *CleanRun Behaviour Change Initiative*, aimed at influencing vehicle driver behaviour, progressed during 2009–10. Development, promotion and implementation of a *CleanRun EcoDrive* 'how to' guide and website resource for fleet-based organisations currently being trialled by DEC and other organisations, will be used to further progress the program.

As part of the *CleanRun* environmental verification program, the Perth Traffic Corridor Study technical report was released in early 2010. The study involved ambient air monitoring for particles and polycyclic aromatic hydrocarbons along one of Perth's major transport routes during 2007 and 2008.

## Haze from domestic wood heaters

The Perth AQMP haze reduction initiative continued with the successful conduct of a pilot smoke patrol program in the City of Armadale. Smoke patrols identify excessively smoky domestic wood heaters. DEC is working with the City of Canning to implement a program in that area in winter 2010 and continues to support other local government authorities and wood heater retailers to address this issue.

## Regional air quality management plans

DEC continued to investigate ambient air quality in regional areas, including Port Hedland, the Goldfields and Wagerup. Technical and policy support was provided to the Port Hedland Dust Management Taskforce which released the *Port Hedland air quality and noise management plan March 2010*.

A comprehensive report on air quality in Kalgoorlie-Boulder from 1999 to 2008 has been prepared, and following industry review will be made available on the DEC website.

## Air quality monitoring

### Monitoring stations

During 2009–10, DEC operated 11 metropolitan and seven regional air quality monitoring stations to assess the presence of pollutants including carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide and particles as PM10 and to report on ambient air quality through the annual *Western Australia Air Monitoring Report*, in periodic State of the Environment Reports and to update the DEC website. A mobile monitoring station was purchased to enable a rapid response to air quality needs across the state.

### Wagerup


DEC has been responding to community concerns about air quality in the Wagerup area for many years and previously published the findings of the *Winter 2006 study: Intensive air quality investigations at Wagerup*.

Further monitoring was carried out in 2009–10 with temporary stations established in Yarloop and Cookernup using proton transfer mass spectrometer and meteorological instruments. Compounds measured included volatile organic compounds, nitrogen oxides, carbon monoxide, sulphur dioxide and particles. Processing the most recent data has commenced.

### Background air quality study, Midland and Kwinana

DEC began the Midland Background Air Quality Study in August 2007 and active and passive sampling methods were used to target a number of common air pollutants. A Fourier Transform Infra Red Spectrometer was used from November 2009 to May 2010 to continuously monitor hydrogen fluoride and hydrogen chloride and a data verification program has commenced to determine how the instrument can be most effectively deployed in the future.

The Kwinana Background Air Quality Study commenced in July 2007. Data collected have been analysed and a report is being prepared. In consultation with industry and the community additional monitoring was initiated in May 2009 at Hillman Child Health Centre and Calista Primary School and has continued in 2009–10, with wind



## Air quality in the spotlight

Staff from DEC's Air Quality Management Branch played a major role in the 19th International Clean Air Society of Australia and New Zealand (CASANZ) Clean Air and Environment conference in Perth.

A number of staff presented papers at the conference to delegates from around the world, and were able to network with people in similar positions in different parts of Australia and the world.

DEC was a silver sponsor for the conference, and also took the opportunity to show off the work of the Air Quality Management Branch at the conference exhibition.



direction, wind speed, temperature and relative humidity also being assessed. Analysis of the data is now under way.

### Redetermination of sulfur dioxide emissions in Kwinana

The Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999 (Kwinana EPP) establishes ambient air quality standards and limits for sulfur dioxide and for total suspended particles in the Kwinana region. Under the Kwinana EPP the Director General of DEC can determine the maximum permissible quantities (emission limits) of sulphur dioxide from significant sources in the Kwinana EPP Area.

In order for the limits to be changed, a formal computer modeling 'redetermination' is required which can involve the reassessment of some or all of the individual emission limits, to ensure that ambient levels continue to remain within EPP standards. A redetermination process was completed in December 2009 following notices issued by the Director General in relation to the eight affected industries in the Kwinana Industry Area.

The report advising the reasons for the redetermination and providing technical details on the process, is available on the DEC website: <http://www.dec.wa.gov.au/q=#70>

# Environmental Sustainability

DEC has the responsibility to develop and implement policies and strategies that promote environmentally sustainable practices in industry, government and the community in Western Australia.

## Legislation

DEC has responsibility for implementing the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act), *Waste Avoidance and Resource Recovery Levy Regulations 2008*, and the *Waste Avoidance and Resource Recovery Levy Regulations 2007*.

Under the WARR Act and WARR Levy Regulations, landfills in the Perth metropolitan area, and landfills anywhere in the state which receive waste from the metropolitan area, are obliged to pay a landfill levy on the waste received. The amount of levy due is conditional on the type of landfill and the quantity of waste.

The landfill levy is due to be paid quarterly at the end of July, October, January and April. DEC administers receipt of landfill levy funds and compliance with the legislation and regulations. In 2009–10 the levy yielded \$18,117,682 from 32 landfill sites which complied with the regulations.

Parts 61–65 of the WARR Act relate to the establishment of local waste laws which must be approved by the CEO of DEC and adopted by local governments. The department dealt with applications from 13 local governments for the development of local laws in 2009–10, and is collaborating with WALGA on the development of a standard model for local laws that can be readily adopted by local governments.

## Establishment of the Office of the Waste Authority

Based on recommendations of the 2009 Parliamentary Inquiry into Municipal Waste Management in Western Australia, the Office of the Waste Authority was established to support the operations of the Waste Authority.

## Delivery of programs on behalf of the Waste Authority

The Department's Waste Management Branch provides program delivery support to the Waste Authority, in accordance with a Service Level Agreement established in 2009.

Programs delivered in the reporting period include a regional funding program for local government, administration of strategic partnership agreements, household hazardous waste collection, and policy advice to government and other stakeholders on waste and recycling issues.

## New resources help create 'Waste Wise' schools



Environment Minister Donna Faragher launched a new accreditation scheme and resource packages for teachers in March, with the help of a group of Wirrabirra Primary School students and DEC's Director Strategic Development and Corporate Affairs Ron Kawalilak, environment teacher Nichola Butler, and school Principal Steve Richards.

The new resources, which include an operating practices manual, curriculum-linked activity guides and fact sheets based on the three 'R's' – reduce, reuse and recycle, will equip and support current and future Waste Wise schools in minimising waste as well as learning about the consequences of not doing so.

To be accredited Waste Wise, a school has to undertake a holistic commitment to waste minimisation and environmental activities, which

may include composting, worm-farming and creative ways of recycling and reusing.

## Strategic Waste Initiatives Scheme and Community Grants Scheme

The Strategic Waste Initiatives Scheme (SWIS) and the Community Grants Scheme (CGS) are two grant funding programs which are funded from the Waste Avoidance and Resource Recovery Account and administered by DEC. Administration involves advertising of funding rounds, assessment of applications, development of recommendations for grant funding, and administration of funding contracts and payments.

Two funding rounds under each scheme were offered in 2009–10. In total, 15 grants were awarded under SWIS and 21 grants under CGS. More detail on these grants is included in the Waste Authority annual report.

## Support for participation in EPHC

DEC participates in inter-jurisdictional working groups to implement EPHC projects and provides policy advice to the Minister on EPHC issues.

As part of the implementation of the National Packaging Covenant, DEC administers a funding program. The National Environment Protection (Used Packaging Materials) Measure is implemented in Western Australia through enforcement of the Environment Protection (NEPM-UPM) Regulations 2007.



## Glass recycling facility a first

The WA Waste Authority helped fund Western Australia's first glass recycling facility in the City of Belmont.

The announcement of \$1.95 million funding from the Western Australian Government was made by Environment Minister Donna Faragher, pictured with Mayor of Canning Giuseppe (Joe) Delle Donne in front of a mountain of waste glass. WA's funding is matched by a \$1.95 million grant from the National Packaging Covenant.

Colmax Glass, the company approved to construct and operate the plant, will contribute the balance to the \$5.4 million project.

Approximately 80,000 tonnes of glass packaging is distributed throughout the state every year as packaging for food and beverages. About 15,000 tonnes of used glass collected in WA is recycled, with the majority sent to South Australia for the production of bottles. However, many shipments of waste glass are rejected because they are contaminated.

The new plant will be able to accept contaminated glass, which will enable sorting facilities to send their used glass there instead of to landfill.

## Sustainability Programs

The Sustainability Programs Unit continues to provide advice and support to government, state agencies, local government, non-government organisations and groups on the development, promotion and implementation of sustainability policy, initiatives and reporting. There is increasing evidence of sustainability principles and objectives influencing the decisions and actions of a widening range of public policy-makers, practitioners and service providers in a practical way, across all sectors of the community.

Interest is also growing in the development of sustainability frameworks that address significant, long-term (inter-generational) aspirations, challenges, outcomes, and paradigms of business decision-making; and that provide new foundations for shaping long and short-term (intra-generational) planning, strategic management directions and determination of meaningful sustainability indicators. These developments reflect the maturing of the sustainability agenda in this state and they will continue to be pursued.

# Coordinating Western Australia's Response to Climate Change

## Taking action on climate change

DEC is charged with providing leadership in the development and implementation of strategies to reduce greenhouse gas emissions and adaptation initiatives to reduce the impact of climate change for Western Australia. This is achieved through the department's Climate Change Unit (CCU).

**Further information** about the CCU is available on the DEC website:

<http://www.dec.wa.gov.au/q=#71>

## Low Emissions Energy Development Fund

The third round of the Low Emissions Energy Development (LEED) funding program started with a call for applications in February 2010, resulting in 27 applications. The LEED fund aims to help develop sustainable low emission technologies to reduce Western Australia's greenhouse emissions. A total of \$10 million was available for suitable projects in this round.

Good progress was made over this period by the first and second round LEED projects, namely, the development of an oil mallee harvester (Future Farm Industries CRC) and construction of a demonstration wave energy facility (Carnegie Wave Energy Ltd).

**Further information** about the LEED fund is available on the DEC website:

<http://www.dec.wa.gov.au/q=#72>

## Climate Change Adaptation and Mitigation Strategy

The CCU continued to develop the Climate Change Adaptation and Mitigation Strategy which will cover each major sector of Western Australian industry as well as urban planning agencies and state water and energy utilities. It will also assess the likely impacts and risks of climate change to various sectors of the economy and to communities and make recommendations on mitigation and adaptation actions.

**Further information** about climate change adaptation and mitigation is available on the DEC website:

*Adaptation:* <http://www.dec.wa.gov.au/q=#73>

*Mitigation:* <http://www.dec.wa.gov.au/q=#74>



## Vehicles for success

In April DEC officially opted into a program that will see it take part in the first-ever Australian trial of fully electric fleet cars.

Environment Minister Donna Faragher and DEC Deputy Director General Environment Robert Atkins were on hand at the launch of the trial, to inspect the Ford Focus that will be incorporated into the department's fleet and garaged as a pool vehicle at the Atrium headquarters.

The trial supports DEC's commitment to lead by example in reducing total greenhouse gas emissions from fleet vehicles. The department has also trialled the new Toyota Hybrid Camry as a potential low emissions fleet option.



### Indian Ocean Climate Initiative Stage 3

Research continued into the nature and impacts of climate change on Western Australia. The Indian Ocean Climate Initiative (IOCI) is supported by a \$4 million investment by the state government in partnership with CSIRO and the Bureau of Meteorology to provide basic climate research in Western Australia. Stage 3 is building on the existing work completed by IOCI to provide better understanding of the current and future climate and the impact of changes, particularly in north-west Western Australia. This investment will enable the development of better projections of regional weather to allow people and businesses, as well as state government agencies, to plan and adapt to a changing climate.

**Further information** on the Indian Ocean Climate Initiative is available on the project website:  
<http://www.ioci.org.au/>

### Electric vehicles trial

DEC signed a memorandum of understanding to participate in a trial of electric vehicles managed by The University of Western Australia and CO2Smart Pty Ltd.

### System for accounting and reporting of government emissions

The CCU continued to administer the system for accounting and reporting of government emissions (SARGE), assisting 26 government agencies to account for and report their greenhouse gas emissions and reductions for 2008–09.

**Further information** about SARGE and greenhouse reporting is available on the DEC website:  
<http://www.dec.wa.gov.au/q=#75>

### Partnership project with the Conservation Council of WA

The CCU completed a partnership project with the Conservation Council of WA to build community capacity in climate change policy and increase the level of community engagement in state and national climate change policy and program development.

### Enabling local government adaptation

The CCU assisted the Midwest Regional Organisation of Councils and the Batavia Regional Organisation of Councils to access Local Adaptation Pathways Program funding from the federal government to undertake risk and vulnerability assessments and to build council capacity, and assisted other councils to identify risks and develop adaptation plans.

**Further information** about climate change adaptation for local government is available on the DEC website:  
<http://www.dec.wa.gov.au/q=#76>

# Glossary of acronyms and abbreviations

AERO	Airborne environmental risk observation
AHU	Aboriginal Heritage Unit
AQIS	Australian Quarantine Inspection Service
AQMP	Air quality management plan
BIF	Banded ironstone formation
CALM	Conservation and Land Management
CCU	Climate Change Unit
CGS	Community Grants Scheme
CPI	Consumer price index
CRC	Cooperative research centre
CSIRO	Commonwealth Scientific and Industrial Organisation
CVA	Conservation Volunteers Australia
DEC	Department of Environment and Conservation
DNA	Deoxyribonucleic acid
EP	Environmental Protection
EPA	Environmental Protection Authority
EPBC	Environment Protection and Biodiversity Conservation
EPHC	Environment Protection and Heritage Council
EPP (Kwinana EPP)	Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999
FDIS	Fauna distribution information system
FESA	Fire and Emergency Services Authority
FMP	Forest Management Plan
FPC	Forest Products Commission
HAZMAT	Hazardous materials
IOCI	Indian Ocean Climate Initiative
LEED	Low Emissions Energy Development
LPW	Land for Wildlife
MATES	Mentored Aboriginal Training and Employment Scheme
MG	Miriuwung Gajerrong
MG Corporation	Yirrgeb Noor Dawang Miriuwung Gajerrong Corporation
ML	Management letter
MOU	Memorandum/memoranda of understanding
MWA	Murchison Widefield Array
NEPM-UPM	National Environment Protection (Used Packaging Materials) Measure
NHT	Natural Heritage Trust
NRM	Natural Resource Management
NVF	Native Vegetation Framework
OEPA	Office of the Environmental Protection Authority
PEC	Priority ecological community
PLANET	Probing Lensing Anomalies Network
PRB	Permeable reactive barrier
RCC	Roadside Conservation Committee
SARGE	System for accounting and reporting of government emissions
sdB	Hot subdwarf
SLIP	Shared land information platform
SWIS	Strategic Waste Initiative Scheme
SWWMP	South West Wetlands Monitoring Council
TEC	Threatened ecological community
UCL	Unallocated Crown land
WAHERB	Western Australian Herbarium specimen database
WAM	Western Australian Museum
WAMS	Western Australian Marine Science Institution
WARR	Waste Avoidance and Resource Recovery
WC	Wildlife Conservation
WESTPLAN HAZMAT	State Emergency Plan for Hazardous Materials
WIN	Works improvement notice
WWF	Worldwide Fund for Nature
ZCA	Zone Control Authority



