

DEPARTMENT OF ENVIRONMENT AND CONSERVATION ANNUAL REPORT 2007–2008



Department of
Environment and Conservation

Our environment, our future

Acknowledgments

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29 August 2008

Hon Donna Faragher MLC

Minister for the Environment

In accordance with section 61 of the *Financial Management Act 2006*, I have pleasure in submitting for presentation to Parliament the Annual Report of the Department of Environment and Conservation for the period 1 July 2007 to 30 June 2008.

This report has been prepared in accordance with provisions of the *Financial Management Act 2006*.

A handwritten signature in black ink, reading "Keiran McNamara". The signature is fluid and cursive, with a long horizontal flourish at the end.

Keiran McNamara

Director General



Conserving the nature of Western Australia and protecting our environment is not something that is achieved from behind a desk. It demands a real commitment and a 'hands-on' approach by highly-trained, professional staff who venture into the field and carry out a wide range of activities across scientific research, day-to-day operations, interaction with visitors to DEC-managed lands and waters, monitoring industry to ensure compliance with environmental and wildlife conservation regulations and, where necessary, taking enforcement action against people who breach the rules.

Often, this field work is in remote and extremely arduous conditions. This is one reason why DEC has extensive training programs to ensure staff have the necessary skills and support. However, such work has inherent risks.

The department's operations in such areas in the year under report were marked by two fatal accidents.

On 30 December 2007, three people died when they were trapped in trucks in a wildfire in the Boorabbin National Park, between Southern Cross and Coolgardie.

On 13 February 2008, a DEC staff member and a pilot were killed when their plane crashed as a result of a mid-air collision during a goat control operation in Kennedy Range National Park near Gascoyne Junction.

Immediately following the Boorabbin tragedy, DEC instigated an intensive response process headed by a director and comprising senior fire management, risk management and community involvement staff. A similar approach was adopted for the Kennedy Range incident.

The aim of this response process is to explore a wide range of issues that may not be readily apparent from the particular incidents. It recognises that as a department, we need to enhance our performance so that in future mistakes are not repeated and we can all learn from hard won lessons.

As a learning organisation, we seek to make the most of our debriefing and post-incident reviews. These form the basis of an analysis of the operational performance of DEC's incident management response and operations for such incidents. And while it may be relatively easy to identify where the lessons might lie, it is by acting quickly to implement them that means we can refer to them as 'lessons learnt' which is at the heart of this approach.

Importantly, this approach is not about apportioning blame to organisations or individuals. Rather, it is about learning and improving our ability to carry out our work effectively and safely into the future.

However, it is important to remember that immediately following the tragedy during the Boorabbin fire, DEC still had to manage the fire. I am immensely proud of how our fire managers, fire crews and support staff continued to manage the fire for a further nine days while under the duress of extreme conditions and the knowledge that such a tragedy had happened and the impact it had on them.

I take this opportunity to extend once again the department's sympathies to the relatives of those who tragically died in the two events.

A third accident during the year resulted in one of DEC's Dwellingup staff members receiving serious injuries during prescribed burning, and has added impetus to the reinforcement of a culture of safety in all departmental operations.

Further progress was made during 2007–08 in respect to integration across the department following the amalgamation of the former Department of Environment and the Department of Conservation and Land Management in July 2006. Much of this work has revolved around business systems, especially in information management, finances, human resources and regional delivery. The process was assisted by an independent review of the department's performance by external consultants.

The department has faced increasing pressure in retaining and attracting staff. The resources boom Western Australia is experiencing has created significant pressures on staff, particularly in terms of environmental assessments and regulation. As well, industry has a high demand for well-qualified staff who understand environmental processes and regulations. Indeed, DEC has become a 'pool' from which the resources sector draws when it comes to employing professional and field staff. There was an increased focus on staff attraction and retention during the year, and further attention and innovation in this area will be essential in the future.

While increasing pressure on staff presents challenges, DEC is fortunate to benefit greatly from the many hundreds of thousands of hours that nearly 8,000 volunteers contribute each year. Whether it be acting as campground hosts in national parks, or assisting DEC staff in community education, or helping our science staff undertake research and monitoring, their contribution is invaluable and I would like to take this opportunity to thank all of them.

I also acknowledge the work of the members of the Conservation Commission of WA and the Marine Parks and Reserves Authority, along with members of the Waste Management Board, Keep Australia Beautiful Council, the Environmental Protection Authority, the Swan River Trust and the Contaminated Sites Committee, to which the department provides administrative and technical support.

But above all, I acknowledge and thank our 2,000 staff from Esperance on the south coast to Kununurra in the far north for their continuing enthusiasm and commitment to our mission and helping in bringing our vision for a sustainable WA to reality.



Keiran McNamara
Director General

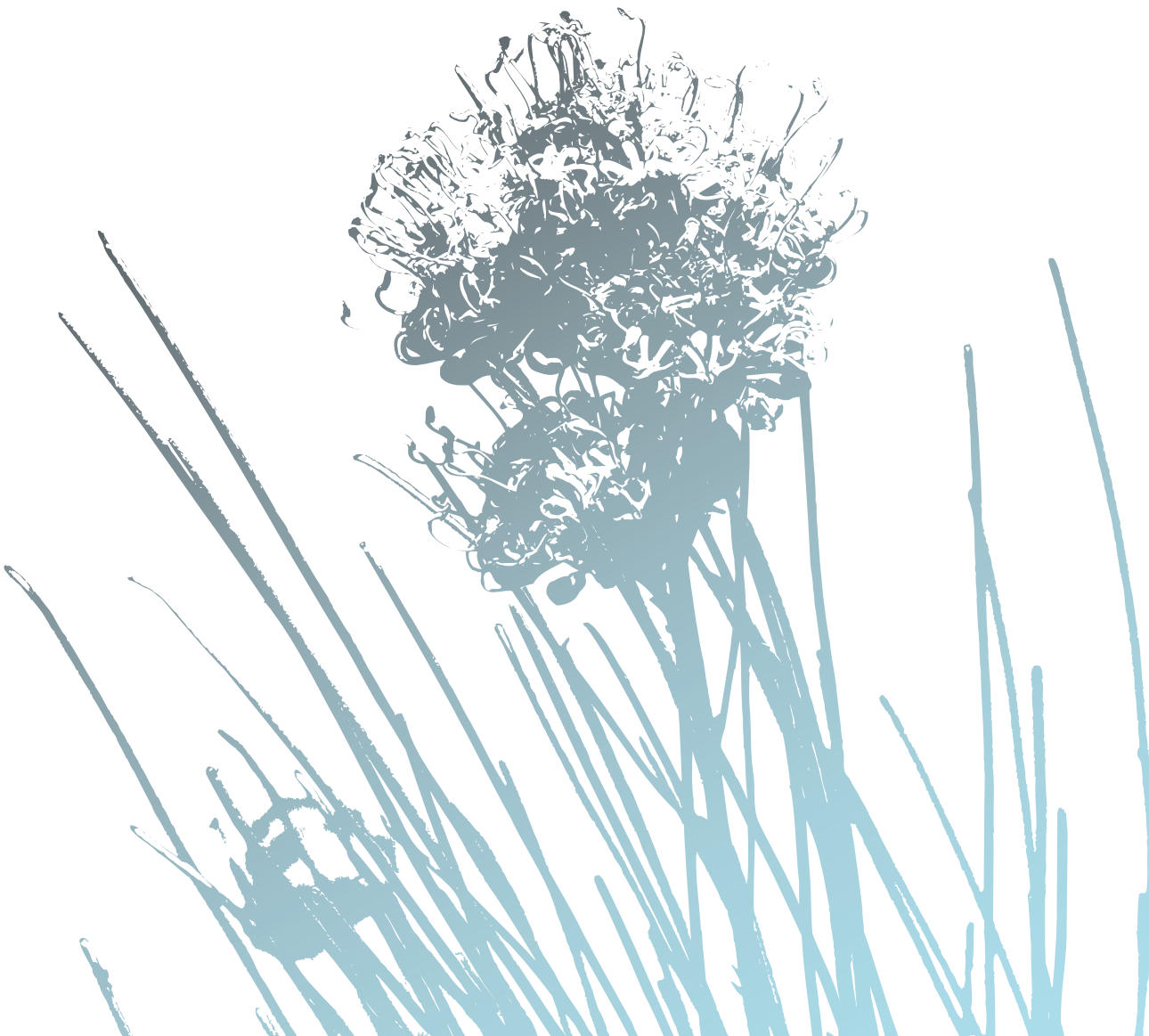
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1 OVERVIEW OF AGENCY



The challenging task of balancing the need to protect the environment with the need to promote responsible developments that will give Western Australia's economy sustained strength was brought even more sharply into focus during 2007–08 by a significant increase in public awareness and concern about climate change and sustainability.

As the State's lead agency on these issues, the Department of Environment and Conservation (DEC) has been firmly focused on setting and exceeding new benchmarks for the delivery of its diverse range of services to stakeholders across government, industry and the community.

Taking action on climate change

In 2007–08 the department established the \$36 million Low Emission Energy Development (LEED) Fund to support technological advances that cut greenhouse gas emissions. The LEED fund, a key initiative of the *Premier's Climate Change Action Statement*, will provide vital investment in a clean energy future for Western Australia.

Through its Office of Climate Change, DEC is the lead coordinating agency for climate change-related policy in the Western Australian Government and initiatives during the year included the expansion of the Solar Schools Program and introduction of 5 Star Plus building standards.

The department also launched the LivingSmart program, a trial household audit and education program involving 15,000 households in Joondalup and Mandurah, that helps people reduce their greenhouse gas emissions at home.

Stage 3 of the Indian Ocean Climate Initiative started during the year. This world-class Western Australia-specific climate change research includes the development of better regional weather projections to enable people, businesses and government agencies to plan and adapt to a changing climate.

Environmental regulation and assessment

Work continued on the implementation of the industry licensing reform program to remove duplication and overlap in licensing approvals. During 2007–08 most State development portfolio projects approvals were processed within the 60 working day target timeframe despite the department's increased workload.

As part of its ongoing efforts to ensure that business and industry comply with the terms of their licences, the department introduced a condition requiring certain licensees to submit an annual audit compliance report.

A State-wide assessment of ports was undertaken to ensure environmental and health standards were being met. The ports of Bunbury, Derby, Geraldton and Wyndham were assessed.

The Environmental Protection Authority (EPA) completed assessments of several significant projects including the Pluto LNG project on the Burrup Peninsula and a number of major iron ore mine and infrastructure projects in the Pilbara region.

The EPA also provided advice on environmental matters to be addressed during the planning of the proposed urban development of Keralup, south of Perth, and the Preston Industrial Park.

Protecting our biodiversity

The development of *A 100-year Biodiversity Conservation Strategy for Western Australia. Phase One: Blueprint to the Bicentenary in 2029* continued in 2007–08, as did the drafting of the Biodiversity Conservation Bill.

The building of biodiversity knowledge progressed with the continuation or completion of several surveys. Fieldwork for the Pilbara Bioregion Biological Survey was completed, floristic and vegetation surveys of the banded ironstone formation of the Yilgarn Craton continued and sampling of the flora and short-range endemic invertebrates of the Ravensthorpe Range was completed.

Vital data about the fauna, flora and ecology of the Kimberley islands were gathered during 2007–08 as part of an ongoing biodiversity survey of the islands.

The successful biodiversity conservation initiative, *Saving Our Species*, entered its second year in 2007–08. The project funded 58 projects across the key areas of invasive animal control, environmental weed control, threatened species and ecological communities' recovery, *Phytophthora* dieback management, biological survey and research and the State Cane Toad Initiative.

DEC is the lead agency for cane toad management in Western Australia. Under the State initiative four key programs are being implemented: fighting the entry and establishment of cane toads in WA; identifying and protecting biodiversity assets at greatest risk from cane toads; raising public awareness of the cane toad threat, and ensuring effective State-wide coordination of cane toad initiatives.

DEC's Kununurra-based team undertook surveillance and control work while the Invasive Animals Cooperative Research Centre was asked to review the effectiveness of on-ground cane toad control operations. To foster cooperation and a coordinated approach to cane toad control operations, a State Cane Toad Initiative Program Coordinator has been appointed.

Collaborative research into the potential impacts of cane toads on the vertebrate fauna of the Kimberley continued and DEC contributed to the establishment of a cane toad genome research program in collaboration with The University of Western Australia.

Research is also being done on a parasitic lung worm found in toads and a 'fear' pheromone in cane toad tadpoles which, when introduced into cane toad tadpole populations, results in smaller toads. A combination of the fear pheromone and the lung worm could provide a significant weapon against the invading toad front.

A decline in woylie numbers in the upper Warren Region of south-western WA prompted the implementation of an intensive Woylie Conservation Research Project to determine the underlying causes of the decline.

There was better news for Gilbert's potoroo (*Potorous gilberti*). The recovery of Australia's most threatened mammal continued with expansion of the translocated population on Bald Island where there are now more than 20 potoroos – a significant number considering the total population is only 50–60 animals. A 380-ha fenced enclosure has been completed near Mt Manypeaks and potoroos will be progressively moved into this site.

The bilby, a threatened marsupial, reclaimed part of its historic home range in the Goldfields in 2007–08. Forty bilbies bred in captivity were released on the former pastoral station Lorna Glen, 150 km north-east of Wiluna.

The department's Threatened Flora Seed Centre made seed collections from 288 taxa for conservation, recovery and research during the year. Many collections were undertaken in partnership with an international seed conservation program, the Millennium Seed Bank project, and duplicate material of 172 collections will be sent for safe keeping to the seed bank at the Royal Botanic Gardens in the United Kingdom.

Seeds of seven taxa collected and stored by the Threatened Flora Seed Centre were used in translocations and seedlings produced by the centre will also enable assessment of species' response to *Phytophthora cinnamomi* dieback in greenhouse pot trials. New research to determine germination temperature profiles will help to identify flora at risk due to climate change.

Managing our forests, national parks and reserves

Parks and protected areas offer the best means of conserving plant and animal species and the communities they form. In addition, they give people the chance to experience and connect to the natural world. In 2007–08 the department continued its work in maintaining and adding to the conservation values of parks while providing opportunities for people to experience WA's remarkable and varied natural environments.

The State's conservation reserve system increased by 42,729 ha. During 2007–08, DEC bought 13 parcels of land of high conservation value, comprising about 149,450 ha, for future addition to the conservation reserve system.

Work continued on the creation of a representative marine parks and reserves system for the State. Planning for the proposed Geographe Bay/Leeuwin-Naturaliste/Hardy Inlet Marine Park and proposed Dampier Archipelago Marine Park and Regnard Marine Management Area is nearing completion.

A management plan for Lake McLarty Nature Reserve, a significant refuge for migratory waterbirds, was released, as was a draft management plan for the Shark Bay Terrestrial Reserves.

Local communities were encouraged to become involved in planning for the future of the Pilbara and Eighty Mile Beach, a diverse stretch of coast with particular significance to Indigenous people. The creation of parks and reserves is part of the Government's commitment to establish a world-class system of protected areas in WA while also developing tourism opportunities for local communities.

The opening of the Karijini Eco Retreat in Karijini National Park highlighted the excellent working relationship between the department, traditional owners and nature-based tourism operators at the outstanding eco-tourism facility.

The release of a draft report on nature-based tourism gave the public the opportunity to help shape the future of tourism in protected areas and the highly successful Community Involvement Program was consolidated, including the publication of the *Healthy Parks, Healthy People Strategic Plan 2008–2011*. In Perth, a new environmental education centre was opened on the Canning River. Across the State, \$13.4 million was spent on capital works projects and tourist road improvements in national parks, conservation parks, State forests and other reserves.

As part of the sustainable management of WA's forests the draft *Guidelines for the Management of Informal Reserves and Fauna Habitat Zones* and draft *Soil and Water Conservation Guidelines* were released for public comment. Biodiversity assessment and ecological modelling tools were further developed to predict the spread of the plant pathogen *Phytophthora cinnamomi*. An analysis of the risk to biodiversity associated with dieback spread was also undertaken.

The Project Vesta report *Fire in Dry Eucalypt Forest*, which finalised a major joint study with CSIRO into fuel dynamics and fire behaviour, was released.

Sustainability

Efforts to reduce waste and increase recycling have been at the forefront of the sustainability initiative and 2007–08 saw the passage of legislation to assist this process. Both the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) and the *Waste Avoidance and Resource Recovery Levy Act 2007* were passed.

Phase two of a program that helps local government prepare strategic plans to manage waste, the Zero Waste Development Scheme, also got underway during the year. This stage aims to encourage local governments to collaborate and take a regional view of waste management.

Under the Strategic Waste Initiatives Scheme, the State Government awarded more than \$1 million to local government, industry and community groups across the State for innovative waste reduction projects.

To address sustainability issues within the department, a DECREASE Project Committee was established to promote sustainable workplace and field practices.

Cleaning up the environment

The next stage of the State Government's *Fertiliser Action Plan*, a strategy to phase-out the use of highly water soluble phosphorous fertilisers in environmentally sensitive areas of the south-west of Western Australia, was announced. During this stage, trials will be conducted using low water soluble phosphorous fertilisers on selected farms, and high water soluble phosphorous fertiliser products for home use will be phased out. Working groups will also be established to guide implementation of the policy.

In addressing air quality issues, a draft *State Environmental (Ambient Air National Environment Protection Measure) Policy* was released for public consultation and DEC continued work on the development of air quality strategies for Collie and Kalgoorlie as part of its commitment to manage air quality in key regional centres.

The *CleanRun* vehicle emissions reduction program, which aims to improve air quality, focused on vehicle emissions testing and driver behaviour during the year. The results of a trial program showed significant changes in driver behaviour, resulting in reduced vehicle emissions.

Fire management

During the 2007–08 fire season, DEC attended and monitored 444 wildfires which covered an area of about 1.42 million ha. About 18 per cent of these fires were caused by lightning while 49 per cent were deliberately lit.

In the south-west forest regions, DEC staff attended 330 fires of which almost 90 per cent were contained to less than 20 ha due to early detection and a rapid fire suppression response by DEC. An estimated 6,600 ha of DEC-managed land and 3,300 ha of non DEC-managed land were burned in these fires. Eight fixed-wing water bomber aircraft were contracted by the department during the peak summer months in the South West and South Coast regions. These provided an aerial rapid-attack capability which helped ground crews in the initial attack on the wildfires.

Long-term drought conditions in the Goldfields, Midwest and parts of the South Coast regions resulted in very dry, highly flammable vegetation that carried high intensity wildfires. The Boorabbin National Park fire on the Great Eastern Highway burned about 40,000 ha and tragically claimed the lives of two truck drivers and a passenger.

Both the Fitzgerald River National Park and the Kalbarri National Park were affected by lightning-caused fires. Although four of the fires in the Fitzgerald River National Park were contained, three combined and burned more than 43,000 ha of the park. In Kalbarri National Park recently prescribed burn areas made it possible to contain the fire which burned only 1,600 ha.

Prescribed burning is an integral part of DEC's fire management strategy and is particularly important for biodiversity conservation. The department applies a range of scientifically derived fire regimes to maintain biodiversity values and prescribed burns are planned using scientific and operational knowledge of the fire responses and life histories of native plants and animals.

During 2007–08, a computer-based planning tool based on Geographic Information System (GIS) technology was developed to aid the planning and execution of the department's prescribed fire program. The GIS tool draws on a wide range of corporate data to ensure decisions concerning the location, extent, seasonality and intensity of prescribed fires consider both biodiversity conservation and strategic asset protection issues. The use of the GIS tool is being extended into all regions and each DEC region is developing a five-year regional scale fire management plan.

A *Code of Practice for Fire Management* was published and the department also revised its operating procedures and standards associated with day-to-day fire management. This has led to the development of new guidelines to deal with emerging issues such as smoke impacts on vineyards.

1.2.1 Enabling legislation

On 1 July 2006, the Department of Environment and Conservation (DEC) was formed from the amalgamation of the former Department of Conservation and Land Management and the former Department of Environment under the *Public Sector Management Act 1994*.

1.2.2 Responsible Minister

DEC's responsibility during the reporting period was to the Minister for the Environment and Climate Change who exercised authority under the *Environmental Protection Act 1986* and the *Conservation and Land Management Act 1984* and other legislation.

1.2.3 The role of the department

DEC is in the portfolio of the Minister for the Environment and Climate Change. The department is also part of a greater environmental community and has responsibilities for implementing Western Australian Government policy within that community. Protection and conservation of the environment is a collective role.

The department has the lead responsibility for protecting and conserving the State's environment on behalf of the people of Western Australia. This includes managing the State's national parks, marine parks, conservation parks, State forests and timber reserves, regional parks, nature reserves, marine nature reserves and marine management areas.

Its key responsibilities include broad roles in conserving biodiversity and protecting, managing, regulating and assessing many aspects of the use of the State's natural resources. The department contributes to the development of environmental protection policies, manages the environmental impact assessment process and carries out regulatory functions to achieve improved environmental outcomes. It is also responsible for the management of contaminated sites and responding to pollution incidents.

The department is responsible for fire preparedness and pest animal and weed control on 89 million hectares of unallocated Crown land and unmanaged reserves.

The department provides support or assists the following portfolio authorities and boards to carry out their functions, which are integral to the department achieving its vision and mission:

- Environmental Protection Authority
- Conservation Commission of WA
- Keep Australia Beautiful Council
- Marine Parks and Reserves Authority
- Swan River Trust
- Waste Management Board
- Contaminated Sites Committee.

Vision

A healthy, diverse and well-managed Western Australian environment.

Mission

Working with the community, we will ensure that Western Australia's environment is valued, protected and conserved, for its intrinsic value, and for the appreciation and benefit of present and future generations.

1.2.4 Legislation administered by DEC as at 30 June 2008

Acts

- *Carbon Rights Act 2003*
- *Conservation and Land Management Act 1984*
- *Contaminated Sites Act 2003*
- *Environmental Protection Act 1986*
- *Environmental Protection (Landfill) Levy Act 1998*
- *National Environment Protection Council (Western Australia) Act 1996*
- *Reserves (National Parks and Conservation Parks) Act 2004*
- *Reserves (National Parks, Conservation Parks and Other Reserves) Act 2004*
- *Reserves (National Parks, Conservation Parks, Nature Reserves and Other Reserves) Act 2004*
- *Sandalwood Act 1929*
- *Wildlife Conservation Act 1950*

Regulations

- Clean Air (Determination of Air Impurities in Gases Discharged into the Atmosphere) Regulations 1983
- Conservation and Land Management Regulations 2002
- Contaminated Sites Regulations 2006
- Environmental Protection Regulations 1987
- Environmental Protection (Abattoirs) Regulations 2001
- Environmental Protection (Abrasive Blasting) Regulations 1998
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004
- Environmental Protection (Concrete Batching and Cement Product Manufacturing) Regulations 1998
- Environmental Protection (Controlled Waste) Regulations 2004
- Environmental Protection (Diesel and Petrol) Regulations 1999
- Environmental Protection (Domestic Solid Fuel Burning Appliances and Firewood Supply) Regulations 1998
- Environmental Protection (Fibre Reinforced Plastics) Regulations 1998
- Environmental Protection (Goldfields Residential Areas) (Sulphur Dioxide) Regulations 2003
- Environmental Protection (Kwinana) (Atmospheric Wastes) Regulations 1992
- Environmental Protection (Metal Coating) Regulations 2001
- Environmental Protection (NEPM-NPI) Regulations 1998
- Environmental Protection (NEPM-UPM) Regulations 2007
- Environmental Protection (Noise) Regulations 1997
- Environmental Protection (Recovery of Vapours from the Transfer of Organic Liquids) Regulations 1995
- Environmental Protection (Rural Landfill) Regulations 2002
- Environmental Protection (Unauthorised Discharges) Regulations 2004
- Forest Management Regulations 1993
- Noise Abatement (Noise Labelling of Equipment) Regulations (No 2) 1985
- Sandalwood Regulations 1993
- Wildlife Conservation Regulations 1970
- Wildlife Conservation (Reptiles and Amphibians) Regulations 2002

Environmental Protection Policies

- Environmental Protection (Swan Coastal Plain Lakes) Policy 1992
- Environmental Protection (Gnangara Mound Crown Land) Policy 1992
- Environmental Protection (Peel Inlet – Harvey Estuary) Policy 1992
- Environmental Protection (Kwinana)(Atmospheric Wastes) Policy 1999
- Environmental Protection (Goldfields Residential Areas) (Sulphur Dioxide) Policy 2003
- Environmental Protection (Ozone Protection) Policy 2000
- Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998

Other written laws on which DEC officers assist

- *Litter Act 1979*
- Litter Regulations 1981
- *Swan and Canning Rivers (Consequential and Transitional Provisions) Act 2006*
- *Swan and Canning Rivers Management Act 2006*
- Swan and Canning Rivers (Transitional) Regulations (No. 2) 2007
- Swan and Canning Rivers (Transitional) Regulations 2007
- Swan and Canning Rivers Management Regulations 2007

Changes made in 2007–08 to legislation administered

In September 2007, the *Swan and Canning Rivers Management Act 2006*, its transitional legislation and regulations came into force. Along with these changes the *Swan River Trust Act 1988* was repealed on 25 September 2007.

On 21 December 2007, assent was given to the *Waste Avoidance and Resource Recovery Act 2007* and the *Waste Avoidance and Resource Recovery Levy Act 2007*. The majority of provisions under both Acts have not started and regulations are yet to be promulgated.

Minor amendments were made to the following Acts that were consequential on other legislation being passed:

- *Conservation and Land Management Act 1984*
- *Environmental Protection Act 1986*

Amendments were made to the Environmental Protection Regulations 1987 when the following amending regulations came into effect:

- Environmental Protection Amendment Regulations 2007 (on 1 July 2007)
- Environmental Protection Amendment Regulations (No. 2) 2007 (on 30 October 2007)

Amendments were made to the Conservation and Land Management Regulations 2002 on 29 January 2008 when the Conservation and Land Management Amendment Regulations (No. 2) 2007 came into effect.

On 25 September 2007 the Environmental Protection (Swan and Canning Rivers) Policy 1998 was revoked.

Copies of legislation relevant to the department are available on the State Law Publishers' website at http://www.slp.wa.gov.au/legislation/agency.nsf/dec_menu.htmlx.

1.2.5 Performance management framework

DEC supports broad, high-level government goals by more specific desired outcomes. The department delivers services to achieve these desired outcomes, which ultimately contribute to meeting the higher-level government goals.

The following table illustrates the relationship between our agency-level desired outcomes and the most appropriate government goal.

Table 1: Government goal, desired outcome and Department of Environment and Conservation services

Government goal	Desired outcomes	Services
Protecting and enhancing the unique Western Australian lifestyle and ensuring sustainable management of the environment.	Conservation and sustainable utilisation of biodiversity.	1. Nature Conservation 2. Sustainable Forest Management
	Community enjoyment of park facilities and services, wildlife and the natural environment displayed in parks.	3. Parks and Visitor Services
	Emissions and discharges meet acceptable criteria.	4. Environmental Regulation
	Adoption of environmentally sustainable practices to protect, manage and restore the State's natural resources.	5. Environmental Sustainability 6. Environmental Impact Assessment and Policies for the Environmental Protection Authority 7. Coordinate the Response to Climate Change

Service 1: Nature Conservation

The development and implementation of programs for the conservation of biodiversity (the variety of life forms: the different plants, animals and micro-organisms, the genes they contain, and the ecosystems they form), including:

- threatened species and ecological communities
- sustainable use of commercially exploited species
- the acquisition, conservation and protection of representative ecosystems, and
- encouraging public awareness, understanding and support for nature conservation.

Service 2: Sustainable Forest Management

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.

Service 3: Parks and Visitor Services

Management of lands and waters, dealing with public involvement, visitation and appreciation of the natural environment on lands and waters managed by the department, including:

- preparing and implementing management and recreation site development plans
- providing, managing and maintaining appropriate access, recreation opportunities and visitor facilities
- protecting natural areas, visitors and facilities from wildfire
- training departmental staff and volunteers
- working with local tourist bureaus and commercial tour operators
- involving Indigenous people in park management and 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, and
- provision of services to, and performance of statutory functions by the Conservation Commission of Western Australia.

Service 4: Environmental Regulation

Regulate emissions and discharges to the environment and the transport of hazardous wastes. Regulate the investigation, classifications and management of contaminated sites. Monitor ambient air quality and develop air quality management plans for priority air sheds (the air canopy surrounding population centres, industrial and other facilities, within which impacts of air pollutants need to be considered from health and environmental viewpoints).

Service 5: Environmental Sustainability

Develop and implement policies and strategies that promote environmentally sustainable practices in industry, government and the community.

Service 6: Environmental Impact Assessment and Policies for the Environmental Protection Authority

Manage the environmental impact assessment process and coordinate the development of policy for the Environmental Protection Authority to enable sound environmental advice to be provided to the Government, developers and the public in accordance with statutory functions.

Service 7: Coordinate the Response to Climate Change

To provide 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.

1.2.6 Changes from the 2006–07 reporting year

The department reviewed its Outcome Based Management (OBM) structure during 2007–08. A new OBM structure was consequently approved by the Department of Treasury and Finance and used for the 2008–09 Budget. It is being applied in the department’s 2007–08 annual report.

The new OBM structure comprises four outcomes and seven services. In the new OBM structure the former five outcomes have been reduced to four outcomes and the 12 former services have been reduced to six services and a new service relating to climate change has been added.

1.2.7 Shared responsibilities with other agencies

During the year, the DEC contributed to whole-of-government reform initiatives including procurement reform and corporate services reform. The department also contributed to the following key cross-agency initiatives.

Table 2: Key cross-agency initiatives

Initiative	Contributing agencies	Result for 2007–08
Responding to climate change	Department of Environment and Conservation (lead agency), Office of Energy, Department of Treasury and Finance and Department for Planning and Infrastructure	Whole-of-government integrated response to climate change
Salinity	Department of Agriculture and Food (lead agency), Department of Environment and Conservation, Department of Water, Forest Products Commission	Improve protection of biodiversity assets and contribute to development of solutions to salinity

Our values

People make organisations and the values they adopt shape those organisations. In working to achieve our mission, we endeavour to behave with:

- Honesty, courage and integrity – acting ethically, lawfully, in the public interest and treating people with impartiality.
- Respect – understanding and respecting individual differences, listening to and valuing each other's contribution, and respecting the views and aspirations of co-workers and the views and contribution of stakeholders.
- Openness – having decision-making processes that are fair, transparent and understandable.
- Commitment – being responsible, accountable and dedicated in our work, both individually and collectively.
- Innovation – continually seeking new and better ways of achieving desired outcomes.

We will demonstrate:

- Teamwork – working collaboratively and cooperatively with co-workers, other agencies and in partnership with the community.
- Leadership – being progressive, showing courage, initiative and creativity in meeting our objectives.
- Professionalism – acting in a courteous and fair manner, and using up-to-date and sound scientific principles and accurate information in our work.
- Value – delivering the best possible result for the protection and conservation of the environment through continual improvement of our efforts.
- Learning-based culture – being open to new ideas and concepts learnt from experience and others.

Our principles

In making decisions or providing advice we will be guided by the following principles.

- Where there are threats of serious or irreversible damage, the lack of full scientific certainty shall not be used as a reason for postponing measures which seek to protect or restore the environment or prevent loss of biodiversity.
- All elements of the environment, including the diversity of ecological communities and native species throughout Western Australia, will be maintained in a healthy state and, where necessary and possible, restored.
- The opportunity for the public to be involved and engaged in developing and delivering benefits to the environment and to their own health and enjoyment will be promoted.
- Outcomes will be delivered in the most effective and efficient way.
- Cooperation, sharing and integration of resources and knowledge within the department and between communities and agencies will be promoted.
- We will be adaptive in our management, taking a flexible and responsive approach to management and operations and being receptive to change.
- Users of the environment and resources should pay fair value for that use.
- Use of environmental resources and wildlife will be on the basis of ecological sustainability.

Strategic directions, objectives and strategies

The vision we are working towards is 'A healthy, diverse and well-managed Western Australian environment'.

The department will achieve this vision by:

- conserving biodiversity
- managing natural resources and promoting sustainable practices
- leading climate change actions
- creating a world class parks system
- implementing sustainable forest management
- preventing pollution and remediating contamination
- maintaining community involvement and support
- improving the way we do business.

1.4 ORGANISATION STRUCTURE

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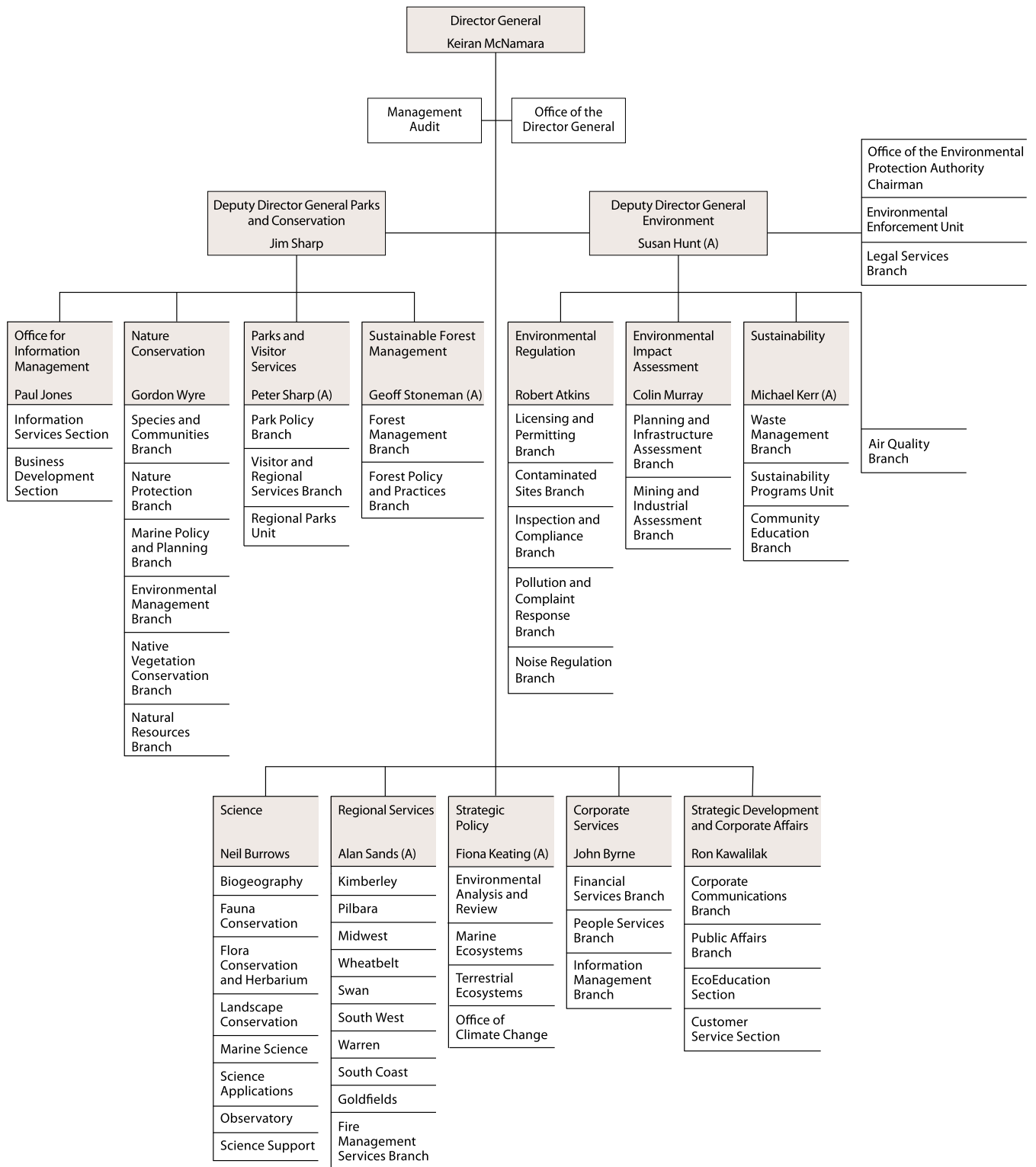


Figure 1: Operating structure of the Department of Environment and Conservation as at 30 June 2008

2

AGENCY PERFORMANCE



Financial Targets: Actual performance compared to budget targets

	2007–08 Target ⁽¹⁾ \$000	2007–08 Actual \$000	Variation ⁽²⁾ \$000
Total cost of services (expense limit)	266,306	286,548	20,242
Net cost of services	195,836	183,497	(12,339)
Total equity	2,807,336	4,108,935	1,301,599
Net increase/(decrease) in cash held	(2,440)	890	3,330
	No.	No.	No.
Approved full time equivalent (FTE) staff level	1,900	1,934	34

(1) As specified in the budget statements for the year in question

(2) Further explanations are also contained in Note 33 'Explanatory Statement' to the financial statements.

2.1.1 Service 1: Nature Conservation

Service description: The development and implementation of programs for the conservation of biodiversity (the variety of life forms: the different plants, animals and micro-organisms, the genes they contain, and the ecosystems they form), including:

- threatened species and ecological communities;
- sustainable use of commercially exploited species;
- the acquisition, conservation and protection of representative ecosystems; and
- encouraging public awareness, understanding and support for nature conservation.

Performance summary

	2007–08 Target \$'000	2007–08 Actual \$'000	Variation \$'000
Expense by service	88,955	113,602	24,647

KPI	2007–08 Target	2007–08 Actual	Variance
Average cost per hectare of managing wildlife habitat	\$3.51	\$4.16	\$0.65

Performance highlights

- The area of terrestrial conservation reserves increased by 42,729 ha during the year (41,741 ha in national parks, 856 ha in nature reserves and 132 ha in conservation parks). The total area in the terrestrial conservation reserve system now equates to 6.9 per cent of the State's land area.
- DEC bought 13 parcels of land of high conservation value covering a combined total area of about 149,450 ha during the year for future addition to the conservation reserve system.
- Progress towards the creation of a representative marine parks and reserves system for the State continued. Planning for the proposed Geographe Bay/Leeuwin-Naturaliste/Hardy Inlet Marine Park and proposed Dampier Archipelago Marine Park and Regnard Marine Management Area was almost complete and the planning process for proposed marine parks and reserves along the Pilbara and Eighty Mile Beach coasts progressed.
- The number of specimens held at the WA Herbarium increased by 1.9 per cent (12,985 specimens). WA's vascular flora (flowering plants, ferns, cycads and conifers) now comprises 13,142 species, subspecies and varieties (11,941 native and 1,201 alien).

- A total of 302 new plant, algae and fungi taxa (species, subspecies and varieties) were described for the first time during the 2007 calendar year, the largest annual addition to the State's flora since 1810.
- Six fauna species were added to the list of threatened fauna: one mammal, and five schizomid species. There are 208 extant threatened fauna and 18 presumed to be extinct.
- The Strategic Review of the Conservation and Resource Values of the Banded Iron Formation of the Yilgarn Craton identified three significant range systems (Helena-Aurora, Mt Manning and Die Hardy Ranges) for conservation in the Mt Manning area as national park or nature reserve.
- Fieldwork associated with the Pilbara Bioregion Biological Survey was completed, which included sampling terrestrial fauna (304 sites) and flora (422 sites), freshwater aquatic flora and invertebrates (from 96 wetlands) and stygofauna (more than 500 bore holes).
- Wet and dry season sampling was completed for six of the nearshore islands as part of the Kimberley Islands Biological Survey.
- An intensive Woylie Conservation Research Project was implemented to determine the underlying factors responsible for the woylie decline in the upper Warren Region of south-western WA. Feral cat predation of adult animals was believed to be the primary source of mortality. The role of disease in predisposing animals to predation was also examined in a collaborative study with Murdoch University.
- The Minister for the Environment and Climate Change endorsed 10 additions to the list of declared rare flora. Another 204 taxa were added to DEC's priority flora list, and 18 taxa were deleted from the list on the basis of further survey and taxonomic reviews. A total of 2,411 taxa were listed as priority flora at 30 June 2008.
- The *Saving Our Species* biodiversity conservation initiative provided \$6.5 million for 58 projects across a range of programs, including introduced species control, threatened taxa and ecological communities recovery and biological survey.
- The recovery of Gilbert's potoroo (*Potorous gilberti*), Australia's most threatened mammal, continued with more than 20 potoroos existing on Bald Island – a significant part of the total population of about 50–60 animals. A 380-ha fenced enclosure has been completed near Mt Manypeaks and potoroos will be progressively moved into this site over the next few years.
- Twenty-five western swamp tortoises were released at Mogumber Nature Reserve in August 2007 in conjunction with Perth Zoo, The Friends of the Western Swamp Tortoise and local adjacent landowners.
- More than 3.9 million ha of conservation lands and State forest were baited to control foxes and feral cats, using more than 1.2 million poison baits, under the *Western Shield* program.
- Forty-three interim recovery plans for flora species and one plan covering four Threatened Ecological Communities (TECs) were approved. Reviews of the implementation and effectiveness of interim recovery plans were completed for three TECs and 11 flora.
- Development of *A 100-year Biodiversity Conservation Strategy for Western Australia. Phase One: Blueprint to the Bicentenary in 2029* continued in 2007–08.
- Drafting of the proposed Biodiversity Conservation Bill continued.
- DEC is the lead agency in the proposed nomination of nine new Ramsar wetlands. Candidate areas are the Cape Range Subterranean Waterways, Ellen Brook Swamps, the northern portion of Lake MacLeod, Spearwood Creek, Lake Ballard, Lake Gregory/Paruka, Millstream Pools, Shark Bay East/Hamelin Pool and Fortescue Marshes.
- The State Cane Toad Initiative program caught 5,636 toads.
- *Phytophthora* dieback management projects continued including the construction of physical and chemical barriers to contain *Phytophthora* spreading and revegetation of about 50 ha of the infested area at the Bell Track infestation in Fitzgerald River National Park.

- Under DEC's *Healthy Wetland Habitats* 18 properties were visited and \$140,000 was awarded for conservation management works which include three km of fencing, 115 ha undergoing weed control and 41 ha of revegetation.
- *Land for Wildlife* staff registered 103 new properties and visited 115 properties for the first time. In addition, 43 properties were formally revisited for stewardship purposes. A significant milestone was reached – more than a quarter of a million ha of property has been registered with the *Land for Wildlife* program (effectively private nature reserves). During visits to properties, staff recorded 160 occurrences of rare or threatened fauna, flora or ecological communities.
- During the year, the voluntary Nature Conservation Covenant Program entered into covenants in perpetuity on more than 18 titles (2,279 ha of native vegetation), bringing the total covenants registered to more than 104 titles and 8,341 ha of land.
- The Minister for the Environment and Climate Change approved management plans for Shoalwater Islands Marine Park, Kennedy Range National Park and proposed additions and Lake McLarty Nature Reserve. The total number of management plans under the *Conservation and Land Management Act 1984* is now 54. The Shark Bay World Heritage Property Strategic Plan (a non-statutory plan) was also approved.
- The sixth national large whale disentanglement workshop was hosted in Perth by DEC and the Federal Department of the Environment, Water, Heritage and the Arts. A large whale disentanglement and satellite tracking expert from the USA was the keynote speaker at the workshop, which attracted delegates from around Australia as well as South Africa.

2.1.1.1 Overview

Service 1: Nature Conservation is delivered through six key strategic directions:

1. Building biodiversity knowledge: inventory and resource condition monitoring
2. Establishing a terrestrial and marine conservation reserve system
3. Effective management of the conservation reserve system
4. Recovery of threatened species and ecological communities; and management of significant species and ecosystems
5. Conserving landscapes and seascapes: integrating off- and on-reserve conservation and managing threatening processes
6. Encouraging public understanding and support of biodiversity conservation and other DEC programs and activities.

2.1.1.2 Building biodiversity knowledge

Biological inventory

Pilbara Bioregion Biological Survey

Fieldwork associated with the Pilbara Bioregion Biological Survey was completed in 2007. This encompassed sampling terrestrial fauna at 304 and flora at 422 sites, freshwater aquatic flora and invertebrates from 96 wetlands and stygofauna from more than 500 bore holes. The sorting and identification of specimens is completed for all groups except terrestrial plants. Many new records for threatened flora and priority species have been documented and numerous taxa new to science have been recorded, particularly among the terrestrial and aquatic invertebrate groups and plants. Manuscripts describing the terrestrial mammal fauna, bat fauna and pre-European mammal fauna of the Pilbara have been completed and those for many other groups of organisms are approaching the final manuscript stage. Dissemination of preliminary survey results continues with more than 15 presentations given on progress associated with the survey.

Kimberley Islands Biological Survey

Wet and dry season sampling was completed for six of the nearshore islands as part of the Kimberley Islands Biological Survey. Site selection and sampling (dry season) also started on the next series of islands. Preliminary results include new species records for all islands visited, documentation for the first time of mainland species on islands and the collection of several new species of Camaenid land snails. Traditional owners and the Kimberley Land Council have been consulted throughout the project to ensure this survey achieves biodiversity outcomes while building capacity in local Aboriginal communities to better manage biodiversity.

Banded ironstone formations of the Yilgarn Craton

Floristic and vegetation surveys of the banded ironstone formations (BIF) of the Yilgarn Craton continued. During 2007–08, the third year for the survey, six ranges were sampled through the establishment of more than 300 sites. A new population of one declared rare flora species and new populations of 12 species of priority flora were located during the surveys. Subsequently 1,450 vouchers have been lodged with the WA Herbarium and the dataset made available to the community and industry for review and value-adding. Several scientific publications were published and others are under review.

Short-range endemics of the Ravensthorpe Range

Sampling of the flora and short-range endemic (SRE) invertebrates of the Ravensthorpe Range was completed. A total of 627 taxa (1,460 lodged vouchers) of vascular plant were recorded from 200 sites. Six declared rare flora species represented by 14 populations were recorded along with 50 taxa of priority flora from 180 populations. Thirty-two taxa were regarded as endemic and an additional 17 have their distributions centred on the Ravensthorpe Range. Four of the endemic plant taxa represented novel entities not previously recognised as distinct species. The SRE sampling focused on 74 sites across the range which produced 1,325 vouchers of Arachnida and Myriapoda species. Four SRE taxa (three millipedes and a pseudoscorpion) were recorded of which one appeared to be endemic. None of these taxa has been formally described. Detailed collections were undertaken on a number of other groups in which SRE taxa are commonly found. A further 12 taxa were identified (of which only seven have been formally described) but all of these taxa have wider distributions than the SRE taxa identified.

Vegetation of Avon Catchment

The existing vegetation maps of the Avon Catchment were collated and digitised. This constitutes an area of 186,000 ha (8.3 per cent of the remnant vegetation of the agricultural zone of the catchment). This mapping has major implications for understanding, managing and restoring the vegetation of the catchment and elsewhere in the Wheatbelt.

Climate change and biodiversity

Climate change is becoming increasingly apparent as one of the most significant challenges for biodiversity conservation. DEC is addressing climate change through mitigation and adaptation responses, such as land management, seed storage and research. Mitigation is achieved and promoted through revegetation by the department and the establishment of carbon accounting data required for revegetation by private landholders. The department is expanding the conservation reserve system and its land management practices are reducing the impacts of threatening processes and increasing the connectedness of reserves and other areas having conservation values. DEC's seed collection and storage program provides an *ex situ* safeguard for plant species which may not be able to survive in their current locations or disperse to new locations. A comprehensive research program is being developed in collaboration with WA's tertiary research community to generate the information required to support sound climate change adaptation decisions. This research program has been significantly enhanced by collaboration between the department and the South African National Biodiversity Institute.

Marine science

A Marine Science Strategy was published and distributed widely in early 2008. The strategy provides a blueprint for developing a marine science capability within DEC to support the department's marine conservation programs. It outlines collaborative marine science delivery models with DEC regional offices and specialist branches and with external science providers.

The Marine Science Program was established in 2006 and represents the department in its role as the lead agency for the Western Australian Marine Science Institution (WAMSI) Node 3: Managing and Conserving the Marine State. The WAMSI Node 3 research program focuses on the Ningaloo Marine Park and involves collaboration with researchers from CSIRO, the Australian Institute of Marine Science (AIMS) and local universities. The WAMSI Node 3 Ningaloo program is complementary to the CSIRO *Wealth from Oceans* flagship program: *Ningaloo Collaboration Cluster*, hosted by Murdoch University. These two large research programs are collectively known as the Ningaloo Research Program and bring together more than 100 scientists who are undertaking research in the Ningaloo Marine Park over the next four years. The research investment in the Ningaloo Research Program is more than \$30 million and results from the initial investment by the WA State Government of \$5 million. A major focus of the department is to ensure that results of this research translate into more effective management of the marine park.

DEC marine scientists and regional staff undertook a number of research and monitoring projects during the year. Examples include monitoring the recovery of coral reef communities near Coral Bay following a catastrophic natural disturbance in 1989, recovery from winter bleaching by intertidal coral communities in Ningaloo Marine Park and a further survey of the coral-eating marine snail *Drupella*. The studies have important implications regarding the response of reef communities in Ningaloo Marine Park to disturbances such as global climate change.

Field surveys of the recently created Montebello/Barrow islands marine protected areas were also undertaken to develop a better understanding of the distribution and condition of the major benthic communities. A major survey of the marine biodiversity of the Rowley Shoals Marine Park was undertaken in collaboration with AIMS in November to provide information on the current condition of this marine park, as a basis for regional comparisons and for future resource condition monitoring. Seed-funding grants were provided for research projects including work on sea lions, dugongs, dolphins and little penguins.

Taxonomy and biotic collection management

At June 2008 the collection at the Western Australian Herbarium in DEC comprised the following specimens, from all major groups of plants, algae and fungi.

Table 3: Specimens held at the Western Australian Herbarium

Taxonomic Group	Number of specimens (June 2008)	Increase since June 2007	
		Number	%
Myxomycetes	590	23	4
Fungi	19,914	-1170 ¹	-5.2 ¹
Lichens	15,177	705	5
Algae	22,188	959	4.5
Liverwort and hornworts	1,876	47	2.5
Mosses	6,408	85	1.3
Ferns and fern allies	3,428	71	3.1
Gymnosperms	1,945	39	2
Flowering plants	611,813	12,226	2
Total number	683,339	12,985	1.9

¹ The apparent decrease in fungi specimens results from an over-estimate based on incomplete records included in the 2006–07 annual report. The specimens were entered into a database in the 2007–08 reporting year and the number of fungi specimens included in the WA Herbarium's collection is now correct.

During 2007–08, 12,985 specimens were added to the collection, which now stands at 683,339, an increase of 1.9 per cent during the year. Many specimens were received at the WA Herbarium from surveys in the Pilbara and banded ironstone formation ranges of the Yilgarn Craton. A decrease in the number of fungi specimens results from the completed audit and incorporation of the CSIRO fungi collection; the 2006–07 number was an estimate based on incomplete records.

During the year, 2,923 specimens were loaned to other institutions and 497 specimens were received on loan from other herbaria. The WA Herbarium received 1,146 exchange specimens and distributed 3,431 exchange specimens to other Australian and international herbaria.

Reference Herbarium

In addition to the main research collection, the WA Herbarium maintains a public-access Reference Herbarium of vascular plants, which is used extensively for flora identification and verification by DEC staff, consultants, researchers and amateur botanists, including members of the Wildflower Society, Landcare and Bushcare groups. The Reference Herbarium aims to include at least one specimen from every species and variety of flowering plant in the State. During 2007–08 it reached 14,162 specimens representing more than 11,000 taxa, and was used by more than 3,000 visitors.

WAHERB

Records of all specimens incorporated in the WA Herbarium are entered into the WA Herbarium Specimen Database (WAHERB). During the year, 12,895 specimen records were added to WAHERB, including 1,065 priority flora and 159 threatened flora. The total collection of priority and threatened flora comprises 40,314 specimens.

Flora data for WA

WA's vascular flora (flowering plants, ferns, cycads and conifers) now comprises 13,142 species, subspecies and varieties (11,941 native and 1,201 alien).

The Census of Western Australian Plants maintained by the WA Herbarium as the authoritative reference for all plants of the State, contained 20,882 names at the end of the year, representing 16,149 currently recognised species, subspecies and varieties of

plants, algae and fungi (14,829 native and 1,320 alien). The figures include names for the vascular flora as well as the bryophytes, algae and fungi. Additions in 2007–08 comprised 87 unpublished new phrase names or manuscript names and 538 published names.

The WA Herbarium image collection database continued to grow through the assistance of volunteers. At the end of 2007–08, 33,930 photographs had been scanned, and composite images illustrating habitat, habit and detail of 6,625 species were available online via FloraBase.

FloraBase

In 2007 a major review of FloraBase, the WA Herbarium's web information system for Western Australia's flora and fungi, confirmed its expanding role as the authoritative source for botanical taxonomic information for Western Australia. Other initiatives during 2007–08 included ongoing planning towards the release of the next major version of FloraBase, the deployment of a significant number of identification keys to families and genera, the inclusion of extensive literature references and the incorporation of more detailed species descriptions

The *Saving Our Species* program funded a project in the WA Herbarium to fast track the description of new species, particularly species currently only known by phrase and manuscript names, in the Yilgarn Craton banded ironstone formation ranges and the Ravensthorpe Range. The project and other taxonomic activity at the WA Herbarium and by other botanists in Australia contributed to a record year for naming new Western Australian plants, algae and fungi. A total of 302 new taxa (species, subspecies and varieties) were described for the first time during the 2007 calendar year, the largest annual addition to the State's flora since 1810.

NatureMap

NatureMap is a new facility developed with the assistance of the WA Herbarium and the Western Australian Museum to provide online information about the distribution of plants and vertebrate animals in the State. The system incorporates data from the WA Herbarium collection, the WA Museum (fauna), agricultural zone and Swan Coastal Plain surveys, Banksia Atlas and Orchid Atlas.

Volunteers

An extensive volunteer program at the WA Herbarium sees volunteers provide critically important skills and assist in many curation activities. During the year, volunteer participation was significant, totalling more than 11,000 hours.

Resource condition monitoring

Native Vegetation Integrity Project

The *Resource Condition Monitoring – Native Vegetation Integrity Project*, which was assisted by Natural Heritage Trust funding, started to standardise methods for documenting changes in native vegetation condition at a State scale through the development of protocols for measuring native vegetation integrity and data management. The project will field test the protocols and establish fixed reference sites for the assessment of quantitative changes in native vegetation and ecosystem processes.

Significant Species and Ecological Communities Project

The *Resource Condition Monitoring – Significant Species and Ecological Communities Project*, which was assisted by Natural Heritage Trust funding, started to achieve as much commonality as possible for threatened taxa and ecological communities monitoring across Western Australia. The project is focusing on reviewing existing monitoring efforts for significant species and communities with a view to improving the way data are collected, stored and managed.

Ecological Condition of Wetlands of the Agricultural Zone

A research project that arose from the State Salinity Strategy aims to monitor trends in the ecological condition of wetlands of the agricultural zone of south-western Western Australia. This ongoing project monitors groundwater; wetland water levels and water quality; and flora and fauna in relation to threats, such as secondary salinisation, climate change and catchment land-use practices.

As part of this program, 25 wetlands have been surveyed for fauna and water chemistry over the past 10 years. To date, 757 invertebrate species have been recorded from 172 samples and a total of 190,000 birds (belonging to 60 species) have been counted from 315 surveys.

Current and historical physico-chemical data and bathymetric charts have been supplied to departmental and external managers and researchers to assist in a variety of tasks including hydrological modeling and ecological investigation.

Inland Aquatic Monitoring

The *Resource Condition Monitoring – Inland Aquatic Monitoring* project is assisting in the implementation of the National Action Plan for Salinity and Water Resources and the Natural Heritage Trust programs in Western Australia by the development of a standard monitoring protocol and establishing permanent monitoring points at

significant wetlands around the State. Significant wetlands in high-value landscapes across Western Australia, such as Ramsar and nationally listed wetlands of importance, will be evaluated for strategic resource condition information that will assist natural resource managers to improve the management of key impacts to wetland systems. Key drivers and threats of wetland ecosystem integrity are also being assessed and monitoring requirements will be targeted to provide maximum benefit to natural resource managers.

2.1.1.3 Establishment of a terrestrial and marine conservation reserve system

Terrestrial conservation

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

The area of terrestrial conservation reserves increased by 42,729 ha during the year (41,741 ha in national parks, 856 ha in nature reserves and 132 ha in conservation parks). The total area in the terrestrial conservation reserve system is now more than 17 million ha and equates to 6.9 per cent of the State's land area.

Details of significant reservations are provided in section 2.3.5 'DEC managed lands and waters'.

Conservation land acquisitions

DEC bought 13 parcels of land of high conservation value covering a combined total area of about 149,450 ha during the year for future addition to the conservation reserve system.

The department's priorities for purchase are for those areas containing ecosystems that are not adequately represented in existing conservation reserves, areas containing threatened species and ecological communities, and for additions to existing reserves that would greatly improve their diversity or facilitate their management.

The purchases were funded from a number of sources: DEC's annual capital allocation for acquiring conservation land; proceeds of asset sales; State Salinity Strategy funds; funds allocated under the Biodiversity Adjustment Scheme; environmental offset funds; Gascoyne-Murchison Strategy funding carried over from previous years; and the National Reserve System component of the

Commonwealth Government's Natural Heritage Trust. The total expenditure from all funding sources for the financial year was more than \$2.264 million.

With funds allocated under the Gascoyne-Murchison Strategy, the Barnong Pastoral Lease in the Shire of Yalgoo was acquired. The lease, covering about 145,735 ha, adjoins land to the west acquired by the department for conservation, and a large tract of unallocated Crown land. The acquisition, along with the adjoining land parcels, will enable the creation of a new conservation reserve in an area that is largely used for agriculture.

State Salinity Strategy funds were used to purchase a parcel of remnant vegetation covering about 658 ha in the Shire of Mt Marshall. The long-term protection of this large remnant in the conservation reserve system will aid in the fight against salinity in a shire that has been predominantly cleared for agricultural purposes.

A second property was purchased under the Biodiversity Adjustment Scheme. This scheme seeks to purchase high quality bushland from landholders who have been refused permission to clear the land. This property is a 766 ha bushland part of a farming property between Dandaragan and Moora in the northern Wheatbelt. The property contains kwongan and woodland vegetation, and a series of wetlands. Land purchase negotiations under the scheme are continuing with a number of other landholders who meet the criteria for this program.

Environmental offset funds provided by Western Power for transmission line clearing funded the purchase of about five hectares on the Swan Coastal Plain supporting the threatened ecological community, *Shrublands and Woodlands on Muchea Limestone*. The property is located south of the Moore River in the Shire of Gingin. The purchase of the property fulfils one of the recommendations in the Interim Recovery Plan for the threatened ecological community.

Environmental offset funds also funded the purchase of a property of about 220 ha near Gillingarra in the Shire of Victoria Plains. The purchase and reservation of the property will help protect the vegetation type *medium woodland; York gum and wandoo* which is poorly represented in the Northern Jarrah Forest Interim Biogeographic Regionalisation for Australia sub-region.

Other purchases finalised during the year were:

- 48 ha between Lake Muir Nature Reserve and Lake Muir National Park in the Shire of Manjimup;
- about 324 ha adjoining the Tarin Rock Nature Reserve in the Shire of Dumbleyung;
- about 464 ha of intact native vegetation in the Shire of Esperance;
- 136 ha in the upper Avon catchment in the Shire of Lake Grace;
- two parcels in the Shire of Ravensthorpe – about 326 ha for addition to the Cheadanup Nature Reserve and 716 ha for addition to the Aerodrome Road Nature Reserve;
- more than six ha in the Shire of Capel supporting two threatened ecological communities (one critically endangered and one endangered), a conservation category wetland and poorly reserved vegetation; and
- about 44 ha of remnant vegetation in the Shire of Bruce Rock for addition to the Pikaring Nature Reserve.

The department gratefully acknowledges the contribution made by the Commonwealth Government through the National Reserve System component of the Natural Heritage Trust to conservation land purchases. This year the contribution amounted to \$287,500. A further \$401,500 was also received towards the purchase of the Thundelarra Pastoral Lease north west of Paynes Find in the Shire of Yalgoo, which was bought with Gascoyne-Murchison Strategy funds in the previous financial year. The support of the Commonwealth Government continues to help with progress towards the establishment of a comprehensive, adequate and representative system of terrestrial conservation reserves in Western Australia.

Marine conservation reserve creation

The area of marine parks at 30 June 2008 was approximately 1,261,000 ha. The area of marine nature reserves was approximately 132,000 ha and the area of marine management areas was approximately 143,000 ha. There were no changes to the marine parks and reserves system during the year.

There was steady progress towards creation of a representative marine parks and reserves system for the State. Preparatory work for the creation of the Walpole and Nornalup Inlets Marine Park was completed.

Planning for the proposed Geographe Bay/Leeuwin-Naturaliste/Hardy Inlet Marine Park is well advanced, with resolution of port and native title issues being achieved.

Planning for the proposed Dampier Archipelago Marine Park and Regnard Marine Management Area is almost complete with discussions under way between government agencies to finalise the reserve boundaries to take the growing demand for resource development into account.

The final management plan for Shoalwater Islands Marine Park was gazetted on 30 October 2007 and the zoning scheme was gazetted on 30 May 2008.

Planning for the creation of the network of marine parks and reserves in the Pilbara and lower west Kimberley (Eighty Mile Beach) regions started in 2007–08. The planning process undertook identification of study areas, collection of background information, community information workshops, establishment of stakeholder relationships, including with Indigenous communities, and development of reserve design principles being undertaken in 2007–08. A government interagency working group was established to ensure a whole-of-government approach is achieved. The group met three times in 2007–08.

2.1.1.4 Effective management of the conservation reserve system

Management planning for conservation reserves

During 2007–08, the Minister for the Environment and Climate Change approved management plans for Shoalwater Islands Marine Park, Kennedy Range National Park and proposed additions and Lake McLarty Nature Reserve. This brings the total number of management plans under the *Conservation and Land Management Act 1984* (CALM Act) to 54. The Minister also approved the Shark Bay World Heritage Property Strategic Plan, which is a non-statutory plan. The management plan for the Proposed St John Brook and Jarrahwood Conservation Parks was also finalised during the year but cannot be approved until the parks are created. A further 11 terrestrial and three marine plans are currently in various stages of preparation.

DEC also prepared draft management plans for public comment for Millstream-Chichester National Park and Mungaroo Range Nature Reserve and Shark Bay Terrestrial Reserves and Proposed Reserve Additions. There were no indicative management plans prepared for marine reserves.

Features were added to DEC's website to enable public submissions to be submitted electronically and information relevant to management planning to be downloaded with the aim of keeping stakeholders up-to-date with progress on each management plan in preparation.

A full list of management plans which were approved or in preparation during 2007–08 and the area of each tenure category managed by DEC as at 30 June 2008 is in Appendix C. There are 54 final management plans, 15 final management plans in preparation, 12 draft management plans in preparation and one indicative management plan in preparation.

Good Neighbour Policy

On 3 July 2007 the Minister for the Environment and Climate Change released the department's Good Neighbour Policy. The release followed an extensive public

involvement process during the development of the policy. Also released were the results of a State-wide benchmarking survey that was sent out to more than 7,000 neighbours to DEC-managed lands and a summary of public submissions on the draft policy.

To give effect to the Good Neighbour Policy, the department has implemented a number of programs to control weeds and feral animals as part of the *Saving Our Species* program. Fire management at the interface between DEC-managed lands or unallocated Crown lands and private property or pastoral leases has been boosted by an increased annual allocation of \$4.7 million for DEC's fire management that was announced in the 2008–09 Budget. Staff training programs have also been developed to help with the effective roll out of the Good Neighbour Policy.

Fire management on unallocated Crown land and unmanaged reserves

From 1 July 2003, DEC assumed responsibility for the coordination and on-ground management of fire risk prevention and fire preparedness works on 89 million ha of non-metropolitan and non-townsite unallocated Crown land and unmanaged reserves. Table 4 shows the distance of firebreak access installed and maintained on these lands, the level of vegetation modification in strategic buffers so as to enable more effective fuel removal by hand burning, and the area of wind-driven open edge prescribed burning and large-scale block ignition using aircraft. Fire risk prevention and fire preparedness works on these lands are mostly undertaken to protect adjacent high risk natural values and community assets.

Table 4: Fire prevention works completed on unallocated Crown land and unmanaged reserves

DEC Region	Firebreak access and maintenance (km)		Scrub rolling/slashing and vegetation modification (km)		Open-edge burning (km)		Block burning (ha)	
	2006–07	2007–08	2006–07	2007–08	2006–07	2007–08	2006–07	2007–08
Kimberley	30	30	0	0	200	300	230,780	663,254 ¹
Goldfields	174	314	0	43	20	10	23,761	495,090 ¹
Midwest	550	264	0	0	55	36	2,101	480
Wheatbelt	718	544	0	0	33	8	0	0
South West	4	4	2.5	6	0	0	0	12
Warren	10	37	0	0	0	0	270	389
South Coast	173	53	75	19	38	158	1728	267
	1,659	1,246	77.5	68	346	512	258,640	1,159,492

¹ The large increases in block burning in the Kimberley and Goldfields regions are due to additional funding for fire management in DEC's remote regions and also a change in bushfire mitigation strategies which includes the aim of developing landscape-scale mosaics.

Fire management for biodiversity

Fire management is used to help conserve biodiversity including through reducing the occurrence and impacts of large, intense wildfires. The department applies a range of scientifically derived fire regimes to optimise and conserve biodiversity values. This is achieved through the creation and maintenance of a spatial and temporal mosaic of vegetation structures, fuel ages and habitat types as a result of applying fire to the landscape at a range of fire frequencies and intervals, seasons, intensities and scales. Prescribed burns that are applied to protect and conserve natural values are required to incorporate the available scientific and operational knowledge of the fire responses and life histories of native plants and animals.

Each DEC region is developing a five-year, regional-scale fire management plan that is aimed at conserving and maintaining biodiversity values and ecosystems, protecting fire

vulnerable assets from unplanned fire events and creating and extending new knowledge. The plans identify the major objectives of fire management in each region and the most appropriate strategies for achieving these objectives. The plans also specify success criteria to be used in monitoring progress in achieving fire management objectives. The plans are based on current knowledge and research findings and encourage an adaptive management approach to the development and application of fire regimes.

A Code of Practice for Fire Management was published that provides a framework for fire management procedure and practice on land managed by the department. The code enables the efficient, effective and safe management of fire to achieve land management objectives, protect human life and property and environmental values from the deleterious effects of wildfire and inappropriate fire regimes.

The department drafted a series of Fire Management Guidelines to assist managers and fire operations staff to manage fires to protect and maintain biodiversity values and ecosystem functions. The guidelines were developed by scientists, nature conservation and fire managers during 2006–07, and several were revised as better knowledge became available in 2007–08.

The department revised most of its Fire Operation Guidelines, which provide guidance on operating procedures and standards associated with day-to-day fire management, to ensure compatibility with contemporary fire management practices. New guidelines have been developed to deal with emerging issues such as smoke impacts on vineyards.

A computer-based planning tool based on Geographic Information System technology was developed during the year to help in the planning and execution of the department's prescribed fire program. The tool draws on a wide range of corporate data sets to ensure decisions concerning the location, extent, seasonality and intensity of prescribed fire consider both biodiversity conservation and strategic asset protection issues. The Master Burn Plan tool has functionality that allows maps and reports to be produced concerning the burning program. The use of the planning tool and its architecture are being extended into all regions to enhance the efficiency and effectiveness of fire planning.

2.1.1.5 Recovery of threatened species and ecological communities, and management of significant species and ecosystems

Recovery of threatened species and ecological communities

The State Threatened Species Scientific Committee's 2007 recommendations for changes to the lists of threatened flora and fauna under the *Wildlife Conservation Act 1950* were endorsed by the Minister for the Environment and Climate Change and gazetted during the year. Details of the gazetted changes are provided in the section below.

The committee also met during the first half of 2008 and made further recommendations for changes to the threatened flora and fauna lists. These changes have yet to be referred to the Minister for endorsement.

Flora

The Minister endorsed 10 additions to the list of declared rare flora (DRF, known as threatened flora). Two taxa (*Grevillea acropogon* and *Eremophila glabra* subsp. *chlorella*) were listed as critically endangered, two (*Commersonia* sp. Mt Groper (R. Cranfield and D. Kabay 9157) and *Goodenia arthrotricha*) as endangered and six (*Acacia woodmaniorum*, *Cryptandra congesta*, *Darwinia calothamnoides*, *Eucalyptus nutans*, *Grevillea fuscolutea* and *Leucopogon* sp. *ciliate*) were listed as vulnerable.

Two species (*Calothamnus accedens* and *Stawellia dimorphantha*) were deleted from the list as they were no longer considered to be threatened but were retained on the monitoring list (priority 4). Another species was also deleted due to taxonomic work which identified *Chamelaucium* sp. Hamersley (N McQuoid 379) as being the same as *Chamelaucium axillare*, a non-threatened species. *Eremophila rostrata* was split into two subspecies (*E. rostrata* subsp. *rostrata* and *E. rostrata* subsp. *trifida*) and both

subspecies were ranked as critically endangered. *Marianthus* sp. Bremer (N. Gibson and M. Lyons 1776) was previously listed as rare flora, but was incorporated with the DRF *Marianthus mollis* in 2006. Further taxonomic study has again considered these taxa to be distinct, and hence *Marianthus* sp. Bremer was again listed as rare flora.

The changes were published in the Wildlife Conservation (Rare Flora) Notice 2008 on 22 January 2008. There are 388 extant DRF and 14 listed as presumed to be extinct.

A further 204 taxa were added to DEC's priority flora list, and 18 taxa were deleted from the list on the basis of further survey and taxonomic review. A total of 2,411 taxa were listed as priority flora at 30 June 2008.

DEC has continued a joint project with the Commonwealth to prepare information sheets as the first stage in nominating changes to the list of threatened species under the *Environment Protection and Biodiversity Conservation Act 1999*, to bring those lists in line with the State lists under the *Wildlife Conservation Act 1950*. One species of flora (*Eremophila veneta*) was de-listed under the *Environment Protection and Biodiversity Conservation Act 1999*. In total, the information sharing partnership between the Australian and State governments has resulted in the following changes to the list of nationally threatened species under the *Environment Protection and Biodiversity Conservation Act 1999*: 11 species have been listed as threatened; 20 species no longer considered nationally threatened have been delisted; and nine species have been transferred from the extinct category to another threatened category because of recent rediscoveries.

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

- 310 species of threatened and priority flora were surveyed or monitored.
- 31 new populations or sub-populations of threatened flora and 36 populations of priority flora were located. Of note was the discovery of two new populations of the critically endangered *Caladenia melanema* which was previously known from a single population.
- *Pityrodia scabra* and *Daviesia euphorbioides* recruitment trials were conducted with 44 and 34 seedlings respectively appearing and surviving the first summer. Recruitment trials were also conducted for *Eremophila lactea* and, although still early, some seedlings have been observed.
- Monitoring of phosphite applications for 17 threatened flora species carried out to control *Phytophthora* dieback indicate that species decline and disease spread have been reduced following treatment.
- Fencing to protect plants from stock movement was put in place for *Pityrodia scabra* and *Eremophila resinosa* populations on private properties. Fencing was also erected for populations of *Caladenia granitica* and *C. melanema*, *Frankenia parvula*, *Roycea pycnophylloides* and a translocated population of *Hemigenia ramosissima*.
- Rare flora markers were erected for many populations of threatened flora.
- Weed control was undertaken for 13 species including *Acacia caesariata*, *Caladenia viridescens*, *Eremophila resinosa* and *Philothea basistyla*.
- Threatened flora training sessions were carried out for shire work crews in Tammin, Quairading and Victoria Plains.
- Postal fliers ('Have you seen this plant') were developed for a number of threatened flora species. These are designed to promote awareness of threatened flora and encourage the reporting of new populations.
- Pictorial maps depicting threatened species flowering times, conservation status and location on shire lands, were produced for the shires of Tammin, Quairading, York, Wyalkatchem and Victoria Plains.

Fauna

The Wildlife Conservation (Specially Protected Fauna) Notice 2008 was published on 22 January 2008. Six fauna were added to the list of threatened fauna: one mammal and five schizomid species. The woylie or brush-tailed bettong (*Bettongia penicillata*) was re-listed as endangered and *Draculoides* sp. Middle Robe and *Paradraculoides* sp. Mesa A, B, G and K were listed as vulnerable. *Paradraculoides* sp. Mesa A was the subject of a mining proposal in the Pilbara. The Barrow Island mouse (*Pseudomys nanus ferculinus*) was removed from the list because molecular studies showed the mouse did not differ from individuals on the mainland. Thus, this subspecies is synonymous with the western chestnut mouse (*Pseudomys nanus*), which is not considered to be threatened. Currently there are 208 extant threatened fauna and 18 presumed to be extinct.

An intensive Woylie Conservation Research Project (a *Saving Our Species* program) was implemented following reports of declines in populations of this species. The project aimed to determine the underlying factors responsible for the woylie decline in the upper Warren Region of south-western WA. The first phase of the investigation into the decline of woylies in the upper Warren Region was completed. Declining populations were monitored intensely over 18 months and feral cat predation of adult animals was believed to be the primary source of mortality. The role of disease in predisposing animals to predation was also examined in a collaborative study with Murdoch University. The project also identified management strategies required to reverse these declines. A second phase is being proposed. This will include monitoring of declining populations at Keninup and implementing a feral cat control program at the site. It is intended that there will be immediate management implications and a revised woylie recovery plan will be developed when results are known.

Research into the effectiveness of current fox control regimes and whether feral cats become a significant predator in the presence of fewer foxes has continued in the northern jarrah forest, rangelands, Lake Magenta and Dryandra. The response of native predators such as chuditch and carpet pythons to fox control is also being examined. In the rangelands it has been demonstrated that annual baiting for feral cats is effective at controlling both foxes and feral cats for 10–12 months. At Lake Magenta and Dryandra, modifications to current fox baiting regimes are being trialled to determine if more effective fox control can be achieved. A significant part of all the projects is to determine the relationship between fox and cat activity, as measured on sand pad transects, and fox and cat abundance. DNA from hair and scat samples is being examined to identify individual animals. This project is a demonstration site for the Invasive Animals Cooperative Research Centre.

The recovery of Gilbert's potoroo (*Potorous gilberti*), Australia's most threatened mammal, continued with the expansion of the translocated population on Bald Island. It is now estimated that more than 20 potoroos exist on the island – a significant part of the total population (thought to be 50–60 animals). A 380-ha fenced enclosure has been completed near Mt Manypeaks and potoroos will be progressively moved into this site over the next few years after predator removal has been completed. It is anticipated that some of these animals will come from a project examining the viability of cross-fostering using a closely related species to increase the output of young for this critically endangered species. Draft recovery plans have been completed for the Shark Bay marsupials: western ringtail possum, quokka and chuditch.

In a collaborative project with The University of Western Australia, WA Museum, and University of Sydney, research has continued on modelling the spread of the cane toad in the Kimberley Region and determining which native species are most at risk. Work is also under way examining the rapid evolutionary response of some native species to cane toad invasion and some behavioural traits are being exhibited which reduce their exposure to the bufotoxin.

Nominations for consideration by the Commonwealth Threatened Species Scientific Committee were finalised for six species of fauna.

Thirty bird species are specially protected because of their listing under Migratory Bird Agreements Australia has with Japan and China, and 11 taxa are specially protected for other reasons, including high values for poaching or competition with commercial activities. The priority fauna list included 193 taxa at 30 June 2008.

Recovery actions were implemented for many threatened fauna. Some highlights include:

- With the assistance of DEC, Perth Zoo continued research into captive husbandry and reproductive technology for threatened frogs.
- The department maintained memoranda of understanding with Perth Zoo for the captive breeding and release of the central rock rat, western swamp tortoise and dibbler as part of recovery programs.
- Educational materials promoting control of damage to crops by Muir's corella using non-lethal methods were produced. These were distributed and non-lethal techniques were demonstrated during field days.
- Smooth marron were removed from the upper reaches of the Margaret River to help stabilise the remaining populations of hairy marron.
- The translocation of captive-bred Lancelin Island skinks to Favorite Island in Jurien Bay in 2002 appears to have been successful with monitoring during 2007–08 capturing juvenile skinks, as well as wild-born adults in breeding condition.
- Monitoring and research were carried out into threatened marsupial populations at Shark Bay.
- Management of the nature reserves for the conservation of the western swamp tortoise continued, including baiting for foxes and rats, fence maintenance, weed control and rehabilitation works. A total of 25 tortoises were released at Mogumber Nature Reserve in August 2007. This was conducted in conjunction with the Perth Zoo, The Friends of the Western Swamp Tortoise and local landowners.

Translocations of plants and animals

Translocation of plants and animals has continued throughout 2007–08 for the augmentation of existing populations of threatened species, or the establishment of new populations in secure areas.

Fauna translocations achieved this year include:

- reintroduction of bilby (threatened) and brushtail possum (non-threatened) to the former pastoral station Lorna Glen;
- dibbler from Perth Zoo to Stirling Range National Parks and from Fitzgerald River National Park to Peniup Nature Reserve;
- numbat from Perth Zoo and Dryandra Woodland to Cocanarup Timber Reserve;
- western ringtail possum from the Busselton area to Leschenault Conservation Park and Yalgorup National Park;
- black-flanked rock-wallaby from the Wheatbelt to Avon Valley National Park;
- banded hare-wallaby from the Peron Captive Breeding Centre to Faure Island (managed by Australian Wildlife Conservancy);
- boodie from the *Return to Dryandra* breeding enclosures to Dryandra Woodland;
- Gilbert's potoroo from Two Peoples Bay Nature Reserve to Bald Island Nature Reserve;
- western swamp tortoise from Perth Zoo to Mogumber Nature Reserve and Moore River National Park;
- quenda from sites on the Swan Coastal Plain to Julimar State Forest and Francois Peron National Park;
- tammar wallaby from Tone Perup Nature Reserve to Palgarup State Forest; and
- brushtail possum from sites on the Swan Coastal Plain to Julimar State Forest.

Fauna reintroductions to the former pastoral lease Lorna Glen (part of the Rangelands Restoration project) commenced in 2007. Following destocking and four years of

feral cat baiting and a reduction of up to 85 per cent in feral cat abundance, bilbies (*Macrotis lagotis*) and brushtail possums (*Trichosurus vulpecula*) were translocated in August as part of the fauna reconstruction of Lorna Glen. Eleven, mainly threatened, species will be reintroduced to Lorna Glen over the next 12 years. Re-establishing populations of these species in the rangelands will not only improve their conservation status, but also improve ecosystem health through the functions they perform such as digging and aerating the soil, improving water and nutrient penetration, and natural grazing and browsing regimes. Bilbies and possums appear to have established and it is proposed to reintroduce mala (*Lagorchestes hirsutus*) in 2008.

Translocations or seed orchards were established or supplemented for the following threatened plant taxa: *Acacia subflexuosa* subsp. *capillata*, *Banksia brownii*, *Daviesia microcarpa*, *Dryandra anatonna*, *Lambertia echinata* subsp. *echinata* and *L. fairallii*.

Western Shield

Western Shield aims to achieve the recovery of native wildlife populations by reducing the impacts of introduced predators and, where necessary, reintroducing native animals.

During 2007–08, more than 3.9 million ha of conservation lands and State forest were baited to control foxes and feral cats, using more than 1.2 million poison baits under the *Western Shield* program. Corporate sponsorship was contributed by ongoing sponsors Alcoa Australia Limited, Tiwest Pty Ltd, BHP Billiton, Worsley Alumina Pty Ltd, Tectonic Resources NL and new sponsor Western Areas NL.

The Minister for the Environment and Climate Change officially opened DEC's expanded bait manufacturing facility at Harvey on 3 June 2008. The facility will produce more than 800,000 fox baits and 425,000 cat baits each year. The expansion will ensure the department continues to have a reliable supply of baits for the *Western Shield* program.

Following trials for feral cat eradication at the former Lorna Glen pastoral station which investigated the most appropriate timing and frequency of baiting determined by cat reinvasion, bilbies (threatened) and brushtail possums (non-threatened) were reintroduced. Results have been encouraging and more translocations to Lorna Glen are planned. Operational research into feral cat control on Peron Peninsula (*Project Eden*) continued.

Work continues with the Australian Wildlife Conservancy and the Invasive Animals Cooperative Research Centre to investigate long-term sustained control of feral cats and foxes in the Mt Gibson and Karara-Lochada areas.

Development of a new toxin and bait delivery mechanism for cat control continued in collaboration with the Victorian Department of Sustainability and Environment and the Commonwealth Department of the Environment, Water, Heritage and the Arts.

While the trap success of some species has increased or remained high through the *Western Shield* baiting program, there has been no recovery of wild unfenced populations of the woylie. However, all extant populations and some reintroduced populations of the woylie appear to be stable, although at low densities. Research into the effectiveness of fox and cat baiting regimes and the role of feral cats and native predators continued this year. Results show there are complex relationships between the abundance of native fauna, introduced predators and bait availability in baited areas. As well as anticipated solutions to improving baiting strategies and methods, benefits of this research include improved monitoring methods for assessing predator abundance, and therefore, baiting effectiveness.

Threatened Ecological Communities

Ecological communities are assemblages of species occurring in specific combinations that occur in unique ways. While Western Australia has a myriad of ecological communities, some of these are becoming increasingly rare and threatened, while others have been destroyed.

The State Threatened Ecological Communities Scientific Committee met once during the year and provided recommendations for communities to be added or deleted from the State list of Threatened Ecological Communities (TECs) and the informal list of Priority Ecological Communities (PECs).

Highlights of actions that were implemented for TECs and PECs, generally with funding support through the Natural Heritage Trust, are listed below.

- A five ha area of private land that contains the endangered TEC shrublands and woodlands on Muchea limestone near Gingin was purchased for addition to the conservation reserve system.
- The condition of occurrences of six TECs in the Midwest Region was monitored. The community shrublands of the Northampton area, dominated by *Melaleuca* species over exposed Kockatea Shale was surveyed and added to the PECs list.
- Educational and awareness-raising products were created to increase the profile of threatened species and community management in the broader community. Products included 'have you seen this species' magnets, an activity book aimed at primary school children, a poster series created by a local artist and the drafting of a teacher resource pack specific to threatened species and communities of the Northern Agricultural Region.
- A draft Recovery Catchment Management Plan for the catchment that contains the critically endangered Lake Bryde TEC ('Unwooded freshwater wetlands of the southern Wheatbelt dominated by *Muehlenbeckia horrida* subsp. *abdita* and *Tecticornia verrucosa*') was completed. Monitoring of water levels and quality was continued for the lake. About 110,000 seedlings were planted in the catchment through the Lake Bryde Recovery Catchment cost share incentive program.
- Bi-annual monitoring of the lake floor and reserve vegetation for the critically endangered Lake Toolibin TEC ('Perched wetlands of the Wheatbelt Region with extensive stands of *Casuarina obesa* and *Melaleuca strobophylla*') was completed.
- Weed mapping and control were undertaken for a number of TECs in the South West Region; fencing and access control plans were developed; seasonal inspections were completed to monitor threats; survey points were relocated and floristic survey plots rescored; and boundaries of TEC occurrences demarcated. Post-fire monitoring and weed control were undertaken in an occurrence of the critically endangered '*Corymbia calophylla*-*Xanthorrhoea preissii* woodlands and shrublands' following a wildfire in Waterloo Nature Reserve, east of Bunbury.
- A taxonomic review of key cave stream invertebrates is well advanced for the Yanchep Caves TEC in Yanchep National Park ('Aquatic root mat community of caves of the Swan Coastal Plain') to better define the component fauna. Monitoring of water levels using the observation bores within the caves to establish long-term trends was continued on a weekly basis. Work on a major re-watering project for the caves and a filtering system to remove iron and manganese from the bore water was continued.
- Informative signs about TECs were designed and constructed for placement at TECs in the Wheatbelt and Midwest regions.
- Macro-invertebrate sampling, water quality testing and sediment analysis were conducted twice in the PEC 'Deep pools of the Avon and Dale River'.
- The Urban Nature group established techniques for controlling *Watsonia* and investigated use of fire as a tool in the restoration process in two TECs in the Perth Hills District. At Brixton Street Wetlands work was continued on the restoration of degraded boundaries of TECs and seed was collected from the reserve for use in future restoration projects. At Talbot Road Bushland, seed was collected for future restoration projects on the two critically endangered TECs that occur in that reserve and Urban Nature staff worked with Midland TAFE on restoration of a creek that runs through the TECs. At Port Kennedy Scientific Park, a technique was developed to control Geraldton carnation weed in the critically endangered 'Sedgeland in Holocene dune swales' TEC. Results were published in proceedings of a workshop held on-site in 2007 for managers of this plant community.

- Monitoring of research trials was continued for the endangered TEC '*Melaleuca huegelii* – *M. systema* shrublands on limestone ridges'. Weed control was undertaken at TEC occurrences in Neaves Nature Reserve, Ellenbrook Nature Reserve, Bootine Nature Reserve, Muchea Nature Reserve and Carousel wetlands. To increase protection for two TECs, fencing was completed at Bootine Nature Reserve and Moore River Nature Reserve. Invertebrate sampling was conducted at a newly located occurrence of a critically endangered tumulus spring ('organic mound springs, Swan Coastal Plain') on private land, and hydrological investigations were completed for an additional spring occurrence on private land. Plots were installed to help confirm the floristic community types present at a number of sites and water monitoring was continued in a suite of TEC occurrences located in reserves.
- A major project to develop and implement procedures to monitor long-term changes in the condition of TECs was initiated. Methods are being developed that are appropriate to a selection of different types of TECs across the State.
- The mapping and updating of data for communities listed on the TEC database were continued. Information about 103 occurrences of 35 newly described PECs and a further 27 occurrences of existing TECs and PECs were added to the database. Regular updates of TEC data are supplied to other State Government departments to assist with assessment of development proposals.

Recovery plans

The Director of Nature Conservation approved 43 Interim Recovery Plans for flora species and one plan covering four TECs. In addition, reviews of the implementation and effectiveness of Interim Recovery Plans were completed for three TECs, and 11 flora. The Interim Recovery Plans and reviews were generally completed with funding assistance from the Natural Heritage Trust.

Fauna Recovery Plans

The department endorsed draft national recovery plans for *Minuria tridens* and *Lepidium aschersonii*.

Interim Flora Recovery Plans

Cape spider orchid	<i>Caladenia caesarea</i> subsp. <i>maritima</i>
Koobabbie poverty bush	<i>Eremophila koobabbiensis</i> ms
Toolinna adenanthos	<i>Adenanthos eyrei</i>
Selena's synaphea	<i>Synaphea</i> sp. Fairbridge Farm
Paynter's tetratheca	<i>Tetratheca paynterae</i> subsp. <i>paynterae</i> ms
Blue tinsel lilly	<i>Calectasia cyanea</i>
Wyalkatchem foxglove	<i>Pityrodia scabra</i>
Robust cone flower	<i>Isopogon robustus</i>
Chiddarcooping wattle	<i>Acacia lobulata</i>
Yornaning wattle	<i>Acacia insolita</i> subsp. <i>recurva</i>
Woolly wattle	<i>Acacia lanuginophylla</i>
Wongan Gully wattle	<i>Acacia pharangites</i>
Orange-flowered wattle	<i>Acacia auratiflora</i>
Spiral fruited wattle	<i>Acacia cochlocarpa cochlocarpa</i>
Wundowlin wattle	<i>Acacia sciophanes</i>
Short-petalled beyeria	<i>Beyeria lepidopetala</i>
Dwarf spider orchid	<i>Caladenia bryceana</i> subsp. <i>bryceana</i>

Majestic spider orchid	<i>Caladenia winfieldii</i>
Wavy-leaved smokebush	<i>Conospermum undulatum</i>
Rare grevillea	<i>Grevillea rara</i>
Silky frankenia	<i>Frankenia conferta</i>
Milky emu fush	<i>Eremophila lactea</i>
Swamp honeypot	<i>Dryandra nivea</i> subsp. <i>uliginosa</i>
Glossy-leaved hammer orchid	<i>Drakaea elastica</i>
Scarp darwinia	<i>Darwinia apiculata</i>
Hairy mat conostylis	<i>Conostylis seorsiflora</i> subsp. <i>trichophylla</i>
Kulin conostylis	<i>Conostylis rogeri</i>
Keighery's macarthuria	<i>Macarthuria keigheri</i>
Chinocup wattle	<i>Acacia leptalea</i>
Broad-fruited haloragis	<i>Haloragis platycarpa</i>
Net-veined gyrostemon	<i>Gyrostemon reticulatus</i>
Lake Varley grevillea	<i>Grevillea involucreta</i>
Spike poison	<i>Gastrolobium glaucum</i>
Resinous eremophila	<i>Eremophila resinosa</i>
Cunderdin daviesia	<i>Daviesia cunderdin</i>
Mogumber and Narrogin bell	<i>Darwinea carnea</i>
Western cyphanthera	<i>Cyphanthera odgersii</i> subsp. <i>occidentalis</i>
Prostrate flame flower	<i>Chorizema humile</i>
Spiny bentleya	<i>Bentleya spinescens</i>
Grand spider orchid	<i>Caladenia huegelii</i>
Sargents snakebush	<i>Hemiandra rutilans</i>
Matstick banksia	<i>Banksia cuneata</i>
Thin-margined leucopogon	<i>Leucopogon marginatus</i>

Threatened Ecological Community Plans

The Interim Recovery Plan for aquatic root mat communities numbers 1–4 of caves of the Leeuwin-Naturaliste Ridge was finalised.

Threatened Flora Seed Centre

Seed collections for conservation, recovery and research were made from 288 taxa including threatened, priority and other poorly known Western Australian flora (428 collections). This included 198 threatened and 167 priority flora as well as 63 general collections. Seeds of 42 critically endangered taxa were collected. Many collections were undertaken in partnership with an international seed conservation program, the Millennium Seed Bank project, and were supported by funding from the Natural Heritage Trust through the South Coast Natural Resource Management Inc and the Northern Agricultural Catchments Council.

Duplicate material of 172 collections will be sent for safe keeping to the Millennium Seed Bank at the Royal Botanic Gardens, Kew, United Kingdom. Twelve collections of critically endangered flora were funded through the *Saving Our Species* program and 16 collections of priority flora were funded through BHP Billiton's Ravensthorpe Nickel Operation. Seeds

of seven taxa collected and stored by the Threatened Flora Seed Centre were used in translocations – *Banksia brownii*, *Lambertia fairallii*, *Hemigenia ramossissima*, *Dryandra anatonata*, *Dryandra montana*, *Calytrix breviseta* subsp. *breviseta* and *Chorizema humile*.

Seedlings produced by the Threatened Flora Seed Centre enable assessment of species response to *Phytophthora cinnamomi* dieback in greenhouse pot trials. New research that involves determination of germination temperature profiles will help to identify flora at risk of decline due to global warming.

Management of marine fauna

DEC attended 26 reported whale and dolphin strandings throughout the year, involving live and dead animals. There were no mass strandings during the period of this report. Three bottlenose dolphins stranded in two separate incidents and were successfully returned to open water. One stranding in the Swan River involved a mother and calf trapped in shallow water. Both were successfully moved to deep water. Overall, the strandings involved 26 individual animals representing eight species – humpback whale, bottlenose dolphin, dwarf sperm whale, pygmy right whale, southern right whale, Brydes whale, long-finned pilot whale and minke whale. The bottlenose dolphin was the most commonly stranded cetacean.

The sixth national large whale disentanglement workshop was hosted in Perth by DEC and the Federal Department of the Environment, Water, Heritage and the Arts.

Three cetacean entanglements in fishing gear were reported during the year. The affected animals included a humpback whale, a southern right whale and a Brydes whale. Two of the whales were disentangled. One whale eluded intervention attempts due to distance and inability to relocate the animal overnight.

Officers also attended 21 reported pinniped stranding incidents throughout the year, comprising 10 sub-Antarctic fur seals and 11 Australian sea lions. One sub-Antarctic fur seal was taken into short-term captive management, but did not survive. Seven sub-Antarctic fur seals were successfully returned to sea.

Wetland conservation

The department has the lead role in the conservation of wetlands in Western Australia. It manages wetlands vested in the Conservation Commission, including many wetlands of regional, national and international significance. It also oversees implementation of international wetland and migratory bird agreements in Western Australia. It provides support and assistance in the conservation and management of privately owned wetlands and seeks to improve community and stakeholder understanding and appreciation of wetland values.

DEC is the lead agency in the proposed nomination of nine new wetlands for listing under the Convention on Wetlands (known as the Ramsar Convention). Candidate areas are the Cape Range Subterranean Waterways, Ellen Brook Swamps, the northern portion of Lake MacLeod, Spearwood Creek, Lake Ballard, Lake Gregory/Paruka, Millstream Pools, Shark Bay East/Hamelin Pool and Fortescue Marshes. It is now a requirement under the Ramsar Convention that nomination of new Ramsar sites includes an ecological character description (ECD) and a Ramsar information sheet together with a management plan for the site. Ramsar information sheets have been developed for each site and all three documents have been completed for Lake MacLeod.

During the year ECDs were completed for the Vasse-Wonnerup and Peel-Yalgorup Ramsar sites and work has begun on others for the Ord River Floodplains, Roebuck Bay, Becher Point, Forrestdale and Thomsons Lakes, Lake Muir-Byenup and Lake Gore Ramsar sites.

The department continues to improve knowledge of the wetlands of the South West through the continuing project 'Wetland Mapping, Classification and Evaluation Program for Priority Areas, South West WA'. The aim of the project is to document the wetland resources of priority areas in the South West and ultimately inform wetland protection and management strategies. To date, wetlands of the Margaret

River, Leeuwin-Naturaliste Ridge and Donnybrook-Nannup areas have been mapped, classified and evaluated. Spatial data are being developed into a dataset for public use. Through this project, 40 wetland sites have been monitored for water quality parameters, macro-invertebrates, vegetation composition and condition, and fauna observations over two consecutive years. The project is funded through the South West Catchments Council, supported by the Australian and Western Australian governments.

The department is also continuing to review the wetland evaluation methodologies for the Swan Coastal Plain to consolidate existing endorsed methods. The revised evaluation method will provide stakeholders with a process to assign wetland management categories.

The department has received funding under the National Action Plan for Salinity and Water Quality to coordinate and support natural resource management regions' wetland mapping, classification, evaluation and prioritisation projects and increase community capacity in wetland management and restoration. Regional groups were consulted to identify their coordination and support requirements and these will form the basis of the products and services DEC delivers in wetland conservation. A wetland restoration and management manual is being developed for use by landholders, community groups, regions and local and State government.

The department continues to maintain and update the State-wide wetlands database that became available at the start of 2006. WetlandBase has increased DEC's ability to distribute wetland management information to assist in improving the management of privately owned wetlands. This free, publicly accessible database brings wetlands data together enabling it to be viewed and queried through an easy-to-use map-based web interface. The database has been developed by the department with assistance and support from the Department of Agriculture and Food, Natural Heritage Trust, WWF-Australia, Coastwest, Murdoch University and Edith Cowan University.

With financial support from Coastwest, the department expanded the scope of WetlandBase in 2007 by including the following coastal map datasets: marine benthic habitat; aquaculture sites; marine conservation reserves and bathymetry. Data from three additional wetland sampling projects in the South West were also made available and the wetland report format was improved to include Aboriginal heritage sites and Western Australian Museum fauna records.

The department secured funding from the National Land and Water Resources Audit to trial a framework and indicators for wetland extent, distribution and condition at the regional level. The project seeks to develop nationally consistent wetland indicators, protocols and methodologies to inform national natural resource management processes, including the Australian Wetland Inventory, State of Environment reporting, Ramsar Convention implementation and national and regional monitoring and evaluation. The Western Australian trial focused on the Wheatbelt Region because substantial wetland mapping and monitoring datasets are available for the region.

Natural Heritage Trust funding was also secured to trial draft criteria for identification and classification of High Conservation Value Aquatic Ecosystems. The trial was undertaken using mound springs of the Swan Coastal Plain and the Rangelands.

Swan Bioplan

The Swan Bioplan project continued to review and update biodiversity conservation measures for the southern Swan Coastal Plain between the Perth metropolitan area and Dunsborough and including the adjoining Darling and Whicher Scarps.

The southern Swan Coastal Plain region is a priority for biodiversity conservation planning. It provides the critical local and regional biodiversity experience to more than 80 per cent of the population in Western Australia, who live, work and recreate on the Swan Coastal Plain. The region is expected to continue to be a focus of future population growth and land use development pressures in the State. Despite this, it retains very significant conservation values, including

a highly diverse flora characteristic of the South-West Botanical Province, and a series of Ramsar listed wetlands that are internationally significant.

The project has already contributed significantly to biodiversity knowledge in the region and provided information to decision-makers that will support better consideration of biodiversity. These include updated remnant vegetation mapping, made available to the Western Australian Local Government Association (WALGA) to support environmental planning and decision-making; a report of the vegetation, flora, fauna and natural areas of the Peel-Harvey Eastern Estuary Area, to support State Government planning for the Eastern Estuaries Environmental Assessment project; a detailed floristic survey of the Whicher Scarp (to be released in 2008), which highlights the importance of this area for flora conservation; and support for the development of a comprehensive database of native and weed flora of the southern Swan Coastal Plain.

The Swan Bioplan project has also worked in partnership with WALGA to advance consideration of biodiversity conservation in local government planning and decisions, through collaboration with WALGA's South West Biodiversity Project, developing the *Local Government Biodiversity Planning Guidelines – Addendum to the South-West Biodiversity Project Area* (released in 2007). This partnership is now being extended to collaboration on a South West Regional Ecological Linkages project to develop linkage methodology and identify regional ecological linkages for the southern Swan Coastal Plain and South West Biodiversity Project Area.

Saving Our Species biodiversity conservation initiative

The *Saving Our Species* initiative was launched in December 2006 and received an allocation of \$4.5 million for 2007–08 which was supplemented with recurrent DEC funds to take the overall budget to \$6.5 million for the financial year.

In 2007–08 *Saving Our Species* funded 58 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 and the State Cane Toad Initiative. Highlights for 2007–08 were:

Invasive animal control

- more than 3,500 invasive animals (feral goats, camels, pigs and donkeys) were destroyed in the south west and pastoral rangelands;
- more than 80 km of boundary fencing was constructed on DEC-managed former pastoral leasehold land, in partnership with neighbouring pastoral lessees;
- 60 person-days of support were given to the Department of Agriculture and Food for the starling surveillance and control program;
- more than 2,800 introduced rainbow lorikeets were removed in the Perth metropolitan area;
- more than 87,000 wild dog baits were laid in the southern rangelands and eastern Wheatbelt;
- more than \$200,000 was provided for feral pig control;
- control of goats was undertaken in the Pilbara and Midwest regions, with significant numbers of animals being removed from Cape Range National Park, Kalbarri National Park and on pastoral leases acquired by DEC; and
- substantial boundary and fencing work as part of the Good Neighbour Policy program was undertaken in the Kimberley and Pilbara.

Environmental weed control

- \$660,000 was spent on weed control operations on 38 species of environmental weed over nearly 4,000 ha of conservation reserves, unallocated Crown land and leasehold land;

- more than 1,000 individual plants of the weed century plant (*Agave american*) were removed from national parks;
- 15 new populations of asparagus fern (*Asparagus scandens*) were identified and treated for removal near Albany;
- more than 4,020 ha were treated to control neem around Kununurra;
- a 268-ha infestation of the declared weed African thistle (*Berkheya rigidia*) was treated in national parks;
- seven populations of declared weeds or weeds of national significance were treated;
- seven weed species were treated in Kings Park;
- a 79-ha infestation of bridal veil (*Asparagus declinatus*) was treated in Kings Park.

Threatened species and ecological communities recovery

- 2,074 plants were propagated for translocation;
- 22 populations of threatened flora were mapped;
- three species and 120 individual threatened fauna were translocated;
- 138 tonnes of rubbish were removed from Bush Forever sites in the Perth metropolitan region;
- 205 surveys of threatened flora/fauna populations were completed;
- 70 ha of weed infestation were treated to protect threatened flora species;
- 2,055 threatened flora plants were translocated;
- five recovery plans or interim recovery plans were drafted;
- 167 flora surveys were conducted for the identification, management, protection and recovery of threatened flora populations. Protection and/or recovery outcomes were achieved for 42 threatened flora species.
- habitat and threatened fauna monitoring was carried out on Bernier and Dorre islands in the Shark Bay World Heritage Property;
- a 380-ha enclosure was constructed to establish a second mainland population of Gilbert's potoroo; and
- a survey was completed of most existing populations of *Drakaea elastica* in the South West Region, with one new population located, along with the addition of three new subpopulations.

Phytophthora dieback management

- three km of subsurface membrane were installed to prevent the spread of *Phytophthora* from root-to-root plant contact at the Bell Track infection in Fitzgerald River National Park;
- *Phytophthora* survey was undertaken over 20,000 ha in the Bell Track area;
- 600 dieback samples taken from the Bell Track area were analysed using a new DNA (polymerase chain reaction) technique;
- 325 ha of low intensity phosphite was sprayed over the Bell Track infestation;
- 15 ha of high intensity phosphite spraying was carried out at the Bell Track infestation; and
- four weather monitoring stations were established at the Bell Track to determine disease activation triggers.

Biological survey and research

- seven ranges and 500 quadrats were surveyed in the Ravensthorpe and banded ironstone formation ranges;
- 1,750 flora voucher specimens were lodged;
- one new population of Declared Rare Flora was collected;
- 99 new flora taxa were described;

- assessment of the conservation status of 33 new taxa was completed;
- new recommendations were made for listing 113 species as priority flora;
- 45 manuscripts were published in the WA Herbarium journal *Nuytsia*, describing 95 new species and varieties of plants in 33 genera (78 of these are declared rare or priority flora);
- 117 sites were sampled for fire research; and
- DEC's online plant identification website, FloraBase and interactive biodiversity information website, NatureMap, were improved.

State Cane Toad Initiative

DEC is the lead agency responsible for cane toad management in Western Australia. The Department of Agriculture and Food and the Agriculture Protection Board (APB) are also involved in implementing the State Cane Toad Initiative, primarily in the areas of quarantine and biosecurity, as cane toads are a declared pest under the *Agriculture and Related Resources Protection Act 1976*. Four key programs are being implemented under the State initiative:

1. fighting the entry and establishment of cane toads in WA
2. identifying and protecting biodiversity assets at greatest risk from cane toads
3. raising public awareness of the cane toad threat, and
4. ensuring effective State-wide coordination of cane toad initiatives.

The DEC surveillance and control team based in Kununurra has continued to undertake on-ground operations, mostly in the Victoria River District of the Northern Territory. In 2007–08 the team:

- deployed and serviced cane toad traps, and collected cane toads by hand (1,605 person days, 5,012 trap nights, 5,636 toads caught);
- undertook surveillance to identify the extent and spread of cane toads in the Victoria River District (50,487 km travelled by vehicle, 7,166 km travelled by quad bike);
- responded to reported sightings of cane toads in Western Australia and the Northern Territory; and
- worked cooperatively with the Northern Territory Government and community groups such as Kimberley Toad Busters and the Stop the Toad Foundation to fight the westward expansion of the toad.

The cane toad front line is about 500 km long and the area of operational work was 950,000 ha. The cane toad front moved about 80 km west during 2007–08.

DEC contracted the Invasive Animals Cooperative Research Centre to review on-ground cane toad control operations to inform decision-making on future investment. The findings of the review indicated that current control methods have had little impact on the westward movement of cane toads. It also recommended that future efforts be undertaken with a coordinated and cooperative approach by all parties involved in cane toad control. As a result of these findings the State Government established the position of Program Coordinator for the State Cane Toad Initiative in May 2008. The position will foster and promote cooperation and a coordinated approach among the various stakeholders involved in cane toad control operations to deliver the best value for the State's investment. A stakeholder working group will be established to develop strategies and advise the State Government on cane toad management issues. Invitations have been issued to a number of organisations and government departments to be represented on the stakeholder working group.

Research into the potential impacts of cane toads on the vertebrate fauna of the Kimberley is continuing with particular emphasis on species likely to be at greatest risk such as frog-eating reptiles (pythons and goannas) and the carnivorous northern quoll. This research, in collaboration with the University of Sydney, The University of Western Australia and the Western Australian Museum, is modelling the spread

of cane toads in the Northern Territory and WA, and establishing monitoring sites in wetlands to examine the response of native frog populations to the arrival of cane toads. DEC is also contributing to the establishment of a cane toad genome research program in collaboration with The University of Western Australia.

This reporting period has seen a decrease in the overall numbers of toads being caught. The reasons for the decline are unclear but pressure on the cane toad front by DEC and volunteer community groups has removed significant numbers of toads from the landscape. Unfortunately, this has not stopped the westward advance of the cane toad front, with toads being found as close as 25 km from the WA/NT border.

Research by the University of Sydney and investigations by the Kimberley Toad Busters have identified a parasitic lung worm in toads closer to the front line. It was thought that the parasite was at least 20 years behind the cane toad front line, but new discoveries indicate that the parasite could be less than two years behind. Research into identifying the species of lung worm is continuing and results indicate that the lung worm found in toads is an introduced species brought with them to Australia from South America. It is hoped that the introduced lung worm will not infect native frog species and that it could be used as a control measure. Other research has identified a 'fear' pheromone in cane toad tadpoles which, when introduced into cane toad tadpole populations, speeds up the metamorphosis process which results in smaller toads. A combination of the fear pheromone and the lung worm could provide a significant weapon against the invading toad front.

Management of commercial activities

DEC ensures that wildlife-based activities are licensed, in accordance with the *Wildlife Conservation Act 1950*, and conducts monitoring and investigations to ensure compliance with legislation and the licences issued.

Management of the commercial harvesting of kangaroos continued throughout the year with input from the Kangaroo Management Advisory Committee. A Wildlife Trade Operation for the euro was approved during the year by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999* for the harvesting of euros for trade, for the period 2007–09. New management programs were also approved for grey and red kangaroos for 2008–12.

Under the grey and red kangaroo management plans, commercial harvest quotas were set for each species for the 2008 calendar year. During 2007, aerial kangaroo population surveys were undertaken over parts of the northern survey zones as part of the triennial survey program, and the South-West forest areas were surveyed to provide a more accurate population estimate for western grey kangaroos. These surveys and submissions endorsed by the State Kangaroo Management Advisory Committee resulted in the submission to the Commonwealth Minister for the Environment of the 2008 grey kangaroo quota of 257,500 (up from 197,780 in 2007). The 2008 red kangaroo quota was recommended at 108,600 (down from 126,585 in 2007) in light of the reduced population following several years of drought conditions over the range of this species. The harvest quota for euros was recommended at 14,000 (down from the initial quota of 30,640 set in 2007).

Commercial harvests of live crocodiles for farm breeding stock development, and limited harvest of eggs and hatchlings, can be approved under the saltwater crocodile and freshwater crocodile management programs. For management purposes, these harvests are primarily restricted to the Cambridge Gulf area, where monitoring ensures that the wild crocodile populations are conserved. New management programs are being drafted for when the current programs expire at the end of 2008.

The Western Australian Flora Industry Advisory Committee provides flora industry management advice to DEC and the Minister for the Environment and Climate Change. The committee met once during the year.

The department revised the management plan for Commercial Harvesting of Protected Flora in Western Australia, and submitted it to the Commonwealth

Department of the Environment, Water, Heritage and the Arts for approval. This plan facilitates the export of native flora harvested in Western Australia.

The department is represented on the National Flora Management Network, established under the Natural Resources Policies and Programs Committee of the Natural Resource Management Standing Committee, which seeks to establish a greater consistency in State and Territory management of the flora industry. Areas of interest include sustainable harvest assessment, monitoring, compliance, enforcement, communication and data management. A guideline for consistent approaches between States to flora tagging was produced during the year and national cycad harvesting guidelines were drafted.

Regulation

Flora and fauna licensing

There were 8,091 fauna licences (other than damage, but including non-commercial) issued during the year, an increase of 9.7 per cent from the previous year (see Appendix D). Continued interest in pet herpetofauna (reptiles and frogs) resulted in an 8.7 per cent increase in licensing with more than 1,763 people licensed to keep reptiles as pets. An 11 per cent increase occurred in avian fauna licences, resulting in the modest increase in the overall licensing picture. The total number of flora licences and permits issued was 1,832, an increase of one per cent from the previous year. DEC issued 346 commercial purposes licences and 274 commercial producer licences and nurseryman licences in 2007–08.

Damage and dangerous fauna licences

The department received three reports of problem crocodiles in the Kimberley Region. Licences to remove three saltwater crocodiles from the wild were issued because of the threat they posed to public safety. Thirteen dangerous fauna licences were issued for magpies (a decrease of 70 per cent); five of the nine dangerous fauna licences issued for western grey kangaroos were to mitigate the risk of aircraft strike at Pearce, Bunbury and Jandakot airports; one licence was issued for euros and one licence issued for red kangaroos at Learmonth airport; one licence was issued for straw-necked ibis at Perth airport; and one licence for banded lapwing and one for ravens were issued for Jandakot airport.

Licences issued for the control of fauna causing damage included 17 licences for emus (a decrease of 39 per cent); 507 licences for western grey kangaroos (a 19 per cent increase); seven licences for little corellas (a decrease of 77 per cent); 27 licences for western long-billed corellas; 22 licences for twenty-eight parrots; 11 licences for galahs; and 10 licences for Australian ravens. One licence was issued to destroy welcome swallows and one licence was issued to destroy one crested pigeon. Such licences are issued only when deterrents, trapping and exclusion methods are unsuccessful and where the birds are causing damage, health or security concerns. The total number of damage licences issued for birds was 119, a decrease of 32 per cent from 2006–07.

Wildlife interaction licences

A total of 113 whale-watch boat-tour operators are licensed State-wide. While these tours are primarily based on humpback whales, southern right whales are the focus of whale watching activity in the lower south-west areas, particularly at Albany, Augusta and Esperance.

There were 90 boat-based dolphin interaction licences, three in-water dolphin interaction licences and two boat-based dugong interaction licences issued. Forty-five boat-based Australian sea lion and New Zealand fur seal interaction licences were issued.

Fourteen whale shark interaction licences were current for the year.

Offences

During the year, DEC staff provided guidance regarding the legal requirements of conservation legislation. There were 637 caution notices issued for minor

offences and 321 infringement notices. Written reports were prepared for 115 offences under the *Wildlife Conservation Act 1950* and its regulations, and the *Conservation and Land Management Act 1984* and its regulations. Action in 82 matters under both statutes was completed.

Table 5: Number of reported offences over time

	2006–07 Reported offences		2007–08 Reported offences ²	
	30.06.07	Revised ¹		As at 30.06.08
Total offences reported	1044	1116	Total offences reported	1073
Court convictions	34	60	Court convictions	20
Court dismissals	0	0	Court dismissals	0
Infringement notices	344	366	Infringement notices	321
Letters of warning	37	29	Letters of warning	43
Caution notices	521	610	Caution notices	637
No further action	46	35	No further action	19
Pending	62	16	Pending	33
Total Court Fines	\$14,600.00	\$29,155.00	Total Court Fines	\$7,200.00
Total Court Costs	\$2,813.40	\$5,125.83	Total Court Costs	\$1,212.21
Infringement Penalties	\$29,020.00	\$31,420.00	Infringement Penalties	\$24,835.00

¹ Figures in this column are updated from those included in the 2006–07 annual report.

² See Appendix D for details of 2007–08 offences.

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

Biodiversity conservation strategy

Development of a State biodiversity conservation strategy continued in 2007–08. Work progressed on the development of a summary document and analysis of submissions on 'A 100-year Biodiversity Conservation Strategy for Western Australia. Phase One: Blueprint to the Bicentenary in 2029'. The State biodiversity conservation strategy will help provide priorities and a framework for conservation actions and decisions at local and regional levels, as well as guidance for national and international initiatives. The goal is to recover and conserve Western Australia's biodiversity – along with representative landscapes and ecosystems – within 100 years.

The strategy will include a focus on species and ecosystems known to be under significant pressure and on the brink of extinction. It will aim to prevent a decline of biodiversity in ecosystems and landscapes that are ecologically intact and in relatively good condition.

Biodiversity Conservation Act

Drafting of the Biodiversity Conservation Bill continued. The draft Bill is being prepared for further consideration by the State Government and consultation with stakeholders.

Regional Marine Planning

DEC is the lead agency for a whole-of-government initiative, Regional Marine Planning (RMP), a collaborative process between government and stakeholders which aims to better coordinate planning and management of the State's marine waters in order to protect and maintain ecological integrity and biological diversity and to ensure sustainable benefits are derived from the marine environment.

A State Marine Policy Stakeholder Group comprising representatives of peak organisations continued to advise government on development of a State Policy Framework for

RMP. The first RMP process in Western Australia is being conducted for State waters of the South Coast from Cape Leeuwin to the South Australian border, led by a multi-agency working group with DEC as lead agency. Extensive stakeholder advice on the preparation of a draft South Coast Regional Marine Strategic Plan has been received through a cross-sectoral stakeholder advisory group and community and specialist workshops. DEC is also a member of the intergovernmental working group facilitating integration between State and Commonwealth marine planning processes.

Managing system-wide threats

Salinity management

A project was initiated in 2007–08 as a collaboration with the Future Farm Industries Cooperative Research Centre to further develop and apply decision tools in managing complex natural resource management tasks, including salinity operations. The work will continue to provide the foundation for dealing with risk and uncertainty in salinity management decisions, including proposed engineering works.

A 10-year review of the department's salinity management program (to 30 June 2006) progressed through completion of a draft review of DEC implementation of allocated tasks under State Government policy documents. An associated review of programs is due for completion in 2008–09. The review will make recommendations for the future of the department's salinity program.

Natural diversity recovery catchments

The Natural Diversity Recovery Catchments program aims to halt degradation and recover high value biodiversity assets in the south west that are at risk from altered hydrology, particularly salinity. There are currently six natural diversity recovery catchments. Key activities for 2007–08 in individual natural diversity recovery catchments included major surface water management works at Lake Bryde and Toolibin Lake. These works, when completed next year, will ensure that waterlogging of vegetation and surface expression of salinity are decreased within parts of the reserve systems. The works will also improve water management in the catchments as a whole.

The Buntine-Marchagee Natural Diversity Recovery Catchment Plan was endorsed by DEC and supported by the Conservation Commission. This is the first of a series of new plans that is being produced for each recovery catchment. Activities in this catchment have also included a large area of integrated water management works on farmland aimed ultimately at decreasing sediment and salt loads reaching biodiversity assets in the valley floor, while at the same time better protecting farmland.

In the Lake Warden Natural Diversity Recovery Catchment planning is well advanced for engineering works to protect the key wetlands from excess water. A detailed Environmental Impact Assessment report has been completed and is being assessed.

Purchase of a freehold enclave on the southern shore of the Torditt-Gurruw wetland is one highlight from work in the Lake Muir-Unicup Natural Diversity Recovery Catchment. Drain closure and rehabilitation works will be undertaken in 2009.

The department has also contributed to a range of committees including those relating to the Engineering Evaluation Initiative, Catchment Demonstration Initiative and the Rural Towns Program Advisory Committee. Two DEC officers and a Masters student from The University of Western Australia involved in the salinity program presented papers at the International Salinity Forum in Adelaide.

Invasive species control

Feral pigs

The department is working towards a more strategic and cooperative approach to the management of feral pigs, with a particular focus on the south west. DEC continued to conduct feral pig control activities, including trapping and

poisoning, in the forests of the south west and in the Midwest. However, the effectiveness of feral pig control efforts continues to be hindered by illegal hunting, transport and release of pigs by recreational shooters.

Starlings

Starlings present a significant threat to Western Australia's biodiversity through spreading disease affecting native animals, out-competing native birds, dominating nesting hollows used by birds and mammals, spreading weeds and damaging and killing roost trees. The department continues to assist the Department of Agriculture and Food on the starling eradication program along the south coast of WA. Teams of DEC staff provided surveillance to locate starlings in the Coomalbidup, Masons Bay, Condingup and Munglinup areas during a 10-week period from October to December 2007. As a result of the joint surveillance activity, 355 starlings were destroyed in 2007–08 in addition to the 620 birds destroyed in 2006–07, with the aim of achieving eradication of these incursions and pushing the control line back towards the South Australian border.

Feral goats

Feral goat control activities continued on the Peron Peninsula and Nanga, to minimise the impacts of these animals on mangrove communities and fauna habitat. Boundary and good neighbour fencing projects in the Murchison will also contribute to the control and management of invasive species.

Cattle, donkeys, camels and invasive rainbow lorikeets

Feral cattle control operations in the Kimberley and feral donkey control operations in the Pilbara were undertaken in partnership with the Department of Agriculture and Food. Feral camel survey work in the Great Victoria Desert and Nullarbor continued in order to provide an assessment of the environmental impacts of feral camels and for developing cost effective control strategies. A program for the control of invasive rainbow lorikeets was undertaken in the Perth metropolitan region to reduce competition for nest spaces and food resources with native species and to prevent the risk of disease impacts to native bird species. More information about these programs is available under the *Saving Our Species* biodiversity conservation initiative section.

European honey bees

Trial work was completed into the control of the European honey bee (*Apis mellifera*) using remote poisoning for large-scale programs and in situations where the location of feral hives cannot be determined or accessed. Baiting trials were conducted at Garden Island and Yellagonga Regional Park, with effective control of feral hives being observed.

The department has developed a Standard Operational Procedures manual for feral bee control based on the results of the trials conducted during the program. The manual considers the impact and risks to non-target species and occupational health and safety requirements for efficient baiting of feral bees using the pesticide. A submission is being prepared for the Australian Pesticides and Veterinary Medicines Authority in a bid to have the pesticide label amended to allow it to be used to control feral honey bees.

Management of environmental weeds

Weed management actions on DEC-managed lands are prioritised in each region according to the policy outlined in the *Environmental Weed Strategy of WA (1999)*. During the year DEC started a weed risk management project that will prioritise weeds in each of the 26 WA bioregions defined by the Interim Biogeographical Regionalisation of Australia (IBRA). The project will assess weed species for their invasiveness, impacts, potential and current distribution and feasibility of control. It will also investigate the use of an asset-protection-based approach to determine the priority of established weeds. The approach looks at setting the priorities for management actions to protect environmental assets from the threat posed by established weeds.

The species targeted for weed management included arum lily, bridal creeper, blackberry, Bathurst burr, cape tulip, African lovegrass, rubber vine, calotrope, athel pine, tamarisk, Victorian tea tree, African boxthorn, cacti and other significant environmental weeds.

DEC continued the implementation of a three-year eradication program in the West Kimberley focusing on rubber vine, a weed of national significance. The project, which started in 2006, is funded through the *Defeating the Weed Menace* program and is administered by the Commonwealth Department of Agriculture, Fisheries and Forestry and the Department of the Environment, Water, Heritage and the Arts. Throughout 2007–08 the project continued to foster coordination and integration between various land managers, including the WA Department of Agriculture and Food, regional natural resource management groups, local community action groups and landowners.

DEC continued as a member of the WA Weeds Committee, which met twice in 2007–08. The committee sponsored two Invasive Plants Awards to acknowledge the weed management efforts of an individual and a group. These awards were announced at the WA Landcare Awards Ceremony held in Bridgetown in April 2008.

Protocols have been developed for systematic assessment of the potential weed risk associated with the introduction of new plant species used in natural resource management and salinity control plantings in agricultural landscapes.

***Phytophthora dieback* management**

The following achievements have been made in 2007–08 in the management of *Phytophthora dieback*:

- Launch of new standardised *phytophthora dieback* signage in conjunction with Project Dieback.
- Completion of the *Phytophthora Dieback Management and Investment Plan for Western Australia 2006–2014* as part of a Dieback Response Group initiative in conjunction with the Centre for *Phytophthora* Science and Management at Murdoch University.
- Phosphite spraying of endangered plant populations in the south west.
- Completion of an epidemiological research project investigating the temporal variation in the pathogen population dynamics at three field sites on the south coast of WA.
- Ongoing monitoring of spatial variation in the soil population dynamics of *Phytophthora cinnamomi* at the three field sites on the south coast of WA.
- Ongoing monitoring of the research trials into the efficacy of the high intensity phosphite application at three field sites in the South Coast Region.
- Construction of a physical and chemical barrier to prevent *Phytophthora* escaping containment at the Bell Track infestation in Fitzgerald River National Park.
- Completion of a catchment hydrological study at Bell Track.
- Application of high intensity phosphite and low intensity phosphite at Bell Track to prevent the outbreak of the disease into the adjoining sub-catchments.
- Completion of the assessment of the conduciveness of South Coast Region soils to *Phytophthora cinnamomi* infection.
- Determination of the origin of the Sussetta infestation within the Fitzgerald River National Park.
- Revegetation of approximately 50 ha of the infested area at the Bell Track infestation.

Tuart woodlands

In February 2008 the State Government approved funding of the Centre of Excellence for Climate Change Woodland and Forest Health. This collaboration of research and industry partners, including DEC, will create strategic opportunities at State and national levels for increasing knowledge about the impacts on ecosystem function, health and biodiversity from natural and human-caused threatening processes. Outputs from the centre will

allow the development of management practices and tools by DEC to mitigate tree and woodland declines, support healthy vegetation communities, and enhance natural values, benefits and land use options in tuart woodlands of the Swan Coastal Plain.

Assessment of land resource use impacts on biodiversity

In 2007–08, the initial environmental impact assessment process for the Gorgon Gas Field development on Barrow Island under the *Environmental Protection Act 1986* was completed with the project receiving approval from the Minister for the Environment and Climate Change in September 2007. The department had a major role in providing advice relevant to the final approval by the Minister. DEC is providing scientific expertise and other resources related to the review and approval of management plans and implementation of other requirements and commitments under State approvals. The department is also providing advice to the Environmental Protection Authority (EPA) on a proposed increase in the capacity of the Gorgon project.

Woodside Petroleum's Pluto Liquid Natural Gas (LNG) Project required considerable departmental input during 2007 in terms of advice and recommendations for management of potential impacts of marine dredging on biodiversity values. The department also had a significant role in providing advice to proponents and decision-making authorities on a range of other major development proposals including the Albany Iron Ore Project, the Central West Coal Project, the Woodside Browse LNG project, the Ichthys LNG project, the Yannarie Salt Project and the Karara Magnetite and Mungada Ridge Hematite projects.

Further advice was provided on the assessment and ongoing management of development projects, including approximately 30 new major development proposals in the Midwest and Pilbara regions. This involvement included contributing to the development and implementation of environmental conditions for the Mount Gibson Iron Ore Project, the Pluto LNG project, the Mesa A – Warramboe Iron Ore project, and expansions of rail and other infrastructure by mining companies in the Pilbara.

DEC contributes to the whole-of-government process of implementation of the Integrated Project Approvals System (IPAS) for projects within the State Development portfolio. DEC is represented on the Inter-Agency IPAS Management Group, which is responsible for monitoring and continuous improvement of IPAS.

As part of the implementation of the IPAS system, DEC is required to provide information on performance in relation to the timeliness of provision of conservation related advice to approvals agencies for a range of government approvals processes for IPAS projects in its annual reports. While the department responds to many requests for advice each year, the data required to be reported (subject to Cabinet agreed time limits) represent a small proportion of its overall advice workload. A summary of performance for the 2007–08 reporting year is provided in Tables 6 and 7.

Table 6: Performance in relation to provision of advice for tasks subject to formal IPAS time limits for the 2008 reporting year^{1 & 2}

Approval process	Stage	Number of advice tasks 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
<i>Environmental Protection Act Part IV – PER/ERMP</i>	Advice/comment on environmental scoping document	15	11	10	66	-1
<i>Environmental Protection Act Part IV – PER/ERMP</i>	Advice/comment on environmental review document	5	13	3	60	2
<i>Environmental Protection Act Part IV – PER/ERMP</i>	Advice during public review period	9	27	5	55	4
<i>Environmental Protection Act Part IV – ARI/EPS</i>	Advice to EPA on project proposal	4	20	2	50	0
<i>Environmental Protection Act Part IV</i>	Post approval environmental management plan/issue management plan	7	15	5	71	-1
<i>Mining Act</i>	Advice on notice of intent/mining proposal	2	19	2	100	-1
<i>Petroleum Act</i>	Advice on petroleum development proposal	1	14	1	100	-1
Mean		NA	17	NA	71	0

¹Based on data for advice requests received between 1 July 2007–30 June 2008.

²Table only includes tasks that were subject of the State Government's formal time limits 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 or Resources portfolios are not included. Overall DEC responded to an estimated 500 IPAS-related requests for advice.

Table 7: Contributory factors in cases where formal time limits were not met for the 2008 reporting year¹

Reason	Number of cases	Percentage of cases
Non-availability of documentation	0	0
Non-availability of expert staff	0	0
Non-availability of staff/time resources	8 ²	100
Administrative error	0	0
TOTAL	8	100

¹Based on data on advice requests received between 1 July 2007–30 June 2008.

²There was approximately 40 per cent turnover and a high vacancy rate in 2007–08 for DEC staff involved in the provision of conservation related advice.

In conjunction with the Department of Water, DEC secured Natural Heritage Trust funding for a project to evaluate the downstream impacts of drainage proposals in the Wheatbelt. The Wheatbelt Drainage Evaluation project has close linkage with the Avon Wetland Base-lining project undertaken by DEC's Science Division. Wetlands across the Wheatbelt have been mapped and they will be assigned one of three broad categories depending on the level of anthropogenic disturbance. A table will be produced for proponents to use when planning drains and a field manual is being produced to assist DEC staff who are required to provide comment on a Notice of Intent to drain. The category of a potentially impacted wetland will be used to guide the level of environmental assessment required for the drainage application.

Banded iron formation ranges strategic review

The Strategic Review of the Conservation and Resource Values of the Banded Iron Formation of the Yilgarn Craton was endorsed by Cabinet on 22 October 2007 and the State Government's endorsement of the strategic framework was announced on 24 October. Three key banded iron formation ranges in the Mt Manning area have been identified for the creation of national parks or nature reserves. The three-year DEC regional floristic survey of banded iron formation ranges, started in 2005 by the Science Division, provided a strong basis for the DEC report and the outcomes.

The outcomes of the review reflect a constructive approach to conservation and exploitation of economic resources. The review has provided a framework to deliver certainty to allow for the development of mines and infrastructure to support a Midwest iron ore industry focused around a port at Oakajee while establishing clear targets and thresholds for biodiversity conservation.

The review identified three valuable range systems (Helena-Aurora, Mt Manning and Die Hardy Ranges) for conservation in the Mt Manning area as class 'A' national park or nature reserve (as generally recommended in EPA Bulletin 1226). Planning for the creation of these reserves is at an early stage.

Applications to clear native vegetation: assessment and activity

Clearing is an offence under the *Environmental Protection Act 1986* unless the clearing is done under the authority of a clearing permit or the proposed clearing is subject to an exemption.

The department's Clearing Permit System database records details of all applications and decisions, and is also the basis of the published records available on the department's website.

Five hundred and sixty-two applications were received to clear vegetation in 2007–08. A total of 517 decisions were made by DEC with 141 decisions made by the Department of Industry and Resources under its delegation from DEC.

Table 8: Permit areas granted to clear under section 51C of the *Environmental Protection Act 1986*

Purpose	Area (hectares)
Mineral production	3,722
Mineral exploration	1,867
State Agreement	1,643
Road construction or maintenance	637
Building or structure	374
Extractive industry	254
Grazing and pasture	253
Drainage	161
Hazard reduction or fire control	157
Timber harvesting	125
Horticulture	113
Infrastructure maintenance	113
Industrial	108
Recreation	53
Plantation	45
Dam construction or maintenance	41
Stockpile	10
Bore construction	8
Fence line maintenance	6
Miscellaneous	4
Restoration	3
Cropping	2
Landscaping	1
Petroleum production	1
Railway construction or maintenance	1
Total	9,702

Table 9: Areas refused a permit to clear under section 51C of the *Environmental Protection Act 1986*

Purpose	Area (hectares)
Grazing and pasture	1,393
Cropping	1,278
Horticulture	1,100
Industrial	218
Extractive industry	133
Timber harvesting	76
Building or structure	64
Aquaculture	34
Dam construction or maintenance	7
Restoration	4
Road construction or maintenance	4
Recreation	2
Hazard reduction or fire control	1
Total	4,314

Vegetation conservation notices

Vegetation conservation notices may be given under section 70 of the *Environmental Protection Act 1986* if the Chief Executive Officer suspects on reasonable grounds that unlawful clearing is likely to take place, is taking place or has taken place on any land. A total of 11 vegetation conservation notices were given requiring the person bound by the notice to ensure that no unlawful clearing or further unlawful clearing takes place on the land. A further five vegetation conservation notices for private land were given requiring the person bound by the notice to take specified measures to repair or mitigate the environmental harm caused by the clearing.

Review of native vegetation clearing processes and legislation

The Auditor General conducted a controls, compliance and accountability examination into the regulation of clearing and tabled his report on 5 September 2007. The Auditor General's report found that the process for regulating the clearing of native vegetation was supported by strong and comprehensive systems and that there were clear principles for assessing applications, as well as adequate transparency and accountability in decision-making. It also found that DEC was redressing the issue of compliance with decisions and permit conditions and enforcement action in respect of illegal clearing through the development and implementation of a compliance inspection program.

The *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* were amended in June 2008 following the recommendation of a stakeholder advisory group. The amendment makes the transitional exemption for clearing that is fire hazard reduction burning done in accordance with Item 3 of Regulation 5, permanent.

Native tree crops/revegetation

Developing new, broadscale flora industries based on native plants, particularly as a means of controlling secondary salinisation in the Wheatbelt, continued as the major focus of work. The role of revegetation in climate change and direct biodiversity benefits is also being explored. In the case of biodiversity benefits, this will be through one of the department's participant partners in the Future Farm Industries Cooperative Research Centre.

The *FloraSearch* project concluded during the year. It was supported by the Joint Venture Agroforestry Program and the Cooperative Research Centre for Plant Based Management of Dryland Salinity. It was a national scale project but the Western Australian component has laid the foundation for intensive development of three native species: *Acacia saligna*, *Atriplex nummularia* and *Eucalyptus loxophleba* subsp. *lissophloia*. Initial assessment of large scale progeny trials of *Acacia saligna* and *Atriplex nummularia* was completed and revealed considerable natural variation that will provide the opportunity for later selection and breeding. The work on *Atriplex* is conducted on a national scale with the help of the department's partners.

The mallee breeding and seed production program obtained useful information from detailed studies of the variation in flowering period for parent trees selected from across the full geographic range of each species. This will enable trees that flower outside the main flowering period to be culled from seed orchards to reduce the impact of self fertilisation and consequent reduction in vigour.

Mallee planting by farmers continued at reasonable levels in spite of difficult seasonal conditions. Mallee seed sales were about 10 million seeds in spring 2007 (to produce seedlings for field planting in winter 2008). The difficult seasons had a strong negative impact on orchard seed production and supply is still below demand for smooth-barked York gum (*Eucalyptus loxophleba* subsp. *lissophloia*).

The Future Farm Industries Cooperative Research Centre commenced business on 1 July 2007. Three major projects have been proposed and will be managed by DEC in the New Woody Crops Industries Program. They involve genetic improvement, supply chain development and economic analysis of woody crop production.

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

The department continued to be a member and co-chair (with WWF-Australia) of a consortium of other government agencies, Commonwealth representatives, non-government organisations, and community representatives seeking to develop a biodiversity conservation strategy for the south-west of Western Australia. The consortium (the Southwest Australia Ecoregion Initiative) is working with James Cook University and Western Australian universities to ensure a sound scientific basis is used for the conservation planning process. During the year a workshop was held on ecosystem processes to help determine the role these processes have in conservation planning.

Public participation programs

DEC provides the administrative support for the Minister's Community Conservation Grants Scheme. Grants were provided to 44 community groups and individuals involved in voluntary community conservation.

DEC's *Healthy Wetland Habitats* 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 may submit an expression of interest in the program for the development and implementation of a management program for their wetland. A technical advisory committee reviews the expressions of interest and ranks them according to priority for management support through the program. Under a voluntary management agreement, a management action plan and funding of up to \$10,000 are offered for prioritised wetlands to provide landholders with assistance in fencing, weeding, replanting and managing wetland habitats. Information seminars aimed at private landholders and other groups with an interest in wetlands are also run as part of the program.

During the year 18 properties were visited covering a total wetland area of 155 ha, together with 212 ha of associated remnant vegetation. Eighteen desktop assessments and field reports were finalised and 14 management action plans and funding offers were developed for properties in association with the landowners. To June 2008, a total of \$140,000 was awarded for conservation management works which included three km of fencing, 115 ha undergoing weed control and 41 ha of revegetation.

Roadside conservation

The Roadside Conservation Committee (RCC) coordinates and promotes the conservation and effective management of native vegetation on road and rail reserves for the benefit of the environment and the people of WA. DEC meets the cost of servicing the committee and obtains contributions towards the committee's operations from Main Roads WA.

The RCC seeks to facilitate best practice management of remnant vegetation in transport corridors by raising awareness, liaison and cooperation. The RCC is aware of the need for a safe and efficient road system and endeavours to ensure that this is 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.

Training road management and maintenance staff in roadside vegetation management is an integral part of the RCC's work. During the year RCC staff coordinated a workshop with DEC and Main Roads WA on declared rare flora and other environmental issues within road reserves for Main Roads WA staff and contractors in Kalgoorlie.

Through the RCC, DEC provided roadside conservation value maps with accompanying reports to local governments. Maps were completed for the shires of Katanning, Westonia and Koorda. Geraldton-Greenough and Mundaring shires completed roadside surveys and are processing the information and the shires of Donnybrook-Ballingup and Kellerberrin collected some information for maps. The RCC is also working with DEC's Information Management Branch and the Department of Agriculture and Food on making the roadside conservation value maps and reports available on the Shared Land Information Platform.

Wetland Coordinating Committee

DEC continues to chair the State's Wetland Coordinating Committee and is actively involved in the implementation of the Wetland Conservation Policy for Western Australia (1997). The committee has reviewed the policy and aims to implement a revised policy in 2008 once it is endorsed. The department is represented on the working groups for Wetland Status; Wetland Buffers; Drainage Evaluation and the Wetland Restoration and Management Manual Project.

The committee is also coordinating the development of key State initiatives to improve the protection of wetlands. These include a framework for evaluating 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 managing and restoring wetlands.

Urban Nature

The *Urban Nature* program continued to work with managers and a wide range of stakeholders during 2007–08 to provide technical advice and support and to facilitate sound bushland management.

The *Urban Nature* program has worked in partnership with managers of nature reserves, regional parks, local government bushland reserves and privately owned Bush Forever sites. The focus has been on identification of values, threat mitigation and bushland restoration. Work has included development of field herbaria, fungi surveys, seed collection, dieback mapping, developing signage and mapping and weed management. The program has secured additional grant and sponsor funds to assist in some of these works.

The program published results of adaptive management trials on control of regionally significant environmental weeds including Geraldton carnation weed, sharp rush and watsonia. Investigations have also continued into managing weed invasion into threatened ecological communities and the role of fire in this process.

Program staff provided training, workshops and presentations, and have produced publications including the quarterly newsletter *Bushland News*. Training included the five-day nationally accredited 'Managing Weeds in Bushland' course.

The *Urban Nature* program has used funds provided by the Commonwealth Government's Natural Heritage Trust through the Swan Catchment Council, and the *Saving Our Species* program, to continue a two-year project to carry out strategic planning for significant environmental weeds, develop plans for management, provide website-based information on these weeds and their control, and to implement on-ground control of significant environmental weeds.

Provision of private land biodiversity conservation support and advice

Land for Wildlife

DEC's *Land for Wildlife* scheme is a voluntary program that aims to increase the area of wildlife habitat on lands under private management. To achieve this, landowners or leaseholders are invited to register their properties in the scheme. An assessment is made of the quality of the wildlife habitat and advice is provided to encourage land management based on sound ecological methods. Advice is also provided to allow landholders to obtain assistance in fencing, replanting and managing wildlife habitats. A number of other public extension activities, such as workshops and field days, are also organised.

During the year 103 new properties were registered in the scheme. The total area of the 115 properties visited for the first time during the year was 36,021 ha, with 3,641 ha being dedicated wildlife habitat. In addition, 43 properties were formally revisited for stewardship matters, raising the total number of on-site property visits to 158. A total of 1,657 properties are registered with *Land for Wildlife*. DEC staff visited 1,528 properties covering 1,110,619 ha (including 251,693 ha of land where the primary management purpose is nature conservation). A significant *Land for Wildlife* milestone

has been reached – more than a quarter of a million ha of property has been registered (effectively private nature reserves). During staff visits to properties, staff recorded 160 occurrences of rare or threatened fauna, flora or ecological communities.

While *Land for Wildlife* does not provide any direct financial support, the scheme is accredited as a non-binding 'voluntary management agreement', which assists landholders in seeking grants. During the year, staff helped with 10 funding applications by registrants to programs such as the Commonwealth Natural Heritage Trust Envirofunds, Mitre 10 Schools grants and a funding program run by the South West Catchments Council. Support included provision of 'voluntary management agreements', project development and letters of support.

Four editions of the *Western Wildlife* publication were produced. During the year, *Land for Wildlife* staff wrote 15 articles for the print media, gave a presentation at an international conference and another at State level, gave 18 radio interviews, organised 23 displays at agricultural shows or similar, and gave 54 talks at workshops, seminars or to schools or other groups. This included 11 events which were specifically bagged with the *Land for Wildlife* brand.

Staff nominated five groups or individuals registered with *Land for Wildlife* for awards during the year, all of which reached the finals of their category. One, Mt Manypeaks Primary School, was the national winner of the United Nations Environment Award, Educators' Category.

A major achievement during the year was entering details of all *Land for Wildlife* sites onto DEC's spatial database. This will facilitate locating where there are interested landholders with private land of nature conservation value and enable the sites to be more easily incorporated into other natural resource management planning.

Nature Conservation Covenant Program

The voluntary Nature Conservation Covenant Program assists 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 18 titles, protecting 2,279 ha of native vegetation. The program now has entered into covenants over 104 titles and 8,341 ha of land, including a number of threatened species and ecological communities (Table 10). A further 36 covenants are being negotiated to protect another 3,854 ha of native vegetation.

Table 10: Cumulative number of land titles under covenant between 1999–2000 and 2007–08

Year	No. titles under covenant	Conditional	Voluntary
99–00	0	0	0
00–01	8	8	0
01–02	20	16	4
02–03	33	19	14
03–04	46	25	21
04–05	61	30	31
05–06	82	45	37
06–07	86	49	37
07–08	104	61	43

The covenant program continues to maintain relationships with other State agencies and non-government organisations to improve the delivery of the covenant service. In particular, the program has been involved in the delivery of the WWF-Australia Healthy

Ecosystems project in the Avon region. The project aims to deliver 10 covenants in the Avon region over two years. As a direct result of this partnership DEC has entered into conservation covenants over five titles with three landholders, protecting approximately 167 ha of bushland. Three more conservation covenants are being negotiated.

There has been an increase in the number of covenants being entered into to meet conditions of subdivision imposed by the Western Australian Planning Commission and Ministerial conditions. As a result of this increasing demand, the program has been contributing to the reviews of various local and State Government planning policies, as well as delivering presentations to other sections of the department to educate staff about the application of conservation covenants as conditions of development approvals. Additional promotion was also conducted outside DEC through *Healthy Wetland Habitats* workshops, agricultural field days and an international GIS conference. A covenant program representative attended a National Covenant Programs Manager's Workshop in Canberra with coordinators of other covenant agencies from throughout Australia to discuss common issues faced by conservation covenant programs. The objective is to have nationally consistent approaches to operating conservation covenant programs.

The department is involved in the operation of the State's revolving fund program *BushBank* that is administered by the National Trust of Australia (WA). *BushBank* seeks to purchase private land of conservation value, protect it under a conservation covenant, and then sell the land to a conservation buyer. The funds 'revolved' from the sale are then available to purchase another property. One million dollars was provided by the State to the revolving fund, and this was matched by the Commonwealth to provide a fund of \$2 million. DEC chairs the technical advisory committee, provides biodiversity advice on prospective properties and makes its covenanting program available for protecting the properties. The department was also represented on the *BushBank* board during the year.

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 and Regional Development. 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*.

Under the code, every staff member involved in fauna research, biological survey, fauna monitoring or animal handling must have Animal Ethics Committee (AEC) approval before starting the activities. An important part of this approval is to be able to demonstrate that staff members have the competencies to undertake the work required. In addition to assessing the department's own projects, the committee has agreed to assess animal ethics applications from other organisations including the Western Australian Museum, the Australian Quarantine and Inspection Service (AQIS), the Australian Wildlife Conservancy, the Centre for Whale Research, and since March 2008, the Department of Fisheries.

Applications and annual reports were assessed by the AEC at six meetings over the past financial year. For the 2007 calendar year, 138 projects were continuing and active, and 129 annual reports were received from them. Twenty-three of these occurred at more than one site and were external to DEC's operations. There were no serious cases of non-compliance with the code during the year.

The AEC maintains a register of projects in accordance with the conditions of its licence to use animals for scientific purposes. A comprehensive database of applications has been developed and this stores details of the project, staff affiliations and competencies.

The animal ethics intranet site was completed early in 2007 and was updated on a regular basis during the year. It is a valuable resource for researchers interested in conducting wildlife work and those interested in animal ethics issues.

The department is continuing to improve the *Standard Operations Procedures* which document the minimum standards for all techniques that have been considered and approved by the committee.

2.1.2 Service 2: Sustainable Forest Management

Service description: 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.

Performance summary

	2007–08 Target \$'000	2007–08 Actual \$'000	Variation \$'000
Expense by service	36,680	40,539	3,859
KPI	2007–08 Target	2007–08 Actual	Variance
Average cost per hectare of managing State forest and timber reserves	\$28.26	\$31.24	\$2.98

Performance highlights

- Continued implementation of the Forest Management Plan 2004–2013 (FMP).
- Draft *Guidelines for the Management of Informal Reserves and Fauna Habitat Zones* and draft *Soil and Water Conservation Guidelines* released for public comment in March 2008.
- Further developed biodiversity assessment and ecological modeling tools to predict the spread of the plant pathogen *Phytophthora cinnamomi* and conducted analysis of the risk to biodiversity associated with the spread.
- Designed and established the final locations of nine indicative fauna habitat zones associated with planned disturbance.
- Worked with the Forest Products Commission (FPC) to complete the three-year rolling Timber Harvest Plan 2008–10.
- Provided information about Western Australia's forests to the Australian Government for publication in *Australia's State of the Forests Report 2008*.
- Maintained the spatial and measurement data sets required to sustainably manage State forest and timber reserves.
- Undertook two community forest inspections.
- Analysed data collected from 48 sites established during the initial five years of the *ForestCheck* monitoring program and prepared the information for publication.
- Released the final report of Project Vesta which finalised a major study of fuel dynamics and fire behaviour in the jarrah forest.
- Continued to facilitate the implementation of the Wungong Catchment Environment and Water Management Project for the Water Corporation.

2.1.2.1 Overview

Consistent with the statutory purpose of State forest and timber reserves as defined in the *Conservation and Land Management Act 1984* (CALM Act), under this service DEC provides for their management on an ecologically sustainable basis. This includes:

- implementing the *Protecting our old-growth forests* and other government policies
- ensuring forest values are managed on an ecologically sustainable basis through implementation of the FMP, and
- providing for the harvesting, regeneration and growth of forest products in accordance with the FMP and guided by the principles of ecologically sustainable forest management.

Service 2: Sustainable forest management addresses five key areas of activity:

1. Implementation of approved forest management plans and government policies and programs
2. Inventory, assessment and modelling of natural resources
3. Maintenance and enhancement of biodiversity and other values
4. 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, and
5. Partnerships.

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

Protecting our old-growth forests policy

Action has 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 with a range of government and other bodies during the year. Once the consultation process has been completed, it is proposed to create the new reserves through the passage of a Reserves Act.

Forest Management Plan 2004–2013

The FMP set times for the development of a number of guideline documents. The documents whose time for completion has expired are *Guidelines for the Management of Informal Reserves* and *Guidelines for the Selection and Management of Fauna Habitat Zones* (end 2004), *Soil and Water Conservation Guidelines*, *Goals for Understorey Structural Diversity* and *Forest Monitoring Guideline* (end 2005). Considerable work was undertaken on development of the contents of guidelines, with draft *Guidelines for the Management of Informal Reserves and Fauna Habitat Zones* and draft *Soil and Water Conservation Guidelines* released for public comment in March 2008. Implementation continues in accordance with the appendices in the FMP and existing guidelines pending finalisation of new guidelines.

DEC continued to develop protocols for collecting data and reporting on key performance indicators of the FMP.

Work began to prepare information for the mid-term audit of the FMP. The audit will look at the extent to which management of land has been undertaken in accordance with the FMP, including consideration of information on key performance indicators. The Conservation Commission report on the mid-term audit is planned to be with the Environmental Protection Authority by 31 December 2008.

Community forest inspection program

Community forest inspections provide community representatives with the opportunity to inspect first-hand the systems and processes that are in place to manage sustainably 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 harvest coupes in the Warren Region in December 2007 and the Swan Region in April 2008. DEC is working with stakeholders to refine the process.

2.1.2.3 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 FPC, 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. The use of LIDAR (Light Detection and Ranging) technology to map forest structure and stratify areas for timber inventory was evaluated and major analyses of non-sawlog timber resources were conducted for industry feasibility studies.
- Vegetation mapping was undertaken to inform silvicultural decisions, old-growth forest assessments, disease impact predictions and the protection of poorly represented vegetation complexes.
- Work continued on a major project to quantify the threat from *Phytophthora* dieback to biodiversity assets.
- Field measurement programs to monitor the yields and silvicultural standards realised in timber harvest operations were increased. Data processing systems were enhanced to increase the detail available from the data collected.
- Specialist services were provided 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, estimation of carbon sequestration by forests and database design and development.

2.1.2.4 Maintenance and enhancement of biodiversity and other values of forests

Activities under the Sustainable Forest Management Service undertaken by the Sustainable Forest Management Division incorporate measures to sustain, or where possible enhance, biodiversity and other forest values. Staff deliver information services and the mapping of *Phytophthora* dieback occurrence to enable operations to be undertaken with the lowest risk of spreading *Pyhytophthora*. Staff are 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 22,276 ha was mapped to assist the planning of roads and timber harvesting operations undertaken by the FPC. This included 5,174 ha of previous mapping that was checked for further spread. Mapping and hygiene planning were undertaken on a further 6,059 ha for DEC's purposes, and 6,783 ha for external parties. Interpretation from helicopters, coupled with field sampling, was undertaken to explore for new infestations in the Fitzgerald River National Park. Training programs were carried out in disease mapping and hygiene management.

A major project to undertake *Phytophthora* dieback threat assessment and risk analyses for vegetation in the South West and Northern Agricultural natural resource management regions on both DEC and non-DEC managed lands continued with the South Coast Natural Resource Management group. This included the collation of information on biological assets, strategic disease mapping, predictive modelling of the future spread of *Phytophthora*, and estimation of threat and risk categories.

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; and
- 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 Soil Trafficability Index and prescribing measures to be applied in each risk period to protect soil during timber harvesting. Revised requirements were introduced in June 2007 for the management of soils associated with timber harvesting. 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.

Considerable development work was undertaken on the *Soil and Water Conservation Guidelines* including an independent review of surface water management practices. The draft *Soil and Water Conservation Guidelines* were released for public comment in March 2008 after considerable input from reference group members including external agencies.

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 ha each in State forest and timber reserves. Design, analysis, survey and/or liaison work was undertaken for 19 indicative fauna habitat zones adjacent to proposed disturbance activities and the location of nine indicative fauna habitat zones was finalised. Considerable development work was undertaken on the *Guidelines for Selection of Fauna Habitat Zones*.

Management system for approvals, monitoring and compliance

All operations on State forest require consideration and approval from DEC. Departmental staff monitor 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 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 2007–08 staff issued 18 WINs and 28 MLs. Fourteen related to systems and process issues, thirteen to ecosystem health and vitality issues, seven to biodiversity issues, seven to productive capacity issues, four to soil and water issues and one to social and economic issues. Of the 46 incidents in 2007–08, nine have been closed, six with satisfactory outcomes and three with unsatisfactory outcomes. Seven of the 31 incidents reported in the 2006–07 financial year have been closed, five with satisfactory outcomes and two with unsatisfactory outcomes. DEC is developing a risk rating system to aid in the identification of significant incidents for future reporting of non-compliance.

Forest monitoring

Knowledge of the genetic resources of tree and understorey shrub species from south-west forests was reviewed and synthesised to provide the basis of a guideline for seed collection zones applied in the management of State forest.

A major study of fuel dynamics and fire behaviour in the jarrah forest was finalised in November 2007 with the release of the final report of Project Vesta. The project

involved scientific collaboration between the department and CSIRO with more than 100 experimental fires ignited during dry summer conditions. This research has clearly demonstrated that the potential rate of spread and intensity of summer fires can be reduced by prescribed burning and that these benefits can persist for 15 years or more.

Information about the effects of timber harvesting on biodiversity and soil physical properties in the jarrah forest collected during the initial five years of the *ForestCheck* monitoring project has been analysed and prepared for publication.

Adaptive management

DEC contributed to the establishment by the Water Corporation of the Wungong Catchment Environment and Water Management project. This adaptive management trial in the 12,845-ha Wungong catchment aims to increase water availability by managing vegetation density. The project has treated about 1,000 ha of State forest. Operations undertaken in advance of thinning have included *Phytophthora* dieback mapping, fuel reduction prescribed burning, tree marking and reserve demarcation, and detailed harvest planning was completed for part of the trial. The total area that has been included in planning is 5,624 ha. Information has been presented to Greens WA party members; the Jarrahdale and Armadale communities; DEC staff; Water Corporation staff; students from the Australian National University, Edith Cowan University, The University of WA and Murdoch University; and members of the Institute of Foresters of Australia.

In conjunction with DEC, CSIRO has started planning and monitoring for the Premier's Water Foundation project on 'Vegetation dynamics and water yield under changing climate and management' within Cobiac and 31-Mile sub-catchments.

Trials are continuing in Jack Rocks subcatchment in relation to the effect of more frequent prescribed burning on water availability. This project is a joint effort between DEC and the Water Corporation.

2.1.2.5 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 for the jarrah, karri and wandoo forests continued with a major emphasis on the jarrah guidelines, training and monitoring and evaluation of current on-ground silvicultural practices.

Preliminary investigations into the genetic adaptations of understorey species within seed collection zones identified for forest rehabilitation following harvesting have been completed. Results will contribute to silviculture guidelines to maintain the genetic integrity of rehabilitated forests.

DEC approved a third interim silviculture guideline developed by the Water Corporation to facilitate implementation of the Water Corporation's Wungong Catchment Environment and Water Management project. The guideline is for the first thinning of bauxite rehabilitation areas established before 1988 with exotic species.

Monitoring of areas subject to timber harvesting and associated treatments

Monitoring of areas subject to commercial timber harvesting, silvicultural treatments and forest disturbance activities carried out under the direction of the FPC was undertaken. In the 12 months to December 2007, 9,740 ha of native forest were harvested with the following silvicultural or management objectives.

Table 11: Silvicultural objectives

Forest type	Silvicultural objective	Area cutover (ha)
Jarrah	Release of regeneration (gap)	410
	Establishment of regeneration – eastern jarrah (shelterwood)	500
	Establishment of regeneration – western jarrah (shelterwood)	2,540
	Promote growth on retained trees (thinning)	360
	Single tree selection (retention in dieback areas)	2,200
	Selective	1,190
	Subtotal	7,200
Karri	Establish jarrah/karri regeneration	20
	Establish regeneration (clearfall karri)	440
	Establish regeneration (partial karri clearfall)	100
	Promote growth on retained trees (thinning)	1,000
	Subtotal	1,560
Wandoo	Establishment of regeneration	20
	Promote growth on retained trees (thinning)	40
	Subtotal	60
Other/any forest type	Other (mining and clearing for utilities)	920
	Total	9,740

Jarrah silvicultural objectives for 4,210 ha harvested in this or previous years were achieved by follow-up treatment during the year. Karri regeneration was completed on 580 ha harvested in either this or previous years.

Regional harvest plans

DEC reviewed the 2008 Indicative Timber Harvest Plan submitted by the FPC to ensure consistency with the settings adopted in the FMP. The Three-year Timber Harvest Plan (2008–2010) required by the FMP to be produced by DEC was finalised following a public consultation process and work commenced on the preparation of the 2009–11 plan.

2.1.2.6 Partnerships

Throughout the year effective communication and interaction continued with:

- the community and stakeholders;
- other State agencies and authorities, and
- Commonwealth 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, Montreal Implementation Group, National Forest Inventory and to other national forums on ecologically sustainable forest management. The department contributed to the preparation of the national State of the Forests Report published in 2008. Partnerships with regional natural resource management groups were also maintained through joint projects.

Collaboration with research teams located at various universities included projects on forest disease, native forest silviculture, climate change and the use of remote sensing to monitor forest condition.

Table 12: Trends in the area of native forest harvested

	Jarrah forest	Jarrah/ wandoo forest	Karri forest	
	(ha)	(ha)	Clearfelled or cut to seed trees (ha)	Thinned (ha)
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

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

2.1.3 Service 3: Parks and Visitor Services

Service description: Management of lands and waters, dealing with public involvement, visitation and appreciation of the natural environment on lands and waters managed by the department, including:

- preparing and implementing management and recreation site development plans
- providing, managing and maintaining appropriate access, recreation opportunities and visitor facilities
- protecting natural areas, visitors and facilities from wildfire
- training departmental staff and volunteers
- working with local tourist bureaus and commercial tour operators
- involving Indigenous people in park management and 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, and
- provision of services to, and performance of statutory functions by the Conservation Commission of Western Australia (Conservation Commission).

Performance summary

	2007–08 Target \$'000	2007–08 Actual \$'000	Variation \$'000
Expense by service	61,016	71,860	10,844

KPI	2007–08 Target	2007–08 Actual	Variance
Cost per visit	\$5.08	\$5.72	\$0.64

Performance highlights

- Finalised management plans for Shoalwater Islands Marine Park, Kennedy Range National Park and proposed additions and Lake McLarty Nature Reserve.
- Expended \$16 million on capital works projects and tourist road improvements in national parks, conservation parks, State forests and other reserves across Western Australia as part of the world-class parks initiative. Maintained facilities in a safe and workable condition with a focus on site works that provide for the protection of environmental and cultural values and/or visitor safety.
- Continued the planning and construction of the Munda Biddi Trail in the south-west forests between Collie and Nannup and maintained and improved the Bibbulmun Track, in conjunction with the Munda Biddi and Bibbulmun Track foundations.
- Completed the Sidings Rail Trail between Nannup and Jarrahwood.
- Won the 2008 Australian Institute of Landscape Architects Award for the Swarbrick recreation site. DEC also won a silver medal for the Bibbulmun Track and a bronze medal for the Munda Biddi Trail, in the 2007 Sir David Brand Tourism Awards in the Significant Tourism Attraction category.
- Advanced the provision of innovative sustainable tourism services and developments through partnerships with the private sector, including leasing and licensing initiatives. This included the opening of the Karijini Eco Retreat developed under lease by the Gumala Aboriginal Corporation.

- Opened the Canning River EcoEducation Centre and completed the Pinnacles Desert Interpretive Centre in Nambung National Park to increase community awareness of nature conservation and to enhance visitor experiences.
- Consolidated the highly successful Community Involvement Program, including the *Healthy Parks, Healthy People* initiative. The *Healthy Parks, Healthy People* Strategic Plan 2008–2011 was published in June 2008.
- Continued to undertake social research, including several partnerships with the Sustainable Tourism Cooperative Research Centre, and started of a review of DEC's visitor data collection program.
- Progressed the nomination process for World Heritage listing of Ningaloo Marine Park and parts of the North West Cape.
- Progressed the implementation of the remaining land tenure recommendations in the Forest Management Plan 2004–2013.
- Continued joint management arrangements with the Miriuwung and Gajerrong #1 (Native Title Prescribed Body Corporate) Aboriginal Corporation under the Ord Final Agreement. DEC assisted with development of a Miriuwung-Gajerrong cultural planning framework and started the preparation of a management plan for six new conservation parks.
- Continued to develop effective and meaningful liaison with Aboriginal groups through the development of joint management agreements and the progression of employment and training opportunities for Aboriginal people through the Mentored Aboriginal Training and Employment Scheme (MATES) program.
- Consulted with Aboriginal groups to finalise Nyoongar names for three national parks and four regional parks in the Darling Range.
- Progressed the construction of a building to house a large one-metre aperture telescope for research and public star viewing at the Perth Observatory.
- Purchased a new All-Sky Camera with a grant obtained from the Astronomical Society of the Pacific, USA, to provide an internet-accessible, real time, wide-angle view of the night sky visible from the Perth Observatory.
- Installed the Oil Region Astronomical Society and Clarion University, USA, internet telescope at the Perth Observatory after substantial building modifications and the development of control software were undertaken by observatory technical staff.
- Jointly organised and conducted the Parks and Protected Areas Forum with the Conservation Commission.
- Continued to assist the Conservation Commission with the auditing of management plan performance, including the management plan performance for Dryandra Woodland.

2.1.3.1 Overview

The performance of Service 3: Parks and Visitors Services is reported in 12 key areas:

1. Planning for management
2. Acquisition and administration of protected areas
3. Park presentation and resource protection
4. Visitor communication and management
5. Aboriginal liaison, consultation and heritage
6. Business management
7. Legislation and policy for parks and visitor services
8. Recreation activities and trails
9. Community involvement and regional parks
10. Social and visitor research
11. Astronomy, and

12. Performance of support to the Conservation Commission.

Several significant projects, such as Miriuwung-Gajerrong, World and National Heritage and regional services merit reporting separately.

2.1.3.2 Planning for management

During 2007–08, the Minister for the Environment and Climate Change approved management plans for Shoalwater Islands Marine Park, Kennedy Range National Park and proposed additions and Lake McLarty Nature Reserve. This brings the total number of management plans under the *Conservation and Land Management Act 1984* (CALM Act) to 54. The Minister also approved the Shark Bay World Heritage Property Strategic Plan, which is a non-statutory plan. The management plan for the proposed St John Brook and Jarrahwood conservation parks was also finalised during 2007–08 but cannot be approved until the parks are created. A further 11 terrestrial and three marine plans are currently being finalised.

The final management plan for Shoalwater Islands Marine Park was gazetted on 30 October 2007, and the zoning scheme established on 30 May 2008 through the publication of a classified waters notice in the *Government Gazette*.

Planning to expand the network of marine parks and reserves in the Pilbara and lower west Kimberley (Eighty Mile Beach) began in 2007–08. An interagency working group was established with representatives from key agencies to ensure a whole-of-government approach is achieved. The group met three times in 2007–08. Community information sessions were held in Perth, Broome, Port Hedland, Onslow and Karratha and a program of engagement with Aboriginal native title representative bodies was started. Ecological and socio-economic information is being collated to support the reserve planning process.

DEC was also responsible for the preparation of draft management plans that were released for public comment for the Millstream-Chichester National Park and Mungaroo Range Nature Reserve and the Shark Bay Terrestrial Reserves and proposed reserve additions. A further 12 terrestrial draft management plans are in various stages of preparation.

The public was given an opportunity to contribute to the content of these management plans through public and peak stakeholder workshops and meetings, formal advisory committees, newsletters, and invitations to comment on draft plans. The engagement of Aboriginal people also continued through the involvement of Aboriginal native title representative bodies and Aboriginal park councils.

DEC's website enables 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. The 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 2007–08, with the third being sent to about 950 stakeholders.

DEC continued to enhance the terrestrial management plan development process through a review of management plans and trials of new tools and formats for management plan development, jointly with the Conservation Commission.

Appendix C shows the status of plans approved or in preparation during 2007–08 and the area of each tenure category managed by DEC that is covered by a management plan as at 30 June 2008.

2.1.3.3 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 12 freehold properties and one pastoral lease during the year. Details of these acquisitions are provided under the heading 'Conservation land acquisitions' in section 2.3.5 'DEC-managed lands and waters'. Agreements to acquire four further properties were also reached during the year, and will be finalised in the next financial year.

Other programs and processes also 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 with consultation continuing with local governments, public utilities, government agencies and people and bodies concerned with native title. Work also continued towards the implementation of outstanding tenure recommendations in other management plans.

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

DEC also undertook actions necessary for excisions from the State's conservation and forest estates to accommodate proposals that have a community benefit.

Leasing activities

DEC has lease arrangements for a wide range of purposes. At the end of the financial year there were 189 formal arrangements for uses on lands managed by DEC including recreation, tourism accommodation, utilities and sawmills.

The formal arrangements comprise 136 leases, 29 written agreements, six licences, 13 memoranda of understanding and three sawmill site permits. Two long-term arrangements with the Department of Foreign Affairs and Trade for monitoring stations in the Shannon and Leeuwin-Naturaliste national parks were also formalised.

DEC entered into 33 formal agreements in 2007–08, which included the formalising of 15 existing arrangements following the gazettal of permits to take water. Other agreements that were finalised included:

- an agreement with the Shire of Kalamunda to manage Paxwold house in Pickering Brook National Park. The shire has sub-let the facility to Kanyana Wildlife Rehabilitation Centre.
- a lease for tree cropping in State forest and timber reserves of the south-west, and
- a lease to the Shire of Albany for the Goode Beach Fire Station in Torndirrup National Park.

The contract for services at Mount Hart Station in the King Leopold Ranges Conservation Park was also renewed for another two years to allow for the management of the homestead and the provision of tourism services.

Apiary site management

At the end of the financial year there were 3,402 current apiary site permits issued on Crown land in the State. Of these, 1,652 (48 per cent) were on lands managed by DEC, with 842 located on State forest, 105 on timber reserves, 396 on national parks, 232 on nature reserves, 62 on conservation parks and 15 on other lands vested in the Conservation Commission.

During the year, 1,165 apiary site permits were issued, comprising:

- 52 permits transferred between beekeepers
- 23 permits from applications to occupy new or previously cancelled sites, and

- 1,090 permit renewals

The Beekeeping Consultative Committee met twice during the year to discuss industry issues, proposed amendments to the *Forest Management Regulations 1993* and DEC's policy on beekeeping on public lands. The committee is convened by DEC and comprises industry, government and beekeeping groups.

2.1.3.4 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 the Parks and Visitor Services Division aims to improve and maintain recreation and tourism assets located in national parks, conservation parks, State forests and other reserves across the State as part of the world-class parks initiative. Works are typically associated with the construction, upgrading and maintenance of roads, day use and camping facilities, and with work required to address 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, \$16 million in capital works funding was expended on park improvements and roads. A more detailed description of capital works projects undertaken within each region is provided under section 2.1.3.15 Parks and Visitor Services regional activities.

Roads

DEC continued to progress the development of its road classification and asset management system, based on the ROMAN Pavement Management system, which is used by most local government authorities throughout Western Australia.

An engineering contract was let to carry out a field assessment to collect, record and categorise information on DEC-managed sealed and unsealed roads, bridges and associated road assets in the Goldfields, Wheatbelt, Midwest, Pilbara and Kimberley regions. These assessments follow collection undertaken in previous years in the Warren, South West, South Coast and Swan regions, and was done in accordance with the new DEC road classification system. The data collection program for the remaining five DEC regions will continue in 2008–09.

Once complete, DEC will have a comprehensive database of more than 37,000 km of roads. This initiative will assist DEC to identify high priority road improvement works, plan its strategic road requirements and continue its collaborative work with local government authorities and Main Roads WA on inter-regional road construction and maintenance work across organisational boundaries.

Recreation planning and design

Master plans, concept plans and site development plans were prepared for many projects around the State. These include plans for upgrading visitor access and facilities at Wallaroo Rocks in the Goldfields, Bottle Bay in Francois Peron National Park, East Mount Barren in Fitzgerald River National Park, Chapman Pool in Blackwood River National Park and Yeagarup Lake in D'Entrecasteaux National Park. Plans were also prepared for fire damaged recreation sites on the south coast at Stokes Inlet in Stokes National Park and Thomas River in Cape Arid National Park. Landscape design development was undertaken for the Pinnacles Desert Interpretive Centre in Nambung National Park. Design continues on upgrading visitor facilities at Yardie Creek in Cape Range National Park as well as Sugarloaf Rock, Hamelin Bay and 'access for more' on the Cape to Cape Track in Leeuwin-Naturaliste National Park. Planning for visitors was completed for Lane Poole Reserve and the Shark Bay area, and continues for the Ningaloo area, Yanchep National Park and Esperance coastal reserves.

Site planning and detailed design were completed for the Walpole Wilderness Discovery Centre sites at the Valley of the Giants and Swarbrick, and continue at Mount Frankland.

Design and/or construction documentation drawings were prepared for many small structures such as boardwalks, toilets, steps and lookouts, including new toilets in Francois Peron National Park and at Yardie Creek in Cape Range National Park, a boardwalk and lookout for viewing stromatolites at Lake Thetis near Cervantes and new camp kitchens and toilets at Stokes Inlet and Thomas River. Design continues for new lookouts at Mount Frankland in Frankland National Park and Castle Rock in Porongurup National Park.

Planning, training and design advice for recreation were 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. The Recreation Planning and Management course was held in November 2007. Advice was given on numerous external projects associated with DEC and DEC was represented on working groups such as the Coastwest Technical Assessment Group and Australian Standards for Outdoor Access for people with disabilities.

Visual impact assessment, recommendations, guidelines and specialist advice were provided for a number of proposals throughout the year.

DEC also contributed to the development of a visual landscape planning manual and guidelines along with the Department for Planning and Infrastructure, Main Roads WA and the Department of Water. The manual was published by the Western Australian Planning Commission in November 2007.

2.1.3.5 Visitor communication and management

Interpretive planning

DEC provided interpretive perspectives into the preparation of management plans, visitor services plans, recreation site development plans and interpretive projects. Interpretation project plans were prepared for major site developments with facilities, exhibits and sign products.

Interpretive design

The DEC Sign Design Studio continued to meet regional needs for signs and displays in managing visitors to DEC-managed areas. Designs were prepared for 328 projects, of which 302 were produced for installation.

Interpretive projects of particular note were the Wilderness Discovery Centre sites at the Valley of the Giants Tree Top Walk, which include a large cross-sectional mural of the landscape with illustrations of wildlife and people over time. Super-sized sculptures of invertebrates from the Walpole Wilderness create an illusion of immersion into the scene. Other exhibits, including interactive multi-media, further develop the stories of the natural and cultural values and the changing perspectives of the forest and wilderness.

Park orientation signs, interpretation panels, trailhead and trailside signs were produced and installed in Lesueur National Park. A similar whole-of-park interpretive approach was applied to the Stirling Range National Park with the installation of orientation and trailhead information and the incorporation of the new across-tenure dieback sign system.

Visitor risk management signs, along with wildlife management signs, site rehabilitation signs and the new dieback sign system, continued to be produced to assist the management of these issues. The Walpole Wilderness Style Guide and Sign System were endorsed as the prototype for a new DEC parks sign system.

Support was provided to the DEC steering group, consultants and DEC staff from the Parks and Visitor Services Division, Midwest Region and Jurien District working on the Pinnacles Desert Interpretive Centre in Nambung National Park.

Community liaison, consultation and advisory services

The dieback sign system was developed with WA's project dieback team, the State Dieback Consultative Council and the Dieback Working Group as an integrated dieback signage system for all land tenures, and is being implemented across the south west.

Consultation with special interest groups, agencies, individuals and Aboriginal communities was a key aspect of the Lake Ballard site development in the Goldfields. Interpretive panels and signs were located away from the artworks at the site and have been designed to inform visitors, address visitor risk and assist in interpretation of the site.

DEC also worked with the City of Canning and the community on the interpretive design of the Canning River EcoEducation Centre, which was opened on 7 June 2008.

Advice was also given to local authorities and various friends groups across the State on the planning, design and production of signs.

Guided interpretive programs

Guided interpretive programs continue to be provided regularly in major areas throughout Western Australia. These include the Nearer to Nature program, which is provided in Perth's regional parks and at the Perth Hills National Parks Centre, 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 and at Leeuwin-Naturaliste National Park.

2.1.3.6 Aboriginal liaison, consultation and heritage

DEC's Aboriginal Heritage Unit focuses on liaison, consultation, planning, relationship building, education, training and Aboriginal protocol.

It 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. Over the year this included:

- working with elders from Quairading to return sacred boulders to Mount Stirling. This connects Aboriginal and non-Aboriginal people back to country for their future wellbeing
- fencing a site of cultural significance at Wedge Island that was being damaged by off-road vehicles. The project was developed in partnership with the Department of Indigenous Affairs, Northern Agricultural Catchments Council, Kwelena Mambakoort Wedge Island Aboriginal Corporation and South West Aboriginal Land and Sea Council
- assisting the Swan River Trust to liaise with local Wadjuk elders to gain Aboriginal cultural input into the River Guardians program, and
- assisting DEC's Species and Communities Branch in developing partnerships with the Balardong (Quairading) community elders to gain Aboriginal cultural input on sites of cultural significance.

Planning and relationship building

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

- the provision of advice to DEC staff regarding Aboriginal involvement on the DEC-managed lands and waters (e.g. assisting with management plans)
- providing the link for ongoing liaison between DEC regional and district staff and Aboriginal communities
- the continuation of work with the Department of Corrective Services to deliver Aboriginal programs at prisons such as Acacia Prison and Bunbury and Albany regional prisons

- male staff attending a Nyoongar maarman (men's) meeting to build partnerships with other Nyoongar men in the community
- organising a meeting between the Gnulla Maarman Moort Boodjah men's group and the Minister for the Environment and Climate Change and DEC staff to progress joint management initiatives, and
- the preparation of a draft DEC policy on Acknowledgement of Traditional Aboriginal Custodians.

Education and training

The Aboriginal Heritage Unit continues to deliver quality Aboriginal educational presentations to schools (primary and secondary), TAFE colleges, universities, community groups and other organisations. During the year the unit:

- conducted 79 presentations at schools, TAFE colleges, universities, community groups and other organisations for 5,345 participants
- completed four cultural protocol workshops at Walyunga National Park for 64 DEC staff
- completed workshops at Walyunga National Park for DEC's Healthy Parks, Healthy People program, in partnership with the Office for Seniors Interests and Carers, and for DEC's Environmental Impact Assessment Division and the Swan River Trust
- continued to assist in the delivery of training to MATES trainees and to support other Aboriginal staff in DEC, and
- continued to progress towards the 10–15 per cent Aboriginal employment target for DEC by 2015.

Aboriginal protocol

The Aboriginal Heritage Unit provides advice to DEC staff regarding the appropriate protocols for acknowledging and involving Aboriginal people in DEC events and activities. The unit was involved in the following activities:

- assisting, along with DEC Aboriginal staff, Nyoongar elders to conduct a healing ceremony at the Dwellingup Training Centre
- assisting DEC staff in organising welcome-to-country presentations, and
- continuing to assist DEC staff to respond in Nyoongar language after traditional owners have undertaken a welcome-to-country.

2.1.3.7 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 2007–08, DEC revised the brochure 'National, marine and regional parks in Western Australia – A visitor's guide to the State' for reprinting and distribution to every visitor centre and DEC office throughout the State. The brochure outlines activities at more than 100 parks for visitors to enjoy.

In November 2007, DEC coordinated an interactive and informative display at the Perth 4WD and Adventure Show. DEC was also present at the 2008 Perth Caravan and Camping Show, which attracted more than 40,000 people.

DEC was represented at trade industry events to build awareness of the department and to provide information on attractions and visitor facilities and services on DEC-managed lands and waters. DEC attended the Western Australian Tourism Exchange at the Burswood Entertainment Complex in August 2007 and was present at Australia's biggest trade industry event, the Australian Tourism Exchange, held on 14–20 June at the Perth Convention Exhibition Centre.

In addition, DEC was involved in a number of other activities providing information and services to the tourism industry and the community, including:

- co-hosting a Tourism WA familiarisation visit for 60 German travel agents in Kalbarri National Park
- partnering with the Tourism Council WA to present at a series of half-day accreditation workshops throughout the State
- continuing to produce and distribute the bi-monthly *Touring Western Australia* e-newsletter for more than 1,800 stakeholders in the tourism and travel industry and for DEC staff, other government agencies and local government authorities
- securing promotional editorial features on national parks and campsites in numerous publications including the *The West Australian* and *Western Australia Experience Guide*, and
- continuing to meet quarterly with DEC's Tourism Industry Reference Group to generate two-way communication between DEC and the nature-based tourism industry.

Park passes and fees

National park passes are distributed at 88 points around the State, including DEC offices and selected national parks, as well as 41 independent retail outlets. Online retail points are increasing in popularity, with two interstate and three Western Australian internet resellers.

Distribution figures indicate that Holiday Park Passes continue to be popular, increasing by 5 per cent in 2007–08. Demand for Goldstar passes increased by 6 per cent, illustrating the pass's value for money in combining 12 months' subscription to DEC's award winning *LANDSCOPE* magazine and unlimited national park entry.

Table 13: Breakdown of pass distribution 2007–08

Type of park pass	Number distributed	Change from 2006–07
Holiday	5,797	Increased 5 per cent
Annual local	5,262	Decreased 37 per cent
Annual all	3,519	Decreased 19 per cent
Annual all concession	1,289	Decreased 32 per cent
Goldstar	1,215	Increased 6 per cent

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

In 2007–08, DEC approved 178 requests for entry fee waivers. The values of foregone revenue is approximately \$36,142 based on estimated visitor numbers of 11,872 (see Table 14).

Table 14: Fees waived – visits by region

Region	Around Perth	Midwest	Pilbara	Kimberley	Warren	South Coast
No. of visitors	6,149	2,377	1,689	72	482	1,103

Commercial operations and events

DEC licenses commercial operations to monitor and manage the commercial use of DEC-managed lands and waters. The Tour Operator Handbook details licence conditions applicable to commercial operators conducting such activities. In January 2008, updates to the Tour Operator Handbook – Terrestrial and Tour Operator Handbook – Marine were printed and distributed to commercial operators.

As at 30 June 2008, 360 commercial operations licences were on issue for activities in marine and terrestrial reserves: 315 general 'T' class licences and 45 'E' class licences

for operations that must be restricted. The number of commercial operations licences was more than the 356 licences on issue at the end of 2006–07. One expression of interest was conducted for the allocation of up to 15 licences permitting commercial in-water whale shark interaction tours in Ningaloo Marine Park. Applicants were required to address selection criteria based on the principles of triple bottom line sustainability and the process was overseen by an independent probity auditor. Fourteen applicants who met the required standards were offered licences.

Three tour operator accreditation programs are currently recognised and strongly encouraged by DEC to assist in raising standards in the tourism industry: Eco Certification (with business and environmental components), National Tourism Accreditation Program (NTAP) (business certification) and Green Globe. At the end of 2007–08, there were 55 Eco Certified (45 in 2006–07) and 118 NTAP accredited operators (117 in 2006–07).

With the increasing number of commercial events occurring in protected areas, particularly in the State's south west, DEC has recognised the need to establish a specific application and internal approval process for large-scale commercial events. To this end, DEC has established an events working group to prepare a policy and a process for managing events.

The implementation of the Coral Bay Boating Strategy, first approved by the Minister for the Environment in 2002, is nearing completion. The strategy is aimed at increasing swimmer safety and reducing user conflict by removing non-essential commercial and all recreational vessel activity from Bills Bay, adjacent to the Coral Bay townsite. The construction of the Coral Bay maritime facility by the Department for Planning and Infrastructure, the installation of moorings at Monck Head and the decommissioning of moorings in southern Bills Bay constituted major steps in the implementation of the strategy. The final stage, the gazettal of a restricted no-boating area at Bills Bay and the development of supporting educational material, is due to be completed in late 2008.

2.1.3.8 Legislation and policy for parks and visitor services

A review of the regulations relating to apiary sites on Crown land continued. Following the receipt of legal and policy advice, the legislative mechanism for the management of apiary sites will be by way of amendments to the Conservation and Land Management Regulations 2002 (CALM Regulations) rather than by amendment to the present Forest Management Regulations 1993. The preparation of advice which will be put to the Parliamentary Counsel's Office is continuing.

In January 2008, the Conservation and Land Management Amendment Regulations (no. 2) 2007 expanded the purposes of indigenous State forest and timber reserves to include the location of public infrastructure which serves the public interest (e.g. telecommunications towers). Such infrastructure cannot be inconsistent with the other statutory purposes State forest (e.g. conservation).

Amendments to the CALM Regulations are also being considered to expand and improve the management of moorings on marine reserves. The changes will be put to the Parliamentary Counsel's Office for drafting of the amendment regulations.

Amendments to the CALM Act and the *Wildlife Conservation Act 1950* are being developed to allow Aboriginal traditional owners and DEC to jointly manage vested reserves (including marine reserves) and freehold land subject to a CALM Act section 16 agreement. The CALM Act amendments under consideration will also allow a wider range of activities by Aboriginal traditional owners to be carried out on CALM Act land and waters and for traditional and customary Aboriginal activities to be accommodated as a management objective.

DEC has provided substantial input into policy considerations and drafting for the *Indigenous Conservation Title Bill 2007*. The Bill seeks to provide a qualified form of freehold title to the Aboriginal traditional owners for Rudall River National Park and Gibson Desert Nature Reserve. These two reserves are proposed to be cancelled

and Indigenous conservation title is proposed to be granted to the traditional owners. The land is proposed to be leased back to DEC and jointly managed with the traditional owners as CALM Act land. The Bill also expands and formalises the carrying out of Aboriginal activities such as hunting and fire lighting.

2.1.3.9 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 2007–08, DEC worked closely with the Department of Sport and Recreation and other key stakeholders on numerous important recreation initiatives, including:

- a strategy for trails in Western Australia
- a State trail bike strategy, and
- the development of adventure activity standards.

DEC continued to work with the Department of Corrective Services in the development and ongoing maintenance of various trails. Specific projects included:

- Bunbury Regional Prison crews working on the development and maintenance of the Munda Biddi Trail between Collie and Nannup and the Cape to Cape Track in Leeuwin-Naturaliste National Park.
- Walpole Work Camp (from Albany Regional Prison) continued with maintenance on the Bibbulmun Track in the Frankland District.

The Bibbulmun Track Foundation, on behalf of the Western Australian trails community, was successful in gaining funding from the Australian Tourism Development Program to identify and market the 'Top Trails' in Western Australia. DEC has been heavily involved in the project, both through the TrailsWA Reference Panel as the coordinating committee, chairing the Projects Assessment Working Group and participating in the Marketing and Promotion Working Group.

DEC also participated and presented at the 5th National Tracks and Trails Conference in Queensland in March 2008, where the department's progressive engagement and involvement with various user groups such as mountain bikers and trail bike riders was discussed with other land management agencies.

DEC has been working on numerous new trail maps, including the Sidings Rail Trail, new Cape to Cape Track maps and the ongoing improvement and reprinting of the existing Bibbulmun Track and Munda Biddi Trail maps.

DEC has continued working with Canoeing WA in the development of high quality canoeing guides for several south-west rivers. Detailed field assessments have been undertaken on each of the rivers as part of the development of the new guides.

Bibbulmun Track

DEC continued its strong partnership with the Bibbulmun Track Foundation in 2007–08. Foundation volunteers contributed more than 13,000 hours of volunteer work assisting DEC in the ongoing maintenance and environmental management of the track. The track was again recognised as an important tourism asset to the State, winning a Silver Medal in the 2007 Sir David Brand Tourism Awards in the Significant Tourism Attraction category.

The 'new' alignment of the track will celebrate its tenth anniversary in 2008 and DEC has been helping the foundation plan the celebrations for this milestone.

All of the trailheads in major towns along the track have been updated and replaced as part of a project funded by DEC and a Lotterywest grant gained through the foundation. Further improvements have also been made along the length of the track, including the installation of new bed frames into several shelters along the south coast, minor realignments and erosion control in several areas, and vegetation maintenance.

Munda Biddi Trail

The partnership between DEC and the Munda Biddi Trail Foundation was formalised through the signing of a memorandum of understanding in October 2007. The trail was also recognised for developing its public profile with a Bronze Medal in the Significant Tourism Attraction category of the 2007 Sir David Brand Tourism Awards.

Construction of the trail between Collie and Nannup is nearing completion and is likely to be finished in late 2008. Planning for the remaining length of the trail between Nannup and Albany has also progressed, with public consultation to be conducted in the South Coast Region later in 2008. Consultation with key stakeholders, including local government authorities, has already started.

Capital improvements to the trail are being planned between Mundaring and Collie, with steel prefabrication completed for new bridges. A new steel-framed toilet has been designed and will be progressively retrofitted to the existing trail campsites.

Construction on the Sidings Rail Trail between Nannup and Jarrahwood was completed and formally opened in November 2007. The Sidings Rail Trail is a 26-km dual purpose trail for both walkers and cyclists and mainly traverses the proposed St John Brook Conservation Park on the old Nannup to Wonnerup freight railway formation. It will also form part of the alignment for the Munda Biddi Trail and, when combined with the Old Timberline Trail, create trail linkages and more recreation opportunities in the Nannup area.

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 partnership, which dates back a number of years, has been formalised in a memorandum of understanding. The Adopt a Track initiative has been embraced by clubs, with nine tracks being adopted and more clubs interested in joining the scheme. DEC is continuing to work with the Western Australian 4WD Association to identify and secure land suitable for their driver training program.

Off road vehicles

During the year, DEC continued to be involved in planning for the better management and control of off road vehicle use in Western Australia. DEC participated in the preparation of the State Trail Bike Strategy, which was jointly prepared by Motorcycling Western Australia, Recreational Trailbike Riders' Association of WA, the Department of Sport and Recreation, Department for Planning and Infrastructure and Department of Local Government and Regional Development. The strategy sets out a comprehensive plan to address the many social environmental and health challenges that exist as a result of off road vehicle use in Western Australia. DEC was also represented on the Off Road Vehicle Area Advisory Committee, which advises the Minister for Local Government and Regional Development in relation to Off Road Vehicle Areas.

DEC began preparing management 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 is also working with Motorcycling Western Australia to identify land suitable for education and training programs.

Recreation in drinking water catchments

DEC participated in a number of policy and planning initiatives undertaken by the Department of Water relating to the management of recreation in drinking water catchments and water reservoirs on land managed by DEC. This included the closure of Logue Brook Dam and catchment (near Harvey) to water skiing, fishing, camping and other recreation activities by the Department of Water and initial advice and input to the review of the Department of Water's policy on recreation within public drinking water source areas on Crown land. DEC also provided input to the preparation of public drinking water source protection plans for the Bolganup Creek Catchment Area, Bremer Bay Water Reserve, Mount Peron and Leeman water reserves, Kalbarri Water Reserve and Jurien Water Reserve.

2.1.3.10 Community involvement and regional parks

Community involvement

DEC's Community Involvement Program continued to provide an effective means of enlisting community support as well as providing meaningful and interesting opportunities for volunteers to participate in conservation and land management activities.

In 2007–08, 3,439 volunteers contributed 424,500 hours of support to projects across Western Australia.

Table 15: Community involvement volunteers

Year	Volunteers registered	New projects	Volunteers contributing	Hours
1998–99	2,400	19	836	108,630
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	406,500
2007–08	7,784*	9	3,349	424,500

*The number of registered volunteers reflects a review of database information carried out in December 2007.

Community involvement volunteers

In December 2007, DEC held its annual Volunteer of the Year and Outstanding Service Awards function, acknowledging the important support it receives from its volunteers.

Volunteers continued to take part in many ongoing projects such as the campground host program, the Bibbulmun Track Foundation (office support and track maintenance), the wildlife rehabilitators program and projects at the Western Australian Herbarium.

In addition, Conservation Volunteers Australia, the Department of Corrective Services and four-wheel drive clubs continued to work closely with DEC to rehabilitate and enhance the natural environment.

Five new volunteer projects started in 2007–08:

- mountain bike trails development in the Perth Hills District
- Gilbert's potoroo enclosure project
- Aboriginal 'restoring connection' project

- Stop the Toad Foundation (Inc) trapping program, and
- the fire biodiversity project.

During 2007–08, DEC provided training programs to volunteers with support from specialist services in DEC and external agencies. Training included the campground host forum, risk management, basic fire awareness, first aid, cross cultural awareness, the basic wildlife rehabilitator’s course (at regional and metropolitan locations), advanced and special topics for wildlife rehabilitation and WILDCARE helpline evaluation and training.

Volunteers also supported DEC at events such as the Perth 4WD and Adventure Show and the Caravan and Camping Show. About 100 volunteers supported the Landcare display at the Royal Agriculture Society Show held in October.

Regional parks

Major achievements in managing Perth’s regional parks during 2007–08 are listed below.

Planning and estate management

- Work continued to finalise management plans for Woodman Point, Rockingham Lakes and Jandakot regional parks.
- DEC assisted the Department for Planning and Infrastructure in planning for the establishment of the proposed East Wanneroo Lakes Regional Park, Peel Regional Park and the Ocean to Preston River Regional Park in Bunbury.
- A fully funded park maintenance agreement for three years has been secured with Alcoa Pty Ltd for DEC to undertake works on Alcoa’s landholdings at The Spectacles in Beeliar Regional Park.
- Crown reserves in Woodman Point Regional Park and Rockingham Lakes Regional Park (Cape Peron) were transferred to the Conservation Commission.
- Liaison occurred with the Department of Health and Department of Housing and Works in relation to the preparation of a memorandum of understanding for environmental management and conservation initiatives associated with the Fiona Stanley Hospital and Health Precinct.
- DEC assisted Mirvac Pty Ltd in completing the Kennedy Bay Conservation and Recreation Enhancement Plan 2007. The plan outlines significant measures to protect and improve the biodiversity values and community use of Port Kennedy Scientific Park in Rockingham Lakes Regional Park.
- DEC consulted extensively with local Aboriginal groups and individuals to finalise Nyoongar names for three national parks and four regional parks in the Darling Range (Table 16).

Table 16: New Aboriginal names for parks in the Darling Range

Interim park name	New park name
Chidlow Regional Park	Wooroloo Regional Park
Kalamunda Regional Park	Mundy Regional Park
Kelmscott-Martin Regional Park	Banyowla Regional Park
Wungong Regional Park	Wungong Regional Park
Mundaring National Park	Beelu National Park
Pickering Brook National Park	Korung National Park
Canning National Park	Midgegoroo National Park

Conservation works

An ongoing water supplementation program was successfully implemented at Thomsons Lake in Beeliar Regional Park to maintain water in the lake for a longer period in early summer. This allowed cygnets to mature to a stage where they could fly to surrounding wetlands before the lake dried in summer.

A number of weed control and revegetation projects across the regional park network were completed, in particular in:

- Canning River Regional Park at the Liege Street Wetland, Greenfield Street Bridge, Masons Landing, Urban Forest, the Billabong and Wilson wetland
- Herdsman Lake Regional Park along the banks of Popeye Lake
- Rockingham Lakes Regional Park at Port Kennedy Scientific Park, Paganoni Swamp, Lake Cooloongup, Lake Walyungup and Cape Peron
- Yellagonga Regional Park at Luisini Winery, in conjunction with the National Trust of Australia (WA)
- Beeliar Regional Park at North Lake, South Lake, Kogolup Lake, Thomsons Lake Nature Reserve and the Henderson region, and
- Wungong Regional Park at the old airstrip.

On-ground park improvements

- Construction of the Canning River EcoEducation Centre near the Kent Street Weir in Canning River Regional Park was completed in December 2007. The centre was funded through the State Government and is now managed by the City of Canning in conjunction with the community. The centre includes education and interpretation services and was opened to the public by Premier Alan Carpenter on 7 June 2008.
- A new road and parking facility has been constructed at Lake Goollelal in the Yellagonga Regional Park. The works included concrete collector paths, a dual use path, an interpretive shelter, park benches and associated landscaping works.
- The dual use path system throughout the regional parks network was extended by 3.7 km. In Yellagonga Regional Park a 2.8-km pathway on the north-eastern side of Lake Joondalup was constructed. Other path works were completed in Canning River, Beeliar and Woodman Point regional parks.
- Day-use facilities at John Graham Recreation Reserve in Woodman Point Regional Park have been upgraded. Works included the installation of four new electric barbecues and underground power, upgrading the path network and re-roofing and rendering the toilet block.
- New boundary signs have been installed at Yellagonga, Beeliar, Canning River, Woodman Point and Rockingham Lakes regional parks.
- Interpretation shelters and panels were installed at Popeye Lake in Herdsman Lake Regional Park and at Lake Goollelal in Yellagonga Regional Park.

Community liaison and participation

DEC continued to administer eight community advisory committees for regional parks (one each for the parks on the Swan Coastal Plain and one for the parks in the Darling Range). A total of 44 committee meetings were held for the year.

The Regional Parks Community Grants Scheme also continued for the sixth year. A total of \$50,000 was offered in 2007–08. A community workshop was held to assist in the assessment of the applications and 26 community groups were successful in securing funding for projects including rehabilitation and weed control works and education programs.

Volunteers contributed 6,743 hours undertaking works primarily related to weed control and rehabilitation in regional parks.

Healthy Parks, Healthy People

The *Healthy Parks, Healthy People* Strategic Plan 2008–2011 was prepared and published in June 2008. The strategic plan focuses on extending cross-promotional opportunities with partners and increasing awareness of the program within DEC.

In partnership with the Office for Seniors Interests and Carers, a new 12-month program of *Healthy Parks, Healthy People* park-based activities for seniors was developed and implemented. An article focusing on the health partners of the program appeared in the Spring 2007 issue of *LANDSCOPE*.

A presentation of DEC's *Healthy Parks, Healthy People* program was delivered at the Parks and Protected Areas forum in Fremantle in September and at the Forum Advocating Cultural and Eco-Tourism (FACET) regional tourism conference in Albany in October.

2.1.3.11 Social and visitor research

DEC's Social Research Unit undertakes a coordinated and comprehensive approach to conducting social research on DEC-managed lands and waters. In the context of DEC management, social research is defined as "research that improves our understanding of how people respond to the environment and protected areas".

During 2007–08, a number of projects were undertaken, working collaboratively with various branches and divisions within DEC (e.g. Parks and Visitor Services Division, Marine Science Program and Pollution Response Unit), tertiary institutions and other agencies such as the Department of Sport and Recreation, CSIRO, Department of Water, Water Corporation, Shire of Shark Bay and the Shark Bay World Heritage Scientific Advisory and Community Consultative committees. Projects included:

- a study of people's interaction with wildlife at Barna Mia
- a review of the penguin viewing experience and interaction with wildlife at Penguin Island
- a study of site use and recreation experience at Little Lagoon near Denham
- a study of the impact of forest thinning techniques in water catchments on perceptions of recreation value and ecosystem health
- a community survey of odour tolerance
- an assessment of the application process to clear a subdivision
- a review of recreation in south-west water catchments, and
- continued involvement in the Commonwealth Government's Wealth from Oceans research program, in Ningaloo Marine Park.

DEC continued to play an active role as a member of the Sustainable Tourism Cooperative Research Centre (STCRC) and is currently involved in 11 STCRC projects at various stages of completion. Several projects were completed under the auspices of the STCRC, including:

- understanding partnerships for protected area tourism
- optimising the use of strategic communication to achieve on-site and post-visit management objectives
- estimating the economic, social and environmental value of protected areas, and
- an integrated framework for developing ecological indicators of visitor use of protected areas.

DEC continued to work closely with WA's major tertiary institutions on nature-based recreation and tourism research. 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 Western Australia, provided funding to honours, masters and PhD students.

DEC also started a review of its visitor data collection program in 2007–08. A strategic rationale for data collection, storage and reporting is being established. As

part of the review, the visitor satisfaction survey will be redesigned. This is part of a STCRC national research project on 'Systematic and Strategic Collection and Use of Visitor Information in Protected Area Management' involving Murdoch University, the University of Technology, Sydney and the University of South Australia. The survey has been pilot tested and is currently being analysed as part of establishing a set of nationally appropriate survey questions to determine visitor satisfaction.

Visitor use monitoring

Visitor use was monitored at 363 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 12,563,723, an increase from the 12,063,000 visits recorded during 2006–07.

Table 17: Total visits to land and waters managed by DEC

Year	Number of data collection sites	Total number of visits (million)
1998–1999	149	8.7
1999–2000	158	8.9
2000–2001	158	9.7
2001–2002	185	9.8
2002–2003	190	10.2
2003–2004	200	10.92
2004–2005	246	10.99
2005–2006	255	11.84
2006–2007	317	12.06
2007–2008	363	12.56

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

Visitor Survey Program

The Visitor Survey Program continued to provide visitor feedback that was used to assess visitor needs and expectations, as well as 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 during their visit. The information collected aids in the planning and management of these recreation areas for issues such as 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 2007–08. 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 2007–08 survey program displayed the following characteristics:

- respondents were from WA (57 per cent), interstate (26 per cent) and overseas (17 per cent)
- the majority of respondents surveyed were visiting with family and/or friends (90 per cent) as opposed to travelling on their own (6 per cent), on a tour (2 per cent) or with an organised group (1 per cent)
- the biggest proportion of respondents were in the 40–59 year age bracket (36 per cent), followed by 60 years and over (33 per cent) and the 25–39 year age bracket (24 per cent), and
- overall, 76 per cent of respondents were first time visitors to the recreation areas surveyed.

As part of the survey 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 2007–08 index, averaged from visitor responses to the survey at the selected parks, reserves and forest areas around the State, was 89.7 per cent. This is illustrated in Figure 2, along with the results from the previous years of the survey program.

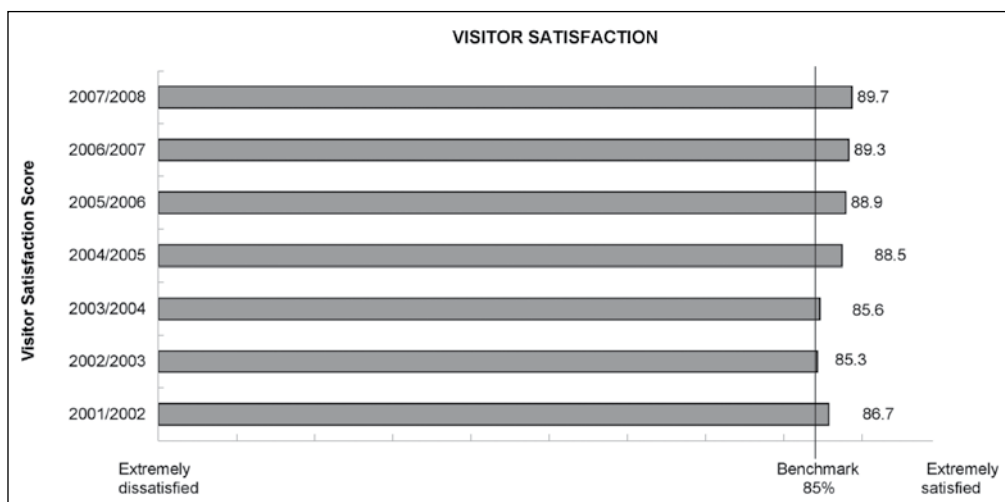


Figure 2: A comparison of annual visitor satisfaction levels within the DEC-managed estate

The survey also asked visitors to rate the condition and management of the site they visited, the activities in which they participated and their overall experience at the site. The visitor experience ratings graph (Figure 3) indicates that professionalism and knowledge of DEC staff, the attractiveness of the area, value for money and the condition and management of facilities received the highest ratings from visitors’ responses to this part of the survey.



Figure 3: Visitor experience ratings for the DEC-managed estate in 2007–08

2.1.3.12 Astronomy

Astronomy is conducted at DEC’s Perth Observatory in Bickley, Western Australia. DEC provides a range of public viewing and participation opportunities at the observatory and 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

A total lunar eclipse captured the attention of the public in August 2007, with many people accessing the Perth Observatory’s website to gain information or view real images of the moon during this eclipse.

A new star-viewing night format was successfully trialled this financial year. Instead of two sessions, only one session, with about 30 per cent more attendees, was conducted each night in order to accommodate the reduction in pre-midnight, night time hours during daylight saving time. The number of visitors attending star viewing nights and daytime guided tours totalled 5,325 for 2007–08 (5,270 for 2006–07). Customer satisfaction remained high.

The visitor experience at star viewing nights was enhanced with the use of a recently acquired 76-cm telescope, which is the largest telescope regularly used in public star viewing in the southern hemisphere. A new telescope was added to the historic Calver telescope in order to provide a view of wide-angle night sky objects.

Observatory outreach activities included 63 lectures and presentations with an attendance of 1,127. These lectures included the majority of a multi-disciplinary first-year unit, second-year and Honours-year university units, and general talks to primary school students and community groups. Observatory staff also actively participated in the Astronomy WA collaboration and assisted in the conduct of astronomy field nights and the ‘astronomy challenge’ event. In addition, the observatory hosted the WA Australia Post stamp launch, celebrating the fiftieth anniversary of space flight (Sputnik).

Public awareness of the observatory also remains high. In 2007–08, the number of people who visited, telephoned for information, attended talks, or attended an astronomy field night, totalled 16,460 (26,100 in 2006–07). Observatory staff informed the public of astronomical events in 49 radio and five television interviews, 121 newspaper articles and 615 email enquiries. The observatory also provides information via its website, and in total there were more than 404,000 'page views' of the website and an additional 5 per cent of pages added during the year. Volunteers helped DEC staff in many activities, notably with star viewing nights, archiving and at displays.

The internet is an increasingly important tool for observatory outreach. A new All-Sky Camera was purchased with a grant obtained from the Astronomical Society of the Pacific, USA, and will provide an internet-accessible real time wide-angle view of the night sky visible from Perth Observatory. The observatory's second internet telescope, owned by the Oil Region Astronomical Society and Clarion University, USA, was completed by observatory technical staff. Both the All-Sky Camera and second internet telescope will soon be commissioned for regular use.

The observatory's first internet telescope, the Real Astronomy Experience Internet Telescope (a collaboration with the University of California, Berkeley, and the Lawrence Hall of Science, USA), was in regular use by students and scientists worldwide. Another project developed during the year was the erection of a simple radio telescope 'RADIO JOVE' in collaboration with a private individual.

Research activities

During the year, many variable stars were monitored using the Perth-Lowell Automated Telescope (PLAT). In particular, 24 central stars of planetary nebulae (old stars surrounded by a shell of ejected gas) were monitored in order to discover signs of variability. Observations using PLAT also confirmed that V341 Arae is a new nova-like cataclysmic variable star (a white dwarf surrounded by a disk of material that has been removed from its closely orbiting stellar companion) and is one of the brightest examples of its class. Also, the long-term monitoring of stars TX Pyx and SS2883 was scheduled in automatic mode on the PLAT telescope.

The Real Astronomy Experience Internet Telescope is also being used to monitor variable stars. This year the telescope began observations of the variable star Eta Carinae, which will have a close pass by its companion star in early 2009. A search for planets transiting distant stars is also being conducted in collaboration with astronomers at James Cook University.

One supernova, SN2008cn in the galaxy NGC4603, was discovered in the supernova search program. This is an important discovery because a candidate progenitor star of the observed supernova has been identified in previous observations of the host galaxy.

The PLANET (Probing Lensing Anomalies NETwork) collaboration is continuing to observe the change in brightness caused by the gravitational focusing of light from a star as it passes directly in front of another as viewed from Earth. One refereed paper was published from this collaboration that determined limits to the characteristics of any possible additional planets orbiting around a star that caused its observed microlensing event. The collaboration also published an invited review (non-refereed) concerning the microlensing project in *The Messenger*, the journal of the European Southern Observatory.

New works

Research activities were given a major boost with a \$350,000 capital works allocation in 2006–07 for the construction of a building to house a one-metre aperture telescope from Lowell Observatory (the USA's biggest private astronomical observatory). In 2007–08, \$290,000 was allocated for site preparation, construction of a concrete base for the telescope, trenching and ducting for power and data, construction of the wall footings and floor, erection of the walls and work on the engineering design for the dome (roof). The remaining capital works to finish the design, fabricate and construct the dome and erect the telescope will be undertaken in 2008–09.

2.1.3.13 Support to the Conservation Commission

DEC supports the Conservation Commission through the Conservation Commission Service Unit, in accordance with the Operational Relationship Agreement between the two organisations signed in 2006 and the CALM Act. Support is provided by various branches and individuals in DEC, such as the Planning Unit. During 2007–08, DEC assisted the Conservation Commission with the following:

- staffing of the Conservation Commission Service Unit, which supported the Conservation Commission in:
 - convening and co-hosting the Parks and Protected Areas Forum
 - auditing of management plan performance, including the management plan performance for Dryandra Woodland
 - implementation of elements of the Forest Management Plan 2004–2013 for which the Conservation Commission is responsible, including assessments of old-growth forest extent in Boorara, Crowea, Dombakup, Dingup, Diamond 2 and Murtin forest blocks and reporting on community nominated old-growth forest in Crowea and Warren forest blocks
 - the performance assessment of biodiversity conservation on islands vested in the Conservation Commission, and
 - a review of the Conservation Commission’s Performance Assessment Policy.
- advice and information relating to the statutory functions of the Conservation Commission, including information regarding leases, licences and permits, land tenure, mining proposals and ecologically sustainable forest management, and
- the preparation of management plans for lands vested in the Conservation Commission. A list of final management plans completed and approved by the Minister for the Environment and Climate Change and management plans in preparation during the 2007–08 is in Appendix C.

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

2.1.3.14 Other initiatives

Memoranda of understanding

DEC continued its successful partnership with the Department of Corrective Services through the long-standing memorandum of understanding (MoU) between the two agencies. Department of Corrective Services prisoners continued to provide a valued contribution to DEC projects and the community through maintenance of the Bibbulmun Track, construction of the Munda Biddi Trail and the Cape to Cape Track, as well as a range of projects including cane toad control, weed removal, maintenance of tracks, firebreaks and signage, and recreation facility maintenance and development in many parks and reserves around the State, including Millstream-Chichester, Lesueur, Porongurup and Leeuwin-Naturaliste national parks and Coalseam Conservation Park.

The MoU partnership between DEC and Leave No Trace Australia continued and further collaborative projects to promote minimal impact visitor behaviour were undertaken during the year. They included production of signage and publications, training programs, as well as input from Leave No Trace Australia to the development of the Adventure Activity Standards. Other activities and outcomes included:

- DEC’s South Coast Region staff worked with Leave No Trace Australia on the BHP Billiton Ravensthorpe Nickel Project to fund South Coast Leave No Trace materials
- a presentation to the DEC Bush Rangers WA conference
- based on the MoU with DEC, Leave No Trace Australia signed an MoU with the Parks Forum to facilitate the development of the Leave No Trace program nationally, and

- a 'Leave No Trace' component was included in the Western Australian secondary school outdoor education curriculum and professional development on the new curriculum was delivered to 150 secondary teachers.

The MoU partnership between DEC, Conservation Volunteers Australia (CVA) and Rio Tinto WA Future Fund to facilitate the Future Volunteers agreement continued. The agreement is underpinned by a \$1 million commitment by the Rio Tinto WA Future Fund to fund CVA to undertake projects primarily on DEC-managed lands over a three-year period. The practical, hands-on work being undertaken by CVA volunteers, with the sponsorship of Rio Tinto WA Future Fund, enabled projects to be carried out throughout the north-west, including Kalbarri and Francois Peron national parks and Wanagarren Nature Reserve. Works included fire hazard reduction, biodiversity monitoring, evaluation and reporting, walk track construction and park maintenance. In all, 610 volunteer days over 22.4 project weeks were contributed through this partnership on DEC-managed lands.

World and national heritage

DEC progressed the World Heritage nomination for the Ningaloo/North West Cape area in collaboration with the Commonwealth Government with the aim of having a nomination prepared to allow the Commonwealth to submit it to the international World Heritage Committee by 1 February 2009.

Advice was also provided to the Australian Heritage Council to assist the Commonwealth Government in the process of assessing the Ningaloo/North West Cape area and Porongurup National Park for inclusion on the National Heritage List.

Miriuwung-Gajerrong

In October 2005, native title consent determination over MG#1 and MG#4 lands of the Miriuwung-Gajerrong people was determined through an Indigenous land use agreement known as the Ord Final Agreement. As part of the agreement, DEC and the Miriuwung and Gajerrong #1 (Native Title Prescribed Body Corporate) Aboriginal Corporation are responsible for developing joint management arrangements to manage six new conservation areas near Kununurra in the east Kimberley, which total 159,000 ha. In April 2006, the Yoorrooyang Dawang Regional Park Council was established to develop and implement a management plan for the proposed conservation areas consistent with the Ord Final Agreement.

In February 2007, the park council endorsed a proposal to develop a Miriuwung-Gajerrong cultural planning framework, which consolidated Miriuwung-Gajerrong people's cultural responsibilities, views and aspirations for the future management of the new conservation areas. A series of on-country field trips and workshops with traditional owners and DEC were undertaken to formulate the final plan for the framework. In December 2007, the park council endorsed the cultural planning framework. The framework underpins the next two stages of the planning process, which involves the development of a joint planning framework that takes into consideration both Miriuwung-Gajerrong policies and DEC management responsibilities under the CALM Act.

In April 2008, the first step was undertaken in the development of joint planning guidelines through a series of on-country workshops, using fire management as the test case or theme. The approach to planning relies heavily on participatory planning, which has been driven by the park council and traditional owners. Strong relationships and understandings have been forged through this process with DEC taking a more supportive rather than influencing role.

In April 2008, the park council endorsed an employment and training strategy. The strategy identified an interim management structure that would provide the template to begin developing employment and training opportunities for Miriuwung-Gajerrong people, consistent with the aims and objectives of the Ord Final Agreement. Employment opportunities arising from the strategy will support joint management of the six new conservation areas. In April 2008, a Miriuwung-Gajerrong Business Administration Trainee was appointed along with a Project Operations Officer. A training program was also

developed with the assistance of DEC's Dwellingup Training Centre, the park council, Kimberley TAFE and DEC staff. In addition, a joint recruitment process was undertaken for eight Miriuwung-Gajerrong Ranger Trainees and seven of them started in June 2008.

2.1.3.15 Parks and visitor services regional activities

Goldfields

- DEC purchased Credo Station north of Coolgardie and started management in September 2007. Considerable work around the homestead and on the proposed reserve was completed with a view to developing the area as a future recreation site.
- Recreation site development, interpretation shelters and information panels at Cave Hill Conservation Park, Burra Rock Conservation Park, Victoria Rock Nature Reserve and Boondi Rock, within the Goldfields Woodland National Park were completed.
- Major site development at Wallaroo Rock Conservation Park was completed.
- Basic facilities were installed at Neale Junction in the Neale Junction Nature Reserve in the Great Victoria Desert.
- Upgrade of Goongarrie homestead camping area, facilities and interpretation was completed.
- Regular maintenance of all recreation sites, including the upgrading of some facilities at Yeo Lake Nature Reserve, Wanjarri Nature Reserve, Lake Mason and Lorna Glen homestead and associated sites continued.
- Goldfields Region managed the development of the Lake Ballard Gormley Statues site for the Shire of Menzies, providing site design and supervision of works.
- Construction of the access road into Wallaroo Rock and the maintenance of the access road into Goongarrie homestead continued with Main Roads WA funding.
- Volunteer campground hosts and caretakers were engaged to assist in managing homesteads on former pastoral stations now managed by DEC, including Credo, Goongarrie, Lorna Glen and Lake Mason.
- Two volunteer projects with Conservation Volunteers Australia teams at Credo and Wallaroo rocks were completed.
- Implementation of the memorandum of understanding with the Goldfields Land and Sea Council Aboriginal Corporation to progress joint management initiatives and the involvement of Aboriginal groups in reserve management continued.
- Significant consultation was undertaken with the Patjarr community and the Central Desert Native Title Services (formerly the Ngaanyatjarra Council) and progress made towards joint management in the Gibson Desert Nature Reserve, Great Victoria Desert Nature Reserve and the Lorna Glen and Earraheedy former pastoral leases (proposed conservation reserves). This involved the following:
 - continuation of agreements with the Ngaanyatjarra people for assistance with Operation Warru (rock wallaby), which includes conservation and management (predator baiting) in the Ngaanyatjarra indigenous protected area
 - continuation of joint management working group meetings with the traditional owners from Wiluna for Lorna Glen (Matuwa) and Earraheedy (Kurrara-Kurrara). This was undertaken through the Central Desert Native Title Services
 - continuation of joint management of the Gibson Desert Nature Reserve with the Patjarr community, under a memorandum of understanding signed in July 2005. The memorandum of understanding resulted in the creation of the 'working together project', and
 - work with the Tjuntjuntjarra community to progress joint management of the Great Victoria Desert Nature Reserve.

Kimberley

- A diesel solar hybrid power facility at Geikie Gorge National Park was completed.
- New ranger accommodation was built in Purnululu National Park.
- New interpretive signs were installed in Geikie Gorge National Park as a result of a sign audit that was completed in 2007–08 and landscape site assessments were completed to allow a master plan to be drafted.
- Fourteen moorings were installed in the Rowley Shoals Marine Park to mitigate coral damage occurring from anchoring within the park. This was a collaborative initiative with the Commonwealth Department of the Environment, Water, Heritage and the Arts.
- Bell Gorge Track in King Leopold Ranges Conservation Park was upgraded.
- Active engagement of the community through membership of the Roebuck Bay Working Group, a community-based group dedicated to the continued protection and enhancement of Roebuck Bay.
- Conservation Volunteers Australia was engaged in conservation activities at Geikie Gorge and Purnululu national parks.
- DEC continued to work with the Rubibi Native Title Working Group to ensure that any joint management proposals are consistent with the reserve selection process.
- Two public forums for the Pilbara and Eighty Mile Beach study area were conducted in Broome and Eighty Mile Beach. Comprehensive consultation with other stakeholders, including neighbouring pastoralists and fishermen, were also undertaken.
- The memorandum of understanding between Bunuba Cattle Company Pty Ltd and DEC was signed in 2006 and continued to be important for employment and fostering opportunities with the Bunuba Aboriginal Corporation.
- The West Kimberley District worked closely with the Karrijarri and Nyangumarta people to ensure that their views and concerns are incorporated in any proposed marine reserve for the Eighty Mile Beach area.

Midwest

- A draft management plan was prepared on behalf of the Shire of Shark Bay for the Cape Inscription area on Dirk Hartog Island. Site development concept plans were also prepared.
- The northern portion of Carrarang pastoral lease was surrendered for creation of a national park. A contract for services was awarded to manage the proposed Edel Land National Park.
- Construction works and fit out of the Pinnacles Desert Interpretive Centre in the Nambung National Park were completed and road works for the Pinnacles Desert Discovery are nearing completion. Business operations for a retail facility in the new Pinnacles Desert Interpretive Centre were established.
- Lookouts, visitor interpretation and walk trails have been established at two recreation sites in Lesueur National Park and the construction of two ablution blocks started.
- The second year of the Coastal Assessment and Restoration project started at Lake Thetis, establishing parking and day use facilities, including a 200-m boardwalk and 1.5-km walk trail. Plans to restore coastal landscapes at Wittecarra Creek and the Buller, Hutt and Bowes river mouths were also progressed.
- The Western Australian Planning Commission awarded DEC's Midwest Region a WA Coastal Award for Excellence for the Coastal Assessment and Restoration project as an outstanding partnership in coastal planning and management.
- Three of eight coastal car parks in Kalbarri National Park were sealed.
- An ablutions block and shade shelter were constructed at the Natural Bridge site in Kalbarri National Park, and boardwalk construction continued on the adjacent coastal walk trail.

- Improved access and safety measures were implemented in Coalseam Conservation Park, including a mine shaft viewing platform at Miners recreation site and new parking and lookout facilities at Irwin Lookout.
- Walk trails in Kennedy Range National Park were more clearly marked to enhance visitor safety.
- Eagle Bluff boardwalk in the Shark Bay World Heritage Property was refurbished.
- A new website for the Shark Bay World Heritage Property was developed with Coastwest funding.
- DEC assisted in developing a promotional plan for the World Heritage Drive, in partnership with the Shire of Shark Bay.
- Interpretive panels were installed at Little Lagoon and Eagle Bluff in the Shark Bay World Heritage Property and at Miners, Irwin Lookout and Riverbend recreation sites in Coalseam Conservation Park.
- Signage for Kalbarri National Park was updated to emphasise the risks of heat stress in the river gorges during summer.
- A magpaper was published for The Turquoise Coast and a brochure published to help protect the outstanding values of Bernier and Dorre Islands Nature Reserve.
- *Wonderfully Wild* activity programs were conducted at Monkey Mia. Slide show safaris and holiday activity programs were conducted in Green Head, Jurien and Cervantes.
- Seasonal campground/homestead hosts were placed at Francois Peron and Kennedy Range national parks, Coalseam Conservation Park, Hamelin Pool telegraph station and Mt Augustus tourist resort.
- A three-year volunteer program with the Subaru 4WD Club continued to assist with the maintenance and improvement of facilities at Lochada, Karara and Kadji Kadji rangeland properties.
- Involvement with the Yued native title claimants continued with the preparation of interpretation for Lesueur National Park and for the Pinnacles Desert Discovery and Lake Thetis in Nambung National Park.

Pilbara

- The first stage of the Fortescue Falls trail development in Karijini National Park was completed.
- Karijini Eco Retreat, a tent resort developed by Gumala Aboriginal Corporation and Gumala Enterprises Pty Ltd, officially opened in Karijini National Park in May 2008.
- Major works were planned for Deep Reach and Millstream Homestead in Millstream-Chichester National Park in partnership with the Pilbara Development Commission. Park Council accommodation was completed at the Millstream Homestead.
- Construction of Milyana campground in Millstream-Chichester National Park was completed.
- Toilets and a gathering area at Yardie Creek in Cape range National Park were planned and tendered for construction.
- An energy-efficient solar/diesel power supply was installed at Milyering in Cape Range National Park to service the visitor centre and ranger's residence.
- DEC re-sealed 11 km of Dales Road and re-sheeted part of Banjima Drive in Karijini National Park, in partnership with the Shire of Ashburton.
- The Millstream Link, a new 90-km sealed road extending from Karratha to Millstream-Chichester National Park will significantly reduce the travel time from Karratha to the park. Planning and development to accommodate a major increase in day visitors are in progress.
- An engineering assessment of Snappy Gum Drive and associated works program in Millstream-Chichester National Park were developed with the Shire of Ashburton.
- Hazard amelioration on Charles Knife Road in Cape Range National Park continued in partnership with the Shire of Exmouth.

- Preparation of the of the Ningaloo coast visitor management strategy continued in cooperation with the Ningaloo Sustainable Development Office and other stakeholders, to prioritise activity management and plan for redevelopment.
- A sign replacement program was implemented in Karijini National Park.
- Installation of compliance and information signs continued at strategic points along the Ningaloo coast.
- Karijini, Coral Coast and Millstream park councils met a number of times throughout the year. The Millstream Park Council was consulted on new logos and signs for the park and the redevelopment of the Deep Reach area.

South Coast

- Areas of the South Coast Region were declared a 'natural disaster' following major wildfires and floods. Considerable capital works to remediate the damage is required and planning for these works started at Stokes, Cape Arid and Fitzgerald River national parks. Road works in these areas were completed.
- Remedial works to address erosion and storm damage at Quoin Head campsite and day-use area in Fitzgerald River National Park were completed and the storm damaged footbridge in Woody Lake Nature Reserve was removed and planned to be replaced in 2008–09.
- Path restoration work (after wildfire damage in 2006) was undertaken on a 1.5-km section of the coastal trail near Hellfire Bay in Cape Le Grand National Park and the upgrading of the path network at the Lucky Bay Campground in Cape Le Grand National Park continued.
- Information/interpretation panels were produced for Le Grand Beach Campsite and Thistle Cove in Cape Le Grand National Park.
- New information panels were installed at the Norseman information shelter, in partnership with the Shire of Dundas, and additional interpretation panels were installed at the Tagon Road information shelter in Cape Arid National Park.
- Rubber belting to assist traffic movement through fragile sandy areas was installed at Margaret Cove and at The Pincers in Stokes National Park.
- Walk trail maintenance was undertaken on coastal walk trails in Torndirrup National Park and the mountainous walk trails in Stirling Range National Park.
- Ninety kilometres of the Bibbulmun Track, and huts along the track, were maintained and new interpretive panels installed at the trail head in Albany.
- Audio and visual displays at the visitor centre in Two Peoples Bay Nature Reserve were replaced.
- Road maintenance in seven national parks and the sealing of Two Peoples Bay and Little Beach roads were completed.
- Engineers engaged by DEC identified 346 road safety issues and rated these according to their risk. Road safety remedial action was undertaken in Cape Arid, Cape Le Grand and Stokes national parks to address the safety concerns identified by the consultants.
- Road safety remedial action along Toolbranup and Stirling Range drives (46 km) as well as patch gravelling, grading and culvert widening and replacement in Stirling Range National Park started.
- Visitor risk assessments were undertaken at recreation attractions with remedial action implemented. The South Coast Region also updated management guidelines for visitor safety on the coastline of Torndirrup National Park and other local areas under DEC management.
- Consultation occurred with the South West Aboriginal Land and Sea Council and the community in regard to works proposed for Gull Rock National Park. A range of concepts were presented to a local Aboriginal Heritage Reference Group and further discussion is proposed.

- The Goldfields Land and Sea Council Aboriginal Corporation and The Esperance Nyoongars native title claimant group were consulted over a range of Aboriginal and environmental issues within the Esperance District.

South West

- Visitor risk management remained the South West Region's highest priority. Formal annual inspections of all recreation sites were conducted, and quarterly and annual reviews to monitor progress on achieving risk mitigation targets were completed.
- DEC continued to work 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 high visitation cliff sites in Leeuwin-Naturaliste National Park (Huzzas, Hamelin Bay and Wilyabrup Cliffs).
- Tree lopping was undertaken at recreation sites, including Honeymoon Pool, Sues Bridge, Calgardup and Giants caves, Boranup and Point Road campgrounds, Wellington Discovery Forest and the Margaret River Eco Discovery Centre to minimise the risk to visitors from falling branches.
- EcoEducation programs for primary and secondary students at Wellington Discovery Forest and the Margaret River Eco Discovery Centre continued. EcoEducation staff conducted 1,572 excursions for students and 410 professional learning days for teachers. There was a successful trial of a new program, 'Our South West', which was designed for Year 10 geography and science students.
- The visitor interpretation program resulted in production of interpretive signs for Calgardup, Giants and Bride caves in Leeuwin-Naturaliste National Park, Honeymoon Pool in Wellington National Park, Buffalo Beach and Belvidere in Leschenault Peninsula Conservation Park and the Brockman Highway Rest Stop near Nannup.
- The five-year development plan for Honeymoon Pool is nearing completion with the construction of universal access footpaths, including a boardwalk linking to the Stone's Brook campsite and an interpretive shelter.
- A major road upgrade program in Wellington National Park continued in conjunction with the shires of Collie and Dardanup, with the surveying, engineering and sealing of Wellington Forest Road and Wellington Discovery Forest car park.
- Maintenance and development of mountain bike trails continued in Wellington National Park in conjunction with the South West Mountain Bike Club and West Australian Mountain Bike Association, with the installation of trailheads and trail markers.
- Hard surfacing and realignment of the Cape to Cape Track from Cape Naturaliste to Sugarloaf Rock to provide access for people with disabilities continued. Planning is now complete for the final 1.2 km and further 30-m timber boardwalk was constructed. The track continues to be maintained and promoted by an enthusiastic group of volunteers, the Friends of the Cape to Cape Track.
- Footpaths, beach access, a viewing platform and interpretation facilities at Hamelin Bay were completed.
- Day-use area parking, picnic facilities and a toilet block were constructed in Blackwood River National Park.
- Planning for the development of new day use facilities at Chapman Pool in Blackwood River National Park was completed. The facilities are designed to protect the significant Aboriginal cultural values of the site.
- DEC continued to progress joint management arrangements with the South West Aboriginal Land and Sea Council, Gnaala Karla Boodja native title claimants and the Office of Native Title, with a view to trialling a demonstration park council for Wellington National Park.

Swan

- Rehabilitation of a beach on Penguin Island that was subject to extensive storm damage which threatened little penguins and island infrastructure was completed. This was a joint project between DEC, the Department for Planning and Infrastructure and the City of Rockingham.
- Repair and replacement of 55 m of boardwalk through the Len Howard Conservation Park near Mandurah was completed.
- Repair and replacement of recreation infrastructure along the Darling Scarp that was damaged as a result of the Dwellingup wildfire in 2007 was completed.
- Sealing of the car park area at Mt John in Yalgorup National Park was completed, improving access to the thrombolite viewing boardwalk.
- Upgrade of the Matilda Bay boat ramp adjacent to the Matilda Bay Reserve was completed to improve aging infrastructure and visitor safety.
- DEC continued to implement the 'You're Welcome' access initiative, where recreation sites in the Swan Region were audited to identify opportunities to improve access and to enhance communication for people with disabilities.
- Regravelling of a section of Lockwood Road near Kalamunda and major repairs to road traffic bridges across the Perth Hills District were completed.
- Eleven locations offered 74 nature-based, community activities in natural environments around the metropolitan area. About 6,000 people participated in activities managed by DEC.
- Perth Hills National Parks Centre, in Mundaring National Park, attracted 31,060 visitors during the year, an increase of 17,800 on last year.
- DEC continued to incorporate Aboriginal culture in interpretive activities at Yanchep National Park and the Perth Hills National Parks Centre.

Warren

- Construction of a camp kitchen at Shannon Campground in Shannon National Park was completed.
- Construction of a jetty at Lake Yeagerup and Oilwell Track Hut in D'Entrecasteaux National Park were completed.
- Construction of a toilet and information shelter at Mt Lindesay and a footbridge across the river that connects a walk trail to these facilities were completed.
- Construction of a 10-km walk trail linking day-use sites and campsites in Warren National Park was completed.
- The informal car park at the Nornalup swimming hole was rehabilitated and a walk trail to the river formalised.
- Swarbrick recreation site (winner of the 2008 Australian Institute of Landscape Architects Award) and the Walpole Wilderness Discovery Centre were completed, including the outdoor classroom and large interpretive display at the Valley of the Giants Tree Top Walk.
- Sealing of the two entry points into Shannon National Park and two km of road into Beedelup Falls in Beedelup National Park were completed.
- Partial realignment, widening and forming of two km of road into the Big Brook Dam recreation site and the widening and forming of two large car parks were completed.
- Realignment and sealing of Coalmine Road junction on the South Coast Highway was completed.
- The second last stage (1.5 km) of the Valley of the Giants Road upgrade was completed.
- Specialists were engaged to assist with the management of visitor risk.

- DEC continued to involve the South West Aboriginal Land and Sea Council and nominated representatives in recreation site development and road works throughout the Warren Region.
- DEC facilitated a joint land rehabilitation project involving South Coast Regional Initiative Planning Team Inc and Walgenup Aboriginal Corporation at Black Point in D'Entrecasteaux National Park. Walgenup Aboriginal Corporation were also involved in the development of interpretive material for the King Jarrah recreation site near Manjimup.

Wheatbelt

- Recreation site developments at Dingo Rock Nature Reserve and Yorkrakine Rock Nature Reserve were completed.
- Establishment of a day-use area at Williams Nature Reserve was completed. This was a jointly funded project with the Shire of Williams, which provided the machinery and funds to establish safe access to the site.
- Conversion to solar power generation at the Barna Mia Visitor Centre in Dryandra Woodland was completed. Solar power is now used for nocturnal tours, which continued to increase in popularity throughout the year.
- Recreation site development at Billyacatting Nature Reserve was completed, in partnership with the Shire of Trayning and the Njaki Njaki people. Works included the development of a car park and 1.6 km of walk trail as well as the installation of an interpretation shelter and picnic tables.
- Recreation site development at Kokerbin Nature Reserve was started, in partnership with the Shire of Bruce Rock, the Njaki Njaki and Balardong people and the community.
- Maintenance work at Dryandra Woodland continued with the assistance of the Toyota Land Cruiser Club of WA.
- Visitor risk assessments were completed.

2.1.4 Service 4: Environmental Regulation

Service description: Regulate emissions and discharges to the environment and the transport of hazardous wastes. Regulate the investigation, classifications and management of contaminated sites. Monitor ambient air quality and develop air quality management plans for priority air sheds (the air canopy surrounding population centres, industrial and other facilities, within which impacts of air pollutants need to be considered from health and environmental viewpoints).

Performance summary

	2007-08 Target \$'000	2007-08 Actual \$'000	Variation \$'000
Expense by service	36,623	30,223	(6,400)
KPI	2007-08 Target	2007-08 Actual	Variance
Average cost per air monitoring station	\$403,222	\$563,709	\$160,487
Average cost per industry licence	\$17,725	\$19,323	\$1,598
Average cost per contaminated site assessment	\$4,687	\$6,066	\$1,379
Average cost of remediating State sites	\$1,506,480	\$316,000	\$(1,190,480)

Performance highlights

- Continued implementation of the industry licensing reform program to remove duplication and overlap in licensing approvals.
- Processed State development project approvals within target timeframes despite increased workload.
- Continued implementation of the *Contaminated Sites Act 2003*, including maintaining the public database.
- Continued the investigation into air quality issues associated with the Alcoa refinery at Wagerup.
- Development of dust management guidelines for Western Australia.

2.1.4.1 Controlled waste

In 2007–08, the Controlled Waste Tracking and Permitting Section processed 294 carrier licences, 827 controlled waste drivers' licences and 381 bulk controlled waste vehicle licences. A total of 309 drivers attended driver training conducted by DEC, an increase of 13 per cent from 2006–07.

As part of a scheduled auditing program, 650 inspections were carried out in the metropolitan and regional areas of waste carriers, disposal sites and waste generator premises, drivers and vehicles, and tankers transporting controlled waste. The regional audits covered the areas of the Midwest and Pilbara (August–September 2007) and Kalgoorlie (March 2008). The auditing program showed a high level of compliance by industry with the Environmental Protection (Controlled Waste) Regulations 2004. Only 8 per cent of the inspections conducted identified areas of non-compliance, most of which related to administrative issues.

DEC investigated 25 complaints regarding liquid waste tankers. The investigations resulted in a range of enforcement actions, including the issuing of Environmental Field Notices and Infringement Notices. One non-compliance issue resulted in court action.

The total volume of waste transported on public roads and tracked via DEC's Controlled Waste Tracking System, was 540,808 kilolitres. This included:

- 55 per cent biological waste;
- 17 per cent alkalis;
- 13 per cent waste oils and emulsions; and
- 9 per cent low strength waste waters.

This year, 63,734 Controlled Waste Tracking Forms were activated to track controlled waste from its point of generation to point of treatment or disposal. The majority were electronic forms, activated by industry using the electronic Controlled Waste Tracking System.

A review of the Environmental Protection (Controlled Waste) Regulations 2004 was undertaken.

2.1.4.2 Implementation of the Keating Review recommendations

DEC is in the fourth year of implementing recommendations of the Keating Review relating to the department's responsibilities for the operation of Part V of the *Environmental Protection Act 1986*. There is an agreed 60 working day timeline for the assessment of State development portfolio project applications. DEC achieved an average of 47 working days to process the 45 works approval applications, and 32 working days to process the 14 licence applications.

The key achievements during 2007–08 in implementing the recommendations were:

- integration of relevant Keating processes, timelines and protocols into DEC's operations as 'core business';
- achievement of agreed timelines for works approvals and licences for the majority of State development portfolio projects;

- development of an internal 'Officer's Guide' to assist officers in managing these projects and meeting the 60 working day timeline; and
- advancing the development of 'regulatory maps' as a means of identifying opportunities for removing regulatory duplication and other reforms for some industrial premises.

2.1.4.3 National Pollutant Inventory

DEC administers reporting of the National Pollutant Inventory of substance emissions from Western Australian industrial facilities. Emission reports were received from 676 facilities in 50 industry sectors for the period 2006–07.

The department provides advice to Western Australian industrial facilities to assist them in their obligations under the National Pollutant Inventory. A workshop program was completed early in July 2007, with fewer attendees than in previous years, indicating an improved understanding of the reporting requirements.

2.1.4.4 Industry regulation

Industry licensing system

The industry licensing system, which allows applications for works approvals and licences to be made via the internet and assists in processing applications, was released on 1 July 2007. Modifications are being made to the system to increase its functionality.

Review of prescribed premises categories

The review of prescribed premises was not completed during 2007–08 due to low staffing levels resulting from difficulties attracting and retaining experienced staff.

Annual Audit Compliance Reports

From 28 April 2008, DEC introduced a condition requiring submission of Annual Audit Compliance Reports for certain Environmental Protection Act licences. With the introduction of this condition, licensees are required to report annually on their compliance with the conditions of their licence.

These reports will enhance audited self-management by occupiers of prescribed premises and will help them achieve greater compliance with their licence conditions. This requirement is being implemented progressively through new licences and where significant amendments to existing licences are made.

Proposal implementation monitoring

DEC has responsibility under Part IV of the *Environmental Protection Act 1986* for monitoring compliance with environmental conditions set on projects as a result of formal environmental impact assessment by the Environmental Protection Authority.

DEC has maintained a base level of monitoring services due to the loss of experienced staff. The section that monitors proposals is undergoing further restructure to build an appropriate level of compliance capability. DEC is actively recruiting to this area to move the monitoring of proposals from a reactive to a proactive framework. Work is being advanced on an annual audit compliance reporting system, requiring proponents to monitor and report on compliance with environmental conditions. This will assist DEC by making industry legally responsible for identifying non-compliance issues and reporting these to DEC to better focus resources to achieve improved outcomes.

Port assessment program

Working with the Department of Health and the Department of Consumer and Employment Protection, DEC initiated inspections of Western Australian ports to determine if there were issues related to emissions from port precincts, assess environmental or health risks and monitor compliance with relevant legislation.

The ports of Bunbury, Derby, Geraldton and Wyndham were assessed during the year and assessments identified issues of concern in relation to infrastructure and management procedures. DEC is working closely with the Department for Planning and Infrastructure and the relevant port authorities to address the issues and improve the environmental performance in handling mineral ores at ports.

Noise regulation

DEC provides technical advice to the environmental impact assessment process as well as policy, technical and enforcement support for a network of about 230 local government environmental health officers, Western Australia Police officers and DEC regional officers.

During 2007–08, the Noise Regulation Branch provided advice on 51 projects undergoing environmental impact assessment. A notice was published in the *Government Gazette* on 27 July 2007 that the Minister for the Environment had approved a variation of the noise emission standard for the Geraldton Gas Turbine Station under Regulation 17 of the Environmental Protection (Noise) Regulations 1997.

2.1.4.5 Southern Metropolitan Regional Council's Canning Vale Waste Composting Facility

The Southern Metropolitan Regional Council's Canning Vale Waste Composting Facility continued to be the subject of numerous odour complaints during the year, despite \$2.6 million being spent on odour improvements by the licence holder. DEC expended significant resources in responding to complaints, investigating odour events and liaising with the council staff. The department continues to work towards a resolution of the odour issue through a series of initiatives including intensive night-time odour assessments, a community survey and requiring the council to prove that it is operating at world's best practice. DEC is also investigating a number of odour incidents under the provisions of the *Environmental Protection Act 1986*.

2.1.4.6 Esperance Port lead issue

The Legislative Assembly Standing Committee Inquiry into the Cause and Extent of Lead Pollution in the Esperance Area tabled its report on 6 September 2007. The report included 46 recommendations and 192 findings. The whole-of-government response to the report was tabled on 29 November 2007. DEC is currently implementing relevant actions identified in the response.

On 9 October 2007, DEC issued an Environmental Protection Notice to the Esperance Port Authority requiring it to determine the extent of lead contamination within the port premises and to clean it up to a defined standard. The port started clean-up in November 2007 and DEC instructed the port to complete the work by 31 July 2008.

On 25 October 2007 DEC issued an Environmental Protection Notice to the Esperance Port Authority requiring it to report on historical air monitoring data and to develop an Air Quality Monitoring Plan. The port has implemented the plan, which includes regular monitoring and reporting on individual nickel shipments that pass through the port.

The Esperance Port Authority has submitted a number of draft proposals for the removal of lead concentrate, which is currently stored at the port. DEC has not found the proposal environmentally acceptable and is awaiting a further submission. Once this is accepted by DEC, a 21-day public comment period will begin, to provide the community with an opportunity to examine the proposal and submit comments before it is implemented.

DEC is continuing to closely monitor all nickel concentrate shipments from the port.

Review of Industry Licensing Inspection Policies and Procedures

DEC contracted an independent consultant to review its compliance and inspection processes to identify where improvements were needed. The review made 25 recommendations to improve processes and procedures. While DEC had already identified and started many of the initiatives, the review provided a sound basis for improvements. DEC has accepted the majority of the recommendations, which are progressively being implemented.

A health and ecological risk assessment has been initiated to assess any risks to the community and environment associated with previous lead concentrate shipments, via the Port of Esperance. The risk assessment will also recommend clean-up measures that may be required.

2.1.4.7 Response to gas explosion on Varanus Island

A gas explosion on Varanus Island on 3 June 2008 created a situation where the Western Australian gas supply was not enough to meet demand.

The whole-of-government response included the re-commissioning of coal-fired power generating facilities that were previously shut down. DEC responded quickly to approve the re-commissioning of the facilities so that increased electrical power generation could offset some of the shortfall in gas supply.

2.1.4.8 Regulation of contaminated sites

Implementation of the *Contaminated Sites Act 2003*

Two hundred and eighty new reports of known or suspected contaminated sites were received under the *Contaminated Sites Act 2003* in 2007–08.

DEC classified 363 sites during the year, bringing the total number of sites classified under the Act to more than 709. Soil and groundwater investigations have confirmed the presence of contamination at approximately 163 of these sites (made up of more than 1,103 individual lots), which are listed on the publicly available database on DEC's website.

Contaminated site and acid sulfate soil assessments

Specialist technical advice was provided to external parties such as community groups, industry 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 502 technical reports relating to contaminated sites and 275 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.

Acid sulfate soils

DEC continued to facilitate workshops on acid sulfate soil issues for the community, local government and environmental consultants at metropolitan and regional venues. To assist with this public education and awareness, a series of fact sheets was published and posted on DEC's website.

An Acid Sulfate Soils Technical Advisory Committee was established to provide guidance and technical support for DEC's acid sulfate soils risk mapping project. The project focused on the Peel area using aerial hyperspectral imagery, field validation, laboratory analysis and interpretation of soil and groundwater information to better characterise the acid sulfate soil risk.

The resulting data will be provided to the public on a database and through detailed scale GIS maps.

Participation in research projects continues, mainly through in-kind contributions including technical advice and support. These projects include assessing the environmental risk due to historic acid sulfate soil disturbances in the Baigup wetlands and Peel Estuary, as well as the soil and water quality changes associated with different land uses on the Gngangara Mound.

2.1.4.9 Perth Air Quality Management Plan

The Perth Air Quality Management Plan (AQMP) is a 30-year initiative that started in 2000. It seeks to reduce the emission of air pollutants which cause unacceptable air quality, and prevent the development of future air quality problems. The aim is to steadily improve Perth's air quality and achieve a level that will not negatively impact on the environment, or on the health of the community.

During 2007–08, DEC continued to focus on strategies to address vehicle emissions, haze from domestic wood heaters and air quality research. It also continued ongoing air quality monitoring and air sampling programs.

During the year, the AQMP was formally reviewed by an external consultant to assess its effectiveness and make recommendations for changes and improvements.

Vehicle emissions

The DEC *CleanRun* vehicle emissions reduction program aims to improve air quality. During 2007–08, *CleanRun* focused on vehicle emissions testing and driver behaviour.

The objective of the vehicle emissions testing is to collect data in order to assess the need for an ongoing in-service vehicle emissions management program. The vehicle emission testing has been separated into two phases. The Phase 1 testing of 160 heavy duty diesel vehicles was completed in November 2006 and the report on the testing is available on DEC's website.

Phase 2 involved testing the emissions of 376 diesel and petrol vehicles. Vehicles were tested according to standard procedures over a 12-week period. The testing was completed on 11 February 2008 and the results are being analysed.

The *CleanRun* communication and education campaign was designed to reduce diesel emissions by influencing driver behaviour. A trial program was undertaken in late 2007 – early 2008. The results of the trial showed significant changes in driver behaviour resulting in reduced vehicle emissions. DEC is liaising with new businesses to participate in the next stage of the program.

Haze from domestic wood heaters

DEC continued to implement a range of programs to manage and reduce winter smoke haze in Perth. The Haze Reduction Initiative of the Perth AQMP aims to reduce emissions contributing to haze formation, including those from domestic wood heaters. Actions included consolidating responses to a policy options consultation paper and producing a report summarising the input received, a wood heater replacement program, environmental health officer training and haze alerts.

Submissions on the wood heater policy options discussion paper, which was released in May 2007, were collated and a summary report was published in May 2008. The report sets out the priorities for future work in managing smoke emissions from wood heaters.

DEC's Wood Heater Replacement Program operated between May 2007 and February 2008. The program provided an economic incentive for people using wood heaters or fireplaces as their main home heat source to convert to an alternative heating source. A total of 577 rebates of \$500 each were allocated. An additional \$100

Kleenheat gas voucher was also available for LPG gas systems. The expansion of the 2007 program was due in part to financial assistance of \$100,000 from Alinta.

In May 2008, DEC again provided training to final year university students and to local government officers responsible for responding to domestic wood smoke complaints and for implementing the nuisance provisions of the *Health Act 1911*.

Haze Alerts continue to be issued between June and September each year. If a haze event is predicted, DEC informs the Bureau of Meteorology. The bureau verifies this prediction and a 'Haze Alert' is issued to all media outlets in Perth. Several haze alerts were issued during June 2008, but particulate concentrations remained below the National Environment Protection Measure standards.

Five-year review of the Perth AQMP

In July 2007, a four-person steering committee was convened under the guidance of the Environmental Protection Authority to conduct the first five-year review of the Perth AQMP. The review was to assess the effectiveness of the existing initiatives, consider the progress made and make recommendations for improvements. An external consultancy, Eco-Energy Options, was selected and engaged to carry out the review, which was completed in November 2007. The final review report was presented to the EPA and is with the Minister for the Environment and Climate Change for consideration.

2.1.4.10 Regional air quality management plans

Collie and Kalgoorlie

DEC continued work on the development of air quality strategies for Collie and Kalgoorlie, as part of its commitment to manage air quality in key regional centres in Western Australia.

To progress the Collie strategy, DEC established a Collie Air Quality Technical Working Group. The group includes representatives from the local community, industry, local government and relevant government agencies, including the Department for Planning and Infrastructure, the Department of Industry and Resources and the Department of Health.

A systematic review of the current knowledge base of air quality in the Collie area has been completed. This includes a review of known air emission sources, air chemistry, gross outputs and meteorology.

During 2007–08, DEC undertook a survey of wood heater use in Collie, used photographic monitoring to understand smoke accumulation and analysed historical particulate and sulphur dioxide monitoring results. It also monitored volatile organic compounds in the air in Collie from July.

Work on updating and improving the Kalgoorlie aggregate air emission data is in progress. The new air emission inventory domain also includes the areas of Coolgardie and Kambalda.

A technical review of the current knowledge base of air quality in Kalgoorlie started in 2007. The first phase of the review includes the preliminary assessment of data from monitoring stations being operated by local industry in Kalgoorlie.

2.1.4.11 Air quality monitoring

Monitoring stations

DEC operates 10 metropolitan and six regional air quality monitoring stations in Western Australia. The stations monitor a range of pollutants such as carbon monoxide, nitrogen dioxide, ozone, sulphur dioxide and particles as PM_{10} ¹. Air quality is measured against the National Environment Protection (Ambient Air Quality) Measure standards. Particles as $PM_{2.5}$ ² are also monitored at selected sites to gather enough data nationally to facilitate a review of the current National Advisory Reporting Standard. Two stations, at Hope Valley and Queens Buildings in Perth, were decommissioned due to redevelopment pressures. These stations will be re-established once suitable new sites are determined.

The data gathered are used to report on ambient air quality through the annual *Western Australia Air Monitoring Report* and *State of Environment Report*, and is also updated on DEC's website each day.

Port Hedland

A consultant was commissioned to develop a Policy Framework for the Port Hedland Regional Air Quality Management Plan. The policy framework will examine the competing pressures and define the context for future planning and actions for managing air quality issues for Port Hedland.

The dust samples collected for the dust toxicological study have been used to analyse the effects of Port Hedland dust on living cells, compared to the effects of dust collected from urban environments such as Sydney and Perth. The results from the study are being collated.

Wagerup

DEC has been active in the Wagerup area for many years in response to industry activities and community concerns about air quality. Data and initial findings from intensive air quality monitoring carried out in late 2006 will be reported to stakeholders later in 2008.

Background sampling campaign, Midland and Kwinana

Routine air quality sampling started in August 2007 at 10 locations around Midland. The sampling followed a pilot trial in Midland during November and December 2006 to investigate the effectiveness of various active and passive sampling technologies. The sampling, which is planned to continue for at least 12 months, targeted a number of compounds including sulphur and nitrogen oxides, carbonyl compounds and hydrogen fluoride and hydrogen chloride. The latter pollutants are known to be emitted from brickworks in the region. In addition to monitoring conducted by DEC, community residents were invited to keep logbooks of odour incidents and help DEC with the use of canisters for additional air quality sampling. Initial results were communicated to residents of the area in a newsletter in April 2008. Final results of the survey are scheduled to be available later in 2008.

A similar approach using passive sampling at a network of 14 sites was also introduced in the Kwinana area in August 2007 to run for 12 months. Ammonia and selected volatile organic and carbonyl compounds were measured at these locations. The results will be summarised and published later in 2008.

1 PM_{10} – Particle matter with an aerodynamic diameter of 10 micrometres or less.

2 $PM_{2.5}$ – Particle matter with an aerodynamic diameter of 2.5 micrometres or less.

2.1.5 Service 5: Environmental Sustainability

Service description: Develop and implement policies and strategies that promote environmentally sustainable practices in industry, government and the community.

Performance summary

	2007–08 Target \$'000	2007–08 Actual \$'000	Variation \$'000
Expense by service	24,845	13,508	(11,337)
KPI	2007–08 Target	2007–08 Actual	Variance
Cost of administering Waste Management and Recycling Account as a percentage of total funds	\$14,081	\$17,122	\$3,041
	11.5%	13.1%	1.6%

Performance Highlights

- Proclamation of the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) and the *Waste Avoidance and Resource Recovery Levy Act 2007* (WARR Levy Act).
- Zero Waste Plan Development Scheme, involving development of Strategic Waste Management Plans for local government.
- Two rounds of the Strategic Waste Initiatives Scheme and Community Grants Scheme.
- Signing of the State/Local Government Climate Change and Sustainability Partnership Agreement and establishment of the Intergovernmental Council chaired by the Minister for the Environment and Climate Change.
- Active community engagement through education and behaviour change programs including Ribbons of Blue-WaterWatch WA; TravelSmart; Waste Wise Schools; AirWatch and CleanRun.

2.1.5.1 *Waste Avoidance and Resource Recovery Act 2007;* *Waste Avoidance and Resource Recovery Levy Act 2007*

The *Waste Avoidance and Resource Recovery Act 2007* and the *Waste Avoidance and Resource Recovery Levy (WARR Levy) Act 2007* were passed by Parliament and given Royal Assent by the Governor in December 2007.

The WARR Act provides for waste avoidance and resource recovery in Western Australia; establishes a statutory waste authority; provides for waste services by local governments in a manner that improves on the provisions available under the *Health Act 1911*; repeals those *Health Act 1911* provisions; allows for product stewardship plans and extended producer responsibility schemes; and provides for the proper administration and disbursement of funds arising from levies placed on certain wastes.

The WARR Levy Act provides for a levy to be imposed on certain wastes, essentially on wastes 'received at disposal premises' as prescribed by way of regulations.

The WARR Act also creates the Waste Avoidance and Resource Recovery Account, which holds funds from the levy on waste disposed in landfill.

The WARR Regulations 2008 and the WARR Levy Regulations 2008 were approved by the Governor in June 2008, to allow for an expected commencement date of 1 July 2008.

2.1.5.2 Zero Waste Plan Development Scheme

Phase One of the Zero Waste Plan Development Scheme started in August 2007. Ninety-one per cent of all Western Australian local governments completed Phase One which required the completion of an internet-based survey. The

survey provided a snapshot of municipal waste services and infrastructure across Western Australia. The data collected from the survey responses were collated and published in the *Zero Waste Plan Development Scheme Phase 1 Report*.

Phase Two of the scheme started in early 2008 and has led to a high level of regional collaboration between local governments in waste management planning. In addition to constituted regional councils working to develop regional Strategic Waste Management Plans on behalf of their member councils, the majority of individual local governments have also indicated their intention to develop regional Strategic Waste Management Plans in partnership with one or more of their neighbouring councils.

As of 11 June 2008, there were 128 local government authorities participating in Phase Two of the scheme. Of these, more than 90 per cent were working in collaboration with at least one other council in a regional planning approach. Twenty-three regional groupings have been confirmed, ranging in size from groups of two to 12 local governments, with an average size of five member councils.

2.1.5.3 Strategic Waste Initiatives Scheme and Community Grants Scheme

Two rounds of funding for the Strategic Waste Initiatives Scheme were advertised and assessed. In Round Two in 2007, grants totalling \$788,265 were awarded to 11 projects. In Round One in 2008, grants totalling \$346,520 were awarded to seven projects.

Two rounds of funding for the Community Grants Scheme were advertised and assessed. In Round Two in 2007, grants totalling \$41,450 were awarded to six projects. In Round One in 2008, grants totalling \$63,704 were awarded to four projects.

2.1.5.4 Sustainability programs

Development of a new sustainability website began, along with the complementary directory designed to showcase the diversity of sustainability initiatives and achievements in Western Australia.

The State/Local Government Climate Change and Sustainability Partnership Agreement was signed in August 2007 and led to the establishment of a State/Local Government Climate Change and Sustainability Council, chaired by the Minister for the Environment and Climate Change. The council meets twice a year to identify and provide strategic direction on addressing priority climate change and sustainability issues of mutual interest to the State Government and local government.

A 25-year sustainability framework is being developed in collaboration with the Batavia Region of Councils. This is being considered as a model for enhancing sustainability in regional local government.

2.1.5.5 Community education

During 2007–08 the Community Education Branch continued to deliver a wide range of initiatives including:

- Launch of *Ribbons of Blue In and Out of the Classroom*; a comprehensive curriculum package for primary teachers.
- In-service workshops attended by more than 100 teachers.
- Launch of a new Ribbons of Blue website in February 2008 <www.ribbonsofblue.wa.gov.au>.
- Five metropolitan area Waste Wise workshops for teachers, with 149 participants from 84 schools.
- Sixty regional schools joined the Waste Wise program during the year, with 104 teachers attending professional learning workshops.
- Waste Wise school van visits to 57 schools where DEC staff talked to 4,316 students.
- A total of \$107,000 in Waste Wise grants was provided to 36 different schools (27 metropolitan schools and nine regional schools).

- Presentation of the TravelSmart workplace program in eight workplaces.
- Launch of a new AirWatch website in February 2008.
- Release of a new CD ROM called *What's up with our air?* to workshop participants at the Primary Science Teachers' Conference in March 2008.
- Upgrade of the air quality monitoring kits in response to the recommendations made in the AirWatch Evaluation of 2007.
- Visits to 19 AirWatch schools as part of the AirWatch school program. Eight hundred and fifty-nine students participated in a 50-minute AirWatch lesson at their school.
- Design of a CleanRun behaviour change program that is 'for drivers, by drivers'. DEC worked in partnership with transport company Toll IPEC to design the program that involves working with volunteer drivers to reduce unnecessary idling of their vehicles. Drivers exposed to all behaviour change tools developed during the trial period reduced idling times by 87 per cent.

Keep Australia Beautiful Council

Keep Australia Beautiful Council is a separate statutory authority and receives support from the Community Education Branch of DEC. The council produces its own annual report for Parliament.

The council's operations are defined by the *Litter Prevention Strategy for Western Australia 2006–09*.

2.1.6 Service 6: Environmental Impact Assessment and Policies for the Environmental Protection Authority

Service description: Manage the environmental impact assessment process and coordinate the development of policy for the Environmental Protection Authority to enable sound environmental advice to be provided to the State Government, developers and the public in accordance with statutory functions.

Performance summary:

	2007–08 Target \$'000	2007–08 Actual \$'000	Variation \$'000
Expense by service	11,385	10,749	(636)

KPI	2007–08 Target	2007–08 Actual	Variance
Cost per environmental assessment	\$31,719	\$32,549	\$830
Cost per environmental policy developed	\$433,857	\$185,500	(\$248,357)

Performance highlights

- Completed the assessment of the Pluto LNG project on the Burrup Peninsula.
- Completed the assessment of a number of major iron ore mine and infrastructure projects in the Pilbara Region.
- Provided advice on environmental matters required to be addressed during the planning of the proposed urban development of Keralup, south of Perth and the Preston Industrial Park.
- Finalised the Peel-Harvey Water Quality Improvement Plan.
- Prepared the draft State Environmental (Ambient Air National Environment Protection Measure) Policy for consultation.
- Started the demonstration phase of the Fertiliser Action Plan.

2.1.6.1 Overview

DEC manages the environmental impact assessment process and policy formulation for the Environmental Protection Authority (EPA). This is done through the provision of advice on development proposals and planning schemes and amendments with the aim to ensure that the environment is protected for the community. In relation to environmental policies, DEC supports the EPA's policy functions through environmental protection policies, State environmental policies, and guidance statements and other policy initiatives. DEC supports the EPA through the EPA Services Unit which sits administratively within the department but, for EPA matters, is under the control of the EPA.

2.1.6.2 Major projects

Pluto LNG Development, Burrup Peninsula

The EPA released its report (Bulletin 1259) in July 2007 on the proposal by Woodside Energy Ltd to undertake the Pluto LNG project in the north-west of Western Australia. The main issues considered in the EPA report were:

- marine impacts from dredging and associated marine infrastructure;
- loss of vegetation from clearing of the plant site;
- terrestrial and migratory/marine fauna species;
- indigenous heritage from development of the plant site;
- air quality from operation of the LNG plant; and
- greenhouse gas from the gasfield and operation of the LNG plant.

The EPA concluded that the proposal, as presented, did not fully meet the EPA's objectives for the marine environment, and that the current offset package being offered was not adequate to address the potential loss of coral. However, provided a substantive offset package was agreed and the recommended stringent conditions were fully implemented, it was recommended that the Pluto LNG Development could be allowed to proceed.

The full EPA report Bulletin 1259 Pluto LNG Development, Burrup Peninsula is available on the EPA website at www.epa.wa.gov.au.

Mesa A/Warrambo Iron Ore Project

In September 2007, the EPA provided further advice and recommendations in Bulletin 1264 to the Minister for the Environment and Climate Change on the proposal by Robe River Mining Company Pty Ltd to mine iron ore at Mesa A/Warrambo. This further report was prepared in response to a request from the Minister under section 43(1) of the *Environmental Protection Act 1986* that the EPA reassess the proposal in the light of additional information provided by the proponent.

The EPA had provided an earlier report and recommendations (Bulletin 1251) on the proposal in March 2007 in which it concluded that, based on the information then available on subterranean fauna and on landforms, closure planning and rehabilitation, that the proposal as a whole was environmentally unacceptable and should not be implemented. The EPA had reached this conclusion primarily because of the inadequate information provided by the proponent on the risk of extinction of species of subterranean (troglobitic) fauna only known to occur at Mesa A.

The proponent appealed the EPA's report and recommendations and subsequently provided the Minister with additional information including the results of further troglobitic fauna surveys and an independent geotechnical assessment. In order to address the EPA's key concern in relation to troglobitic fauna, the proponent also proposed reducing the area of mining to provide greater surety that all troglobitic fauna species would be protected.

Having considered the additional information provided by the proponent, the EPA concluded in Bulletin 1264 that the proposal could be managed to meet its environmental objectives provided that conditions were imposed requiring:

- (a) a troglobitic fauna monitoring program;
- (b) protection of the sand sheet vegetation community; and
- (c) a mine closure and rehabilitation plan.

The full EPA report Bulletin 1264 Mesa A/Warramboe Iron Ore Project is available on the EPA website at www.epa.wa.gov.au.

330 MW Gas-Fired Power Station, Neerabup

On 29 October 2007, the EPA released its report and recommendations (Bulletin 1268) on the proposal by NewGen Neerabup Pty Ltd to construct and operate:

- a 330-megawatt (MW) open cycle gas turbine (OCGT) power station within Lots 506 and 507 Pederick Road Neerabup, located approximately 30 km north of Perth;
- a 30-km long gas pipeline and a compressor station to transport natural gas from the Dampier to Bunbury Natural Gas Pipeline to the power station; and
- a 330-kV electricity transmission line, approximately two km long, to connect the power station to the Western Power Neerabup terminal substation.

The EPA determined that the relevant environmental factors for the proposal were conservation of biodiversity, air quality, noise, and greenhouse gases. The EPA concluded that the proposal could be managed to meet the EPA's environmental objectives, provided there was satisfactory implementation by the proponent of the conditions recommended in Bulletin 1268.

The full EPA report Bulletin 1268 '330 MW Gas-Fired Power Station, Neerabup', is available on the EPA website at www.epa.wa.gov.au.

Freshwater Point 1 Drilling Proposal within Beekeepers Nature Reserve

The EPA provided advice and recommendations (Bulletin 1277) to the Minister for the Environment and Climate Change on the proposal to conduct drilling of the Freshwater Point 1 petroleum exploration well within Beekeepers Nature Reserve, 40 km south of Dongara, by Origin Energy Resources Limited.

Beekeepers Nature Reserve is vested in the Conservation Commission for the purpose of conservation of flora and fauna. The petroleum drilling would include the construction of a lease pad (drilling area) and access track from existing borrow pits to Freshwater Point 1. Construction material would be sourced from one of the existing reserve borrow pits. A fire buffer with a 150-m radius around the lease pad would be cleared of vegetation. A temporary camp site would be established on privately owned and previously cleared property 10.5 km south of Freshwater Point 1. Almost 6.5 ha of vegetation within the Beekeepers Nature Reserve was proposed to be cleared and later rehabilitated.

In its report, the EPA noted that there was an increasing number of proposals for resource extraction in Beekeepers Nature Reserve, including both petroleum projects and extractive industry projects. It would be important to ensure that the conservation values of the nature reserve were not adversely impacted by this development activity. To this end it was essential that proposals in the area be planned, sited and managed so as to avoid or minimise impact to native vegetation. Should residual impacts remain, then appropriate environmental offset measures needed to be considered with the aim of ensuring there was no net loss of biodiversity values.

The EPA concluded that the proposal could be managed to meet the EPA's environmental objectives, provided there was satisfactory implementation by the proponent of their commitment and the recommended conditions in Bulletin 1277.

The full EPA report Bulletin 1277 Freshwater Point 1 Drilling Proposal within Beekeepers Nature Reserve is available on the EPA website at www.epa.wa.gov.au.

Proposed land clearing in the shires of Jerramungup and Lake Grace

The EPA assessed and provided advice and recommendations to the Minister for the Environment and Climate Change on two large agricultural land clearing proposals by Mr Brian Burns. One report (Bulletin 1262) was about a proposal to clear approximately 1,000 ha of native vegetation on Kent Location 1664, corner Lake Magenta and Reserve roads, Shire of Jerramungup. The second report (Bulletin 1263) related to the proposal to clear approximately 779 ha of native vegetation at Roe Locations 2598 and 2599, Mallee Hill Road, Shire of Lake Grace

Both proposals involved clearing for agricultural purposes within the agricultural area of Western Australia, as defined by the map presented as Figure 1 of the EPA's Position Statement No. 2 'Environmental Protection of Native Vegetation in Western Australia – Clearing of Native Vegetation, with Particular Reference to the Agricultural Area'. Consistent with the EPA's position as outlined in Position Statement No. 2, from an environmental perspective any further reduction in native vegetation through clearing for agricultural purposes, could not be supported (EPA, 2000). The bioregion had been extensively cleared and was subject to numerous threats that were contributing to the overall decline in health and biodiversity values of the region.

The EPA therefore concluded that neither clearing proposals could be managed to meet the EPA's objective in relation to biodiversity conservation and potential land degradation, and that the EPA held the view that the proposals should not be implemented.

In arriving at those conclusions, the EPA noted that there were two separate but related aspects to the proposals to clear land in the shires of Jerramungup and Lake Grace. The first was environmental and clearly within the remit of the EPA to advise. On the basis of environmental values, the EPA recommended that the land not be cleared, and that the proposals not be implemented. This was a firm recommendation of the Authority. The second aspect was beyond the brief of the EPA, and within the realm of government. It related to the consequence of the environmental decision on the particular proponent. The authority made no recommendation on the matter, except to highlight to government the consideration of this consequence.

The full EPA reports, Bulletin 1262 'Clearing of approximately 1,000 ha of native vegetation Kent Location 1664, corner Lake Magenta and Reserve Roads, Shire of Jerramungup' and Bulletin 1263 'Clearing of approximately 779 ha of native vegetation Roe Location 2598 & 2599, Shire of Lake Grace' are available on the EPA website at www.epa.wa.gov.au.

2.1.6.3 Environmental policies

Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999

In accordance with s36(1)(b) of the *Environmental Protection Act 1986*, the EPA has deferred starting the review of the *Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999* as directed by the Minister for the Environment. This direction is in effect until 31 December 2009.

Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998

The EPA has initiated the review of the *Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998*. A review document will be released inviting public comment.

State Environmental (Ambient Air) Policy

The State Environmental (Ambient Air) Policy (Ambient Air SEP) will encompass the intent of current ambient air related National Environment Protection Measures, (NEPMs), to allow air quality that is protective of human health and wellbeing. To achieve this, the Draft Ambient Air SEP outlines policy direction and specifies processes for monitoring, managing and reducing emissions of pollutants to ensure that the quality of ambient air meets the standards and guidelines set through National Environment Protection Measures and relevant State Government policies and criteria.

During 2008, the EPA has undertaken targeted consultation on the Draft Ambient Air SEP and Explanatory Document. Submissions were received from the EPA's Reference Panel members and, where appropriate, incorporated in the draft.

Water Quality Improvement Plan for the Rivers and Estuary of the Peel-Harvey System – Phosphorus Management

A Water Quality Improvement Plan for the Rivers and Estuary of the Peel-Harvey System – Phosphorus Management is being developed by the EPA in partnership with the Australian Government's Department of the Environment, Water, Heritage and the Arts under the Coastal Catchments Initiative to reduce pollution in coastal water quality hotspots.

The draft plan was released for public comment in September 2007. These comments have now been considered and, where appropriate, issues and concerns have been taken on board in the preparation of the final plan.

Fertiliser Action Plan

In 2006 the former Minister for the Environment announced the phase-out of highly water soluble phosphorous fertilisers in environmentally sensitive areas of the south-west of Western Australia. The Fertiliser Action Plan was developed and tabled in Parliament in May 2007. A symposium was held in July 2007 to consult with stakeholders.

In March 2008, DEC provided its report to the Minister on stakeholder input and implementation of the Fertiliser Action Plan following consultation with stakeholders, including a key meeting with fertiliser producers and retailers in November 2007.

On 17 June 2008 the Minister announced the next phase of the State Government's plan. This phase includes the start of demonstrations to trial low water soluble phosphorous fertilisers on selected farms, the earlier phase-out of high water soluble phosphorous fertiliser products for home use, the establishment of working groups to provide guidance on implementation of the policy, and the proposal for the EPA to prepare a State Environmental Policy for phosphorous fertilisers.

2.1.6.4 Northern Development Taskforce – West Kimberley

DEC is a member of the Northern Development Taskforce – which was established by Cabinet in 2007, with one of its functions being to coordinate a strategic approach to development of the natural gas resources of the Browse Basin which lies offshore from the West Kimberley. The taskforce is to ensure that economic development is balanced against the wilderness, environmental, tourism and heritage values of the West Kimberley. Of particular importance is informed consent by Indigenous people to any proposal, meaningful Indigenous participation in the resource development, a comprehensive benefits package for traditional owners and regional benefits distribution.

DEC has coordinated and supported a range of terrestrial and marine studies to help inform decisions around the environmental opportunities and constraints of potential LNG hub sites. In June 2008 the taskforce released an interim report that outlined the process for selection of a shortlist of possible sites for an LNG hub that will be released for public comment as well as EPA review and advice to the Minister.

An agreement between the State and Commonwealth governments under the *Environment Protection and Biodiversity Conservation Act* facilitates a coordinated strategic assessment of plans for an LNG hub. The agreement also acknowledges the region's outstanding heritage values and commits both governments to assess the West Kimberley for national (and potentially international) heritage values.

2.1.6.5 Bulletins produced during 2007–08

Public Environmental Review

Bulletin number	Title	Release date
1259	Pluto LNG Development, Burrup Peninsula: Woodside Energy Ltd	9 July 2007
1269	Keysbrook Mineral Sands Mine: Olympia Resources Limited	29 Oct 2007
1270	Fimiston Gold Mine Operations Extension (Stage 3) and Mine Closure Planning: Kalgoorlie Consolidated Gold Mines Pty Ltd	29 Oct 2007
1285	Spinifex Ridge Molybdenum Project: Moly Metals Australia Pty Ltd	14 April 2008
1289	Pardoo Direct Shipping Ore Project, Port Hedland: Atlas Iron Limited	16 June 2008
1291	Albany Iron Ore Project – Southdown Magnetite Proposal: Grange Resources Limited	30 June 2008

Formal/Section 43

Bulletin number	Title	Release date
1264	Mesa A/Warramboe Iron Ore Project: Robe River Mining Company Pty Ltd	17 Sept 2007
1272	Lot 4 Underwood Avenue, Shenton Park 2007 Development and Conservation Proposal: University of Western Australia	29 Oct 2007
1273	Fimiston Gold Mine Operations Extension (Stage 3) and Mine Closure Planning: Kalgoorlie Consolidated Gold Mines Pty Ltd	3 Dec 2007

Section 48A

Bulletin number	Title	Release date
1275	Harvey District Planning Scheme No. 1 Amendment No 13: Shire of Harvey	10 Dec 2007

Assessment on Referral Information/Environmental Protection Statement

Bulletin number	Title	Release date
1267	Tilley Siding Ore Transport Facility: Midwest Corp Ltd	22 Oct 2007
1278	Jansz Feed Gas Pipeline Barrow Island Nature Reserve: Mobil Australia Resources Company Pty Ltd	10 Dec 2007
1286	Port Facility Upgrade – Anderson Point, Port Hedland, Dredging and Wharf Construction – Third Berth: Fortescue Metals Group Ltd	14 April 2008
1261	Coyote Gold Mine – Stage 2 (Sandpiper and Kookaburra Open Pits and Haul Road) 280 km South-East of Halls Creek: Tanami Gold NL	30 July 2007
1265	Dampier Port Increase in Throughput to 145 Mtpa: Hamersley Iron Pty Limited	1 Oct 2007
1266	Mullering 3D Onshore Seismic Survey: Empire Oil Company (WA) Limited	1 Oct 2007
1268	330 MW Gas-Fired Power Station, Neerabup: NewGen Neerabup Pty Ltd	29 Oct 2007
1277	Freshwater Point 1 Drilling Proposal within Beekeepers Nature Reserve: Origin Energy Resources Limited	10 Dec 2007
1280	Construction of Warehouse and Transport Depot on Lot 46 Tomah Road, Welshpool: Merilla Pty Ltd	14 Jan 2008
1283	Mesa K Remnant Mining Project: Robe River Mining Company Pty Ltd	25 March 2008
1287	Class II Landfill, Fernview Farm, Gingin: Veolia Environmental Services (Australia) Pty Ltd	12 May 2008
1288	Windimurra Vanadium Project: Land clearing and mining below the base of weathering: Windimurra Vanadium Limited	16 June 2008
1292	Subdivision, Lot 48 Furnissdale Road, Furnissdale: SAS Global Furnissdale Pty Ltd	30 June 2008

Proposal Unlikely to be Environmentally Acceptable

Bulletin number	Title	Release date
1262	Clearing of approximately 1,000 hectares of native vegetation Kent Location 1664, corner Lake Magenta and Reserve Roads, Shire of Jerramungup: Mr Brian Burns	10 Sept 2007
1263	Clearing of approximately 779 hectares of native vegetation Roe Location 2598 & 2599, Shire of Lake Grace: Mr Brian Burns	10 Sept 2007

Section 46

Bulletin number	Title	Release date
1260	Worsley Alumina – Production to Maximum Capacity of 4.4 MTPA Alumina and Associated Mining, Change to Environmental Conditions: Worsley Alumina Pty Ltd	23 July 2007
1276	Magellan Lead Carbonate Project, Wiluna – To Facilitate the Export of Containerised Lead from the Port of Fremantle, Change to Environmental Conditions: Magellan Metals Pty Ltd	10 Dec 2007
1279	Wastewater treatment and disposal, Albany (ministerial statement 675): Water Corporation	7 Jan 2008
1284	Oakajee Deepwater Port, Oakajee, Shire of Chapman Valley, Change to Conditions: Minister for Resources Development	25 March 2008

Section 16

Bulletin number	Title	Release date
1281	Keralup (formerly Amarillo) Masterplan, Karnup: Department of Housing and Works	4 March 2008
1282	Advice on areas of conservation significance in the Preston Industrial Park	25 March 2008
1290	Conservation of Roadside Vegetation	23 June 2008
1293	Advice on Clearing for Mining in the Lane Poole Reserve Recreation Area, North Willowdale: Alcoa World Alumina Australia	30 June 2008

2.1.7 Service 7: Coordinate the response to Climate Change

Service description: To provide 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.

Performance summary

	2007–08 Target \$'000	2007–08 Actual \$'000	Variation \$'000
Expense by service	6,802	6,067	(735)

KPI	2007–08 Target	2007–08 Actual	Variance
Cost of administering Low Emissions Energy Development Fund as a percentage of total funds	0.55%	0.25%	(0.30%)

Performance highlights

- Establishment of the Low Emission Energy Development (LEED) Fund to promote emission reduction and support technological advances that cut greenhouse gas emissions.

- Launch of the demonstration phase of the Household Audit and Education Program (now called 'Living Smart') in Joondalup and Mandurah.
- Expansion of the Solar Schools Program.
- Introduced 5 Star Plus building standards.
- Hosted and managed the *Act Now for the Future* website www.actnow.wa.gov.au.
- The *Pictures of a Changing Climate Photographic Exhibition* toured Western Australia.
- Commencement of Stage 3 of the Indian Ocean Climate Initiative which will continue to undertake world class Western Australia-specific climate change research and develop better projections of regional weather to allow people and businesses, as well as State Government agencies, to plan and adapt to a changing climate.
- Initiation of a number of projects that will assess the vulnerability of regions and sectors of WA to the impacts of climate change, identify on-ground priorities and develop climate change adaptation options.

2.1.7.1 Overview

Through its Office of Climate Change (OCC), DEC is the lead coordinating agency for climate change-related policy in the Western Australian Government. The OCC also administers the LEED Fund, a \$36 million leveraged technology fund over five years.

The rapid escalation of climate change mitigation and adaptation activities at all levels of government has placed increased demands on OCC staff. The skills shortage and the recent emergence of climate change as a separate discipline have slowed the recruitment of experienced staff to the OCC. The full staffing level of 16 FTEs is expected to be in place by August 2008.

2.1.7.2 Premier's Climate Change Action Statement

The Premier's Climate Change Action Statement, which was released on 6 May 2007, outlines significant new measures to mitigate greenhouse gas emissions and initiatives to assist the community and industry to adapt to the impacts of climate change. The Premier's Climate Change Action Statement is available at www.actnow.wa.gov.au.

Significant achievements in the 2007–08 financial year included the establishment of the LEED Fund to promote emission reduction and support technological advances that cut greenhouse gas emissions. In June 2008, the Premier announced the two successful applicants under Round 1 of the LEED Fund were Future Farm Industries to further develop a mallee harvester to allow woody biomass to generate electricity, and Solar Systems Ltd to construct a concentrator solar power station in Kalgoorlie.

The demonstration phase of the Household Audit and Education Program (now called 'Living Smart') was launched in Joondalup and Mandurah. Living Smart will assist 15,000 households across Joondalup and Mandurah to reduce their household greenhouse gas emissions.

During the year the Solar Schools Program expanded with 64 schools joining the program in March 2008, taking total program participation to 131 schools.

Other achievements included the introduction of 5 Star Plus building standards requiring compliance with the Building Code of Australia 5 Star standard as well as the inclusion of a minimum standard hot water system and water efficient taps, showerheads and toilets.

The *Act Now for the Future* website (www.actnow.wa.gov.au), which provides a one-stop shop for information on sustainable living and climate change action measures.

2.1.7.3 Climate change adaptation program

The State Government has invested \$8.625 million over five years to help adapt to the impacts of climate change.

Research on the impacts of climate change was boosted with a \$4 million investment into the successful Indian Ocean Climate Initiative (IOCI). The State Government signed an agreement with CSIRO and the Bureau of Meteorology initiating Stage 3 of IOCI. Stage 3 will build on the existing work completed by IOCI and will provide a 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. More information about IOCI is available at www.ioci.org.au.

The State Government has committed \$4.625 million to identify regions and sectors in Western Australia most vulnerable to climate change impacts and to develop adaptation programs to reduce this vulnerability. Actions that are being progressed under this initiative include:

- a risk assessment of the State's infrastructure and related services from the impacts of climate change. The study will identify the social, governance, legal and financial implications of the risks and identify the policy options available to the State Government to manage and reduce current risks and minimise or avoid future risks.
- in partnership with the Commonwealth Government, commissioning a study that will identify the impacts of climate change on Indigenous communities in the tropical north and assess the vulnerability of these communities. The study will also assist in identifying knowledge gaps and future on-ground priorities.
- developing a blueprint for agriculture and forestry adaptation to climate change. This will increase the resilience of agricultural crops and systems to cope with long-term climate change and seasonal variability and identify the necessary responses to climate change in Western Australia's native forest and plantation strategies.
- in partnership with the Western Australian Local Government Association developing resources, including an online toolkit, that will assist local government to respond to climate change issues and incorporate climate change considerations into policies and decision-making processes.

2.1.7.4 Pictures of a Changing Climate Photographic Exhibition – Art on the Move

The *Pictures of a Changing Climate Photographic Exhibition* was opened by the former East Metropolitan MLC Louise Pratt at the Western Australian Museum in March 2007. The exhibition toured Western Australia during the year and was shown in numerous regional centres from Albany in the south to Denham in the north, finishing at Kalgoorlie on 31 July 2008. The exhibition was developed by DEC and the Department of the Premier and Cabinet with the assistance of the Climate Group. Art on the Move was responsible for showcasing the exhibition in the regions.

The travelling exhibition consisted of four components:

1. Twenty-two international images on climate change taken by 10 of the world's Magnum photographers and with contributions from Tony Blair, David Suzuki, Kofi Annan and Leonardo DiCaprio.
2. Ten Australian images (excluding Western Australia) taken by a photographer from *The Age* newspaper, from areas that are currently being affected by climate change such as Kakadu, the Alps, the Great Barrier Reef, Queensland tropical rainforests and the Murray-Darling Rivers.
3. Ten images selected from a Western Australian Climate Change Photographic Competition to represent local images of climate change.
4. Images from the State Government on the leadership action taken to combat this global phenomenon.

The exhibition's internationally acclaimed and regionally focused photographic artwork was well received by the public and it helped inform audiences about climate change and inspired them to *Act Now for the Future*.

2.2.1 Strategic Development and Corporate Affairs

The Strategic Development and Corporate Affairs (SDCA) Division provides corporate leadership in communications and organisational development for the department.

It works closely with other areas of DEC to provide services and products that support the department in achieving its mission and maintaining community trust. Responsibilities include media relations, publications and online services, public participation, events coordination, advertising, marketing, EcoEducation programs and corporate planning.

The division provided communications support for other sections of the department on a range of major issues and programs in 2007–08, including:

- media management of large fires in the Goldfields, Midwest and South Coast regions
- publicising management plans and draft management plans for protected areas including Kennedy Range National Park; Shoalwater Islands Marine Park; Shark Bay terrestrial reserves and Lake McLarty Nature Reserve
- design and production of a strategic review by DEC and the Department of Industry and Resources of the conservation and resource values of the banded iron formations of the Yilgarn Craton
- media activity to raise public awareness of the *Saving Our Species* program
- planning, implementation and evaluation of 10 community workshops for the South Coast Regional Marine Planning process
- coordination of information sessions (including two publications) for the Wagerup community to disseminate the scientific results of DEC's Air Quality Monitoring program
- assisting with the planning, facilitation and evaluation for five *Zero Waste Plan* workshops across the State for local government
- planning and implementing a trial of the Community Based Participatory Research Guide for Air Quality Management with Perth Modern School
- assistance with public and stakeholder participation in the Midland Air Quality Monitoring project

Media, publications and marketing support was also provided for programs including Waste Wise Schools, Ribbons of Blue, Clean Up Australia and Keep Australia Beautiful programs including Tidy Towns, Sustainable Communities and the National Litter Index.

Work continued to develop a single website for the department. The new website is being developed completely by DEC staff and was close to completion at the end of June. The website will provide easy access to the latest DEC information and bring together the information from the websites operated by the former Department of Conservation and Land Management and Department of Environment.

There was also a continued focus on building awareness of the department's new corporate image and branding. Consistent design elements were introduced for use in DEC communications products from major displays developed for the WA on Show exhibition at the Perth Convention Exhibition Centre in February, to online and printed display advertisements for recruitment developed to attract attention in a tight employment market. The eye-catching, professional advertisements drew big fields of applicants for essential positions in key areas of business in DEC.

The department also continued its lead role in the whole-of-government *Act Now for the Future* campaign to promote ways for more sustainable living and counter climate change. This included major media campaigns involving television, outdoor, internet and print advertising. DEC also continued to host and manage the *Act Now for the Future* website, providing a single entry point to State Government sites with information for people who want to help the environment.

Other major campaigns during the year included an extensive media campaign to highlight Western Australia's marine parks and another to promote an anti-litter message.

DEC's annual Environment Awards continued to attract strong interest during the year with 69 entries received for the 2007 awards. The awards recognise individuals, community groups, industry organisations, businesses and government agencies that contribute to the protection and conservation of WA's environment and the ecosystems it sustains.

In addition to the quality publications and online services to support major departmental initiatives, the division continued to publish a range of saleable products including the quarterly *LANDSCOPE* magazine and eight revised editions in the popular Bush Books and Discovering series and a reprint of the *LANDSCOPE* Special Edition 'The best of the South-West'. Staff writers also started work on several new publications for release in 2008–09.

Information for staff was also boosted with the introduction of a daily online news bulletin about DEC people and their activities. This supplemented the department's monthly newsletter, *Environment and Conservation News*, which is distributed to all DEC staff and volunteers.

LANDSCOPE Expeditions conducted five research expeditions in 2007–08 and contributed \$140,000 towards scientific research in remote areas of Western Australia. Fifty volunteers helped scientists and regional staff on field research programs as part of broader DEC programs. One of the highlights for the year was the first of a series of expeditions along the Canning Stock Route to survey plants and animals and to map fire boundaries in cooperation with the Martu people, the traditional owners of the land. The expedition was part of a project to celebrate the centenary of the construction of the Canning Stock Route.

EcoEducation continued its busy programs for schools throughout the year, building on established activities and introducing new programs including *Climate change – Measuring baseline biodiversity* linking with DEC's initiatives in this area, and *Our South West* for studies in the jarrah forest ecosystems at the Wellington and Margaret River EcoEducation centres. The Perth Hills National Parks EcoEducation Centre hosted nearly 12,000 students and teachers in school programs and professional development days.

The section also gave a range of presentations and provided professional development sessions to diverse groups during the year including addressing the 2007 World Conference on Science and Technology Education in Perth in July and leading an EcoEducation tour for delegates after the conference. It also introduced a new program for schools in which the program leaders go into the schools with the EcoEducation programs.

The Bush Rangers WA Program, part of the Cadets WA Program, provided personal development training opportunities for more than 1,400 Bush Ranger cadets in 47 units in schools across WA and contributed more than 300,000 volunteer hours to local conservation and community projects.

The Bush Rangers units included an even mix of male and female participants including 16 per cent Indigenous cadets. Four per cent of the units catered for cadets with disabilities.

The Curriculum Council of WA has endorsed the program as a Senior School course and, at the end of the 2007 school year, the first Bush Ranger cadets were credited with points towards their Western Australian Certificate of Education.

2.2.2 Environmental Enforcement Unit

Enforcement support

The Environmental Enforcement Unit (EEU) was established in 2003 following recommendations from a review of the Enforcement and Prosecution Guidelines of the then Department of Environmental Protection. The EEU contributes to the protection of the environment through the provision of investigative and enforcement support to the department's environment protection activities.

The unit is responsible for taking the lead role in investigations into major environmental incidents and has conducted and assisted with departmental investigations into a broad range of environmental events. The EEU investigators have successfully coordinated and

concluded environmental investigations throughout Western Australia in partnership with regional environmental staff, resulting in prosecutions and other sanctions.

As part of its 'quality assurance' role and commitment to promoting and improving the investigative skill sets of officers throughout the State, the EEU is involved in developing and conducting the Regulatory Officers Training Course in consultation with the department's Environmental Training Coordinator. The two-week course, a 2006 Premier's Award finalist, is held at the WA Police Academy at Joondalup and involves the co-delivery of generic investigations and DEC agency specific training. Since its inception in 2005, more than 200 departmental officers have benefited from the course.

2.2.2.1 EEU finalised prosecutions for 2007–08

The following DEC environmental prosecutions were subject to final court determination during 2007–08. Several other matters remain before the courts and are expected to be finalised within the next 12 months. More than 15 other matters are scheduled to progress soon to prosecution or high level sanction.

Moora Magistrates Court M0214/07

A 50-year-old man from Badgingarra appeared in the Moora Magistrates Court on 3 October 2007 to answer a charge of implementing a proposal after being advised that it could not be implemented contrary to sections 47(4) and 99Q of the *Environmental Protection Act 1986*.

It was alleged that between 12 November 2003 and 11 January 2005 approximately 470 ha of vegetation was cleared after being advised that this proposal could not be implemented.

The matter was part heard at the Moora Magistrates Court on 5 March 2008 and the remainder of the hearing was heard at the Perth Magistrates Court on the 28 and 29 May 2008.

The decision was reserved until 2 July 2008 at the Joondalup Magistrates Court.

Kununurra Magistrates Court Charge Number 250/08

A 50-year-old man from Kununurra appeared in the Kununurra Magistrates Court on 22 April 2008 and pleaded guilty to causing the clearing of native vegetation without authorisation; contrary to sections 51C and 99Q of the *Environmental Protection Act 1986*.

It was alleged in court that between 1 August 2006 and 23 October 2006, approximately 3,188 square metres of native vegetation had been cleared from the accused's property located on Riverfarm Road, Kununurra.

The offender was fined \$1,000, ordered to pay \$400 costs and a conviction was recorded.

Manjimup Magistrates Court Charge Number MJ77/08

A 54-year-old man from Northcliffe appeared in the Manjimup Magistrates Court on 6 March 2008 and pleaded guilty to causing clearing of native vegetation without authorisation; contrary to sections 51C and 99Q of the *Environmental Protection Act 1986*.

It was alleged in court that between 1 December 2005 and 25 January 2006, approximately 4.8 ha of native vegetation had been cleared from an environmentally sensitive area situated in the property owned by the accused in Pioneer Road, Meerup (Northcliffe).

The offender was fined \$10,000, ordered to pay \$300 costs and a conviction was recorded.

Midland Magistrates Court Charge Number 07010343

A 55-year-old woman from Neergabby appeared in the Midland Magistrates Court on 27 November 2007 and pleaded guilty to causing clearing of native vegetation without authorisation; contrary to sections 51C and 99Q of the *Environmental Protection Act 1986*.

It was alleged in court that between 20 December 2005 and 12 February 2006 that approximately 24 ha of native vegetation had been cleared from the offender's Neergabby property, near Guilderton, without authorisation.

It was also alleged that the clearing occurred while an appeal against the granting of a clearing permit was being considered by the Appeals Convenor.

The offender was fined \$5,000 and ordered to pay \$300 costs and a conviction was recorded.

Midland Magistrates Court Charge Number 07006560

A Hazelmere landfill company pleaded guilty in the Midland Magistrates Court on 5 July 2007 to the charge that as the occupier of prescribed premises, it caused an emission³ from the prescribed premises, without being the holder of a licence issued in respect of those premises; contrary to Section 56(1) (a) of the *Environmental Protection Act 1986*.

It was alleged in court that between 1 October 2004 and 31 December 2004, the defendant received inert waste at its landfill site without holding an appropriate licence under the *Environmental Protection Act 1986*.

The offender was fined \$20,000 and ordered to pay \$300 costs

2.2.2.2 Modified penalties

DEC administers modified penalties under Section 99A of the *Environmental Protection Act 1986* which empowers the department to issue a modified penalty where certain statutory conditions are met. If the fine is not paid within the specified time, the department will start prosecution action.

Modified Penalty Notice 1/2008 \$25,000

On 21 January 2008 DEC issued a \$25,000 modified penalty to a Kalgoorlie mining company for allegedly causing environmental harm under Section 50B (2) of the *Environmental Protection Act 1986*.

The penalty was issued after an investigation by DEC identified that between 26 and 27 February 2006, the company allegedly caused a spill of process water from a containment pond at its Kalgoorlie facility. It is alleged that the spill impacted on native vegetation.

Modified Penalty Notice 2/2008 \$25,000

On 5 May 2008 DEC issued a \$25,000 modified penalty to a Hazelmere company for allegedly emitting an unreasonable emission (odour) from its premises under Section 49 (5)(a) of the *Environmental Protection Act*.

The penalty was issued after an investigation by DEC identified that on 23 June 2006, the company allegedly emitted an unreasonable odour from its meat rendering facility located in Hazelmere.

2.2.2.3 Infringements

Infringements are a form of modified penalty administered by DEC for breaches of legislation which are considered less serious than those that result in a prosecution or modified penalty. Infringements are a cost-effective way in which to ensure compliance and are acknowledged as an important tool in effecting a change in offender behaviour.

Act	Total infringements issued
<i>Litter Act</i>	3,766
<i>Environmental Protection Act</i>	50

³ Depositing of inert waste on the premises is considered an 'emission' under the Act.

2.2.3 Legal Services

The Legal Services Branch provides general legal advice to the department in relation to the legislation administered by DEC; public law generally; and pending litigation matters relevant to the department.

2.2.3.1 Litigation

The department defended an action brought by Narrogin Beef Producers Pty Ltd. The action was commenced in the Supreme Court of Western Australia alleging a denial of procedural fairness and a failure to properly apply certain environmental management guidelines. On 3 June 2008 both parties agreed to Consent Orders dismissing the action.

Narrogin Beef Producers Pty Ltd also applied for an interim injunction to prevent the department from enforcing the licence issued under Part V of the *Environmental Protection Act 1986*, pending certain outcomes. The injunction application was dismissed with costs awarded in favour of the department on 2 May 2008.

2.2.3.2 Freedom of Information Services

The Legal Services Branch also manages the processes for the department under the *Freedom of Information Act 1992*. The department's Information Statement has been reviewed and approved by the Office of the Information Commissioner. The Information Statement accurately reflects the functions of the department and its related agencies, the nature of the information held by the department and its related agencies, and that information which is made available to the public. The Information Statement is on the department's website.

During the year, the department received 239 applications for access to information, 15 of which were subsequently withdrawn. The average time taken to process each application was 21 days.

Six applications were made for an internal review of the department's decision and one of those applications went to the Information Commissioner for external review.

2.2.4 Fire Management Services

2.2.4.1 Fire season 2007–08

The southern parts of Western Australia experienced mostly moderate fire danger conditions during the 2007–08 fire season due to the good rainfall in winter, spring and autumn. The karri and southern forest near Pemberton and Manjimup were affected by regular rainfall events during spring and autumn which severely restricted the number of suitable prescribed burning days. As a result, very little prescribed burning was undertaken in these southern forests.

The total area of the 444 wildfires attended and monitored by DEC staff throughout the State was about 1.42 million ha. Of this area, about 35,500 ha occurred in the Pilbara Region, 173,000 ha in the Goldfields Region, 1.05 million ha in the Kimberley Region, 105,000 ha in the South Coast Region, 13,000 ha in the Midwest Region, 34,000 ha in the Wheatbelt Region and about 9,900 ha in the three forest regions (Swan, South West and Warren regions).

Lightning-caused fires represented about 18 per cent of all wildfires attended by DEC staff. This is slightly below the 10-year average of about 21 per cent. Deliberately lit or arson-caused fires started 49 per cent of all fires. This is a small increase on the 10-year average of about 43 per cent.

Other causes of wildfires included accidental fires (11 per cent); escapes from private burns (6 per cent) and unknown (15 per cent). Six small wildfires that were the result of escapes from DEC prescribed burns represented less than 1 per cent of all fires. Only two burns escaped in the forest regions.

DEC staff attended 330 wildfires in the three south-west forest regions. These fires burned about 6,600 ha of DEC-managed land and an additional 3,300 ha burned on non DEC-managed lands. Five of the biggest fires (in the forest regions) accounted for a total of 6,500 ha (65 per cent). Almost 90 per cent of all fires were contained to less than 20 ha due to the early detection and rapid fire suppression response by DEC. In many cases the fires were rapidly contained where they burned into low fuels within previously prescribed burned areas.

Long-term drought conditions experienced in the Goldfields, Midwest and parts of the South Coast regions resulted in very dry, highly flammable vegetation that carried high intensity wildfires in these regions.

The Boorabbin National Park fire on the Great Eastern Highway about 200 km west of Kalgoorlie burned about 40,000 ha between 28 December 2007 and 8 January 2008. On Sunday 30 December 2007, two trucks owned by commercial transport companies that were travelling along the highway were over-run by the fire and the three occupants died.

On 7 January 2008 three lightning-caused fires occurred within 50 km of the Boorabbin fire. These fires were contained to less than 2,600 ha by DEC forces.

On 8 January 2008, lightning-caused fires burned intensely in and near the Fitzgerald River National Park. Four of these fires were contained to a small size by DEC forces and local bushfire brigades. The remaining three fires combined and burned about 43,000 ha of the Fitzgerald River National Park.

On 13 February 2008, a lightning-caused fire burned 1,600 ha of the Kalbarri National Park. This fire was able to be contained due to the presence of recently prescribed burn areas in the park.

Departmental pre-formed incident management teams comprised of about 60 incident management staff were engaged at four big fires during the year. These teams consist of departmental personnel who train together and are ready during the bushfire season to respond to big incidents. The mobilisation of teams to these large, complex fire incidents proved very effective.

Details on the wildfires attended by DEC staff are provided in the tables on the following pages.

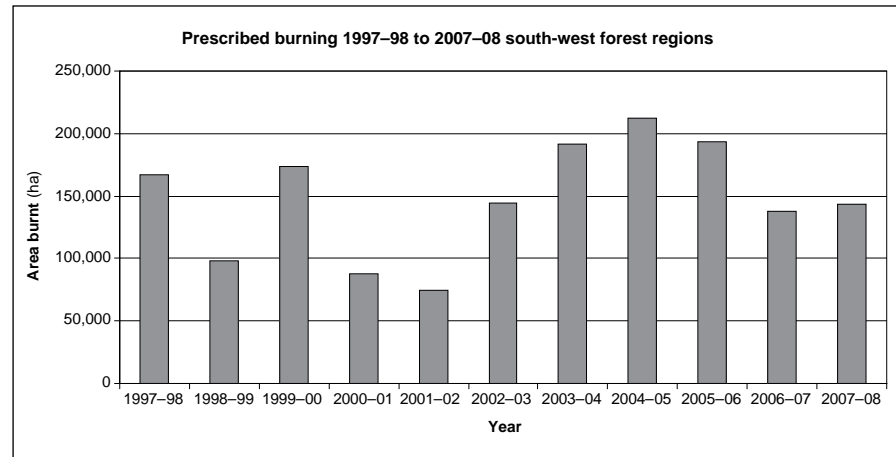
2.2.4.2 Prescribed burning

Each year the department plans and implements prescribed burning on DEC-managed lands in the south-west for three primary purposes: to protect and conserve biodiversity values and community assets; to reduce the occurrence and impacts of large, intense wildfires; and to regenerate and protect forest ecosystems following harvesting operations or other disturbances. In many cases these outcomes are achieved together within a prescribed burn. The annual indicative burn target for the south-west regions in 2007–08 was 200,000 ha.

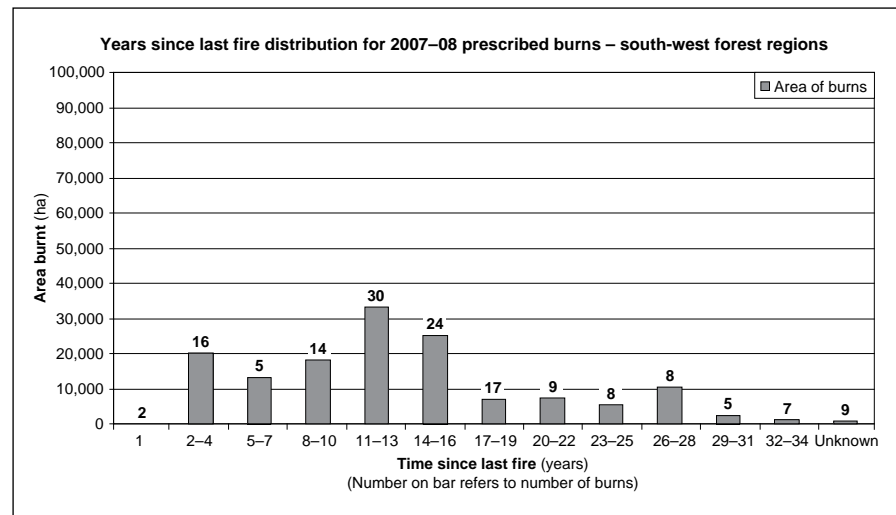
In order to meet these objectives, the department's Master Burn Planning process identified more than 300,000 ha that was available for prescribed burning in the south-west forest regions for the 2007–08 burning seasons. This available burn area, which is more than the annual target, provided the flexibility required to take advantage of any favourable burning situations throughout the south-west.

In the south-west regions, the prescribed burn program for 2007–08 achieved a total of about 143,700 hectares, including about 7,700 ha that were burnt for pine plantation protection. About 62 per cent of all burns were undertaken in the spring–early summer period (September to December 2007); 21 per cent in autumn (April to June 2008); 14 per cent in summer (January to March); and 3 per cent in winter (July and August 2007). The low achievement in autumn was due to the limited number of suitable burning days as wet conditions prevailed throughout the south of Western Australia during April and May.

The chart below shows the achievement of prescribed burning in the south-west forest regions from 1997–98 to 2007–08. The decline in the burning from 1998 to 2003 reflects the impacts of drought and unfavourable burning conditions that prevailed in these years. The average annual area of burning achieved since 2003 has been about 178,000 hectares.



The following chart shows the year of the last burn of the vegetation/fuel within all the prescribed burns conducted in the south-west regions in 2007–08. About 65 per cent of the burns contained fuels that had not been burnt since 1997, or more than 11 years ago.



In addition to the burn programs achieved in the south-west regions, a total of about 789,300 ha of prescribed burning was undertaken by DEC in the South Coast (3,000 ha), Midwest (900 ha), Kimberley (533,500 ha), Goldfields (115,200 ha), Wheatbelt (500 ha) and Pilbara (136,200 ha) regions. Many of these burns were open-edge burns and aerially ignited wind-driven burns that provided protective buffers to limit the spread of wildfires from burning out entire reserves, thus protecting biodiversity and nearby community assets and maintaining a diversity of habitat. The burns were carried out on DEC-managed lands as well as on unallocated Crown lands and unmanaged reserves within these regions.

Details on the prescribed burn areas achieved are provided in Appendix G.

2.2.4.3 Aerial water bombing operations

The department contracted eight fixed-wing water bomber aircraft during the peak summer months of the 2007–08 fire season to provide rapid aerial suppression capability in the South Coast Region and south-west forest regions, and the Perth outer metropolitan area. Two pairs of Dromader aircraft were based at Manjimup and Albany. A pair of Air Tractor 602 aircraft and an Air Tractor 802 aircraft were based at Bunbury and Perth. The aircraft provided an aerial rapid-attack capability to help ground crews in the initial attack on wildfires. In addition to the fixed-wing aircraft, the Fire and Emergency Services Authority (FESA) contracted four light helicopters (helitankers) to provide coverage for the Perth urban and nearby rural areas. FESA also trialled a heavy lift helicopter (Sikorsky 61) for 110 days to determine the cost-effectiveness of this large-volume (3,800-litre capacity) aerial tanker. This aircraft was used effectively at the Fitzgerald River National Park fire near Albany to provide rapid transport of fire crews to and from the fire line. This application effectively reduced fire crew fatigue, increased work time at the fire line and reduced the time and safety risks associated with ground transport over long distances.

The fixed-wing aircraft and helitankers were used successfully in combination on several bushfires that threatened residential areas in the outer metropolitan area of Perth.

The eight fixed-wing aircraft contracted by DEC from 10 December 2007 to 3 April 2008 attended 99 wildfires stretching from Jurien Bay to Jerramungup. These aircraft dropped 938 loads and flew a total of 543 operational hours. This compares with 1,384 loads and 880 hours in 2006–07.

2.2.4.4 Fire training

Fire Management Services development and education staff conducted 44 formal fire training courses involving 580 participants. In addition, district and regional staff delivered 16 formal fire training programs to 189 participants.

The formal courses conducted in 2007–08 included Australasian Interagency Incident Management System (AIIMS) Awareness, Introduction to AIIMS, Prescribed Burning, Fireline Construction Using Machines, Basic Wildfire Awareness, Basic Fire Fighting, Fire Fighting Level 1, Fire Fighting Level 2, Structural Fire Fighting, Fire Operations 1, Operational Management, Wildfire Suppression 3, Fire Weather, Information Services Management, Ground Support Unit Management, Management Support, Incident Mapping, Advanced Incident Leadership Program and Fireline Leadership.

Training was also provided for aerial operations personnel including fire detection pilots, aerial suppression support staff, air attack supervisors, Helitorch operators, incendiary machine supervisors and incendiary machine bombardiers. A total of 222 participants were involved in all aspects of the aerial operations training programs.

Participants were predominantly from DEC, but included personnel from the Forest Products Commission, FESA, local government authorities, contractors, and the department's Bush Ranger WA Cadets. The Advanced Incident Leadership Program included participants from across Australia and New Zealand.

The development and promotion of common fire training programs and course materials continued between DEC and FESA, and with other agencies in Australia and New Zealand. Of particular note is the introduction of Structural Fire Fighting training that is directed at DEC firefighting personnel who, in the course of wildfire fighting, encounter structures on fire or at risk of burning.

A total of 170 staff took part in the Fireline Leadership program in 2007–08, bringing the total over the past two years to 299 participants.

2.2.4.5 Fire detection

DEC provided an effective fire detection system in the high fire risk zones of the south-west regions, based on the combination of nine single-engine aircraft and 13 fixed

lookout towers. The department's fleet of nine aircraft (American Champion Scout) flew 3,900 hours for aerial surveillance within pre-determined circuits in the south-west forest regions at schedules that varied according to the fire danger levels and the fire activity. The aircraft also flew 380 hours in support of aerial suppression operations. The aircraft were flown by two permanent senior pilots and 15 seasonal and casual pilots.

2.2.4.6 Fire preparedness on unallocated Crown lands

Since 1 July 2003, DEC has taken responsibility for the coordination and on-ground management of fire risk prevention and fire preparedness works on rural unallocated Crown land and unmanaged reserves. This Crown land consists of about 89 million ha.

The fire preparedness works undertaken in 2007–08 included the upgrade and maintenance of about 700 km of fire access and firebreaks, establishment of 30 km of fuel breaks by scrub rolling and slashing; about 20,000 ha of prescribed burning of buffers; and establishment and maintenance of water supplies. Most of the works were on lands adjacent to high value or high risk areas.

2.2.4.7 Fire management for biodiversity

DEC applies a range of scientifically derived fire regimes to optimise and conserve biodiversity values. This is achieved through the creation and maintenance of a spatial and temporal mosaic of vegetation structures, fuel ages and habitat niches as a result of applying fire to the landscape at a range of fire frequencies and intervals, seasons, fire intensities and scales. Prescribed burns that are applied to protect and conserve natural values are required to incorporate the available scientific and operational knowledge of the fire responses and life histories of native plants and animals.

The department has drafted a series of Fire Management Guidelines to assist managers and fire operations staff to manage fires to protect and maintain biodiversity values and ecosystem functions. The guidelines were developed by scientists, nature conservation and fire managers during 2006–07 and several were revised as more knowledge was gained in 2007–08.

A Code of Practice for Fire Management was published that provides a framework for fire management procedure and practice on land managed by the department. The code enables the efficient, effective and safe management of fire to achieve land management and biodiversity conservation objectives as well as the protection of human life and property and environmental values from the deleterious effects of wildfire and inappropriate fire regimes.

2.2.4.8 Fire research

DEC is involved in collaborative research as part of the Bushfire Cooperative Research Centre (CRC). The Bushfire CRC has more than 30 specific projects which have the potential to benefit DEC's strategic intent. They include:

- Completion of the analysis on the fire behaviour studies in dry eucalypt forests and woodlands known as Project Vesta. The work includes the integration of the new fire behaviour model into existing models leading to the development of a National Fire Behaviour Prediction System.
- Evaluation of aerial suppression techniques for suppressing bushfires in Western Australia and other States that has resulted in the publication of a report on 'The Effectiveness and Efficiency of Aerial Firefighting in Australia'.
- Monitoring grassland curing at a number of locations in the Kimberley, Goldfields, Wheatbelt and Warren regions as part of a project to develop reliable methods for assessing fuel dryness from satellite imagery.
- Studying the ecological effects of landscape-scale prescribed fires over the past three years in the Walpole Wilderness Area. Thirty monitoring sites have been established in forest and heathland communities north-east of Walpole

to study the response of flora and fauna to different fire regimes over the past 30 years. The study has used a comprehensive fire history database developed from annual records of prescribed burning and wildfires. The findings will lead to a decision-support model that can predict the sensitivity of forest ecosystems to various fire management strategies and climate change.

- Development and delivery of smoke trajectory models following a study by the Bureau of Meteorology and land management agencies such as DEC of the behaviour of smoke plumes and haze from bushfires and prescribed fires. DEC is using this model to help minimise the impact of smoke from prescribed burns on communities and other smoke sensitive values such as wine grape vineyards.
- Participating in a national study on the impact of long-term fire exclusion on the health and vigour of eucalypts. The WA component of this study is being conducted on tuart woodlands in and near Yalgorup National Park where there is a serious decline in tuart stands that have experienced few fires in the past 40 years.
- Completion of an assessment of biodiversity relationships to fire regimes in the southern jarrah forest.
- Providing scientific input to the development of seasonal bushfire activity outlooks for northern and southern Australia.
- Continuing work on an operational research project to implement a fine-grain mosaic of seral stages (fuel ages) to promote habitat diversity in forest and shrubland ecosystems north of Walpole. No ignitions were carried out during 2007 but monitoring of biodiversity grids continued. Additional monitoring grids are being installed as the diversity of seral stages increases with time. At the landscape scale, increased levels of biodiversity, especially invertebrates, are being recorded commensurate with increased diversity of seral stages. Further introductions of patchy fire are planned for spring 2008.

2.2.4.9 Fire ecology education programs

The fire education program continued to operate in 2007–08 through the EcoEducation section of DEC's Strategic Development and Corporate Affairs Division, and the Fire Management Services Branch. The program aims to educate students and their teachers at primary and secondary school levels about inter-relationships of fire, flora and fauna, and the role of fire and science in conserving biodiversity and protecting communities and natural values.

In 2007–08, 2,082 students, teachers and parents participated in fire-related EcoEducation programs at the Perth Hills National Parks and Henderson Environmental centres.

A total of 216 students from eight different metropolitan schools attended DEC's 'Fire – A Force of Life' program at the Perth Hills National Parks Centre.

Fire was addressed in six other excursions that involved 1,853 students, teachers and parents. Two fire Professional Learning days were held with 13 teachers attending.

The department hosted a DEC Bush Rangers WA Fire Awareness Course in spring 2007 at Dwellingup which included both theoretical fire course work and field exercises involving the conduct of a small prescribed burn in nearby forest.

EcoEducation fire resources were developed in both printed and electronic forms for use in the classroom. These are now available for teachers from the EcoEducation section of DEC's website.

The Fire Management Section of DEC's website has been upgraded to provide easy access to information on a range of fire management and fire ecology topics, as well as updates on current prescribed fire operations.

2.2.4.10 Fire Management Services performance indicators

1. Prescribed burning in south-west regions

Region	10 year rolling average (ha)	Actual 2007–08	Difference (ha)	%
Swan	45,878	27,335	-18,543	-40%
South West	46,108	53,152	7,044	15%
Warren	52,508	63,194	10,686	20%
Total	144,494	143,681	-813	-1%

These statistics compare the 2007–08 prescribed burning achievements with the 10-year rolling average for prescribed burning.

The prescribed burning achieved within the south-west forest regions was on par with the 10-year rolling average primarily due to the extended drought conditions and unfavourable fuel moisture and weather conditions during the spring-early summer and autumn months.

The total area achieved (143,681 ha) was below the nominal annual program for the south-west regions of 200,000 ha.

2. Fire suppression in south-west regions

The fire suppression efficiency indicator is represented by the percentage of all forest wildfires burning under 95 percentile weather conditions, that are attacked with effective DEC suppression forces before these fires exceed five ha in Priority 1 and Priority 2 areas. These priority areas include high values that may be vulnerable to wildfires or inappropriate fire regimes. The percentage standard to be exceeded is 95 per cent of all forest fires requiring suppression by direct attack. The 95 percentile weather conditions include the days when forest fire danger is below 'Very High' as calculated in the department's Forest Fire Behaviour Tables (1998).

2.2.4.11 Radio communications services

The department owns an extensive radio communications network that provides reliable and flexible communications for fire and other emergency operations as well as normal day-to-day administration. The network includes about 1,300 mobile and portable radios, 125 office radios, and more than 70 repeaters and towers, and 12 portable broadband satellite terminals.

As a major stakeholder in the Western Australian Emergency Radio Network, the department's Radio Communications Section staff have continued to commission new radio infrastructure such as towers and repeaters across the State including in the Warren, South Coast, Wheatbelt and Swan regions. The network will see the complete change of the department's current mid band VHF radio network to high band VHF over the next two to three years. This will provide better interoperability with FESA, volunteer bushfire brigades, local authorities and other government agencies during incidents and other day-to-day operations.

The Radio Communications Section has been involved in planning and establishing an improved satellite communications system for remote areas throughout the State, and commissioning a central satellite hub located at DEC's operations headquarters at Kensington.

Six new VHF repeaters have been installed in the Kimberley Region in the Purnululu, Mitchell River national parks and the King Edward area. These repeaters will enable reliable radio communications for day-to-day park management including search and rescue operations. The facilities include new CB repeaters that will provide for effective communications with the public.

A new repeater has been located on Warroora Station south of Coral Bay to facilitate reliable communications for marine park management at Ningaloo reef.

All DEC regions, districts and specialist sections were provided with fault rectifications and radio service programs.

Fire information technology

The department has developed a new version of the DEC Master Burn Planning Tool which captures the department's six season indicative prescribed burn programs across the State.

The department has developed satellite remote sensing techniques to map fire-affected areas on lands managed by DEC. These techniques are also being used to validate the department's fire history database using Landsat imagery. The improvement in the quality of DEC's fire history information provides for better planning and fire management for biodiversity conservation and asset protection outcomes.

The department is undertaking a major improvement program over the next four years to increase capabilities of its radio and satellite communications systems. The program will provide communications facilities to track and communicate with field-based emergency resources and supply reliable telecommunications services that connect frontline workers and other organisations in remote locations.

2.3.1 People Services Branch

People Services Branch provides client-focused human resource services including employee relations, workforce services, policy delivery, learning and development programs and initiatives, strategic planning, data analysis and reporting, and risk management of the safety, health and wellbeing of our employees.

A significant proportion of the financial year focused on implementing new pay rates for professional staff covered by the Specified Calling Provisions of the *Public Service Award 1992* and dealing with risk management issues associated with the Boorabbin National Park fire and the Kennedy Range National Park aircraft accident.

Workforce services

A number of actions were taken in Workforce Services Section to assist in the recruitment of a skilled workforce including the development of a new job description form and streamlining of the selection process, expansion of advertising media to target specific workforce markets, improved branding of the department in job vacancy advertisements, and use of recruitment pools in areas of high turnover.

In addition, an overseas recruitment campaign was conducted across South Africa, Canada, New Zealand and the United Kingdom and a significant pool of overseas applicants was established for current and future employment opportunities. Eleven sponsorships of employees from overseas have been approved and progressed to date.

The department's Human Resources Information Management System was successfully upgraded, resulting in improvements to system navigation.

Restructures across a number of divisions including Environmental Regulation and Nature Conservation were also implemented this year.

Achievements in the areas of equal employment opportunity, diversity management and disability services are included in the Statutory Information section of this report.

Workforce planning and performance

The recently established Workforce Planning and Performance Section has been concentrating on a number of key strategic and tactical initiatives derived from the department's workforce planning and performance reporting model. Priorities identified and being addressed include recruitment and selection, induction, leadership development, succession planning, and workplace conditions and practices. These issues are linked to the attraction and retention of staff.

The department has undertaken or facilitated both major and minor internal staff surveys to enhance the quality of decision-making in attraction and retention processes. These surveys covered staff attraction and retention, an external employment climate update and a management perspective of recruitment and selection processes. Information from a public sector-wide retirement intention survey, as it applied to this department, together with surveys with past employees (retired and others) have contributed towards the development and implementation of attraction and retention strategies.

Risk management

The Risk Management Section is responsible for developing and implementing risk management policies and procedures in regard to occupational safety and health, corporate health and fitness, workers' compensation, injury management, general liability, and the corporate insurance portfolio.

The department is committed to providing and maintaining a safe and healthy working environment for its workers. The objective is to prevent work-related injury and illness, as well as create a working environment that maximises the effectiveness of each worker.

Organisational learning and development

The department is a Registered Training Organisation operating within the Vocational Education and Training system. As such, the department is able to offer nationally recognised training to help them to safely, effectively and efficiently carry out their duties through the delivery of high quality training, development and assessment initiatives.

The Mentored Aboriginal Training and Employment Scheme (MATES) is a multi-faceted program which started in 2002 and continues to increase employment opportunities for Indigenous Australians.

The National Indigenous Cadetship Project component of the program has four cadets supported by the department, with another cadet recently graduating from the program. This recent graduate, as well as four previous graduates, are employed within DEC.

The Indigenous traineeship element has 16 trainees, with 10 trainees recently graduating from certificates II, III or IV in Conservation and Land Management. Since the inception of the program 19 trainees have graduated, 14 of whom are still employed full-time with DEC.

A review of the Graduate Development Program was undertaken in 2006 to ensure that the requirements of the department were addressed. The Graduate Development Program for 2008 placed 23 new and existing recruits in the department.

Nine employees received assistance through the following DEC scholarships:

- career development scholarship
- sciences scholarship
- leadership scholarship, and
- women's scholarship.

2.3.2 Financial Services Branch

The department's central Financial Services Branch coordinates the processing of revenue and expenditure and the recording of assets. The branch also manages the department's fleet of light and heavy vehicles and produces statutory and management reports. During 2007–08 the Financial Services Branch continued to refine the financial and related systems for the department.

2.3.3 Information Management Branch

Corporate Information

The Corporate Information Section continued to support the department's compliance with the *State Records Act 2000*. The DEC Recordkeeping Plan and DEC Retention and Disposal Schedule were submitted to the State Records Commission for approval.

The Electronic Document and Records Management System continues to be progressively implemented across the department concurrently with the corporate keyword classification system. Regular recordkeeping workshops are also provided to support staff and to maintain awareness of individual recordkeeping responsibilities. The department's award-winning Recordkeeping Awareness Training (RAT) program also continues to be rolled out to all new staff as part of their induction. The online RAT survey indicates that 95 per cent of the 1,500 participants agree the course has improved their understanding of State Government recordkeeping responsibilities.

Geographic Information Services

The Geographic Information Services Section provided maintenance and support for DEC's corporate spatial databases and started the integration of the spatial databases of CALM and DoE following their merger. The section is nearing completion of its contribution to the South West Emergency Services Directory and has provided digital spatial data depicting the DEC-managed estate, aerial photography and georeferenced versions of the department's operations maps. It also provided training and support in desktop geographic information systems (GIS) and customised GIS software.

The section continued to provide GIS support for the processes involved in the establishment of the national reserves system. It carried out hydrological modelling for natural diversity recovery catchments and provided help for the Road Classification Project and the development of the State Wetlands Database. It also used remote sensing technology for a variety of projects including vegetation monitoring over the Gngangara sustainability strategy study area, monitoring for wandoo decline, Wheatbelt wetlands baseline monitoring and coastal mapping in the Pilbara, Kimberley and South Coast regions.

In other significant activities, the section participated in Landgate's Shared Land Information Platform (SLIP) project with contribution to the Natural Resource Management, Emergency Management and Interest Enquiry focus areas.

2.3.4 Office for Information Management

In May 2008, the department established the Office for Information Management to provide a stronger business and best practice focus on coordinated information management that is enabled by information technology. Establishment of the office was a key proposal in the information management plan developed during the year and approved in early May.

The office is led by the Chief Information Officer and includes the Information Services Section, which was previously in the Information Management Branch, and a new section, Business Development.

Information Services

The Information Services Section continued to pursue the objectives identified in the department's Information Technology and Telecommunications Strategic Plan, with a focus on the standardisation, integration and operational management of infrastructure and critical environmental information systems.

It completed the major project of transferring the environmental information systems into the DEC computing infrastructure and a project to implement a new DEC computing network domain is currently in progress. The section also continued to implement the Information Technology Infrastructure Library framework with emphasis on incident, problem and change management processes.

Business Development

The Business Development Section, which was established during the year, focused on improvements to the strategic aspects of information management. This included support for the development of the information management plan, developing terms of reference for a review of network performance, enterprise architecture and work planning and delivery.

2.3.5 DEC-managed lands and waters

Total estate

As at 30 June 2008, the total area under DEC's care was 27,308,451 ha, representing an increase of 295,661 ha during 2007–08.

The terrestrial area (that is, not including marine reserves) is approximately 10.16 per cent of the land area of Western Australia. Table 18 provides a summary of all tenure classifications.

National parks

National parks are for wildlife and landscape conservation, scientific study, preservation of features of archaeological, historic or scientific interest, and enjoyment by the public. They have national or international significance for scenic, cultural or biological values.

The area of the 97 national parks at 30 June 2008 was 5,637,482 ha, a net increase of 41,741 ha for the year. The major addition was a net increase of 2,093 ha to D'Entrecasteaux National Park.

Area discrepancies were discovered during the year affecting Millstream-Chichester and Wellington national parks, which have resulted in a net increase of 38,761 ha to Millstream-Chichester National Park and an increase of 630 ha to Wellington National Park.

Conservation parks

Conservation parks have the same purpose as national parks, but they do not have the same national or international significance.

The area of conservation parks at 30 June 2008 was 844,039 ha, an increase of 132 ha, the majority of which was at Woodman Point (131 ha).

Nature reserves

Nature reserves are for wildlife and landscape conservation, scientific study, and preservation of features of archaeological, historic or scientific interest. Recreation that does not harm natural ecosystems is allowed.

The area of nature reserves at 30 June 2008 was 10,873,039 ha, representing a net increase of 856 ha for the year.

The most significant addition was 1,279 ha to an un-named reserve approximately 11 km north-west of the Eneabba townsite. Another notable addition was Marble Rocks Nature Reserve with an area of 117 ha.

These and other additions were, however, offset by excisions and reserve cancellations which resulted in a net increase as shown above.

State forest

State forests are managed for multiple purposes, including water catchment protection, recreation, timber production on a sustained yield basis and conservation. Provision is also made for public utilities and mineral production, where these activities are imposed. Within State forests, designated areas are managed for specific purposes, such as conservation or optimum yield of exotic plantings.

The area of State forest at 30 June 2008 was 1,304,710 ha, an increase for the year of 218 ha.

This increase was generally due to the closure and consolidation of road reserves within State forest (117 ha) and the inclusion of part of a cancelled reserve (101 ha) about four km north-west of Quinninup townsite.

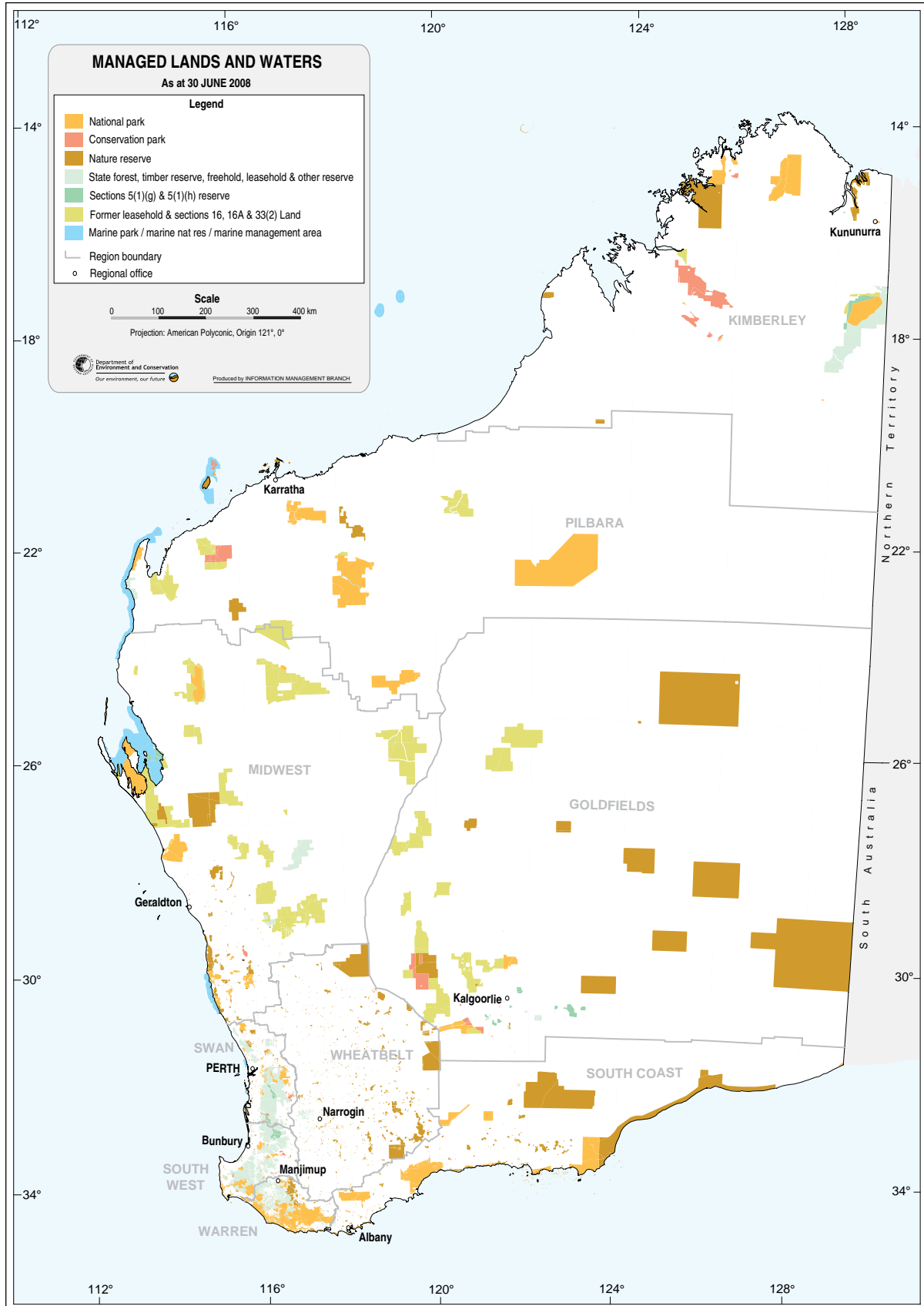
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Table 18: DEC-managed lands and waters (ha) by region as at 30 June 2008

Tenure classification	Goldfields	Kimberley	Midwest	Pilbara	South Coast	South West	Swan	Warren	Wheatbelt	Total
National park	153,161	829,689	505,360	2,432,461	894,066	141,800	117,195	562,458	1,292	5,637,482
Conservation park	182,817	460,232	14,967	149,348	7	13,560	21,473	76	1,559	844,039
Nature reserve	6,304,226	809,611	740,209	249,669	1,566,192	12,963	52,429	86,742	1,050,998	10,873,039
Marine park	-	87,807	868,860	288,108	-	-	16,391	-	-	1,261,166
Marine nature reserve	-	-	132,000	-	-	-	-	-	-	132,000
Marine management area	-	-	-	143,385	-	-	-	-	-	143,385
State forest	781	-	-	-	4,055	542,629	466,523	262,656	28,066	1,304,710
Timber reserve	28,509	-	26,338	-	5,231	26,484	28,501	8,216	-	123,279
Sections 5(1)(g) & 5(1)(h) reserve	81,566	80,624	1,940	7,810	<1	31,014	27,597	1,513	1,427	233,491
Miscellaneous reserve	<1	575,245	509	1,779	3,766	124	5,944	245	15	587,627
Freehold (CALM exec body)	-	<1	<1	<1	-	20,838	85	4,658	1	25,582
Leasehold (CALM exec body)	-	-	173,618	49,731	-	-	-	-	-	223,349
Former leasehold	1,846,091	80,748	3,069,912	783,995	-	-	-	-	-	5,780,746
Section 33(2) managed land	28,514	-	90,118	-	-	-	-	-	-	118,632
Sections 16 & 16a managed land	-	4,840	7,020	-	-	121	7,903	40	-	19,924
Totals	8,625,665	2,928,796	5,630,851	4,106,286	2,473,317	789,533	744,041	926,604	1,083,358	27,308,451

Source: Information Management Branch



Timber reserves

Timber reserves declared under the CALM Act are managed on the same basis as State forests. The category is often transitional – as reserves are evaluated they may be changed to a more appropriate tenure, for example, State forest or nature reserve.

The area of timber reserves at 30 June 2008 was 123,279 ha, a decrease of 66 ha which was due to an excision from Kangaroo Hills Timber Reserve.

Marine parks and marine nature reserves

Marine parks and nature reserves comprise marine parks and marine nature reserves. Marine parks are managed for conservation and recreation, with areas zoned for commercial fishing on a sustained yield basis. Marine nature reserves are managed for the conservation of marine flora and fauna and their habitats. Fishing and collecting are not permitted.

The area of marine parks at 30 June 2008 was approximately 1,261,166 ha. There were no changes during the year.

The area of marine nature reserves at 30 June 2008 was approximately 132,000 ha. There were no changes during the year.

Marine management areas

Marine management areas provide a formal integrated management framework over areas that have high conservation value and intensive multiple use, selected primarily on the basis of their biological and recreational values and their existing or future commercial activities.

The area of marine management areas at 30 June 2008 was approximately 143,385 ha. There were no changes during the year.

Table 19: Marine reserves vested in the Marine Parks and Reserves Authority as at 30 June 2008. Note: There is no change from 30 June 2007.

Name	Area (ha)
Barrow Island Marine Park	4,169
Barrow Island Marine Management Area	116,616
Hamelin Pool Marine Nature Reserve	132,000
Jurien Bay Marine Park	82,376
Marmion Marine Park	9,500
Montebello Islands Marine Park	58,375
Muiron Islands Marine Management Area	26,769
Ningaloo Marine Park	263,313
Rowley Shoals Marine Park	87,807
Shark Bay Marine Park	748,735
Shoalwater Islands Marine Park	6,545
Swan Estuary Marine Park	346
TOTAL	1,536,551

Section 5(1)(g) and 5(1)(h) reserves

Within the meaning of the CALM Act, lands categorised as sections 5(1)(g) and 5(1)(h) reserve are lands reserved under the *Land Act 1933* and the *Land Administration Act 1997* respectively, for which care, control and management is issued to the Conservation Commission. Unlike national parks, conservation parks and nature reserves, they are not automatically vested in the Conservation Commission. Immediately before the commencement of the CALM Act some were vested in, or were under the control of, the National Parks Authority but not as a national park, for example, Matilda Bay Reserve. Predominantly they have conservation/recreation purposes.

The area of sections 5(1)(g) and 5(1)(h) reserves at 30 June 2008 was 233,491 ha. This represents a net decrease for the year of 164 ha.

One notable addition was 143 ha at Point Peron.

The net decrease in area was the result of islands in the Dampier Archipelago having their boundaries redefined to high water mark.

Miscellaneous reserves

The department manages some remaining reserves which do not fall within any of the above categories. The purposes of reserves within this category are varied and may include settlements and offices for the department's operations.

The area of miscellaneous reserves at 30 June 2008 was 587,627 ha, unchanged from last year.

Two changes made during the year had negligible affect on the area figures.

Other land

The area of freehold land held by DEC at 30 June 2008 was 25,582 ha. There were no changes during the year. Softwood forests occupy the major portion of this freehold land.

The area of leasehold land held at 30 June 2008 was 223,349 ha. There were no changes during the year.

The area of former pastoral lease land being held under an interim management arrangement prior to formal reservation is 5,780,746 ha, representing an increase of about 252,965 ha. This increase was due largely to the acquisition of the remainder of Barnong Pastoral Lease and the early surrender of lands identified under the 2015 exclusion process. These included parts of Texas Downs, Mabel Downs, Carrarang and Mt Jackson pastoral stations.

The Conservation land acquisitions section provides further details.

Crown land placed under the management of the department under section 33(2) of the CALM Act as at 30 June 2008 totalled 118,632 ha, a decrease of 21 ha. Of this, 385 ha comprises unvested Crown reserves. The remainder is land proposed for addition to the conservation reserve system, which is managed accordingly under an interim arrangement.

Areas currently managed under section 16a of the CALM Act by agreement between the lessees and the department amount to 11,860 ha. There were no changes during the year.

The area of freehold land managed by the department under section 16 of the CALM Act at 30 June 2008 was 8,064 ha. There were no changes during the year. Most of this land falls within regional parks and is managed by agreement between the Western Australian Planning Commission and the department.

Conservation land acquisitions

The department bought 13 parcels of land of high conservation value covering a combined total area of about 149,450 ha during the year for future addition to the conservation reserve system.

The department's priorities for purchase are for those areas containing ecosystems that are not adequately represented in existing conservation reserves, areas containing threatened species and ecological communities, and for additions to existing reserves that would greatly improve their diversity or facilitate their management.

The purchases were funded from a number of sources: DEC's annual capital allocation for acquiring conservation land; proceeds of asset sales; State Salinity Strategy funds; funds allocated under the Biodiversity Adjustment Scheme; environmental offset funds; Gascoyne-Murchison Strategy funding carried over from previous years; and the National Reserve System component of the Commonwealth Government's Natural Heritage Trust. The total expenditure from all funding sources for the financial year was more than \$2.264 million.

With funds allocated under the Gascoyne-Murchison Strategy, the Barnong pastoral lease within the Shire of Yalgoo was acquired. The lease, covering about 145,735 ha, adjoins land to the west acquired by the department for conservation, and a large tract of unallocated Crown land. This acquisition, along with the adjoining land parcels, will enable the creation of a new conservation reserve in an area that is largely used for agriculture.

State Salinity Strategy funds were used to purchase a parcel of remnant vegetation covering about 658 ha in the Shire of Mt Marshall. The long-term protection of this large remnant in the conservation reserve system will aid in the fight against salinity in a shire that has been predominantly cleared for agricultural purposes.

Under the Biodiversity Adjustment Scheme about 766 ha in the Shire of Dandaragan was purchased.

Environmental offset funds provided by Western Power for transmission line clearing funded the purchase of about five ha on the Swan Coastal Plain supporting the Threatened Ecological Community, *Shrublands and Woodlands on Muchea Limestone*. The property is located south of the Moore River in the Shire of Gingin. The purchase of the property fulfils one of the recommendations in the interim recovery plan for the community.

Environmental offset funds also funded the purchase of a property of about 220 ha near Gillingarra in the Shire of Victoria Plains. The purchase and reservation of the property will help protect the vegetation type *Medium woodland; York gum and wandoo* which is poorly represented in the Northern Jarrah Forest Interim Biogeographic Regionalisation for Australia (IBRA) sub region.

Other purchases finalised during the year were: 48 ha between Lake Muir Nature Reserve and Lake Muir National Park in the Shire of Manjimup; about 324 ha adjoining the Tarin Rock Nature Reserve in the Shire of Dumbleyung; about 464 ha of intact native vegetation in the Shire of Esperance; 136 ha in the upper Avon catchment in the Shire of Lake Grace; two parcels in the Shire of Ravensthorpe – about 326 ha for addition to the Cheadanup Nature Reserve and 716 ha for addition to the Aerodrome Road Nature Reserve; more than six ha in the Shire of Capel supporting two threatened ecological communities (one critically endangered and one endangered), a conservation category wetland and poorly reserved vegetation; and about 44 ha of remnant vegetation in the Shire of Bruce Rock for addition to the Pikaring Nature Reserve.

The department gratefully acknowledges the contribution made by the Commonwealth Government through the National Reserve System component of the Natural Heritage Trust to conservation land purchases. In 2007–08 the contribution amounted to \$287,500. A further \$401,500 was also received towards the purchase of the Thundelarra pastoral lease north-west of Paynes Find in the Shire of Yalgoo, which was bought with Gascoyne-Murchison Strategy funds in the previous financial year. The support of the Commonwealth Government continues to help with progress towards the establishment of a comprehensive, adequate and representative system of terrestrial conservation reserves in Western Australia.

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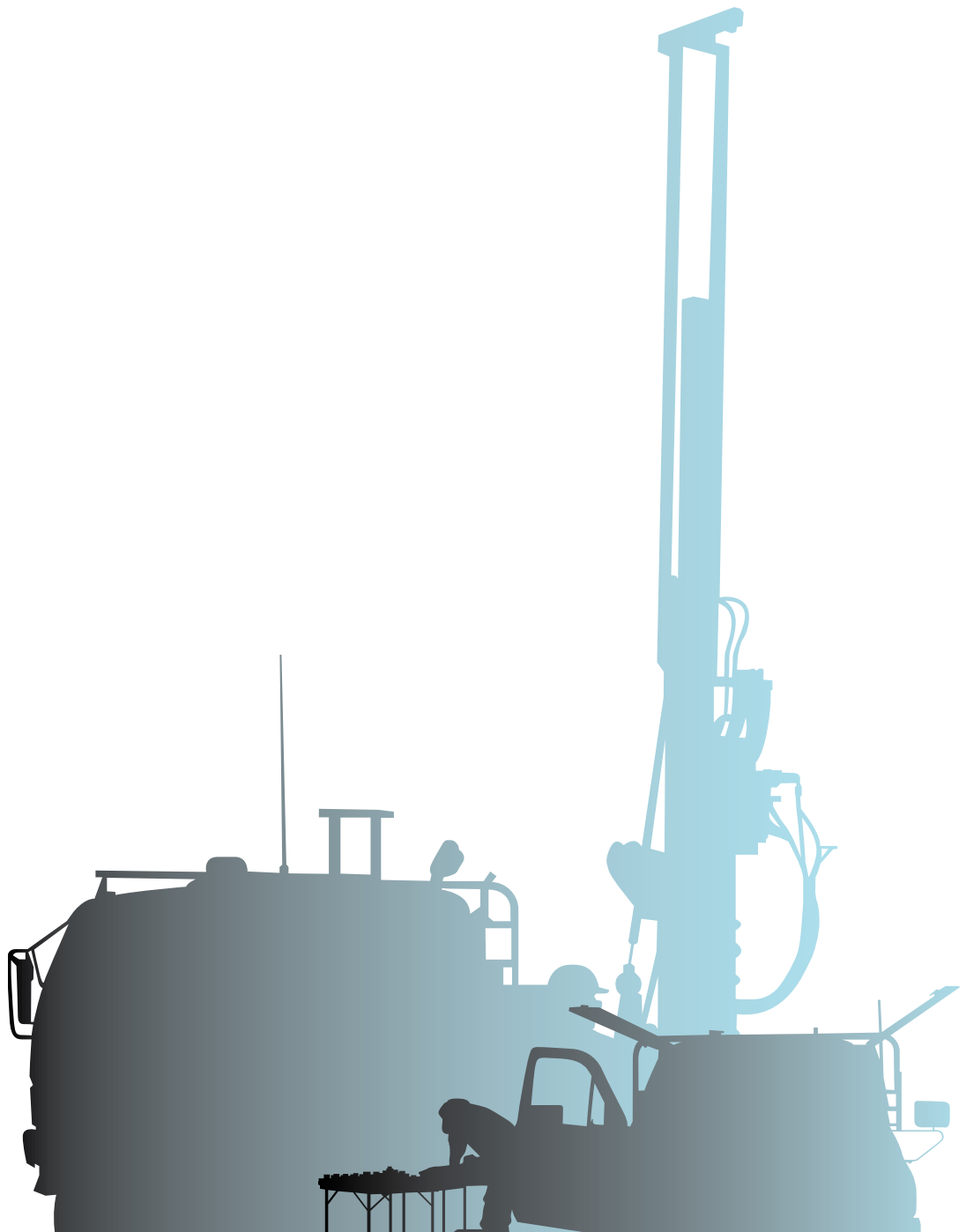
Table 20: National parks vested in the Conservation Commission of Western Australia as at 30 June 2008

Name	Area (ha)	Name	Area (ha)
Alexander Morrison	8,500	Leeuwin-Naturaliste	19,092
Avon Valley	4,366	Lesmurdie Falls	56
Badjingga	13,108	Lesueur	27,235
Beelu (formerly <i>Mundaring</i>)	4,617	Midgegooroo (formerly <i>Canning</i>)	2,492
Blackwood River	20,477	Millstream-Chichester	238,497
Boorabbin	28,153	<i>Milyeannup</i>	18,692
<i>Boorara Gardner</i>	11,008	<i>Mirima</i>	2,068
<i>Boyndaminup</i>	5,439	<i>Mitchell River</i>	115,325
<i>Bramley</i>	3,892	Moore River	17,254
Brockman	52	Mount Augustus	9,168
Cape Arid	279,446	<i>Mount Frankland</i>	37,359
Cape Le Grand	31,801	<i>Mount Frankland North</i>	22,053
Cape Range	47,655	<i>Mount Frankland South</i>	42,283
Collier Range	235,162	<i>Mount Lindesay</i>	39,541
D'Entrecasteaux	118,779	<i>Mount Roe</i>	127,726
<i>Dalgarup</i>	2,377	Nambung	18,613
Drovers Cave	2,681	Neerabup	943
Drysdale River	448,264	Peak Charles	39,959
<i>Easter</i>	2,985	Porongurup	2,621
<i>Eucla</i>	3,560	Purnululu	239,723
Fitzgerald River	329,882	Scott	3,273
Forest Grove	1,379	Serpentine	4,387
Francois Peron	52,587	Shannon	52,598
Frank Hann	67,550	Sir James Mitchell	247
Geikie Gorge	3,136	Stirling Range	115,920
Gloucester	878	Stokes	9,726
<i>Goldfields Woodlands</i>	64,612	Tathra	4,322
Goongarrie	60,397	Torndirrup	3,936
Gooseberry Hill	33	Tuart Forest	2,049
<i>Greater Beedelup</i>	19,379	<i>Tunnel Creek</i>	91
<i>Greater Dordagup</i>	6,408	<i>Un-named</i>	1,571
<i>Greater Hawke</i>	14,004	<i>Un-named</i>	79
<i>Greater Kingston</i>	21,092	Walpole-Nornalup	19,447
<i>Greater Preston</i>	12,665	Walyunga	1,814
Greenmount	202	Wandoo	46,493
<i>Gull Rock</i>	2,104	Warren	2,981
Hassell	1,265	Watheroo	44,481
<i>Helena</i>	12,255	<i>Waychinicup</i>	3,982
Hilliger	16,962	Wellington	17,420
<i>Jane</i>	6,863	West Cape Howe	3,605
John Forrest	2,678	Whicher	6,343
Kalamunda	375	William Bay	1,734
Kalbarri	183,005	Wiltshire-Butler	11,645
Karijini	627,442	Windjana Gorge	2,050
Karlamilyi (formerly Rudall River)	1,283,706	Wolfe Creek Crater	1,460
Kennedy Range	141,660	Yalgorup	13,141
Korung (formerly <i>Pickering Brook</i>)	6,344	Yanchep	2,876
<i>Lake Muir</i>	9,625	<i>Yelverton</i>	729
<i>Lawley River</i>	17,572		
		TOTAL	5,637,482

Names shown in italics are unofficial

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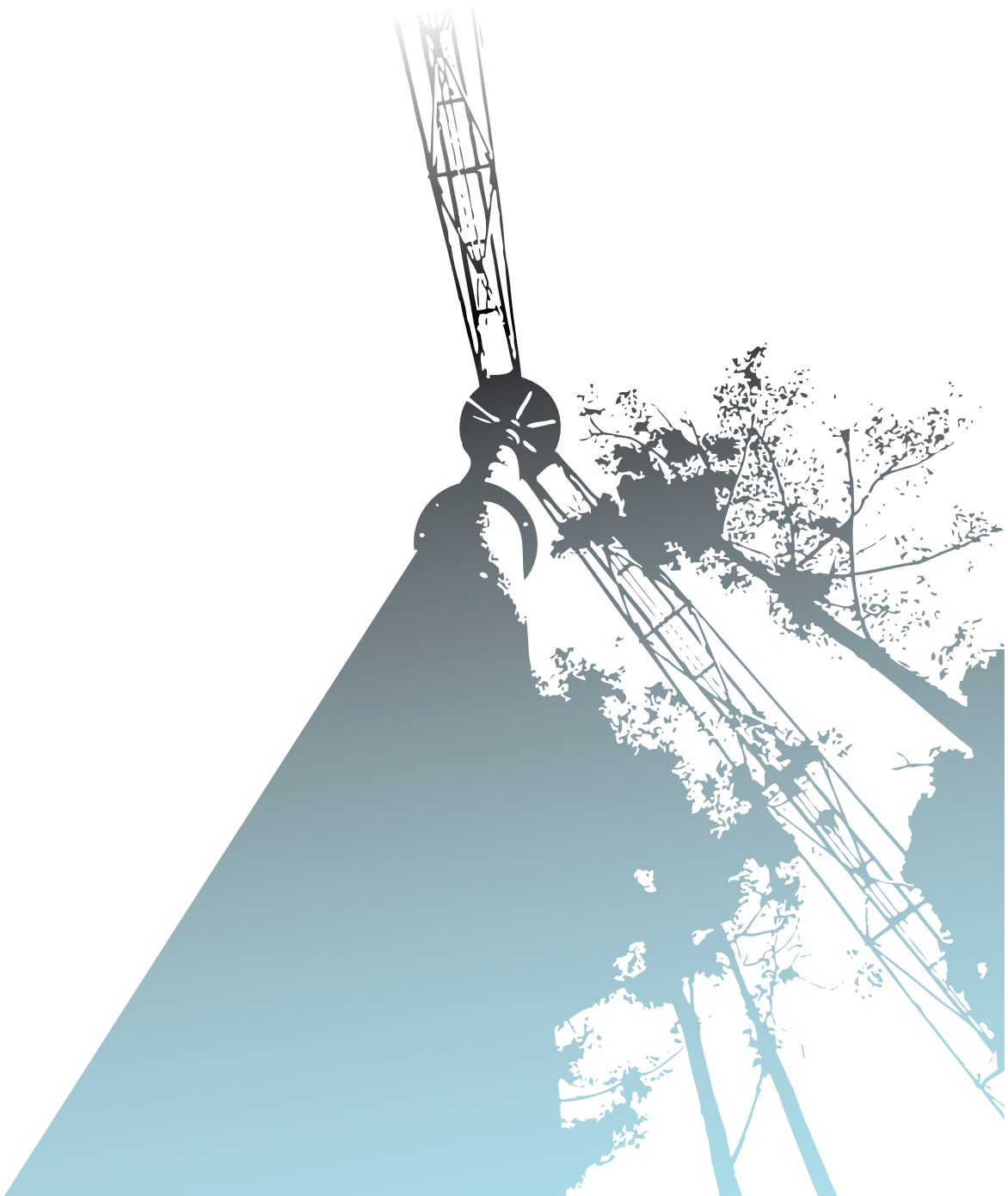
SIGNIFICANT ISSUES AND TRENDS



- There is increasing community awareness and expectations for action to reduce predicted impacts of climate change on the environment and biodiversity of Western Australia, associated with significant policy development at international, national and state levels.
- The State's biodiversity continues to be threatened by introduced animals and weeds, *Phytophthora* dieback, salinity, altered fire regimes, habitat loss and climate change, with the need for further recovery actions for approximately 600 threatened taxa and approximately 70 threatened ecological communities.
- Strong economic growth and major resource development and infrastructure projects, particularly in the Kimberley, Pilbara and Midwest regions, are placing pressure on biodiversity values and on the department's environmental impact assessment and regulatory functions.
- There is a continuing need to complete the establishment of a conservation reserve system, both terrestrial and marine, that is comprehensive, adequate and representative, to conserve biodiversity and provide for sustainable nature-based recreation and tourism.
- There is an increasing expectation from the community, particularly Indigenous communities, for involvement in both terrestrial and marine park and reserve planning and management and expectation that facilities, park infrastructure and services will be maintained and upgraded.
- Increasing interaction is occurring with private industry, individuals and other government agencies to conserve biodiversity on private and public lands that are not part of the formal conservation reserve system and to develop partnerships with the non-government sector in providing tourism and recreation services and facilities.
- The department is increasingly expected to be a 'good neighbour' to pastoralists, farmers and others, including protecting the community from wildfires.
- Staff recruitment and retention are challenges in a buoyant economy, as is the impact of rising costs of both materials and labour on the capacity to deliver projects and services, especially in remote areas.
- There is continuing strong community and industry interest in air quality management and health protection in the Perth metropolitan area and key regional centres including Wagerup, Port Hedland, Kwinana, Esperance, Collie and Kalgoorlie.
- New approvals and modifications to licenses for industrial premises are growing strongly, increasing the level of demand on the department's emissions regulation function.
- There is continuing reduction in reliance on landfill through waste avoidance, recycling and better management of hazardous wastes and increasing support for the concept of extended producer responsibility in waste management.

4

DISCLOSURES AND LEGAL COMPLIANCE



Certification of Financial Statements

The accompanying financial statements of the Department of Environment and Conservation have been prepared in compliance with the provisions of the *Financial Management Act 2006* from proper accounts and records to present fairly the financial transactions for the financial year ending 30 June 2008 and the financial position as at 30 June 2008.

At the date of signing we are not aware of any circumstances which would render any particulars included in the financial statements misleading or inaccurate.



John Byrne
Chief Finance Officer
29 August 2008



Keiran McNamara
Accountable Authority
29 August 2008



Auditor General

INDEPENDENT AUDIT OPINION

To the Parliament of Western Australia

DEPARTMENT OF ENVIRONMENT AND CONSERVATION FINANCIAL STATEMENTS AND KEY PERFORMANCE INDICATORS FOR THE YEAR ENDED 30 JUNE 2008

I have audited the accounts, financial statements, controls and key performance indicators of the Department of Environment and Conservation.

The financial statements comprise the Balance Sheet as at 30 June 2008, and the Income Statement, Statement of Changes in Equity, Cash Flow Statement, Schedule of Income and Expenses by Service, and Summary of Consolidated Account Appropriations and Income Estimates for the year then ended, a summary of significant accounting policies and other explanatory Notes.

The key performance indicators consist of key indicators of effectiveness and efficiency.

Director General's Responsibility for the Financial Statements and Key Performance Indicators

The Director General is responsible for keeping proper accounts, and the preparation and fair presentation of the financial statements in accordance with Australian Accounting Standards (including the Australian Accounting Interpretations) and the Treasurer's Instructions, and the key performance indicators. This responsibility includes establishing and maintaining internal controls relevant to the preparation and fair presentation of the financial statements and key performance indicators that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; making accounting estimates that are reasonable in the circumstances; and complying with the Financial Management Act 2006 and other relevant written law.

Summary of my Role

As required by the Auditor General Act 2006, my responsibility is to express an opinion on the financial statements, controls and key performance indicators based on my audit. This was done by testing selected samples of the audit evidence. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion. Further information on my audit approach is provided in my audit practice statement. Refer "<http://www.audit.wa.gov.au/pubs/Audit-Practice-Statement.pdf>".

An audit does not guarantee that every amount and disclosure in the financial statements and key performance indicators is error free. The term "reasonable assurance" recognises that an audit does not examine all evidence and every transaction. However, my audit procedures should identify errors or omissions significant enough to adversely affect the decisions of users of the financial statements and key performance indicators.

**Department of Environment and Conservation
Financial Statements and Key Performance Indicators for the year ended 30 June 2008**

Audit Opinion

In my opinion,

- (i) the financial statements are based on proper accounts and present fairly the financial position of the Department of Environment and Conservation at 30 June 2008 and its financial performance and cash flows for the year ended on that date. They are in accordance with Australian Accounting Standards (including the Australian Accounting Interpretations) and the Treasurer's Instructions;
- (ii) the controls exercised by the Department provide reasonable assurance that the receipt, expenditure and investment of money, the acquisition and disposal of property, and the incurring of liabilities have been in accordance with legislative provisions; and
- (iii) the key performance indicators of the Department are relevant and appropriate to help users assess the Department's performance and fairly represent the indicated performance for the year ended 30 June 2008.



COLIN MURPHY
AUDITOR GENERAL
19 September 2008

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
INCOME STATEMENT
FOR THE YEAR ENDED 30 JUNE 2008

	Note	2008 \$'000	2007 \$'000
COST OF SERVICES			
Expenses			
Employee benefits expense	5	144,171	135,347
Supplies and services	6	89,398	82,108
Depreciation and amortisation expense	7	19,471	17,154
Accommodation expenses	8	5,148	5,153
Grants and subsidies	9	6,620	5,067
Capital user charge	10	0	16,256
Other expenses	11	21,740	20,962
Total cost of services		286,548	282,047
Income			
<i>Revenue</i>			
User charges and fees	12	52,862	46,841
Commonwealth grants and contributions	13	9,404	11,576
Other grants and contributions	14	27,483	12,630
Interest revenue		4,639	3,442
Other revenue	16	7,420	3,804
Total revenue		101,808	78,293
Gains			
Gain on disposal of non-current assets	15	1,243	1,538
Total income other than income from State Government		103,051	79,831
NET COST OF SERVICES		183,497	202,216
INCOME FROM STATE GOVERNMENT	17		
Service appropriation		202,280	212,538
Liabilities assumed by the Treasurer		0	2,551
Assets assumed (transferred)		111	52
Resources received free of charge		763	575
Total income from State Government		203,154	215,716
SURPLUS FOR THE PERIOD		19,657	13,500

See also the 'Schedule of Income and Expenses by Service' at page 150.
The Income Statement should be read in conjunction with the accompanying notes.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
BALANCE SHEET
AS AT 30 JUNE 2008

	Note	2008 \$'000	2007 \$'000
ASSETS			
Current Assets			
Cash and cash equivalents	29	69,200	68,833
Restricted cash and cash equivalents	18	70	97
Inventories	19	376	344
Receivables	20	18,622	17,145
Amounts receivable for services	21	7,377	7,306
Other current assets	22	731	716
Non-current assets classified as held for sale	23	2	0
Total Current Assets		96,378	94,441
Non-Current Assets			
Restricted cash and cash equivalents	18	1,378	828
Inventories	19	1,046	1,377
Amounts receivable for services	21	61,766	50,604
Property, plant and equipment	24	3,998,252	3,432,898
Total Non-Current Assets		4,062,442	3,485,707
TOTAL ASSETS		4,158,820	3,580,148
LIABILITIES			
Current Liabilities			
Payables	26	17,024	19,397
Provisions	27	22,022	22,462
Total Current liabilities		39,046	41,859
Non-Current Liabilities			
Provisions	27	10,839	9,687
Total non-current liabilities		10,839	9,687
TOTAL LIABILITIES		49,885	51,546
Net Assets		4,108,935	3,528,602
Equity			
Contributed Equity	28	2,791,647	2,779,619
Reserves		1,284,131	735,483
Accumulated surplus		33,157	13,500
Total equity		4,108,935	3,528,602
TOTAL LIABILITIES AND EQUITY		4,158,820	3,580,148

The Balance Sheet should be read in conjunction with the accompanying notes.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
STATEMENT OF CHANGES IN EQUITY
FOR THE YEAR ENDED 30 JUNE 2008

	Note	2008 \$'000	2007 \$'000
Balance of equity at start of period		3,528,602	0
CONTRIBUTED EQUITY	28		
Balance at start of period		2,779,619	0
Capital contribution		9,862	17,406
Other contributions by owners		2,166	2,762,213
Distributions to owners		0	0
Balance at end of period		2,791,647	2,779,619
RESERVES	28		
Asset Revaluation Reserve			
Balance at start of period		735,483	0
Gains/(losses) from asset revaluation		548,648	735,483
Balance at end of period		1,284,131	735,483
ACCUMULATED SURPLUS	28		
Balance at start of period		13,500	0
Surplus for the period		19,657	13,500
Balance at end of period		33,157	13,500
Balance of equity at end of period		4,108,935	3,528,602
Total income and expense for the period (a)		568,305	748,983

(a) The aggregate net amount attributable to each category of equity is: surplus \$19,657,000 plus gains from asset revaluation \$548,648,000, (2007: surplus \$13,500,000 plus gains from asset revaluation \$735,483,000).

The Statement of Changes in Equity should be read in conjunction with the accompanying notes.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
CASH FLOW STATEMENT
FOR THE YEAR ENDED 30 JUNE 2008

	Note	2008 \$'000	2007 \$'000
CASH FLOWS FROM STATE GOVERNMENT			
Service appropriation		183,741	195,639
Capital contributions		9,862	17,406
Holding account drawdowns		7,306	7,106
Non-retained revenue distributed to owner		0	0
Net cash provided by State Government		200,909	220,151
Utilised as follows:			
CASH FLOWS FROM OPERATING ACTIVITIES			
Payments			
Employee benefits		(142,478)	(132,468)
Supplies and services		(90,940)	(74,544)
Capital user charge		0	(16,361)
Accommodation		(5,462)	(5,046)
Grants and subsidies		(6,607)	(5,067)
GST payments on purchases		(14,553)	(11,619)
Other payments		(21,403)	(20,356)
Receipts			
User charges and fees		51,089	44,996
Commonwealth grants and contributions		7,837	12,245
Interest received		3,882	2,810
GST receipts on sales		5,390	3,751
GST receipts from taxation authority		8,550	7,759
Other receipts		37,549	16,295
Net cash used in operating activities	29	(167,146)	(177,605)
CASH FLOWS FROM INVESTING ACTIVITIES			
Proceeds from sale of non-current physical assets		1,851	1,934
Purchase of non-current physical assets		(34,724)	(32,027)
Net cash used in investing activities		(32,873)	(30,093)
Net increase in cash and cash equivalents		890	12,453
Cash and cash equivalents at the beginning of the period		69,758	57,305
CASH AND CASH EQUIVALENTS AT THE END OF THE PERIOD	29	70,648	69,758

The Cash Flow Statement should be read in conjunction with the accompanying notes.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
SCHEDULE OF INCOME AND EXPENSES BY SERVICE
FOR THE YEAR ENDED 30 JUNE 2008

	Nature Conservation		Sustainable Forest Management		Parks and Visitor Services		Environmental Regulation		Environmental Sustainability		Environmental Impact Assessment and Policies for the Environmental Protection Authority		Coordinate the Response to Climate Change		Total	
	2008	2007	2008	2007	2008	2007	2008	2007	2007	2008	2007	2008	2007	2008	2007	
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	
COST OF SERVICES																
Expenses																
Employee benefits expense	60,571	56,692	21,066	21,163	33,717	32,893	15,617	12,330	4,707	2,810	7,337	8,467	1,156	992	144,171	135,347
Supplies and services	37,661	33,716	9,288	14,517	21,755	19,255	11,051	9,154	3,668	2,685	2,243	1,584	3,732	1,197	89,398	82,108
Depreciation and amortisation expense	5,179	4,097	4,036	3,160	9,366	9,103	675	590	58	46	150	139	7	19	19,471	17,154
Accommodation expenses	1,424	1,124	272	359	915	964	1,289	1,521	562	243	573	808	113	134	5,148	5,153
Grants & subsidies	452	497	2	0	165	101	688	1,336	4,262	3,166	64	0	987	(33)	6,620	5,067
Capital user charge	0	4,108	0	2,749	0	9,373	0	14	0	2	0	5	0	5	0	16,256
Other expenses	8,315	8,076	5,875	7,033	5,942	4,404	903	890	251	169	382	426	72	(36)	21,740	20,962
Total cost of services	113,602	108,310	40,539	48,981	71,860	76,093	30,223	25,835	13,508	9,121	10,749	11,429	6,067	2,278	286,548	282,047
Income																
User charges and fees	4,059	3,007	7,525	9,659	12,699	11,256	16,142	10,382	12,247	11,784	190	753	0	0	52,862	46,841
Commonwealth grants and contributions	8,327	8,495	201	801	543	196	516	1,623	(223)	173	40	17	0	271	9,404	11,576
Other grants and contributions	19,036	8,079	2,005	105	5,538	3,792	282	481	479	167	128	6	15	0	27,483	12,630
Interest revenue	3,479	2,558	97	123	229	315	93	1	741	445	0	0	0	0	4,639	3,442
Other revenue	2,624	762	2,003	2,189	2,525	536	217	236	51	69	0	5	0	7	7,420	3,804
Gain on disposal of non-current assets	282	298	721	1,024	240	222	0	(6)	0	0	0	0	0	0	1,243	1,538
Total income other than income from State Government	37,807	23,199	12,552	13,901	21,774	16,317	17,250	12,717	13,295	12,638	358	781	15	278	103,051	79,831
NET COST OF SERVICES	75,795	85,111	27,987	35,080	50,086	59,776	12,973	13,118	213	(3,517)	10,391	10,648	6,052	2,000	183,497	202,216
INCOME FROM STATE GOVERNMENT																
Service appropriation	81,863	84,507	36,157	41,783	49,909	53,749	17,513	15,853	190	2,979	10,599	11,363	6,049	2,304	202,280	212,538
Liabilities assumed by the Treasurer	0	238	0	86	0	140	0	56	0	13	0	609	0	1,409	0	2,551
Assets assumed (transferred)	42	0	39	0	30	52	0	0	0	0	0	0	0	0	111	52
Resources received free of charge	172	108	95	64	115	77	172	194	95	34	95	53	19	45	763	575
Total income from State Government	82,077	84,853	36,291	41,933	50,054	54,018	17,685	16,103	285	3,026	10,694	12,025	6,068	3,758	203,154	215,716
Surplus/(deficit) for the period	6,282	(258)	8,304	6,853	(32)	(5,758)	4,712	2,985	72	6,543	303	1,377	16	1,758	19,657	13,500

The Schedule of Income and Expenses by Service should be read in conjunction with the accompanying notes.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION
SUMMARY OF CONSOLIDATED ACCOUNT APPROPRIATIONS AND INCOME ESTIMATES
FOR THE YEAR ENDED 30 JUNE 2008

	2008 Estimate \$'000	2008 Actual \$'000	Variance	2008 Actual \$'000	2007 Actual \$'000	Variance
DELIVERY OF SERVICES						
Item 110 Net amount appropriated to deliver services	182,922	188,566	5,644	188,566	0	188,566
Item 111 Net amount appropriated to deliver services	13,166	13,166	0	13,166	0	13,166
Item 93 Net amount appropriated to deliver services	0	0	0	0	174,818	(174,818)
Item 95 Net amount appropriated to deliver services	0	0	0	0	23,643	(23,643)
Item 96 Net amount appropriated to deliver services	0	0	0	0	13,010	(13,010)
Section 25 transfer of service appropriation	0	(72)	(72)	(72)	505	(577)
Amount Authorised by Other Statutes						
– <i>Salaries and Allowances Act 1975</i>	466	620	154	620	562	58
Total appropriations provided to deliver services	196,554	202,280	5,726	202,280	212,538	(10,258)
CAPITAL						
Item 167 Capital Contribution	0	0	0	0	16,556	(16,556)
Item 169 Capital Contribution	0	0	0	0	850	(850)
Item 181 Capital Contribution	20,212	9,862	(10,350)	9,862	0	9,862
GRAND TOTAL	216,766	212,142	(4,624)	212,142	229,944	(17,802)
Details of Expenses by Service						
Nature Conservation	88,955	113,602	24,647	113,602	108,310	5,292
Sustainable Forest Management	36,680	40,539	3,859	40,539	48,981	(8,442)
Parks and Visitor Services	61,016	71,860	10,844	71,860	76,093	(4,233)
Environmental Regulation	36,623	30,223	(6,400)	30,223	25,835	4,388
Environmental Sustainability	24,845	13,508	(11,337)	13,508	9,121	4,387
Environmental Impact Assessment and Policies for the Environmental Protection Authority	11,385	10,749	(636)	10,749	11,429	(680)
Coordinate the Response to Climate Change	6,802	6,067	(735)	6,067	2,278	3,789
Total Cost of Services	266,306	286,548	20,242	286,548	282,047	4,501
Less total income	(70,470)	(103,051)	(32,581)	(103,051)	(79,831)	(23,220)
Net Cost of Services	195,836	183,497	(12,339)	183,497	202,216	(18,719)
Adjustments (1)	718	18,783	18,065	18,783	10,322	8,461
Total appropriations provided to deliver services	196,554	202,280	5,726	202,280	212,538	(10,258)
Capital Expenditure						
Purchase of non-current physical assets	33,132	34,724	1,592	34,724	32,027	2,697
Adjustment for other funding sources	(12,920)	(24,862)	(11,942)	(24,862)	(14,621)	(10,241)
Capital Contribution (appropriation)	20,212	9,862	(10,350)	9,862	17,406	(7,544)
DETAIL OF INCOME ESTIMATES						
Income disclosed as Administered Income	125	161	36	161	186	(25)

(1) Adjustments comprise movements in cash balances and other accrual items such as receivables, payables and superannuation.

Note 33 "Explanatory statement" provides details of any significant variations between estimates and actual results for 2008 and between the actual result for 2007 and 2008.

DEPARTMENT OF ENVIRONMENT AND CONSERVATION NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 30 JUNE 2008

1. DEC mission and funding

Working with the community, we will ensure that Western Australia's environment is valued, protected and conserved, for its intrinsic value, and for the appreciation and benefit of present and future generations.

In 2007–08 the Department of Environment and Conservation (DEC) was predominantly funded by Parliamentary appropriations supplemented by fees received for the provision of services to the public.

2. **Australian equivalents to International Financial Reporting Standards**

General

DEC's financial statements for the year ended 30 June 2008 have been prepared in accordance with Australian equivalents to International Financial Reporting Standards (AIFRS), which comprise a Framework for the Preparation and Presentation of Financial Statements (the Framework) and Australian Accounting Standards (including the Australian Accounting Interpretations).

In preparing these financial statements DEC has adopted, where relevant to its operations, new and revised Standards and the Interpretations from their operative dates issued by the AASB and formerly the Urgent Issues Group (UIG).

Early adoption of standards

DEC cannot early adopt an Australian Accounting Standard or Australian Accounting Interpretation unless specifically permitted by TI 1101 'Application of Australian Accounting Standards and Other Pronouncements'. No Standards and Interpretations that have been issued or amended but are not yet effective have been early adopted by DEC for the annual reporting period ended 30 June 2008.

3. Summary of significant accounting policies

(a) General Statement

The financial statements constitute a general purpose financial report which has been prepared in accordance with the Australian Accounting Standards, the Framework, Statements of Accounting Concepts and other authoritative pronouncements of the Australian Accounting Standards Board as applied by the Treasurer's Instructions. Several of these are modified by the Treasurer's Instructions to vary application, disclosure, format and wording.

The Financial Management Act and the Treasurer's Instructions are legislative provisions governing the preparation of financial statements and take precedence over the Accounting Standards, the Framework, Statements of Accounting Concepts and other authoritative pronouncements of the Australian Accounting Standards Board.

Where modification is required and has a material or significant financial effect upon the reported results, details of that modification and the resulting financial effect are disclosed in the notes to the financial statements.

(b) Basis of Preparation

The financial statements have been prepared in accordance with Accounting Standard AAS 29 'Financial Reporting by Government Departments' on the accrual basis of accounting using the historical cost convention, modified by the revaluation of land and buildings which have been measured at fair value.

The accounting policies adopted in the preparation of the financial statements have been consistently applied throughout all periods presented unless otherwise stated.

The financial statements are presented in Australian dollars and all values are rounded to the nearest thousand dollars (\$'000).

(c) Reporting Entity

DEC administers assets, liabilities, income and expenses on behalf of Government which are not controlled by, nor integral to the function of DEC. These administered balances and transactions are not recognised in the principal financial statements of DEC but schedules are prepared using the same basis as the financial statements and are presented at note 40 'Administered expenses and income' and note 41 'Administered assets and liabilities'.

(d) Contributed Equity

UIG Interpretation 1038 'Contributions by Owners Made to Wholly-Owned Public Sector Entities' requires transfers in the nature of equity contributions to be designated by the Government (the owner) as contributions by owners (at the time of, or prior to transfer) before such transfers can be recognised as equity contributions. Capital contributions (appropriations) have been designated as contributions by owners by T1 955 'Contributions by Owners made to Wholly Owned Public Sector Entities' and have been credited directly to Contributed Equity.

Transfer of net assets to/from other agencies are designated as contributions by owners where the transfers are non-discretionary and non reciprocal. See note 28 'Equity'.

(e) Income

Revenue recognition

Revenue is measured at the fair value of consideration received or receivable. Revenue is recognised for the major business activities as follows:

Sale of goods

Revenue is recognised from the sale of goods and disposal of other assets when the significant risks and rewards of ownership control transfer to the purchaser and can be measured reliably.

Rendering of services

Revenue is recognised upon delivery of the service to the client or by reference to the stage of completion of the transaction.

Interest

Revenue is recognised as the interest accrues.

Service Appropriations

Service Appropriations are recognised as revenues in the period in which DEC gains control of the appropriated funds. DEC gains control of appropriated funds at the time those funds are deposited into DEC's bank account or credited to the holding account held at Treasury. See note 17 'Income from State Government' for further detail.

Net appropriation determination

The Treasurer may make a determination providing for prescribed receipts to be retained for services under the control of DEC. In accordance with the determination specified in the 2007–08 Budget Statements, DEC retained \$103.051 million in 2008 (\$79.831 million in 2007) from the following:

- proceeds from fees and charges;
- sale of goods;
- Commonwealth specific purpose grants and contributions;
- sale of property, plant and equipment; and
- other departmental revenue.

Grants, donations, gifts and other non-reciprocal contributions

Revenue is recognised at fair value when DEC obtains control over the assets comprising the contributions which is usually when cash is received.

Other non-reciprocal contributions that are not contributions by owners are recognised at their fair value. Contributions of services are only recognised when a fair value can be reliably determined and the services would be purchased if not donated.

Where contributions recognised as revenues during the reporting period were obtained on the condition that they be expended in a particular manner or used over a particular period, and those conditions were undischarged as at the balance sheet date, the nature of, and amounts pertaining to, those undischarged conditions are disclosed in the notes.

Gains

Gains may be realised or unrealised and are usually recognised on a net basis. These include gains arising on the disposal of non-current assets and some revaluations of non-current assets.

(f) Property, Plant and Equipment

Capitalisation/Expensing of assets

Items of property, plant and equipment costing over \$1,000 are recognised as assets and the cost of utilising assets is expensed (depreciated) over their useful lives. Items of property, plant and equipment costing less than \$1,000 are immediately expensed direct to the Income Statement (other than where they form part of a group of similar items which are significant in total). In future years the capitalisation policy will be changing from \$1,000 to \$5,000 as mandated by the Treasurer's Instructions.

Initial recognition and measurement

All items of property, plant and equipment are initially recognised at cost.

For items of property, plant and equipment acquired at no cost or for nominal consideration, the cost is their fair value at the date of acquisition.

Subsequent measurement

After recognition as an asset, DEC uses the revaluation model for the measurement of land and buildings and the cost model for all other property, plant and equipment. Land and buildings are carried at fair value less accumulated depreciation on buildings and accumulated impairment losses. All other items of property, plant and equipment are carried at historical cost less accumulated depreciation and accumulated impairment losses.

Where market-based evidence is available, the fair value of land and buildings is determined on the basis of current market buying values determined by reference to recent market transactions. When buildings are revalued by reference to recent market transactions, the accumulated depreciation is eliminated against the gross carrying amount of the asset and the net amount restated to the revalued amount.

Where market-based evidence is not available, the fair value of land and buildings is determined on the basis of existing use. This normally applies where buildings are specialised or where land use is restricted. Fair value for existing use assets is determined by reference to the cost of replacing the remaining future economic benefits embodied in the asset, i.e. the depreciated replacement cost. Where the fair

value of buildings is dependent on using the depreciated replacement cost, the gross carrying amount and the accumulated depreciation are restated proportionately.

Independent valuations of land and buildings are provided annually by the Western Australian Land Information Authority (Valuation Services) and recognised with sufficient regularity to ensure that the carrying amount does not differ materially from the asset's fair value at the balance sheet date.

The most significant assumptions in estimating fair value are made in assessing whether to apply the existing use basis to assets and in determining estimated useful life. Professional judgment by the valuer is required where the evidence does not provide a clear distinction between market type assets and existing use assets.

Refer to note 24 'Property, plant and equipment' for further information on revaluations.

Derecognition

Upon disposal or derecognition of an item of property, plant and equipment, any revaluation reserve relating to that asset is retained in the asset revaluation reserve.

Depreciation

All non-current assets having a limited useful life are systematically depreciated over their estimated useful lives in a manner that reflects the consumption of their future economic benefits.

Land is not depreciated. Depreciation on other assets is calculated using the straight-line method, using rates which are reviewed annually.

Estimated useful lives for each class of depreciable asset are:

Buildings	20–40 years
Furniture	10 years
Office equipment	6–7 years
Computer equipment	4 years
Software (i)	2.5 years
Aircraft	5–6 years
Boats	5 years
Plant and machinery	4–10 years
Heavy fleet vehicles	5 years
Parks and visitor facilities	10–20 years

(i) Software that is integral to the operation of related hardware.

(g) Intangible Assets

Capitalisation/Expensing of assets

Acquisitions of intangible assets costing \$1,000 or more and internally generated intangible assets costing \$50,000 or more are capitalised. The cost of utilising the assets is expensed (amortised) over their useful lives. Costs incurred below these thresholds are immediately expensed directly to the Income Statement.

All acquired and internally developed intangible assets are initially recognised at cost. For assets acquired at no cost or for nominal cost, the cost is their fair value at the date of acquisition.

The cost model is applied for subsequent measurement requiring the asset to be carried at cost less any accumulated amortisation and accumulated impairment losses.

Amortisation for intangible assets with finite useful lives is calculated for the period of the expected benefit (estimated useful life) on the straight-line basis using rates which

are reviewed annually. All intangible assets controlled by DEC have a finite useful life and zero residual value. The expected useful lives for each class of intangible assets are:

Licences	up to 10 years
Software (i)	2.5 years
Research and Development costs	3 to 5 years
Website costs	3 to 5 years

(i) Software that is not integral to the operation of any related hardware.

Licences

Licences have a finite useful life and are carried at cost less accumulated amortisation and accumulated impairment losses.

Research and Development

Research costs are expensed as incurred. Development costs incurred for an individual project are carried forward when the future recoverability can reasonably be regarded as assured and the total project costs are likely to exceed \$50,000. Other development costs are expensed as incurred.

Computer Software

Software that is an integral part of the related hardware is treated as property, plant and equipment. Software that is not an integral part of the related hardware is treated as an intangible asset. Software costing less than \$1,000 is expensed in the year of acquisition.

Website costs

Website costs are charged as expenses when they are incurred unless they relate to the acquisition or development of an asset when they may be capitalised and amortised. Generally, costs in relation to feasibility studies during the planning phase of a website, and ongoing costs of maintenance during the operating phase are expensed. Costs incurred in building or enhancing a website, to the extent that they represent probably future economic benefits that can be reliably measured, are capitalised.

(h) Impairment of Assets

Property, plant and equipment are tested for any indication of impairment at each balance sheet date. Where there is an indication of impairment, the recoverable amount is estimated. Where the recoverable amount is less than the carrying amount, the asset is considered impaired and is written down to the recoverable amount and an impairment loss is recognised. As DEC is a not-for-profit entity, unless an asset has been identified as a surplus asset, the recoverable amount is the higher of an asset's fair value less costs to sell and depreciated replacement cost.

The risk of impairment is generally limited to circumstances where an asset's depreciation is materially understated, where the replacement cost is falling or where there is a significant change in useful life. Each relevant class of assets is reviewed annually to verify that the accumulated depreciation/amortisation reflects the level of consumption or expiration of asset's future economic benefits and to evaluate any impairment risk from falling replacement costs.

Intangible assets with an indefinite useful life and intangible assets not yet available for use are tested for impairment at each balance sheet date irrespective of whether there is any indication of impairment.

The recoverable amount of assets identified as surplus assets is the higher of fair value less costs to sell and the present value of future cash flows expected to be derived from the asset. Surplus assets carried at fair value have no risk of material impairment where fair value is determined by reference to market-based evidence.

Where fair value is determined by reference to depreciated replacement cost, surplus assets are at risk of impairment and the recoverable amount is measured. Surplus assets at cost are tested for indications of impairment at each balance sheet date.

See note 25 'Impairment of assets' for the outcome of impairment reviews and testing. See also note 3 (p) 'Receivables' and note 20 'Receivables' for impairment of receivables.

(i) Non-Current Assets Classified as Held for Sale

Non-current assets held for sale are recognised at the lower of carrying amount and fair value less costs to sell and are presented separately in the Balance Sheet. Assets classified as held for sale are not depreciated or amortised.

Most land holdings are Crown land vested in DEC by the Government. The Department for Planning and Infrastructure (DPI) is the only agency with the power to sell Crown land. DEC transfers Crown land and any attaching buildings to DPI when the land becomes available for sale.

(j) Leases

DEC holds operating leases for buildings, office equipment and motor vehicles. Lease payments are expensed on a straight-line basis over the lease term as this represents the pattern of benefits derived from the leased assets.

(k) Financial Instruments

In addition to cash, DEC has two categories of financial instrument:

- Loans and receivables; and
- Financial liabilities measured at amortised cost.

These have been disaggregated into the following classes:

Financial Assets

- Cash and cash equivalents
- Restricted cash and cash equivalents
- Receivables
- Amounts receivable for services

Financial Liabilities

- Payables

Initial recognition and measurement of financial instruments is at fair value which normally equates to the transaction cost or the face value. Subsequent measurement is at amortised cost using the effective interest method.

The fair value of short-term receivables and payables is the transaction cost or the face value because there is no interest rate applicable and subsequent measurement is not required as the effect of discounting is not material.

(l) Cash and Cash Equivalents

For the purpose of the Cash Flow Statement, cash and cash equivalents includes restricted cash and cash equivalents. These are comprised of cash on hand and short-term deposits with original maturities of three months or less that are readily convertible to a known amount of cash and which are subject to insignificant risk of changes in value.

(m) Accrued Salaries

The accrued salaries suspense account (refer note 18 'Restricted cash and cash equivalents') consists of amounts paid annually into a suspense account over a period of

10 financial years to largely meet the additional cash outflow in each eleventh year when 27 pay days occur instead of the normal 26. No interest is received on this account.

Accrued salaries (refer note 26 'Payables') represent the amount due to staff but unpaid at the end of the financial year, as the pay date for the last pay period for that financial year does not coincide with the end of the financial year. Accrued salaries are settled within a fortnight of the financial year end. DEC considers the carrying amount of accrued salaries to be equivalent to its net fair value.

(n) Amounts Receivable for Services (Holding Account)

DEC receives appropriation funding on an accrual basis that recognises the full annual cash and non-cash cost of services. The appropriations are paid partly in cash and partly as an asset (Holding Account receivable) that is accessible on the emergence of the cash funding requirement to cover items such as leave entitlements and asset replacement.

See also note 17 'Income from State Government' and note 21 'Amounts receivable for services'.

(o) Inventories

Inventories are measured at the lower of cost and net realisable value. Costs are assigned by the method most appropriate to each particular class of inventory, with the majority being valued on a first in first out basis.

See note 19 'Inventories'

(p) Receivables

Receivables are recognised and carried at original invoice amount less an allowance for uncollectible amounts (i.e. impairment). The collectability of receivables is reviewed on an ongoing basis and any receivables identified as uncollectible are written-off against the allowance account. The allowance for uncollectible amounts (doubtful debts) is raised when there is objective evidence that DEC will not be able to collect the debts. The carrying amount is equivalent to fair value as it is due for settlement within 30 days. See note 3(k) 'Financial Instruments' and note 20 'Receivables'.

(q) Payables

Payables are recognised when DEC becomes obliged to make future payments as a result of a purchase of assets, goods or services. The carrying amount is equivalent to fair value, as they are generally settled within 30 days. See note 3(k) 'Financial Instruments' and note 26 'Payables'.

(r) Provisions

Provisions are liabilities of uncertain timing and amount and are recognised where there is a present legal, equitable or constructive obligation as a result of a past event and when the outflow of resources embodying economic benefits is probable and a reliable estimate can be made of the amount of the obligation. Provisions are reviewed at each balance sheet date. See note 27 'Provisions'.

(i) Provisions – Employee Benefits

Annual Leave and Long Service Leave

The liability for annual and long service leave expected to be settled within 12 months after the end of the balance sheet date is recognised and measured at the undiscounted amounts expected to be paid when the liabilities are settled. Annual and long service leave expected to be settled more than 12 months

after the end of the balance sheet date is measured at the present value of amounts expected to be paid when the liabilities are settled. Leave liabilities are in respect of services provided by employees up to the balance sheet date.

When assessing expected future payments consideration is given to expected future wage and salary levels including non-salary components such as employer superannuation contributions. In addition, the long service leave liability also considers the experience of employee departures and periods of service.

The expected future payments are discounted using market yields at the balance sheet date on national government bonds with terms to maturity that match, as closely as possible, the estimated future cash outflows.

All annual leave and unconditional long service leave provisions are classified as current liabilities as DEC does not have an unconditional right to defer settlement of the liability for at least 12 months after the balance sheet date.

Sick Leave

Liabilities for sick leave are recognised when it is probable that sick leave paid in the future will be greater than the entitlement that will accrue in the future.

Past history indicates that on average, sick leave taken each reporting period is less than the entitlement accrued. This is expected to continue in future periods. Accordingly, it is unlikely that existing accumulated entitlements will be used by employees and no liability for unused sick leave entitlements is recognised. As sick leave is non-vesting, an expense is recognised in the income statement for this leave as it is taken.

Superannuation

The Government Employees Superannuation Board (GESB) administers the following superannuation schemes.

Employees may contribute to the Pension Scheme, a defined benefit pension scheme now closed to new members or the Gold State Superannuation Scheme (GSS), a defined benefit lump sum scheme also closed to new members. DEC has no liabilities for superannuation charges under the Pension or the GSS schemes as the liability has been assumed by the Treasurer.

Employees commencing employment prior to 16 April 2007 who were not members of either the Pension or the GSS schemes became non-contributory members of the West State Superannuation Scheme (WSS). Employees commencing employment on or after 16 April 2007 became members of the GESB Super Scheme (GESBS). Both of these schemes are accumulation schemes. DEC makes concurrent contributions to GESB on behalf of employees in compliance with the Commonwealth Government's *Superannuation Guarantee (Administration) Act 1992*. These contributions extinguish the liability for superannuation charges in respect of the WSS and GESBS schemes.

The GESB makes all benefit payments in respect of the Pension and GSS schemes, and is recouped by the Treasurer for the employer's share.

See also note 3(s) 'Superannuation expense'.

(ii) Provisions – Other

Employment On-Costs

Employment on-costs, including workers' compensation insurance, are not employee benefits and are recognised separately as liabilities and expenses when the employment to which they relate has occurred. Employment on-costs are included as part of 'Other expenses' and are not included as part of DEC's 'Employee benefits expense'. The related liability is included in 'Employment on-costs provision'. See note 11 'Other Expenses' and note 27 'Provisions'.

(s) Superannuation Expense

The following elements are included in calculating the superannuation expense in the Income Statement:

- (a) Defined benefit plans – Change in the unfunded employer’s liability (i.e. current service cost and actuarial gains and losses) assumed by the Treasurer in respect of current employees who are members of the Pension Scheme and current employees who accrued a benefit on transfer from that scheme to the Gold State Superannuation Scheme (GSS); and
- (b) Defined contribution plans – Employer contributions paid to the GSS (concurrent contributions), the West State Superannuation Scheme (WSS), and the GESB Super Scheme (GESBS).

Defined benefit plans – in order to reflect the true cost of services, the movements (i.e. current service cost and, actuarial gains and losses) in the liabilities in respect of the Pension Scheme and the GSS Scheme transfer benefits are recognised as expenses directly in the Income Statement. As these liabilities are assumed by the Treasurer (refer note 3(r)(i)), a revenue titled ‘Liabilities assumed by the Treasurer’ equivalent to the expense is recognised under Income from State Government in the Income Statement. See note 17 ‘Income from State Government’.

The superannuation expense does not include payment of pensions to retirees, as this does not constitute part of the cost of services provided in the current year.

Defined contribution plans – in order to reflect DEC’s true cost of services, DEC is funded for the equivalent of employer contributions in respect of the GSS Scheme (excluding transfer benefits). These contributions were paid to the GESB during the year and placed in a trust account administered by the GESB on behalf of the Treasurer. The GESB subsequently paid these employer contributions in respect of the GSS Scheme to the Consolidated Account.

The GSS Scheme is a defined benefit scheme for the purposes of employees and whole-of-government reporting. However, apart from the transfer benefit, it is a defined contribution plan for agency purposes because the concurrent contributions (defined contributions) made by the agency to GESB extinguishes the agency’s obligations to the related superannuation liability.

(t) Resources Received Free of Charge or for Nominal Cost

Resources received free of charge or for nominal cost that can be reliably measured are recognised as income and as assets or expenses as appropriate, at fair value.

(u) Comparative Figures

Comparative figures are, where appropriate, reclassified to be comparable with the figures presented in the current financial year.

4. Disclosure of changes in accounting policy and estimates

Initial application of an Australian Accounting Standard

DEC has applied the following Australian Accounting Standards and Australian Accounting Interpretations effective for annual reporting periods beginning on or after 1 July 2007 that impacted on DEC:

1. AASB 7 ‘Financial Instruments: Disclosures’ (including consequential amendments in AASB 2005-10 ‘Amendments to Australian Accounting Standards [AASB 132, AASB 101, AASB 114, AASB 117, AASB 133, AASB 139, AASB 1, AASB 4, AASB 1023 & AASB 1038]’). This Standard requires new disclosures in relation to financial instruments and while there is no financial impact, the changes

have resulted in increased disclosures, both quantitative and qualitative, of the department's exposure to risks, including enhanced disclosure regarding components of the department's financial position and performance, and changes to the way of presenting certain items in the notes to the financial statements.

Future impact of Australian Accounting Standards not yet operative

DEC cannot early adopt an Australian Accounting Standard or Australian Accounting Interpretation unless specifically permitted by TI 1101 'Application of Australian Accounting Standards and Other Pronouncements'. Consequently, DEC has not applied the following Australian Accounting Standards and Australian Accounting Interpretations that have been issued and which may impact DEC but are not yet effective. Where applicable, DEC plans to apply these Standards and Interpretations from their application date: but are not yet effective. These will be applied from their application date:

Title	Operative for reporting periods beginning on/after
AASB 101 'Presentation of Financial Statements' (September 2007). This Standard has been revised and will change the structure of the financial statements. These changes will require that owner changes in equity are presented separately from non-owner changes in equity. The department does not expect any financial impact when the Standard is first applied.	1 January 2009
Review of AAS 27 'Financial Reporting by Local Governments', 29 'Financial Reporting by Government Departments and 31 'Financial Reporting by Governments'. The AASB has made the following pronouncements from its short term review of AAS 27, AAS 29 and AAS 31:	
AASB 1004 'Contributions' (December 2007).	1 July 2008
AASB 1050 'Administered Items' (December 2007).	1 July 2008
AASB 1051 'Land Under Roads' (December 2007).	1 July 2008
AASB 1052 'Disaggregated Disclosures' (December 2007).	1 July 2008
AASB 2007-9 'Amendments to Australian Accounting Standards arising from the review of AASs 27, 29 and 31 [AASB 3, AASB 5, AASB 8, AASB 101, AASB 114, AASB 116, AASB 127 & AASB 137] (December 2007).	1 July 2008
Interpretation 1038 'Contributions by Owners Made to Wholly-Owned Public Sector Entities (December 2007).	1 July 2008
The existing requirements in AAS27, AAS 29 and AAS 31 have been transferred to the above new and existing topic-based Standards and Interpretation. These requirements remain substantively unchanged. The new and revised Standards make some modifications to disclosures, otherwise there will be no financial impact.	

		2008	2007
		\$'000	\$'000
5.	Employee benefits expense		
	Wages and salaries (a)	118,566	112,850
	Superannuation – defined contribution plans (b)	11,535	10,342
	Superannuation – defined benefit plans (c)(d)	0	2,551
	Long service leave (e)	3,012	2,071
	Annual leave (e)	11,058	7,533
		<u>144,171</u>	<u>135,347</u>
	(a) Includes the value of the fringe benefits to the employee plus the fringe benefits tax component.		
	(b) Defined contribution plans include West State and Gold State (contribution paid).		
	(c) Defined benefit plans include Pension Scheme and Gold State (pre-transfer benefit).		
	(d) An equivalent notional income is also recognised (see note 17 'Income from State Government'). For 2008 there was a decrease in the liability from the prior year, in complying with T11101A the net gain has not been included in the superannuation expense.		
	(e) Includes a superannuation contribution component.		
	Employment on-costs such as workers' compensation insurance are included at note 11 'Other Expenses'. The employment on-costs liability is included at note 27 'Provisions'.		
6.	Supplies and services		
	Communications	3,840	3,160
	Consultants and contractors	16,754	12,064
	Services and contracts	33,948	33,013
	Materials	15,583	16,433
	Repairs and maintenance	4,805	4,256
	Travel	5,506	4,879
	GROH rental expense	3,031	2,386
	Other	5,931	5,917
		<u>89,398</u>	<u>82,108</u>
7.	Depreciation and amortisation expense		
	<i>Depreciation</i>		
	Plant, equipment and vehicles	9,046	7,617
	Software	515	194
	Buildings	9,910	9,343
	Total depreciation	<u>19,471</u>	<u>17,154</u>
8.	Accommodation expenses		
	Lease rentals	3,919	3,889
	Electricity, power and water	1,229	1,264
		<u>5,148</u>	<u>5,153</u>

	2008	2007
	\$'000	\$'000
9. Grants and subsidies		
<i>Recurrent</i>		
Department for Planning and Infrastructure	1,050	0
Keep Australia Beautiful Council (WA)	764	547
Southern Metropolitan Regional Council	458	135
Rottneest Island Authority	400	0
Department of Agriculture and Food	360	0
Conservation Council of WA Inc	223	230
Mindarie Regional Council	174	0
C & D Recycling	172	0
Department of Water	168	0
City of Wanneroo	152	0
Eastern Metropolitan Regional Council	137	74
Shire of Wagin	113	0
Bibbulmun Track Foundation	110	50
WA Chip and Pulp Co Pty Ltd	102	82
The Perth Mint	100	0
Wildflower Country	98	0
South East Metropolitan Regional Council	95	0
Geocatch	84	61
Shire of Roebourne	80	0
City of Albany	79	0
Shire of York	79	0
Printing Industries Association	75	56
Heady Enterprises	73	0
Shire of Merredin	71	0
City of Geraldton – Greenough	68	0
Earthcare Consulting	68	50
City of Nedlands	65	0
Housing Industry Association	61	0
Pioneer Road Services Pty Ltd	60	0
Amcor Recycling Australasia	55	55
Vintec Corporation Pty Ltd	55	0
Agsafe Ltd	50	0
Shire of Victoria Park	50	0
Shire of Kent	50	0
Fire and Emergency Services	0	750
Water and Rivers Commission	0	166
City of Stirling	0	94
City of Mandurah	0	91
Murdoch University	0	84
Green Skills Inc	0	80
Curtin University of Technology	0	80
Swan Catchment Council	0	65
WA Local Government Association	0	56
Various grants under \$50,000	821	2,261
	6,620	5,067

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	2008	2007
	\$'000	\$'000
10. Capital user charge		
Capital user charge	0	16,256
The charge was a levy applied by Government for the use of its capital. The final charge was levied in 2006–07.		
11. Other expenses		
Employment on-costs (a)	268	350
Operating lease – motor vehicle	11,472	10,106
Other lease, rental and hire expenses	10,000	10,506
	<u>21,740</u>	<u>20,962</u>
(a) Includes workers' compensation insurance and other employment on-costs. The on-costs liability associated with the recognition of annual and long service leave liability is included at note 27 'Provisions'. Superannuation contributions accrued as part of the provision for leave are employee benefits and are not included in employment on-costs.		
12. User charges and fees		
User charges	10,795	9,570
Fees	14,255	15,909
Landfill levy revenue	12,155	11,302
Emission and discharge licences	13,750	8,549
Waste control permits	1,907	1,511
	<u>52,862</u>	<u>46,841</u>
13. Commonwealth grants and contributions		
Capital	401	1,066
Recurrent	9,003	10,510
	<u>9,404</u>	<u>11,576</u>
At 30 June 2008 \$5,909,702 relates to outstanding commitments.		
14. Other grants and contributions		
Capital	1,307	1,309
Recurrent	26,176	11,321
	<u>27,483</u>	<u>12,630</u>
At 30 June 2008 \$21,581,630 relates to outstanding commitments.		
15. Net gain/(loss) on disposal of non-current assets		
<i>Costs of Disposal of Non-Current Assets</i>		
Plant, property, equipment and vehicles	130	187
Buildings	10	392
Land		587
<i>Proceeds from Disposal of Non-Current Assets</i>		
Plant, property, equipment and vehicles	1,383	1,794
Land	0	910
Net gain/(loss)	<u>1,243</u>	<u>1,538</u>
See also note 3(i) 'Non-Current Assets Classified as Held for Sale' and note 24 'Property, plant and equipment'		
16. Other revenue		
Publications revenue	489	452
Mining compensation revenue	4,708	1,629
Other revenues	2,223	1,723
	<u>7,420</u>	<u>3,804</u>

	2008 \$'000	2007 \$'000
17. Income from State Government		
Appropriation revenue received during the year:		
Service appropriations (a)	188,494	198,966
Services provided to EPA	13,166	13,010
<i>Salaries and Allowances Act 1975</i>	620	562
Total appropriations	202,280	212,538
The following liabilities have been assumed by the Treasurer during the financial year:		
– Superannuation (b)	0	2,551
Total liabilities assumed by the Treasurer	0	2,551
The following assets have been assumed from other State government agencies during the financial year: (c)		
– Plant, equipment and vehicles	94	44
– Buildings	17	8
Total assets not previously recognised	111	52
Resources received free of charge (d)		
Determined on the basis of the following estimates provided by agencies:		
– Department of Land Information	0	155
– Landgate	209	75
– State Solicitor's Office	305	251
– Department of Water	0	2
– Department of Treasury and Finance	249	92
Total resources received free of charge	763	575
	203,154	215,716

- (a) Service appropriations are accrual amounts reflecting the full cost of services delivered. The appropriation revenue comprises a cash component and a receivable (asset). The receivable (holding account) comprises the depreciation expense for the year and any agreed increase in leave liability during the year.
- (b) The assumption of the superannuation liability by the Treasurer is a notional income to match the notional superannuation expense reported in respect of current employees who are members of the Pension Scheme and current employees who have a transfer benefit entitlement under the Gold State Superannuation Scheme. (The notional superannuation expense is disclosed at note 5 'Employee Benefits Expense'). For 2008 there was a decrease in the liability from the prior year, in complying with T11101A the net gain has not been included in the superannuation expense.
- (c) Where the Treasurer or other entity has assumed a liability, DEC recognises revenues equivalent to the amount of the liability assumed and an expense relating to the nature of the event or events that initially gave rise to the liability. From 1 July 2002 non-discretionary non-reciprocal transfers of net assets (i.e. restructuring or administrative arrangements) have been classified as Contributions by Owners (CBO's) under TI 955 and are taken directly to equity. Discretionary transfers of assets between State Government agencies are reported as assets assumed/(transferred) under Income from State Government.
- (d) Where assets or services have been received free of charge or for nominal cost, DEC recognises revenues equivalent to the fair value of the assets and/or the fair value of those services that can be reliably determined and which would have been purchased if not donated, and those fair values shall be recognised as assets or expenses, as applicable. The exception occurs where the contribution of assets or services are in the nature of contributions by owners, in which case DEC makes the adjustment direct to equity.

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	2008 \$'000	2007 \$'000
18. Restricted cash and cash equivalents		
<i>Current</i>		
Cash amounts in suspense account	70	97
<i>Non Current</i>		
Accrued salaries suspense account (a)	1,378	828
(a) Amount held in the suspense account is only to be used for the purpose of meeting the 27th pay in a financial year that occurs every 11 years.		
19. Inventories		
<i>Current</i>		
Inventories held for resale:		
Publications	288	232
Souvenirs	88	112
	376	344
Non-current		
Publications	1,152	1,377
Impairment of publications	(460)	(391)
Souvenirs	354	448
	1,046	1,377
See also note 3(o) 'Inventories'.		
20. Receivables		
<i>Current</i>		
Receivables	11,606	9,841
Allowance for impairment of receivables	(223)	(72)
GST receivable	2,621	2,499
Accrued revenue	4,618	4,877
	18,622	17,145
Reconciliation of changes in the allowance for impairment of receivables:		
Balance at start of year	72	0
Doubtful debts expense recognised in the income statement	200	93
Amounts written off during the year	(49)	(21)
Balance at end of year	223	72
Credit Risk		
Ageing of receivables past due but not impaired based on the information provided to senior management, at the balance sheet date:		
Not more than 3 months	1,979	3,174
More than 3 months but less than 6 months	1,988	323
More than 6 months but less than 1 year	1,286	1,085
	5,235	4,582
Receivables individually determined as impaired at the balance sheet date:		
Carrying amount, before deducting any impairment loss	464	138
Impairment loss	(223)	(72)
	241	66

DEC does not hold any collateral as security or other credit enhancements relating to receivables. See also note 3(p) 'Receivables' and note 34 'Financial Instruments'.

	2008 \$'000	2007 \$'000
21. Amounts receivable for services		
Current	7,377	7,306
Non-current	61,766	50,604
	69,143	57,910
<p>Represents the non-cash component of service appropriations. See note 3(n) 'Amounts receivable for services (Holding Account)'. It is restricted in that it can only be used for asset replacement or payment of leave liability.</p>		
22. Other assets		
<i>Current</i>		
Prepayments	731	716
23. Non-current assets classified as held for sale		
<i>Opening balance</i>		
Plant, equipment and vehicles	0	6
Less write-down from cost to fair value less selling costs	0	0
	0	6
<i>Assets reclassified as held for sale</i>		
Plant, equipment and vehicles	2	0
Less write-down from cost to fair value less selling costs	0	0
	2	0
<i>Total assets classified as held for sale</i>		
Plant, equipment and vehicles	2	6
Less write-down from cost to fair value less selling costs	0	0
	2	6
<i>Less assets sold</i>		
Plant, equipment and vehicles	0	6
Less write-down from cost to fair value less selling costs	0	0
	0	6
<i>Closing balance</i>		
Plant, equipment and vehicles	2	0
Write-down from cost to fair value less selling costs	0	0
	2	0

	2008	2007
	\$'000	\$'000
24. Property, plant and equipment		
<i>Land</i>		
At fair value (a)	3,800,519	3,251,302
	<u>3,800,519</u>	<u>3,251,302</u>
<i>Buildings</i>		
At fair value (a)	78,226	70,413
Accumulated depreciation	(4,043)	(3,216)
	<u>74,183</u>	<u>67,197</u>
<i>Plant and equipment</i>		
At cost	114,431	99,839
Accumulated depreciation	(23,264)	(11,286)
	<u>91,167</u>	<u>88,553</u>
<i>Vehicles</i>		
At cost	16,787	13,951
Accumulated depreciation	(6,092)	(2,652)
	<u>10,695</u>	<u>11,299</u>
Assets under construction	21,688	14,547
	<u>3,998,252</u>	<u>3,432,898</u>

(a) Land and buildings were revalued as at 1 July 2007 by the Western Australian Land Information Authority (Valuation Services). The valuations were performed during the year ended 30 June 2008 and recognised at 30 June 2008. In undertaking the revaluation, fair value was determined by reference to market values for land: \$2,069,965,350 and buildings: \$5,724,800. For the remaining balance, fair value of land and buildings was determined on the basis of existing use or depreciated replacement cost. See note 3(f) Property, Plant and Equipment.

Valuation Services, the Office of the Auditor General and the Department of Treasury and Finance assessed the valuations globally to ensure that the valuations provided (as at 1 July 2007) were compliant with fair value at 30 June 2008.

In accordance with AASB 116.35 DEC credits accumulated depreciation to the asset account prior to revaluation and restates the net amount to the revalued amount.

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Reconciliations of the carrying amounts of property, plant, equipment and vehicles and assets under construction at the beginning and end of the reporting period are set out below:

	Land	Buildings	Plant and equipment	Vehicles	Assets under construction	Total
2008	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Carrying amount at start of year	3,251,302	67,197	88,553	11,299	14,547	3,432,898
Additions	4,056	5,370	14,609	2,867	7,141	34,043
Assets not previously identified	0	17	94	0	0	111
Transfers (a)	1,991	175	0	0	0	2,166
Disposals	0	(10)	(128)	(2)	0	(140)
Classified as held for sale	0	0	(2)	0	0	(2)
Revaluation increments	543,170	5,477	0	0	0	548,647
Depreciation	0	(4,043)	(11,959)	(3,469)	0	(19,471)
Carrying amount at end of year	3,800,519	74,183	91,167	10,695	21,688	3,998,252

	Land	Buildings	Plant and equipment	Vehicles	Assets under construction	Total
2007	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Carrying amount at start of year	2,525,375	55,810	79,905	7,414	10,517	2,679,021
Additions	3,453	2,281	20,055	6,552	4,030	36,371
Assets not previously identified	0	8	44	0	0	52
Transfers (a)	285	0	0	0	0	285
Disposals	(587)	(393)	(165)	(15)	0	(1,160)
Revaluation increments	722,776	12,707	0	0	0	735,483
Depreciation	0	(3,216)	(11,286)	(2,652)	0	(17,154)
Carrying amount at end of year	3,251,302	67,197	88,553	11,299	14,547	3,432,898

(a) DEC has received assets from other agencies, this is accounted for as a contribution by owners.

25. Impairment of assets

There were no indications of material impairment to property, plant and equipment at 30 June 2008.

DEC held no goodwill or intangible assets with an indefinite useful life during the reporting period and at balance sheet date there were no intangible assets not yet available for use. All surplus assets at 30 June 2008 have been written off.

26. Payables

Current

	2008	2007
	\$'000	\$'000
Trade payables	10,082	14,897
Accrued expenses	3,285	2,244
Accrued salaries	1,150	234
Accrued superannuation	95	41
Unearned revenue	2,412	1,981
	<u>17,024</u>	<u>19,397</u>

See also note 3(q) 'Payables' and note 34 'Financial Instruments'.

27. Provisions

Current

Employee benefits provision		
Annual leave (a)	11,751	12,053
Long service leave (b)	10,075	10,209
	<u>21,826</u>	<u>22,262</u>
Other provisions		
Employment on-costs (c)	196	200
	<u>22,022</u>	<u>22,462</u>

Non-current

Employee benefits provision		
Long service leave (b)	10,742	9,601
Other provisions		
Employment on-costs (c)	97	86
	<u>10,839</u>	<u>9,687</u>

(a) Annual leave liabilities have been classified as current as there is not an unconditional right to defer settlement for at least 12 months after reporting date. Assessments indicate that actual settlement of the liabilities will occur as follows:

Within 12 months of reporting date	11,751	12,053
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(b) Long service leave liabilities have been classified as current where there is no unconditional right to defer settlement for at least 12 months after reporting date. Assessments indicate that actual settlement of the liabilities will occur as follows:

Within 12 months of reporting date	10,075	10,209
More than 12 months after reporting date	10,742	9,601
	<u>20,817</u>	<u>19,810</u>

(c) The settlement of annual and long service leave liabilities gives rise to the payment of employment on-costs including workers' compensation insurance. The provision is the present value of expected future payments. The associated expense apart from the unwinding of the discount (finance cost), is included in note 11 'Other expenses'.

	2008 \$'000	2007 \$'000
28. Equity		
Equity represents the residual interest in the net assets of DEC. The Government holds the equity interest in DEC on behalf of the community. The asset revaluation reserve represents that portion of equity resulting from the revaluation of non-current assets.		
Contributed equity		
Balance at the start of the year	2,779,619	0
Contributions by owners		
Capital contribution (a)	9,862	17,406
Transfer of net assets from other agencies (a)		
Ex Department of Environment and Ex Conservation and Land Management	0	2,758,856
Land transfer Department of Agriculture and Food	0	285
Munda Biddi Trail	0	3,006
Land and Building transferred from Department for Planning and Infrastructure	2,166	0
Other asset transfers	0	66
Total contributions by owners	2,791,647	2,779,619
Distributions to owners		
Transfer of net assets to other agencies and Government (b) (c)	0	0
Balance at the end of the year	2,791,647	2,779,619
(a) Capital Contributions (appropriations) and non-discretionary (non-reciprocal) transfers of net assets from other State government agencies have been designated as contributions by owners in Treasurer's Instruction TI 955 'Contributions by Owners Made to Wholly Owned Public Sector Entities' and are credited directly to equity.		
(b) UIG Interpretation 1038 'Contributions by Owners Made to Wholly-Owned Public Sector Entities' requires where the transferee accounts for a transfer as a contribution by owner, the transferor must account for the transfer as a distribution to owners. Consequently, non discretionary (non-reciprocal) transfers of net assets to other State government agencies are distributed to owners are debited directly to equity.		
(c) TI 955 requires non-reciprocal transfers of net assets to Government to be accounted for as distribution to owners.		
Reserves		
Asset revaluation reserve:		
Balance at the start of the year	735,483	0
Net revaluation increments/(decrements):		
Land	543,170	722,776
Buildings	5,478	12,707
Balance at the end of the year	1,284,131	735,483
Accumulated surplus		
Balance at the start of the year	13,500	0
Result for the period	19,657	13,500
Balance at the end of the year	33,157	13,500

	2008 \$'000	2007 \$'000
29. Notes to the Statement of Cash Flows		
<i>Reconciliation of cash</i>		
Cash at the end of the financial year as shown in the Cash Flow Statement is reconciled to the related items in the Balance Sheet as follows:		
Cash	69,200	68,833
Restricted cash and cash equivalents (see note 18)	1,448	925
	70,648	69,758
<i>Reconciliation of net cost of services to net cash flows used in operating activities</i>		
Net cost of services	(183,497)	(202,216)
Non-cash items:		
Depreciation and amortisation expense	19,471	17,154
Superannuation expense	0	2,551
Resources received free of charge	763	575
Net (gain)/loss on sale of property, plant and equipment	(1,243)	(1,538)
<i>(Increase)/decrease in assets:</i>		
Current receivables (b)	(1,392)	(1,637)
Inventories	298	34
Prepayments	8	873
Other current assets	(338)	(2,281)
<i>Increase/(decrease) in liabilities:</i>		
Current payables (b)	(1,316)	4,525
Provisions	712	4,464
Net GST receipts/(payments) (a)	(612)	(109)
Net cash used in operating activities	(167,146)	(177,605)
(a) This is the net GST paid/received, i.e. cash transactions.		
(b) Note that Australian Taxation Office (ATO) receivable/payable in respect of GST and receivable/payable in respect of the sale/purchase of non-current assets are not included in these items as they do not form part of the reconciling items.		

30. Resources provided free of charge

During the year the following resources were provided to other agencies free of charge for functions outside the normal operation of DEC:

Department of Agriculture and Food – office accommodation	0	5
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	2008 \$'000	2007 \$'000
31. Commitments		
<i>Capital expenditure commitments</i>		
Capital expenditure commitments, being contracted capital expenditure additional to the amounts reported in the financial statements payable as follows:		
Within 1 year	21,543	17,209
Later than 1 year and not later than 5 years	4,388	17,650
	25,931	34,859
The capital commitments include amounts for:		
Buildings	24,743	26,645
Plant and Equipment	1,188	8,214
	25,931	34,859
<i>Non-cancellable operating lease commitments</i>		
Commitments in relation to leases contracted for at the reporting date but not recognised in the financial statements are payable as follows:		
Within 1 year	9,197	2,761
Later than 1 year and not later than 5 years	13,343	6,774
Later than 5 years	12,107	10,072
	34,647	19,607

DEC's fleet leases account for the majority of the non cancellable operating lease commitments. The lease term varies depending on the vehicle. The lease payments are fixed for the term of the lease and are payable monthly. There is no option to renew the lease at the end of the lease term.

32. Contingent liabilities and contingent assets

Contingent liabilities

In addition to the liabilities incorporated in the financial statements, DEC has the following contingent liabilities:

(a) Litigation in progress

DEC has various pending litigation that may affect the financial position to the value of \$479,875, of which \$355,106 is fire related. DEC has denied liability and any legal claim will be defended.

(b) Native title claims

DEC's land is subject to a number of native title claims that have yet to be assessed by the National Native Title Tribunal. The financial effect should these claims be successful cannot be estimated at this time.

(c) Contaminated sites

Under the *Contaminated Sites Act, 2003* DEC is required to report known and suspected contaminated sites to DEC. In accordance with the Act, DEC classifies these sites on the basis of the risk to human health, the environment and environmental values. Where sites are classified as contaminated – remediation required or possibly contaminated – investigation required, DEC may have a liability in respect of investigation or remediation expenses.

During the year DEC submitted a program for reporting known or suspected sites to itself under Section 12 of the *Contaminated Sites Act 2003*. All sites are to be reported by 31 December 2008. The financial effect cannot be estimated at this time.

33. Explanatory statement

Significant variations between estimates and actual results for income and expenses as presented in the financial statement titled "Summary of Consolidated Account Appropriations and Income Estimates" are shown below. Significant variations are considered to be those greater than 10 per cent or \$5 million.

(i) Significant variances between estimate and actual for 2008 – total appropriation to deliver services:

	2008 Estimate \$000	2008 Actual \$000	Variation \$000
Total appropriation provided to deliver services	196,554	202,280	5,726
<p>There was a significant variance in the total appropriation provided due to increases that relate to wildfire suppression expenses of \$14.6m, specified callings pay rise of \$2.4m, depreciation of \$0.8m, cane toad initiatives for \$1m, rehabilitation of the Pemberton sawmill site for \$0.5m and various smaller amounts totalling \$1.8m and deferrals of \$7.4m for contaminated sites, \$3m Brookdale, \$1.6m Ord native title, \$1m hazardous waste and various other deferrals of \$1.2m.</p>			
Service expenditure			
Nature Conservation	88,955	113,602	24,647
<p>The significant variation in this service was due to a range of factors, predominately increased expenditure funded by external grants \$11m, wildfire expenses of \$6.7m, extra depreciation costs of \$1.2m.</p>			
Sustainable Forest Management	36,680	40,539	3,859
<p>There was a significant variation due to wildfire costs of \$9.6m offset by reduced expenditure in supplies and services including payments to other States for assistance provided to the U.S. Forest service \$2.3m.</p>			
Parks and Visitor Services	61,016	71,860	10,844
<p>There was a significant variation largely reflecting wildfire costs of \$6.6m, \$0.8m of depreciation.</p>			
Environmental Sustainability	24,845	13,508	(11,337)
<p>There was a significant variation due to the deferral of expenditure in the Waste Avoidance and Resource Recovery account of \$8.3m, Brookdale Site decommissioning \$3m and hazardous waste \$1m.</p>			
Total revenue			
The variation is due to increased revenues from grants and subsidies revenues of \$26.3m, interest revenues \$2.9m and mining compensation \$3.1m.	(70,470)	(103,051)	(32,581)

(ii) Significant variances between actuals for 2007 and 2008 – total appropriation to deliver services:

	2008 \$000	2007 \$000	Variance \$000
The variation was due to the elimination of the capital user charge of \$16.5m, specified callings pay rise of \$2.4m, depreciation of \$0.8m, cane toad initiatives for \$1m, rehabilitation of the Pemberton sawmill site for \$0.5m and various smaller amounts totalling \$1.8m.	202,280	212,538	(10,258)
Service expenditure			
Nature Conservation	113,602	108,310	5,292
<p>There was a significant variation due to the increase of specific purpose accounts expenditure of \$11m and a reduction of biodiversity expenditure of \$3m and the elimination of the capital user charge of \$4m.</p>			
Sustainable Forest Management	40,539	48,981	(8,442)
<p>There was a significant variation due to the reduction of wildfire cost in State forests and plantations of \$6.4m, elimination of the capital user charge of \$2.7m and a reduction in the amount of recoup works of \$1m.</p>			

	2008 \$000	2007 \$000	Variance \$000
Parks and Visitor Services There was a significant variation due to the elimination of the capital user charge of \$9m and an increase of wildfire costs in national parks of \$4m.	71,860	76,093	(4,233)
Environmental Regulation There was a significant variation due to the increase in the outlying regional cost of Environmental Regulation of \$1m, an increase in air quality monitoring costs of \$1.8m.	30,223	25,835	4,388
Environmental Sustainability There was a significant variation due to the increase of expenditure in Waste Avoidance and Resource Recovery costs of \$0.7m, community education \$0.7m, administration costs \$0.7m specific purpose accounts expenditure \$0.5m, accrued grants \$0.4m.	13,508	9,121	4,387
Environmental Impact Assessment and Policies for the Environmental Protection Authority No significant variation	10,749	11,429	(680)
Coordinate the Response to Climate Change The variance is due to the service being established in the 2006–07 financial year and policies gradually being implemented resulting in increased salary and other costs.	6,067	2,278	3,789

(iii) Significant variances between actuals for 2007 and 2008 – total revenue:

The variation was due to other recurrent grants and contributions \$14.9m, emission and discharge licences \$5.2m and mining compensation revenue of \$3.1m.	(103,051)	(79,831)	(23,220)
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(iv) Significant variances between estimate and actual for 2008 – capital contribution:

	2008 Estimate \$000	2008 Actual \$000	Variation \$000
Capital contribution (appropriation) The capital contribution decrease was due to the delayed start to the construction of the new herbarium building at Kensington.	20,212	9,862	(10,350)

(v) Significant variances between actuals for 2007 and 2008 – capital contributions:

	2008 \$000	2007 \$000	Variance \$000
The variation is due to a reduction in funding requirement due to the construction of the herbarium and the completion of other works.	9,862	17,406	(7,544)

(vi) Significant variances between estimate and actual for 2008 – administered income:

	2008 Estimate \$000	2008 Actual \$000	Variation \$000
The variation is due to infringement and administered fees above the estimate.	125	161	36

(vii) Significant variances between actuals for 2007 and 2008 – administered income:

	2008 \$000	2007 \$000	Variance \$000
The variation is due to a reduction in infringements \$0.015m and administered fees \$0.01m.	161	186	(25)

34. Financial Instruments

(a) Financial Risk Management Objectives and Policies

Financial instruments held by DEC are cash, receivables and payables. All of DEC's cash is held in the public bank account (interest bearing) apart from restricted cash held in a special purpose account. DEC has limited exposure to financial risks. DEC's overall risk management program focuses on managing the risks identified below.

Credit risk

Credit risk arises when there is the possibility of debtors defaulting on their contractual obligations resulting in financial loss to DEC. DEC measures credit risk on a fair value basis and monitors risk on a regular basis.

The maximum exposure to credit risk at balance sheet date in relation to each class of recognised financial assets is the gross carrying amount of those assets inclusive of any provisions for impairment, as shown the table at Note 34(c).

Credit risk associated with DEC's financial assets is minimal because the main receivable is the amounts receivable for services (holding account). For receivables other than government, DEC trades only with recognised, creditworthy third parties. DEC has policies in place to ensure that sales of products and services are made to customers with an appropriate credit history. In addition, receivable balances are monitored on an ongoing basis with the result that DEC's exposure to bad debts is minimal. There are no significant concentrations of credit risk. At 30 June 2008 48 per cent is owed by State and Federal Government.

Provision for impairment of financial assets is calculated based on past experience, and current and expected changes in client credit ratings. For financial assets that are either past due or impaired, refer to note 20 'Receivables'.

Liquidity risk

DEC is exposed to liquidity risk through its trading in the normal course of business. Liquidity risk arises when DEC is unable to meet its financial obligations as they fall due.

DEC has appropriate procedures to manage cash flows including drawdowns of appropriations by monitoring forecast cash flows to ensure that sufficient funds are available to meet its commitments.

Market risk

DEC does not trade in foreign currency and is not materially exposed to other price risks. Other than as detailed in the Interest rate sensitivity analysis table at Note 34(c), DEC is not exposed to interest rate risk because DEC has no borrowings.

(b) Categories of Financial Instruments

In addition to cash, the carrying amounts of each of the following categories of financial assets and financial liabilities at the balance sheet date are as follows

	2008 \$'000	2007 \$'000
Financial Assets		
Cash	69,200	68,833
Restricted cash	1,448	925
Loans and receivables (a)	85,144	72,556
Financial Liabilities		
Financial liabilities measured at amortised cost	17,024	19,397

(a) The amount of loans and receivables excludes GST recoverable from the ATO (statutory receivable).

(c) Financial Instrument Disclosures*Credit Risk, Liquidity Risk and Interest Rate Risk Exposures*

The following table details the exposure to liquidity risk and interest rate risk as at the balance sheet date. DEC's maximum exposure to credit risk at the balance sheet date is the carrying amount of the financial assets as shown on the following table. The table is based on information provided to senior management of DEC. The contractual maturity amounts in the table are representative of the undiscounted amounts at the balance sheet date. An adjustment for discounting has been made where material.

DEC does not hold any collateral as security or other credit enhancements relating to the financial assets it holds.

DEC does not hold any financial assets that had to have their terms renegotiated that would have otherwise resulted in them being past due or impaired.

	Weighted Average Effective Interest Rate %	Variable Interest Rate \$000	Non Interest Bearing \$000	Contractual Maturity Dates:						Adjust- ment for discounting	Carrying Amount
				Within 1 year	1–2 Years	2–3 Years	3–4 Years	4–5 Years	More than 5 Years		
2008											
<i>Financial Assets</i>											
Cash and cash equivalents	6.909	69,200	0	0	0	0	0	0	0	0	69,200
Restricted cash and cash equivalents	6.909	1,448	0	0	0	0	0	0	0	0	1,448
Receivables (a)		0	16,001	0	0	0	0	0	0	0	16,001
Amounts receivable for services		0	69,143	0	0	0	0	0	0	0	69,143
		70,648	85,144	0	0	0	0	0	0	0	155,792
<i>Financial Liabilities</i>											
Payables		0	17,024	0	0	0	0	0	0	0	17,024
		0	17,024	0	0	0	0	0	0	0	17,024

	Weighted Average Effective Interest Rate %	Variable Interest Rate \$000	Non Interest Bearing \$000	Contractual Maturity Dates:						Adjust- ment for discounting	Carrying Amount
				Within 1 year	1–2 Years	2–3 Years	3–4 Years	4–5 Years	More than 5 Years		
2007											
<i>Financial Assets</i>											
Cash and cash equivalents	6.021	68,833	0	0	0	0	0	0	0	0	68,833
Restricted cash and cash equivalents	6.021	925	0	0	0	0	0	0	0	0	925
Receivables (a)		0	14,646	0	0	0	0	0	0	0	14,646
Amounts receivable for services		0	57,910	0	0	0	0	0	0	0	57,910
		69,758	72,556	0	0	0	0	0	0	0	142,314
<i>Financial Liabilities</i>											
Payables		0	19,397	0	0	0	0	0	0	0	19,397
		0	19,397	0	0	0	0	0	0	0	19,397

The amounts disclosed are the contractual undiscounted cash flows of each class of financial liabilities.

(a) The amount of receivables exclude GST recoverable from the ATO (statutory receivable).

Interest rate sensitivity analysis

The following table represents a summary of the interest rate sensitivity of DEC's financial assets and liabilities at the balance sheet date on the surplus for the period and equity for a 1 per cent change in interest rates. It is assumed that the change in interest rates is held constant throughout the reporting period.

	Carrying amount \$000	-1% change		+1% change	
		Profit \$000	Equity \$000	Profit \$000	Equity \$000
2008					
<i>Financial Assets</i>					
Cash and cash equivalents	69,200	(692)	(692)	692	692
Restricted cash and cash equivalents	1,448	(15)	(15)	15	15
Total Increase/(Decrease)		(707)	(707)	707	707
	Carrying amount \$000	-1% change		+1% change	
		Profit \$000	Equity \$000	Profit \$000	Equity \$000
2007					
<i>Financial Assets</i>					
Cash and cash equivalents	68,833	(688)	(688)	688	688
Restricted cash and cash equivalents	925	(9)	(9)	9	9
Total Increase/(Decrease)		(697)	(697)	697	697

Fair Values

All financial assets and liabilities recognised in the balance sheet, whether they are carried at cost or fair value, are recognised at amounts that represent a reasonable approximation of fair value unless otherwise stated in the applicable notes.

35. Remuneration of senior officers

Remuneration

The number of senior officers, whose total of fees, salaries, superannuation, non-monetary benefits and other benefits for the financial year, fall within the following bands are:

\$	2008	2007	2008	2007
	Number	Number	\$'000	\$'000
90,000–100,000	1	0		
100,001–110,000	1	0		
110,001–120,000	0	1		
120,001–130,000	3	1		
130,001–140,000	5	6		
140,001–150,000	2	1		
150,001–160,000	1	3		
160,001–170,000	1	0		
180,001–190,000	1	0		
330,001–340,000	0	1		
340,001–350,000	1	0		
			2,390	1,995

The total remuneration of senior officers is:

The total remuneration includes the superannuation expense incurred by DEC in respect of senior officers. Three senior officers are members of the Pension Scheme.

	2008	2007
	\$'000	\$'000

36. Remuneration of Auditor

Remuneration payable to the Auditor General for the financial year is as follows:

Auditing the accounts, financial statements and performance indicators	125	125
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The expense is included at note 6 'Supplies and services'.

37. Affiliated bodies

The Environmental Protection Authority, Conservation Commission and Marine Parks and Reserves Authority are government affiliated bodies that received administrative support from DEC, they are not subject to operational control by DEC.

Environmental Protection Authority	1,073	776
Conservation Commission	831	762
Marine Parks and Reserves Authority	201	199
	<u>2,105</u>	<u>1,737</u>

38. Special Purpose Accounts

Special Purpose Account section 16 1(b) of FMA

Nature Conservation and National Parks Trust Account

The purpose of the trust account is for scientific research relating to flora and fauna.

Balance at the start of the year	1,053	977
Receipts	422	252
Payments	(125)	(176)
Balance at the end of the year	<u>1,350</u>	<u>1,053</u>

Waste Management and Recycling Account

The purpose of the trust account is to: encourage the conservation of resources and energy through waste reduction and recycling; to promote, support and encourage viable alternatives to landfill disposal of waste; to encourage applied research and the development of appropriate waste management, waste reduction and recycling infrastructure and markets. The fund will be used to fund nominated programs and other waste management initiatives established by the Minister for the Environment and Climate Change on the advice of the Waste Management Board.

Balance at the start of the year	7,072	4,535
Receipts	12,857	9,869
Payments	(8,459)	(7,332)
Balance at the end of the year	<u>11,470</u>	<u>7,072</u>

	2008 \$'000	2007 \$'000
Contaminated Sites Management Account		
<p>The purpose of the trust account is to enable investigation or remediation of any site where the State or a public authority (excluding Local Government) is responsible for remediation. The account also funds DEC costs of investigation and ensuring compliance with notices.</p>		
Balance at the start of the year	3,847	0
Receipts	302	3,892
Payments	(952)	(45)
Balance at the end of the year	3,197	3,847
39. Supplementary financial information		
Write-offs		
<p>During the financial year \$48,707.37 was written off as bad debts and \$7,140.75 was written off DEC's asset register, under the authority of:</p>		
The Accountable Authority	56	36
The Minister	0	0
Executive Council	0	0
	56	36
40. Administered expenses and income		
Expenses		
Receipts paid into Consolidated Fund	234	113
Total administered expenses	234	113
Income		
For transfer:		
Fauna licences	80	90
Revenue from regulatory fines	81	96
Total administered income	161	186
41 Administered assets and liabilities		
Current assets		
Cash assets	0	73
Total administered current assets	0	73
Current liabilities		
Payables	0	73
Total administered current liabilities	0	73

Certification of Key Performance Indicators

I hereby certify that the performance indicators are based on proper records, are relevant and appropriate for assisting users to assess the Department of Environment and Conservation's performance, and fairly represent the performance of the Department of Environment and Conservation for the financial year ended 30 June 2008.



Keiran McNamara
Accountable Authority
29 August 2008

Performance Indicators

Vision

A healthy, diverse and well-managed Western Australian environment.

Mission

Working with the community, we will ensure that Western Australia's environment is valued, protected and conserved, for its intrinsic value, and for the appreciation and benefit of present and future generations.

Funding objectives

Funding for the year was received in accordance with the following outcomes and services.

Outcome 1

Conservation and sustainable utilisation of biodiversity.

Service 1: Nature Conservation

The development and implementation of programs for the conservation of biodiversity (the variety of life forms: the different plants, animals and microorganisms, the genes they contain, and the ecosystems they form), including threatened species and ecological communities; sustainable use of commercially exploited species; the acquisition, conservation and protection of representative ecosystems; and encouraging public awareness, understanding and support for nature conservation.

Service 2: Sustainable Forest Management

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

Outcome 2

Community enjoyment of park facilities and services, wildlife and the natural environment displayed in parks.

Service 3: Parks and Visitor Services

Management of land and waters, dealing with public involvement, visitation and appreciation of the natural environment on lands and waters managed by the department, including preparing and implementing management and recreation site development plans; providing, managing and maintaining appropriate access, recreation opportunities and visitor facilities; protecting natural areas, visitors and facilities from wildfire; training departmental staff and volunteers; working with local tourist bureaus and commercial tour operators; involving Indigenous people in park management and 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 and provision of services to, and performance of statutory functions by the Conservation Commission of Western Australia.

Outcome 3

Emissions and discharges meet acceptable criteria.

Service 4: Environmental Regulation

Regulate emissions and discharges to the environment and the transport of hazardous wastes. Regulate the investigation, classifications and management of contaminated sites. Monitor ambient air quality and develop air quality management plans for priority air sheds (the air canopy surrounding population centres, industrial and other facilities, within which the impacts of air pollutants need to be considered from health and environmental viewpoints).

Outcome 4

Adoption of environmentally sustainable practices to protect, manage and restore the State's natural resources.

Service 5: Environmental Sustainability

Develop and implement policies and strategies that promote environmentally sustainable practices in industry, government and the community.

Service 6: Environmental Impact Assessment and Policies for the Environmental Protection Authority

Manage the environmental impact assessment process and coordinate the development of policy for the Environmental Protection Authority to enable sound environmental advice to be provided to the Government, developers and the public in accordance with statutory functions.

Service 7: Coordinate the Response to Climate Change

To provide 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.

Outcomes and Key Effectiveness Indicators

Outcome: Conservation and sustainable utilisation of biodiversity.

	2007-08 Target	2007-08 Actual	Variation
Total number of listed threatened taxa and ecological communities	697	698	1
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	0	0	0
Proportion of critically endangered and endangered taxa and ecological communities that have a recovery plan ^(b)	55.2%	52.4%	(2.8%)
Proportion of terrestrial sub-bioregions with greater than 15% reservation	20.4%	20.4%	0
Proportion of marine bioregions with marine conservation reserves ^(c)	42.1%	36.8%	(5.3%)

Note to the indicator: (a) Two taxa were removed from the list due to taxonomic clarification. Two taxa deemed no longer threatened. (b) A number of draft recovery plans not endorsed by the end of the year. (c) Walpole and Nornalup Inlets Marine Park was not created when expected.

Percentage of Forest Management Plan performance indicators where defined annual targets are met

The department aims to achieve a high level of compliance with standards for management of forests

	2007-08 Target	2007-08 Actual	Variation
	75%	80%	5%

Outcome: Community enjoyment of park facilities and services, wildlife and the natural environment displayed in parks.

Average level of visitor satisfaction with their visit

The average level of customer satisfaction with their visit is a key indicator of the department's effectiveness in delivering parks and other natural areas that allow the community to understand, enjoy and appreciate the natural environment. Visitor satisfaction levels are consistently high.

	2007-08 Target	2007-08 Actual	Variation
	85%	89.7%	4.7%

Park visitation (annual number of visits)

	2007-08 Target	2007-08 Actual	Variation
	12.01	12.56	0.55

Note to the indicator: The annual number of visits is measured in millions.

Annual percentage change in park visitation

	2007-08 Target	2007-08 Actual	Variation
	-0.4%	4.2%	4.6%

Note to the indicator: The anticipated reduction in visitor numbers due to increased fuel costs did not eventuate.

Outcome: Emissions and discharges meet acceptable criteria.

Number of exceedances of approved environment criteria by regulated activities

The number of exceedances of approved environment criteria is a key indicator of the department's effectiveness in setting and monitoring environmental standards.

	2007-08 Target	2007-08 Actual	Variation
	110	53	(57)

Note to the indicator: The variance between the target and actual exceedances is due to improved industry practice and setting of licence limits as industry licences are reviewed and made consistent with licensing policy.

Number of air National Environment Protection Measure (NEPM) exceedances per annum of criteria pollutants

The monitoring of air quality for criteria pollutants against national health standards and goals specified under the National Environment Protection Measure (NEPM) for air quality is a vital tool to enable the effective monitoring and management of emissions and discharges to air sheds. Monitoring of air quality against criteria pollutants enables the assessment of compliance with NEPM standards and goals set to protect human health, the effectiveness of long term air quality management strategies and tools to be evaluated, effectiveness of industry emission controls and management strategies to be evaluated and reporting on the State of the Environment.

	2007-08 Target	2007-08 Actual	Variation
	11	12	1

Outcome: Adoption of environmentally sustainable practices to protect, manage and restore the State's natural resources.

Percentage of waste in the metropolitan area diverted from landfill through recycling

Developing strategies to reduce and recycle the volume of waste produced remains a significant challenge. Diverting waste that is currently being disposed of via landfill to recycling is an important component of reducing the impact of waste on our environment.

	2007-08 Target	2007-08 Actual	Variation
	24.8%	40.7%	15.9%

Note to the indicator: Under the previous Resource Recovery Rebate Scheme, auditing of returns was so rigorous that reporting was reduced. Councils now report on a more comprehensive basis.

Number of approved projects with environmental impacts significantly exceeding those assessed

The number of projects with impacts significantly exceeding those assessed is a key indicator for the community.

	2007-08 Target	2007-08 Actual	Variation
	0	0	0

Percentage of Low Emissions Energy Development Fund milestones achieved within the targeted timeframe

	2007-08 Target	2007-08 Actual	Variation
	100%	100%	0

Key Efficiency Indicators

Service 1: Nature Conservation

Average cost per hectare of managing wildlife habitat

The cost per hectare of wildlife habitat management is an indirect indicator for the department's efficiency in delivering nature conservation. Increases in the indicator generally reflect increases in funding.

	2007–08 Target	2007–08 Actual	Variation
	\$3.51	\$4.16	\$0.65

Note to the indicator: Higher expenditure relative to increase in area managed is due mainly to increases in the level of grants and other contributions.

Service 2: Sustainable Forest Management

Average cost per hectare of managing State forest and timber reserves

The figure used is the accrual basis average gross cost per hectare of managing State forest and timber reserves in accordance with the relevant management plan. The area managed is less than the area gazetted State forest and timber reserve because areas of State forest and timber reserve proposed to become part of the formal conservation reserve system in the Forest Management Plan 2004–2013 are being managed as if the land category change had already occurred.

	2007–08 Target	2007–08 Actual	Variation
	\$28.26	\$31.24	\$2.98

Note to the indicator: The increase was due to large fire suppression costs on State forest.

Service 3 Parks and Visitor Services

Cost per visit

The cost per visit is affected by changes in both visitor numbers and levels of funding for park management.

	2007–08 Target	2007–08 Actual	Variation
	\$5.08	\$5.72	\$0.64

Note to the indicator: The increase was primarily due to increased fire expenditure and rising fleet costs.

Service 4: Environmental regulation

Average cost per air monitoring station

The monitoring of air quality for criteria pollutants against national health standards and goals specified under the National Environment Protection Measure (NEPM) for air quality is a vital tool to enable the effective monitoring and management of emissions and discharges to air sheds. Monitoring of air quality against criteria pollutants enables assessment of compliance with NEPM standards and goals set to protect human health, the effectiveness of long term air quality management strategies and tools to be evaluated, effectiveness of industry emission controls and management strategies to be evaluated and reporting on the State of the Environment.

	2007-08 Target	2007-08 Actual	Variation
	\$403,222	\$563,709	\$160,487

Note to the indicator: There were 13.7 monitoring stations fully operational for 2007-08 compared to the planned 18 monitoring stations in the 2007-08 target.

Average cost per industry licence

The department increased the level of resourcing applied to the management of regulation of discharges to the environment. The increased resource level to achieve improved performance outcomes will result in increase costs per licence.

	2007-08 Target	2007-08 Actual	Variation
	\$17,725	\$19,323	\$1,598

Note to the indicator: There was a decrease in the number of licensed premises as low-risk industries moved to registration.

Average cost per contaminated site assessment

This indicator is affected by the number of contaminated site assessments carried out each year.

	2007-08 Target	2007-08 Actual	Variation
	\$4,687	\$6,066	\$1,379

Note to the indicator: There were fewer reports submitted than estimated which impacted on the unit cost.

Average cost of remediating State sites

This indicator reflects average costs in remediating State contaminated sites. Costs can be affected by a range of variables but mainly reflect the extent of contamination on sites.

	2007-08 Target	2007-08 Actual	Variation
	\$1,506,480	\$316,000	(\$1,190,480)

Note to the indicator: Three sites required remediation.

Service 5: Environmental sustainability

Cost of administering Waste Management and Recycling Account as a percentage of total funds

The Waste Management and Recycling Account includes programs which provide grants to a range of waste reduction and recycling activities. Managing the administration costs associated with the fund is important to ensure that maximum levels of funding are available for waste reduction and recycling initiatives.

	2007-08 Target	2007-08 Actual	Variation
	11.5%	13.1%	1.6%

Note to the indicator: Despite economies of scale from higher overall turnover, administration expenses were higher as the non-recurring costs of supporting the passage of the Waste Avoidance and Resource Recovery Act were recognised as an administration cost in 2007-08. Had that particular cost been excluded, the percentage would have been 11%.

Service 6: Environmental impact assessment and policies for the Environmental Protection Authority

Cost per environmental assessment

The cost per environmental assessment largely reflects the number of significant development proposals considered each year.

	2007-08 Target	2007-08 Actual	Variation
	\$31,719	\$32,549	\$830

Cost per environmental policy developed

This indicator is an indirect measure of efficiency and is largely impacted by the number of environmental policies developed.

	2007-08 Target	2007-08 Actual	Variation
	\$433,857	\$185,500	(\$248,357)

Note to indicator: More than double the number of policies were developed which led to the significant decrease in the unit cost.

Service 7: Coordinate the response to climate change

Cost of administering Low Emissions Energy Development Fund as a percentage of total funds

	2007-08 Target	2007-08 Actual	Variation
	0.55%	0.25%	(0.30%)

4.3 MINISTERIAL DIRECTIVES

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No Ministerial directives were received during the financial year.

4.4.1 Pricing policies of services provided

The department is largely funded by appropriations, however, fees are charged for a range of goods, services and licensing arrangements where government has determined that full or partial cost recovery is appropriate. Fees are determined in accordance with guidelines on 'Costing and Pricing Government Services' published by the Department of Treasury and Finance. Fees are appropriately set and reasonably relate to the cost of providing the goods or services. Fees are reviewed on an annual basis.

4.4.2 Major capital projects

The department's planned capital works program of \$36.6 million for 2007–08 provided funds for tourism roads and park facilities, plant and equipment, conservation estate land purchase, fire fighting fleet replacement, and buildings and other works.

Table 21: Summary of major capital works 2007–08

Details of major capital projects undertaken			
Works in progress	Expected year of completion	Estimated expenditure remaining \$'000	Estimated total project cost \$'000
Biodiversity Conservation Science Centre and Herbarium – Stage 1	2009–10	23,630	29,390
Ord new parks infrastructure	2010–11	995	1,000
Denham office – new accommodation	2009–10	812	935
Dirk Hartog Island pastoral lease acquisition	2008–09	300	300
Improvements to aerial fire management facilities	2008–09	100	100
Walpole Wilderness Discovery Centre	2008–09	254	1,000
Ningaloo Marine Park capital works	2008–09	120	2,834
Perth Observatory new telescope building	2008–09	152	290
Recurring capital programs	Expected year of completion		2007–08 Expenditure
Conservation land acquisition	Ongoing		1,806
Fire fighting fleet and equipment	Ongoing		5,231
Plant and equipment purchase and replacement	Ongoing		7,748
Tourism road improvements	Ongoing		2,502
Gnangara Park development	Ongoing		257
Parks improvement program (excluding works detailed above)	Ongoing		10,002

4.4.3 Employment and industrial relations

Table 22: Staff profile 2007–08

	FTE	Head count
Full-time permanent	1,371.00	1,371
Full-time contract	493.00	493
Part-time measured by FTE	123.22	210
On secondment	13.40	14
Total	2,000.62	2,088

Note: The figures include DEC employees deployed to the Swan River Trust and Keep Australia Beautiful Council.

Staff development

During 2007–08, employees were offered more than 100 internally and externally run training programs in the areas of field operations, safety and health, nature conservation, marine and fire operations, cultural development, compliance, regulation licensing and corporate training.

All staff were offered the opportunity to pursue postgraduate and undergraduate studies. DEC personnel were also provided with opportunities to participate in on-the-job training, job rotation, transfers and acting positions to provide additional development opportunities.

Graduate recruits, DEC Indigenous trainees and Conservation Employees have targeted programs that are offered to provide specific learning opportunities. Twenty-three graduate recruits graduated this year after attending up to three months of structured training during their first two years of employment with DEC.

Ten Indigenous trainees graduated from a Certificate II, III or IV in Conservation and Land Management as part of the Mentored Aboriginal Training and Employment Scheme (MATES). A number of Conservation Employees, through self-directed learning, are also being helped through studies in Conservation and Land Management.

Workers compensation

The department recognises there is a direct relationship between occupational safety and health and workers' compensation and injury management. If there is an increase in the number or severity of incidents then there are automatically increased costs. Equally relevant is the strong link between a safe and healthy workplace and performance. Although the major objective is caring for employees and looking after their safety and health, it also translates into a return on investment by implementing an effective workers' compensation and injury management system and related procedures to minimise premium and associated costs.

In 2007–08 DEC's workers' compensation contribution was \$860,670 compared with \$839,144 for the previous year. The number of lost time injuries in 2007–08 was 28 (up from 14 in 2006–07) with 93 medical treatment injuries (up from 71 in 2006–07).

Contracts with senior officers

At the date of reporting, senior officers of the department held no contracts with the department other than normal employment contracts. No senior officers of the department had substantial interests in entities with existing or proposed contracts or agreements with the department.

4.6.1 The *Electoral Act 1907* – Section 175ZE

In accordance with Section 175ZE of the *Western Australian Electoral Act 1907*, the Department of Environment and Conservation incurred the following expenditures in advertising, market research, polling, direct mail and media advertising.

Total expenditure for 2007–08 was \$2,297,928.78.

Expenditure was incurred in the following areas:

Advertising Agencies	\$237,755.82	
Cooch Creative Pty Ltd		\$2,446.40,
Macwrite Publicity Services		\$2,541.00,
Marketforce Communications		\$172,860.50,
Sauce Films Pty Ltd		\$59,907.92,
Direct mail organisations	Nil	Nil
Market research organisations	\$98,450.00	
Patterson Market Research		\$14,520.00,
Synovate		\$83,930.00,
Media advertising organisations	\$1,961,722.96,	
Australia's Golden Outback		\$1,955.00,
Australia's South West		\$4,145.00,
Britel Enterprises Pty Ltd		\$2,040.10,
Community Newspaper Group		\$3,294.84,
Denmark Bulletin		\$3,028.00,
Email Media		\$2,895.45,
Hallmark Editions Pty Ltd		\$10,021.00,
Market Creations		\$11,303.01,
Marketforce Express		\$638,454.19,
Media Decisions		\$1,259,167.81,
MRG International		\$2,750.00,
Penguin & Seal Island Cruises		\$14,347.54,
State Law Publisher		\$4,555.02,
Walpole Community Resource Telecentre		\$3,766.00,
Polling organisations	Nil	Nil

4.6.2 Disability Access and Inclusion Plan outcomes

The department launched its new Disability Access and Inclusion Plan 2007–12 which details what DEC will be doing to improve access, facilities and services to ensure they meet the needs of the public and staff with disabilities. The plan was widely distributed and promoted in the community and in DEC and seminars and workshops were held for employees to inform them about the plan and disability awareness.

DEC is a leading proponent of the Universal Access philosophy which is based on the fundamental principles of equal opportunity and equity. DEC's policy on access seeks to ensure that everyone in the community, including older people and people with disabilities, can gain access to, use and enjoy the facilities, services and programs provided by the department.

DEC is participating in the "You're Welcome" access initiative which provides members of the community, including people with disabilities, clear access to information about DEC facilities. DEC has surveyed most of the 169 recreational sites in the Swan Region that could provide accessibility for wheelchairs and collected data about the facilities and services at the sites. The width of doorways, heights of pedestals and sinks, manoeuvrability within toilet facilities, car parks and the steepness of ramps and firmness of surfaces has been checked.

DEC was recognised by the Disability Services Commission as a participant in the Companion Card initiative which allows people with a profound disability who require attendant care to be able to visit DEC's sites and have free admission for their companion.

DEC continues the practice of providing documentation to staff and the community, upon request, in alternative formats such as audio and large print. The department is in the process of undertaking a review of its complaints policy to ensure procedures are accessible for people with disabilities. It also continues the practice of emailing disability employment agencies details of all advertised vacancies with the aim of increasing the recruitment of people with a disability.

Some of the access improvement works undertaken during the year included:

- New toilets, change rooms and access paths to Cabaret Cave in Yanchep National Park.
- New visitor facilities along a scenic drive in Lesueur National Park that provide better access to the spectacular views in the park.
- Improved landscape works at Hamelin Bay in Leeuwin-Naturaliste National Park that provide a more stable foreshore and better visitor facilities to enjoy views over the ocean.
- A new jetty viewing over Yeagarup Lake so that more people can experience the lake without undue damage to the natural environment of the lake edges.
- Improved walk track up Mount Frankland in Frankland National Park, providing a better walking surface, seats and rest points along the way.
- Works continue on the Cape to Cape Walk Track in Leeuwin-Naturaliste National Park. The track has been designed to ensure more people can enjoy the experience. The "Access for More" track is wider, has even gradients and is sealed, with new boardwalks (at locations to protect fragile areas), seats, signs and lookouts at strategic locations.

4.6.3 Equal employment opportunity and diversity management outcomes

The department launched its new Equity and Diversity Management Plan 2007–12. The plan aims to achieve a corporate culture that embraces and values a diverse workforce and an inclusive environment that is free from discrimination and harassment. The plan was developed by the Equity and Diversity Management Committee which also oversees the implementation of the plan including monitoring, reporting on progress and keeping up-to-date on equity and diversity issues. The committee consists of 12 members from various divisions of the department.

Some of the noteworthy initiatives and achievements carried out this year included:

- The graduation of seven MATES trainees in Certificate IV, nine in Certificate III and six in Certificate II of Conservation and Land Management.
- A Women in Management project started with aims to develop and implement strategies to encourage attraction, appointment and retention of women in senior management positions.
- The development of a Reconciliation Action Plan which focuses on the steps DEC is making towards building relationships and encouraging respect and opportunity for Indigenous people.
- Refresher training for all Good Working Relations Contact Officers in the department's grievance resolution procedure.
- Code of Conduct awareness raising sessions for employees and volunteers.
- Cross cultural awareness training for employees.
- International Women's Day was celebrated through participation in a breakfast run by the Equal Opportunity Commission and the profiling of DEC women in various internal and external media.
- Harmony week was celebrated with various lunchtime activities for staff.

- Resurveying of all employees to update their Equal Employment opportunity data.
- Ongoing training of employees in workplace discrimination and sexual harassment using online training for all Good Working Relations Contact Officers, Peer Supporters and Occupational Safety and Health representatives.
- The sponsorship of DEC women to attend Women in Leadership forums and workshops.
- Promotion of work and life balance to employees through guidelines and awareness raising sessions.
- Ongoing targeted recruitment such as advertising in disability, international and Indigenous media.
- Increasing the number of school-based trainees.

4.6.4 Compliance with Public Sector Standards and Ethical Codes

Table 24: Office of the Public Sector Standard Commissioner reporting under s31 of the *Public Sector Management Act 1994* for 2007–08

Compliance Issue	Significant action taken to monitor and ensure compliance
<p>Public Sector Standards (PSS)</p> <p>Four breach claims were lodged in 2007–08.</p> <p>Two breach claims were against the Recruitment, Selection and Appointment Standard. No breach of PSS was found.</p> <p>One was against the Transfer Standard. No breach of PSS was found.</p> <p>One was against the Temporary Deployment Standard. No breach of PSS was found.</p>	<ul style="list-style-type: none"> • The department’s People Services Branch intranet site has information on the Public Sector Standards including a hyper link to the Office of Public Sector Standards Commissioner’s (OPSSC) internet site. • The department made direct contact with Regional Managers when advised that the OPSSC was having a PSS awareness raising workshop in their region. This was followed by a general email broadcast to all personnel. • Ongoing training is provided to grievance officers and officers required to participate on recruitment panels to ensure that relevant PSS are complied with. • Management Audit has completed an internal audit of the department’s compliance with the PSS and its opinion was: <i>“Management Audit is of the opinion that the department has taken appropriate action to ensure compliance with the Public Sector Standards”</i>.
<p>WA Code of Ethics</p> <p>There were no reports of non compliance with the WA Code of Ethics.</p>	<ul style="list-style-type: none"> • The department has incorporated WA Code of Ethics reference in the revised Code of Conduct including a hyper link to the OPSSC internet site for <i>“Western Australia Public Sector Code of Ethics”</i>.
<p>Department’s Code of Conduct</p> <p>Two allegations raised in 2006–07 were carried into 2007–08.</p> <p>Three allegations of breaches of the Code of Conduct were raised in 2007–08.</p>	<ul style="list-style-type: none"> • The two alleged breaches from 2006–07 have been cleared with both officers resigning in 2007–08. • One of the three alleged breaches has been investigated and the officer was cleared of any misconduct. • The other two have been carried over to 2008–09. • The Code of Conduct is included in the department’s induction package and is available on the People Services Branch intranet site. • The department’s Code of Conduct has been amended to incorporate the revised WA Code of Ethics and employee declarations.

4.6.5 Recordkeeping plans

During 2007–08 the department’s new Recordkeeping Plan (RKP2007087) was cleared by the State Records Commission.

4.7.1 Corruption prevention

The department is continuing to promote its Code of Conduct. Seminars on acting ethically and appropriately are planned for the executive and managers and the requirement of the Code of Conduct forms part of the new induction program for new staff. A communication strategy involving People Services staff visiting major locations to provide information and respond to questions is planned.

Staff are reminded of the Code of Conduct and its specific requirements at staff meetings and workshops and through broadcast emails.

During the year, the Premier's Circular 2007–09: 'Contact with Lobbyists Code and the Register of Lobbyists' was issued. The requirements of the policy have been incorporated into the department's Code of Conduct and all staff have been advised of the requirements.

4.7.2 Substantive equality

During 2007–08, progress was made towards implementing the Government's *Policy Framework for Substantive Equality*.

Requirements to meet Level 1 outcomes described in the policy have been partly completed, including adopting a draft implementation plan and establishing governance structures to support the process across the agency. DEC has also started embedding the principles of the policy framework into relevant operational policies.

The department started a review of the processes involved in producing management plans for national parks, marine parks, State forest and other lands managed by DEC. This included a review of community consultation strategies and processes. The visitor survey program also piloted a new visitor satisfaction survey that includes a question on ethnicity. The new survey will be distributed in 2008–09.

The preliminary findings from the review could also be applied to other areas in DEC.

4.7.3 Sustainability

The DEC Corporate Plan and agency business plans include a focus on sustainability in respect of policies, regulations, practices and initiatives implemented in government, industry and the community. DEC liaises and consults extensively with key stakeholders in carrying out its statutory, advisory and service delivery roles. It works closely with other State agencies and local government on a diverse range of matters in helping to advance the State Sustainability Strategy.

The DECrease Project Committee, comprised of representatives from across agency functional areas of the department, was established in April 2008 to ensure a stronger emphasis throughout the department on the identification, promotion and adoption of sustainable workplace and field practices. It is addressing energy, water and waste management issues, transport and travel strategies, procurement and any other matters with a view to enhancing ecological outcomes and reducing carbon emissions and negative environmental impacts.

4.7.4 Occupational safety and health and injury management

The department is committed to providing a safe and hygienic working environment for its employees and helping injured workers to return to work as soon as medically appropriate.

The importance of incident prevention is recognised as the major contributor to a safe and healthy working environment. This approach, in conjunction with an effective injury management system, contributes to our overall strategy.

Occupational safety and health team leaders and committees have been established across the State to coordinate and assist in all matters relating to the safety and

health of workers and to monitor compliance with the relevant occupational safety and health legislation and the department's systems and procedures.

Table 25: Occupational safety and health performance indicators

	2006-07	2007-08
Fatalities	0	*1
** Lost time injury (LTI) frequency rate	4	7
Average days lost (per LTI)	12	16

* Death of a worker in a mid-air light aircraft collision in Kennedy Range National Park on 13 February 2008. The collision is the subject of an investigation by the Australian Transport Safety Bureau.

** Lost time injury frequency rate has been calculated using an Australian Standards formula, based on the total number of incidents for the 12-month period, multiplied by 1,000,000 and divided by the total number of hours worked in that period.

Metropolitan locations

Atrium

– Director General and
Environmental Services Divisions
168 St Georges Terrace, Perth

Postal address
Locked Bag 104
Bentley Delivery Centre WA 6983

Phone (08) 6467 5000
Fax (08) 6467 5562

Crawley

– Parks and Conservation Services
Divisions: Executive
Australia II Drive, Crawley

Postal address
Locked Bag 104
Bentley Delivery Centre WA 6983

Phone (08) 9442 0300
Fax (08) 9386 1578

Kensington

17 Dick Perry Avenue, Kensington

Postal address
Locked Bag 104
Bentley Delivery Centre WA 6983

Phone (08) 9219 8000
Fax (08) 9334 0498

– Forest Management Branch
7 Turner Avenue, Bentley

Postal address
PO Box 1167
Bentley Delivery Centre WA 6983

Phone (08) 9368 4399
Fax (08) 9423 2901

– WA Herbarium
George Street, Kensington

Postal address
Locked Bag 104
Bentley Delivery Centre WA 6983

Phone (08) 9334 0500
Fax (08) 9334 0515

Booragoon

Cnr Davey St and Marmion St, Booragoon

Postal address
Locked Bag 104
Bentley Delivery Centre WA 6983

Phone (08) 9333 7400

Strategic Development and Corporate Affairs

Cygnets Hall, Corner Stirling Highway
and Mounts Bay Road, Crawley

Postal address
Locked Bag 104
Bentley Delivery Centre WA 6983

Phone (08) 9389 8644
Fax (08) 9389 8296

Regional Parks

Level 1, 4–6 Short Street, Fremantle

Postal address
PO Box 1535
Fremantle WA 6959

Phone (08) 9431 6500
Fax (08) 9431 6599

Marine Policy and Planning Branch

Suite 3, Level 3, Queensgate Building
10 William Street
Fremantle WA 6160

Phone (08) 9336 0100 Fax
(08) 9430 5408

Woodvale Research

Wildlife Place
(Ocean Reef Road), Woodvale

Postal address
PO Box 51
Wanneroo WA 6946

Phone (08) 9405 5100
Fax (08) 9306 1641

Perth Observatory

337 Walnut Road
Bickley WA 6076

Phone (08) 9293 8255
Fax (08) 9293 8138

Goldfields Region

Kalgoorlie (regional headquarters)32
Brookman Street, Kalgoorlie

Postal address

PO Box 10173
Kalgoorlie WA 6433

Phone (08) 9080 5555
Fax (08) 9021 7831

Kimberley Region

Kununurra (regional headquarters)
Lot 248 Ivanhoe Road, Kununurra

Postal address

PO Box 942
Kununurra WA 6743

Phone (08) 9168 4200
Fax (08) 9168 2179

Broome Work Centre

111 Herbert Street, Broome

Postal address

PO Box 65
Broome WA 6725

Phone (08) 9195 5500
Fax (08) 9193 5027

– Derby Work Zone

Senior Ranger Residence

Postal address

PO Box 694
Derby WA 6728

Phone (08) 9193 1411
Fax (08) 9193 1415

– Fitzroy Crossing Work Zone

180 Emanuel Way, Fitzroy Crossing

Postal address

PO Box 37
Fitzroy Crossing WA 6765

Phone (08) 9191 5121
Fax (08) 9191 5165

Midwest Region

Geraldton (regional headquarters)1st
Floor, The Foreshore Centre
201 Foreshore Drive, Geraldton

Postal address

PO Box 72
Geraldton WA 6531

Phone (08) 9921 5955
Fax (08) 9921 5713

– Casablanca Complex

81 Forrest Street, Geraldton

Postal address

PO Box 72
Geraldton WA 6531

Phone (08) 9920 7500 Fax
(08) 9964 5983

Shark Bay District

89 Knight Terrace
Denham WA 6537

Phone (08) 9948 1208
Fax (08) 9948 1024

– Carnarvon Work Centre

211 Robinson Street, Carnarvon

Postal address

PO Box 500
Carnarvon WA 6701

Phone (08) 9941 3754
Fax (08) 9941 1801

Moora District

Lot 124 Bashford Street, Jurien Bay

Postal address

PO Box 638
Jurien Bay WA 6516

Phone (08) 9652 1911
Fax (08) 9652 1922

– Cervantes Work Centre

Bradley Loop, Light Industrial Area,
Cervantes

Postal address

PO Box 62
Cervantes WA 6511

Phone (08) 9652 7043
Fax (08) 9652 7340

Pilbara Region

Karratha (regional headquarters)Lot
3, Anderson Road
Karratha Industrial Estate, Karratha

Postal address

PO Box 835
Karratha WA 6714

Phone (08) 9143 1488
Fax (08) 9144 1118

Exmouth District

20 Nimitz Street, Exmouth

Postal address

PO Box 201
Exmouth WA 6707

Phone (08) 9947 8000
Fax (08) 9947 8050

South Coast Region

Albany (regional headquarters)120

Albany Highway
Albany WA 6330

Phone (08) 9842 4500
Fax (08) 9841 3329, (08) 9841 7105

– Ravensthorpe Office

Tourist Bureau Building
Lot 13, Morgan Street, Ravensthorpe

Postal address

PO Box 307
Ravensthorpe WA 6349

Phone (08) 9838 1967
Fax (08) 9838 1965

Esperance District

92 Dempster Street, Esperance

Postal address

PO Box 234
Esperance WA 6450

Phone (08) 9083 2100
Fax (08) 9071 3657

South West Region

Bunbury (regional headquarters) South West Highway, Bunbury

Postal address

PO Box 1693
Bunbury WA 6231

Phone (08) 9725 4300
Fax (08) 9725 4351

Blackwood District

14 Queen Street
Bunbury WA 6280

Phone (08) 9752 5555
Fax (08) 9752 1432

– Kirup Work Centre

South Western Highway, Kirup

Postal address

14 Queen Street Busselton WA 6280

Phone (08) 9731 6232
Fax (08) 9731 6366

– Nannup Work Centre

Warren Road, Nannup

Postal address

14 Queen Street
Busselton WA 6280

Phone (08) 9756 0211
Fax (08) 9756 0233

– Nannup Shop Front

Unit 2, 36 Warren Road, Nannup

Postal address

14 Queen Street
Busselton WA 6280

Phone (08) 9756 1101
Fax (08) 9756 1242

– Margaret River Work Centre

Bussell Highway, Margaret River

Postal address

14 Queen Street
Busselton WA 6280

Phone (08) 9780 5500
Fax (08) 9757 2930

Wellington District

147 Wittenoom Street, Collie

Postal address

PO Box 809
Collie WA 6225

Phone (08) 734 1988
Fax (08) 9734 4539

– Harvey Work Centre

64 Weir Road, Harvey

Postal address

PO Box 809
Collie WA 6225

Phone (08) 9729 1505
Fax (08) 9729 1868

Swan Region

Bentley (regional headquarters)

7 Turner Avenue, Technology Park

Postal address

PO Box 1167
Bentley Delivery Centre WA 6983

Phone (08) 9368 4399
Fax (08) 9423 2901

– Nearer to Nature

Perth Hills National Parks Centre

Allen Road
Mundaring WA 6073

Phone (08) 9295 2244
Fax (08) 9295 3247

Perth Hills District

51 Mundaring Weir Road

Mundaring WA 6073

Phone (08) 9295 9100
Fax (08) 9295 9101

– Dwellingup Work Centre

Banksiadale Road
Dwellingup WA 6213

Phone (08) 9538 1078
Fax (08) 9538 1203

– Jarrahdale Work Centre

398 George Street
Jarrahdale WA 6124

Phone (08) 9526 1209
Mobile 0427 449 267

Swan Coastal District

5 Dundobar Road
Wanneroo WA 6065

Postal address

PO Box 459
Wanneroo WA 6946

Phone (08) 9405 0700
Fax (08) 9405 0777

– Yanchep National Park

Yanchep National Park
Yanchep WA 6035

Phone (08) 9561 1004
Fax (08) 9561 2316

– Marine Parks Work Centre

Unit 1A/8 Calabrese Avenue, Wanneroo

Postal address

PO Box 459
Wanneroo WA 6946

Phone (08) 9206 4795
Fax (08) 9405 1460

– Mandurah Work Centre

423 Pinjarra Road, Mandurah

Postal address

PO Box 1266
Mandurah WA 6210

Phone (08) 9582 9333
Fax (08) 9582 9725

– Cockburn Sound Management Council

Shop 1, 15 Railway Terrace,
Rockingham Beach

Postal address

PO Box 5161
Rockingham Beach WA 6969

Phone (08) 9591 3837
Fax (08) 9528 5387

– **Kwinana Work Centre**
2 Stidworthy Court, Kwinana

Postal address
PO Box 454
Kwinana WA 6966

Phone (08) 9411 1777
Fax (08) 9419 5897

– **Peel Work Centre**
Peel Waterways Centre
Suite 6, 21 Sholl Street, Mandurah

Postal address
PO Box 332
Mandurah WA 6120

Phone (08) 9550 4222
Fax (08) 9581 4269

Warren Region

Manjimup (regional headquarters) Brain Street, Manjimup

Postal address
Locked Bag 2
Manjimup WA 6258

Phone (08) 9771 7988
Fax (08) 9771 2677

Donnelly District
Kennedy Street, Pemberton

Postal address
PO Box 20
Pemberton WA 6260

Phone (08) 9776 1207
Fax (08) 9776 1410

– **Manjimup Work Centre**
Brain Street, Manjimup

Postal address
PO Box 20
Pemberton WA 6260

Phone (08) 9771 7988
Fax (08) 9771 2677

Denmark Office
Suite 1, 59 Strickland Street, Denmark

Postal address
PO Box 353
Denmark WA 6333

Phone (08) 9848 1445
Fax (08) 9848 1419

Avon-Mortlock District
54 Fitzgerald Street, Northam

Postal address
PO Box 354
Northam WA 6401

Phone (08) 9622 8940
Fax (08) 9622 8947

Wheatbelt Region

Narrogin (regional headquarters)
7 Wald Street, Narrogin

Postal address
PO Box 100
Narrogin WA 6312

Phone (08) 9881 9222
Fax (08) 9881 3297

Great Southern District
Hough Street, Narrogin

Postal address
PO Box 100
Narrogin WA 6312

Phone (08) 9881 9200
Fax (08) 9881 1645

– **Katanning Work Centre**
56 Clive Street, Katanning

Postal address
PO Box 811
Katanning WA 6317

Phone (08) 9821 1296
Fax (08) 9821 2633

Yilgarn District
33 Bates Street, Merredin

Postal address
PO Box 332
Merredin WA 6415

Phone (08) 9041 2488
Fax (08) 9041 2454

AQMP	Air Quality Management Plan
AUSSI	Australian Sustainable Schools Initiative
BIF	Banded Ironstone Formation
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVA	Conservation Volunteers Australia
DEC	Department of Environment and Conservation
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FACET	WA Forum Advocating Cultural and Eco Tourism
FMP	Forest Management Plan 2004–2013
FPC	Forest Products Commission
IOCI	Indian Ocean Climate Initiative
KABC	Keep Australia Beautiful Council
MATES	Mentored Aboriginal Training and Employment Scheme
ML	Management Letter
MoU	Memorandum of Understanding
NEPM	National Environment Protection Measure
NPI	National Pollutant Inventory
NRM	Natural Resource Management
RCC	Roadside Conservation Committee
SoE	State of the Environment
TAFE	Technical and Further Education
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee
WA	Western Australia
WAHERB	Western Australian Herbarium database
WIN	Works Improvement Notice
WWF	World Wildlife Fund

The tables below list the status of plans approved or in preparation during 2007–08 and the area of each tenure category managed by DEC as at 30 June 2008.

Final management plans (completed and approved during 2007–08)	Region	Gazettal date
Shoalwater Islands Marine Park	Swan	30.10.07
Kennedy Range National Park and Proposed Additions	Midwest	02.05.08
Lake McLarty Nature Reserve	Swan	06.06.08

Final management plans (completed and approved as at 30 June 2008)	Region	Gazettal date
Mooradung Nature Reserve	Swan	21.02.86
Nature Reserves in the Shire of Wyalkatchem	Wheatbelt	21.02.86
Nature Reserves of the shires of York and Northam	Swan	10.07.87
Shannon National Park and D'Entrecasteaux National Park	Warren	08.01.88
Benger Swamp Nature Reserve	South West	12.02.88
Leeuwin-Naturaliste National Park	South West	21.04.89
Yanchep National Park	Swan	29.09.89
Waroona Reservoir and Catchment Area	South West	16.03.90
Logue Brook Reservoir and Catchment Area	South West	16.03.90
Cape Range National Park	Pilbara	23.03.90
Dampier Archipelago Nature Reserves	Pilbara	31.08.90
Lane Poole Reserve	Swan, South West	14.12.90
Fitzgerald River National Park	South Coast	19.07.91
South Coast Region	South Coast	13.03.92
Marmion Marine Park	Swan	15.05.92
Walpole-Nornalup National Park	Warren	03.07.92
Shoalwater Islands	Swan	20.10.92
Matilda Bay Reserve	Swan	21.05.93
John Forrest National Park	Swan	19.08.94
West Cape Howe National Park	South Coast	04.08.95
Yalgorup National Park	Swan	15.08.95
Lesueur National Park and Coomaloo Nature Reserve	Midwest	13.10.95
Purnululu National Park	Kimberley	05.03.96
Two Peoples Bay Nature Reserve	South Coast	07.06.96
Wanjarri Nature Reserve	Goldfields	02.07.96
Goldfields Region	Goldfields	09.08.96
Dryandra Woodland	Wheatbelt	09.08.96
Shark Bay Marine Reserves	Midwest	07.03.97
Canning River Regional Park	Swan	05.12.97
Nambung National Park and Wanagarren, Nilgen and Southern Beekeepers Nature Reserves	Midwest	11.09.98
Leschenault Peninsula	South West	08.01.99
Esperance Lakes Nature Reserves	South Coast	11.05.99
Karijini National Park	Pilbara	15.06.99
Stirling Range and Porongurup National Parks	South Coast	03.12.99
Swan Estuary Marine Park and Adjacent Nature Reserves	Swan	07.04.00
Jurabi and Bundegi Coastal Parks and Muiron Islands	Pilbara	25.08.00

Final management plans (completed and approved as at 30 June 2008)	Region	Gazettal date
Serpentine National Park	Swan	03.10.00
Shark Bay Terrestrial Reserves	Midwest	03.10.00
Rowles Lagoon Conservation Park and Clear and Muddy Lakes Nature Reserve	Goldfields	19.01.01
Yellagonga Regional Park	Swan	15.07.03
Carnac Island Nature Reserve	Swan	07.10.03
Forest Management Plan	Swan, Warren and South West	01.01.04
Herdsmen Lake Regional Park	Swan	03.12.04
Ningaloo Marine Park and Muiron Islands Marine Management Area	Pilbara	14.01.05
Turquoise Coast Island Nature Reserves	Midwest	24.03.05
Thomsons Lake Nature Reserve	Swan	27.05.05
Forrestdale Lake Nature Reserve	Swan	27.05.05
Jurien Bay Marine Park	Midwest	01.07.05
Beeliar Regional Park	Swan	20.10.06
Rowley Shoals Marine Park	Kimberley	10.04.07
Montebello/Barrow Islands Marine Conservation Reserves	Pilbara	10.04.07
Shoalwater Islands Marine Park	Swan	30.10.07
Kennedy Range National Park and Proposed Additions	Midwest	02.05.08
Lake McLarty Nature Reserve	Swan	06.06.08

Final management plans (being prepared)	Region	Submission period
Woodman Point Regional Park	Swan	30.08.02–30.11.02
Rockingham Lakes Regional Park	Swan	27.10.03–27.02.04
Jandakot Regional Park	Swan	24.11.04–24.02.05
Proposed Dampier Archipelago Marine Park and Regnard Marine Management Area Indicative Management Plan	Pilbara	11.01.05–10.05.05
Proposed St John Brook and Jarrahwood Conservation Parks	South West	04.01.05–11.03.05
Shannon and D'Entrecasteaux National Parks	Warren	21.05.05–31.08.05
Dryandra Woodland	Wheatbelt	02.12.05–06.02.06
Cape Range National Park	Pilbara	14.02.06–14.05.06
Murujuga National Park (formerly Proposed Burrup Peninsula Conservation Reserve)	Pilbara	11.07.06–11.09.06
Wellington National Park, Westralia Conservation Park and Wellington Discovery Forest	South West	08.09.06–10.11.06
Walpole Wilderness and Adjacent Parks and Reserves	Warren	27.08.06–01.12.06
Proposed Walpole and Nornalup Inlets Marine Park Indicative Management Plan	Warren	27.08.06–01.12.06
Proposed Geographe Bay/Leeuwin-Naturaliste/Hardy Inlet Marine Park Indicative Management Plan	South West	06.09.06–15.12.06
Millstream-Chichester National Park and Mungaroo Range Nature Reserve	Pilbara	30.10.07–11.01.08
Shark Bay Terrestrial Reserves and Proposed Reserve Additions	Midwest	30.04.08–07.07.08

Draft management plans (being prepared)	Region
Albany Coastal Reserves	South Coast
Barrow Island Nature Reserve	Pilbara
Dampier Archipelago Terrestrial Reserves	Pilbara
Esperance Coastal Reserves	South Coast
Lane Poole Reserve	Swan, South West
Northern Yilgarn Conservation Reserves	Goldfields
Miriuwung-Gajerrong (Ord River Stage 2) Conservation Areas	Kimberley
Ord River and Parry Lagoons Nature Reserves	Kimberley
Parks of the Leeuwin-Naturaliste Ridge, Scott National Park and Gingilup Swamps Nature Reserve	South West
Pilbara and West Kimberley (Eighty Mile Beach) Marine Parks and Reserves	Pilbara and Kimberley
Tone-Perup and Greater Kingston National Parks and Lake Muir and Adjacent Nature Reserves	Warren
Tuart Forest National Park	South West
Yanchep and Neerabup National Parks and Neerabup Nature Reserve	Swan

Area covered by management plans*			
Tenure classification	Area covered by management plan (ha)	Total tenure area (ha)	Percentage covered (by area)
National park	1,893,213	5,637,482	33.5
Nature reserve	362,175	10,873,039	3.3
Marine parks and reserves	1,536,551	1,536,551	100
Other recreation/conservation reserves	94,110	991,025	9.5
Total DEC-managed estate	3,886,049	19,038,097	20.4

*Figures exclude (a) some regional park management plan areas (b) the area covered by the Forest Management Plan 2004–2013, except those reserves with specific area management plans and (c) CALM Act section 33(2) lands.

Offences under the *Wildlife Conservation Act* and *Regulations* and *Agriculture and Related Resources Protection Act 2007–08*

Charges	Reported offences	Convictions	Fines \$	Costs \$	Dismissed	Letter of Warning	Caution Notice	No Further Action	Pending
Wildlife Conservation Act									
Illegal taking or possession of protected fauna	34	9	\$4,133.34	\$679.58		1	7	5	12
Illegal importation, selling or taking for sale of fauna	39						37		2
Use of illegal devices in taking fauna	1								1
Offences relating to the taking or possession of rare or threatened fauna	8					4		3	1
Illegal taking of protected flora	13					8	2	1	2
Offences relating to the sale of protected flora									
Taking declared rare flora without the Minister's consent									
Offences against wildlife officers									
Failing to comply with licence conditions	258	5	\$900.00	\$146.94		1	247		5
Wildlife Conservation Regulations									
Offences relating to the acquisition, possession, control and disposal of fauna	49	3	\$266.66	\$128.56			32	5	9
Agriculture and Related Resources Protection Act									
Illegal keeping/import of declared animals	3	1	\$300.00	\$36.73			2		
Totals	405	18	\$5,600.00	\$991.81	0	14	327	14	32

Offences under the *Conservation and Land Management Act* and Regulations 2007–08

Conservation and Land Management Act

Charges	Reported Offences	Convictions	Fines \$	Costs \$	Dismissed	Infringement Notice	Letter of Warning	Caution Notice	No Further Action	Pending
Conservation and Land Management Act										
Illegal taking or possession of forest produce	31	2	\$1,600.00	\$220.40		6	1	21		1
Offences relating to the occupation of CALM land	3							3		
Offences relating to Marine Parks and Reserves	5							5		
Offences against officers	1							1		
Offences relating to disease risk areas	35							35		
Offences relating to activities on State Forests, Nature Reserves and National Parks	593		\$24,835.00			315	28	245	5	
Sandalwood Act										
Illegal taking sandalwood										
Totals	668	2	\$26,435.00	\$220.40	0	321	29	310	5	1

Wildlife licences issued in 2007–08

Fauna licences	Licences issued
SCIENTIFIC	
Scientific collection (Reg 17)	498
Bird/Bat banding (Reg 23)	128
EDUCATION AND PUBLIC	
(to take) (Reg 15)	
Marine interaction	252
Other	562
EDUCATION AND PUBLIC	
(to hold) (Reg 16)	65
AVIAN FAUNA	
Keep and breed in captivity (Reg 12)	3,183
Deal (Reg 13)	33
Breed for commercial purposes (Reg 14)	0
Trap (Reg 11)	2
Species trapped commercially	Number
Twenty-eight parrot	185
Red-capped parrot	109
Western rosella	341
Galah	72
Long-billed corella (Eastern sp)	31
FAUNA	
Keep in captivity (Reg 12A)	87
HERPETOFAUNA (Reptiles and Amphibians)	
Keeping	1,763
Dealing	18
Farming	1
Taking	8
EMUS	
Emu farming (Reg 14)	9
Dealing (Reg 8)	3
Dealing (Emu eggshells Reg 13)	4
Processing (Reg 7)	0
CROCODILES	
Crocodile farming (Reg 14)	2
Skin dealing (Reg 10)	0
Processing (Reg 7)	1
KANGAROO	
Take kangaroos for sale (Reg 6)	428
Deal in carcasses (Reg 8)	21
Skin dealing (Reg 10)	12
Processing (Reg 7)	23

Fauna licences	Licences issued
EXPORTS INTERSTATE	
Skins of fauna (or other dead fauna)	58
Fauna (live)	340
Herpetofauna (reptiles and amphibians)	57
	455
EXPORT OVERSEAS	
Skins of fauna (or other dead fauna) from WA	36
Emu eggs or products (personal items) from WA	0
Fauna (avian) from WA (live)	3
	39
IMPORTS INTERSTATE	
Skins of fauna (or other dead fauna) into WA	29
Australian fauna (live)	289
Live exotic birds and other animals	166
Herpetofauna (reptiles and amphibians)	10
	494
Total fauna licences	8,091
Flora licences	
Licences issued	
Commercial purposes	346
Sandalwood (from Crown land)	1
Forest produce (from Crown land)	2
Commercial producers	274
Sandalwood (from private land)	36
Scientific/prescribed purposes	991
Permits to take declared rare flora	182
Total Flora Licences	1,832

	No. of licences issued	Total no. of each species authorised to be taken
OTHER AVIAN FAUNA		
Australian raven	10	130 destroy
Little corella	2	550 destroy
	5	1,850 scare
Galah	11	650 destroy
Crested pigeon	1	1 destroy
Brown goshawk	1	10 trap and relocate
Western long-billed corella	25	9,310 destroy
	2	700 scare
Port Lincoln ringneck	18	2,890 destroy
	4	400 trap and euthanase
Long-billed corella (ES Sp)	3	150 destroy
WATERFOWL		
Eurasian coot	1	100 trap and relocate
Pied cormorant	1	10 destroy
Maned geese	8	226 destroy
	1	50 scare
	1	100 trap and euthanase
DANGEROUS FAUNA		
Grey butcherbird	1	1 destroy
Magpie	13	14 destroy

Table G1a: Type of prescribed burns for all DEC regions 2005–06 to 2007–08

	2005–06	2006–07	2007–08
Indigenous vegetation – hand burning (ha)			
State forest	5,819	3,687	2,434
National parks	55,873	17,534	8,062
Nature reserves	5,485	2,192	3,218
Other Crown land and private property *	2,538	13,449	13,880
Total	69,715	36,862	27,594
Indigenous vegetation – aerial burning (ha)			
State forest	66,475	35,282	38,894
National parks	104,411	341,174	401,143
Nature reserves	66,314	41,579	239,775
Other Crown land and private property *	112,287	240,738	199,854
Total	349,487	658,773	879,666
Indigenous vegetation – silviculture burning (ha)			
– Jarrah dominant forests	15,321	21,491	17,527
– Karri, karri/marri dominant forests	497	403	505
– Other forest	11	-	4
Total	15,829	21,894	18,036
Softwood plantation – burning (ha)			
– Strategic protection	10,381	13,160	5,199
– Second rotation clearing burns	554	180	1,688
– Logging debris removal, silviculture	2,563	3,346	778
Total	13,498	16,686	7,665
Grand total	448,529	734,215	932,961

Only includes data from 20.06.2007–09.06.2008

For data specific to south-west forest regions see Tables G4 and G5

* Includes other Crown land, other DEC reserve, and private property

Table G1b: Area of prescribed burns for all DEC regions 2005–06 to 2007–08

South-west forest regions		2005–06	2006–07	2007–08
Swan	Area (ha)	73,386	37,509	27,335
	Number	92	72	52
South West	Area (ha)	56,148	45,496	53,152
	Number	35	42	51
Warren	Area (ha)	64,571	55,597	63,194
	Number	74	65	51,
Sub total	Area (ha)	194,105	138,602	143,681
	Number	201	179	154
Other regions		2005–06	2006–07	2007–08
Kimberley	Area (ha)	225,348	302,800	533,454
	Number	14	10	8
Pilbara	Area (ha)	-	231,165	136,230
	Number	-	8	8
Midwest	Area (ha)	4,342	19,451	942
	Number	19	39	14
Goldfields	Area (ha)	4,369	11,500	115,232
	Number	5	8	3
Wheatbelt	Area (ha)	476	2,250	466
	Number	3	5	7
South Coast	Area (ha)	19,889	28,447	2,956
	Number	36	26	20
Sub total	Area (ha)	254,424	595,613	789,280
	Number	77	96	60
Grand total (All regions)	Area (ha)	448,529	734,215	932,961
	Number	278	275	214

Table G2: Wildfires in all regions 2005–06 to 2007–08
 – Number and area by land category
 – Number and per cent by cause

ALL REGIONS	Number **			Area burnt (ha) *		
	2005–06	2006–07	2007–08	2005–06	2006–07	2007–08
State forest						
native hardwood	134	96	76	7,486	8,079	5,426
softwood plantation	79	89	64	160	183	325
National parks	60	117	73	40,124	326,124	100,425
Nature reserves	33	43	41	49,217	104,268	691,258
Other CALM reserves	66	61	50	35,356	139,702	314,908
Other Crown lands	15	22	13	254,670	711,857	83,721
Private property	66	112	87	8,040	202,361	5,139
Unallocated Crown land	27	65	40	2,292,464	453,058	224,603
Total	480	605	444	2,687,516	1,945,633	1,425,806

CAUSES	Number **			Per cent		
	2005–06	2006–07	2007–08	2005–06	2006–07	2007–08
ALL REGIONS						
Deliberately/illegally lit	244	219	217	51	36	49
Escapes – DEC burns	7	9	6	1	1	1
Escapes – non DEC burning	37	22	26	8	4	6
Accidental – timber industry	2	3	3	0	0	1
Accidental – other industries	17	26	20	4	4	5
Accidental – recreationists	29	26	21	6	4	5
Lightning	94	219	82	20	36	18
Unknown	33	52	51	7	9	11
Other causes	17	29	18	3	5	4
Total	480	605	444	100	100	100

Only includes data from 20.06.2007–09.06.2008

* Area (ha) burnt by wildfires in the tenure type

** Number of wildfires that started in each tenure type and fire cause

APPENDIX G – FIRE MANAGEMENT

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Table G3: Area and number of wildfires attended and monitored by DEC for all regions 2007–08

Region		State forest native hardwood	State forest softwood plantation	National parks	Nature reserves	Other DEC reserves	Other crown lands	Private property	Unallocated Crown land	Total
South-west Forest Regions										
Swan	Area (ha) *	537	313	61	468	89	4	2,717	471	4,660
	Number **	42	51	34	9	23	6	34	4	203
South West	Area (ha) *	175	13	33	28	25	1	426	23	724
	Number **	28	13	5	3	11	3	36	7	106
Warren	Area (ha) *	3,910	-	5	2	388	2	142	30	4,478
	Number **	5	-	2	-	3	1	8	2	21
Sub total	Area (ha) *	4,622	325	98	499	502	7	3,285	524	9,862
	Number **	75	64	41	12	37	10	78	13	330
Other regions										
Kimberley	Area (ha) *	-	-	2,474	558,340	304,216	70,170	-	120,600	1,055,799
	Number **	-	-	2	3	6	1	-	4	16
Pilbara	Area (ha) *	-	-	23,440	-	-	12,089	-	-	35,529
	Number **	-	-	6	-	-	1	-	-	7
Midwest	Area (ha) *	-	-	8,674	829	-	-	1,782	1,492	12,778
	Number **	-	-	6	1	-	-	3	8	18
Goldfields	Area (ha) *	-	-	16,330	95,110	10,183	1,455	-	49,590	172,668
	Number **	-	-	6	15	2	1	-	5	29
Wheatbelt	Area (ha) *	-	-	-	33,673	2	-	64	2	33,741
	Number **	-	-	-	4	1	-	3	2	10
South Coast	Area (ha) *	804	-	49,409	2,808	6	-	8	52,395	105,430
	Number **	1	-	12	6	4	-	3	8	34
Sub total	Area (ha) *	804	-	100,327	690,760	314,406	83,714	1,854	224,079	1,415,945
	Number **	1	-	32	29	13	3	9	27	114
Grand total (All regions)	Area (ha) *	5,426	325	100,425	691,258	314,908	83,721	5,139	224,603	1,425,806
	Number **	76	64	73	41	50	13	87	40	444

Only includes data from 20.06.2007–09.06.2008

* Area (ha) burnt by wildfires in the tenure type

** Number of wildfires originating in the tenure type

Table G4: Area prescribed burnt within south-west forest regions for 2007–08

Dominant purpose	Region	Area (hectares)				Year of last fire*
		Winter	Spring	Summer	Autumn	
Community/ strategic protection	Swan	-	10,852	-	1,528	1981–1999
	South West	-	17,427	-	3,869	1982–1999
	Warren	-	25,314	1,422	4,722	1976–2002
Biodiversity conservation	Swan	-	4,213	-	100	1989–2003
	South West	-	5,540	-	8,595	1982–1999
	Warren	-	11,166	16,177	9	1994–2007
Hardwood silviculture	Swan	20	1,958	-	100	1976–1993
	South West	-	9,617	-	4,851	1986–1995
	Warren	-	1,048	30	521	1977–2004
Plantation silviculture/ protection	Swan	3,263	231	-	965	1995–2005
	South West	286	885	-	1,898	1955–1996
	Warren	-	-	-	24	2007
Tourism and recreation/ protection	Swan	-	992	-	3,113	1980–1985
	South West	-	174	-	10	1981–1991
	Warren	-	-	2,761	-	2001–2006
Grand total by season (ha)		3569	89,417	20,390	30,305	
Seasonal %		3	62	14	21	
Grand total (ha)			143,681			

Only includes data from 20.06.2007–09.06.2008

* Range of vegetation/fuel ages as at July 2007

Table G5: Number of prescribed burns conducted within south-west forest regions in each season for various purposes in 2007–08

Dominant Purpose	Region	Winter		Spring		Summer		Autumn		Total number of burns	No. of escapes
		Aerial	Hand	Aerial	Hand	Aerial	Hand	Aerial	Hand		
Community/ strategic protection	Swan	-	-	6	10	-	-	1	5	22	-
	South West	-	-	5	1	-	-	3	4	13	-
	Warren	-	-	6	3	2	2	4	4	21	1
Biodiversity conservation	Swan	-	-	3	3	-	-	-	1	7	-
	South West	-	-	2	1	-	-	2	-	5	-
	Warren	-	-	3	2	3	-	-	2	10	-
Hardwood silviculture	Swan	-	1	1	-	-	-	-	1	3	-
	South West	-	-	5	1	-	-	4	2	12	1
	Warren	-	-	1	3	-	2	-	11	17	-
Plantation silviculture/ protection	Swan	-	6	-	3	-	-	-	4	13	-
	South West	-	2	1	1	-	-	-	14	18	-
	Warren	-	-	-	-	-	-	-	1	1	-
Tourism and recreation/ protection	Swan	-	-	-	6	-	-	1	-	7	-
	South West	-	-	-	2	-	-	-	1	3	-
	Warren	-	-	-	-	1	1	-	-	2	-
Total		-	9	33	36	6	5	15	50	154	2

Only includes data from 20.06.2007–09.06.2008

Please note this table counts carryover burns (same Burn ID done over multiple seasons) as different records. e.g. burn started in spring and finished in autumn is counted as two burns.

The Department of Environment and Conservation provided administrative support to the following boards and committees.

Statutory authorities

Conservation Commission of Western Australia
Contaminated Sites Committee
Environmental Protection Authority
Keep Australia Beautiful Council
Marine Parks and Reserves Authority
Swan River Trust

Advisory committees

Air Quality Coordinating Committee
Animal Ethics Committee
Avon Nature Conservation Advisory Committee
Beekeeping Consultative Committee
Beeliar Regional Park Community Advisory Committee
Bellevue Community Consultative Committee
Brookdale Community Reference Group
Canning River Regional Park Community Advisory Committee
Cockburn Sound Management Council
Coral Coast Park Council
Coral Coast Parks Advisory Committee
Darling Range Regional Park Community Advisory Committee
Dieback Consultative Council
Dieback Response Group
Drummond Recovery Catchment Advisory Committee
Environmental Regulation Stakeholder Reference Group
Esperance Parks and Reserves Community Advisory Committee
Fitzgerald River National Park Advisory Committee
Gibson Desert Working Together Group (Park Council)
Goldfields Land and Sea Council Joint Management Working Group
Herdsman Lake Regional Park Community Advisory Committee
Jandakot Regional Park Community Advisory Committee
Kangaroo Management Advisory Committee
Karijini Park Council
Keep Australia Beautiful Council Litter Prevention Taskforce
Lane Poole Reserve Advisory Committee
Lorna Glen (Matuwa) and Earraheedy (Kurrara Kurrara) Joint Management Working Group
Millstream Park Council

Miriuwung-Gajerrong Regional Council
Murujuga-Burrup Park Council
Purnululu Park Council
Roadside Conservation Committee
Rockingham Lakes Regional Park Community Advisory Committee
Shark Bay Terrestrial Reserves Community Advisory Committee
Shoalwater Islands Marine Park Focus Group
South Coast Regional Marine Planning Advisory Group
State/Local Government Climate Change and Sustainability Council
State Marine Policy Stakeholders Group
Talbot Road Nature Reserve Management Team
Threatened Ecological Communities Scientific Committee
Threatened Species Scientific Committee
Tuart Forest National Park Community Advisory Committee
Tuart Response Group
WA Flora Industry Advisory Committee
Walpole Wilderness Area
Wandoo Recovery Group
Waste Management Board
Western Australian Weeds Committee
Wetlands Coordinating Committee
Wetland Restoration and Management Manual Project Steering Committee
Wetland Status Working Group
Woodman Point Regional Park Community Advisory Committee
Yanchep Community Advisory Committee
Yellagonga Regional Park Community Advisory Committee

General publications

Most new publications are available to download in PDF format from our website at www.dec.wa.gov.au. Many publications are also available on CD.

10 information session flyers for the Community Based Participatory Research Trial	Flyer
10 information session posters for the Community Based Participatory Research Trial	Poster
1080 meat bait register (fox and cat)	Logbook
1080 meat bait register (wild dog)	Logbook
2008 Personnel Pass	Card
2008 Tidy Towns sustainable communities registration and entry	Form

A

Access to the Department of Environment and Conservation	Poster
Acid sulfate soils fact sheet 1 – What are acid sulfate soils?	Flyer
Acid sulfate soils fact sheet 2 – Recognising and managing disturbed acid sulfate soils.	Flyer
Acid sulfate soils fact sheet 3 – Acid sulfate soils risk map	Flyer
Acid sulfate soils fact sheet 4 – Managing urban development in acid sulphate soil areas.	Flyer
Acid sulfate soils in Western Australia banner	Banner
Acid sulfate soils indicators – What to look for in soil and water banner	Banner
Acid Sulfate Soils presentation folder	Folder
ACT NOW banner	Banner
ACT NOW carry bags	Bags
Aid-memoire for Environmental Enforcement Unit	Card
Air Quality Branch-Draft sulfur dioxide in Collie	Report
Air Quality Management Community Grants – Application	Form
Air Quality Management Community Grants – Guidelines	Form
Air Quality Management community grants program	Brochure
Aircraft Noise and its effects	Gatefold
Annual audit compliance guideline for industry licence	Report
Annual audit compliance report – FAQ	Report
Annual audit compliance report process map spreadsheet	Map
Annual audit compliance report proforma	Report
Application for commercial operations licence or renewal – T class marine reserves only	Booklet
Arbor Day 2008 poster	Poster
Asbestos – Is your load legal?	Brochure
Australian Coral Reef Society Conference poster	Poster
Australian Tourism Exchange DEC CD	CD
Authority to remove firewood form book	Booklet
Avon's Most Wanted	Brochure
Avon's Most Wanted	Poster

B

Back From the Edge – Saving Native Species and Communities most at Risk	Flyers
BANKWEST LANDSCOPE VISA card	Brochure
Bernier and Dorre Islands Nature Reserve: A refuge for threatened wildlife	Brochure
Best of the South-West LANDSCOPE special edition	Book

Bibbulmun Track Tourism Award submission	Booklet
Birds of Prey	Bush Book
Buntine-Marchagee Natural Diversity Recovery Catchment – Summary document	Report
Buntine-Marchagee News – Spring 2007	Newsletter
Buntine-Marchagee News – Winter 2008	Newsletter
Bush Rangers WA	Brochure
Bush Rangers WA Certificate of Participation	Flyers
Bush Rangers WA Certificate of Promotion	Flyers
Bush Rangers WA Instructor’s Award for Excellence	Flyers
Bush Rangers WA: a collection of animal sounds	CD
Bush Rangers WA: a photo display	CD
Bush Rangers Western Australia Annual Report 2007	Booklet
Bushland News – Autumn 08	Newsletter
Bushland News – Spring 07	Newsletter
Bushland News – Summer 07/08	Newsletter
Bushland News – Winter 07	Newsletter
Bushland Weeds – Golden crownbeard	Brochure
Bushland weeds – Haas grass	Brochure
C	
CBPR (community based participatory research) communications plan	Brochure
CBPR for Air Quality Management	Manual
CBPR guide for Air Quality Management – Graham Farmer Freeway	Pamphlet
CBPR guide for Air Quality Management – Trial location	Brochure
CBPR guide for Air Quality Management – What is CBPR?	Brochure
CleanRun diesel users short course	Flyer
CleanRun Update January 08	Newsletter
Clearance of subdivision conditions	Form
Climate Change – Measuring baseline biodiversity	Flyer
Cockburn Sound Monitoring Program 2006–2007	Report
Commercial Operators activity docket book	Booklet
Commercial Operators watermark security paper	Flyers
Common Birds in the Backyard	Bush Book
Common Plants of the Kimberley	Bush Book
Conservation Commission bookmarks	Bookmark
Conservation Commission display banner	Display
Conservation Science WA	Report
Conservation Science Western Australia, Vol. 6, No. 1	Report
Conservation Science Western Australia, Vol. 6, No. 3	Report
Conserving Threatened Ecological Communities	Brochure
Conserving Threatened Ecological Communities	Brochure
Coral Bay boating in Ningaloo Marine Park	Brochure
Coronial Investigation – Boorabbin National Park Wildfire Fact Sheet	Brochure
Corporate Plan 2007–2009	Booklet
Crocodiles	Brochure

D

DEC Annual Report 2006–07	Report
DEC Avon-Mortlock District display	Display
DEC banner	Display
DEC Code of Practice for Fire Management	Report
DEC corporate folder	Folder
DEC Employee Information Handbook	Booklet
DEC internal phone directory	Book
DEC Organisational Learning and Development Manual	Report
DEC Outstanding service Award	Flyers
DEC peer support	Brochure
DEC safe participants' manual	Report
DEC Volunteer of the Year Award	Flyers
Declared rare flora posters × 16	Flyers
DEC's Graduate Development Program	Brochure
DEC's Mentoring Aboriginal Training and Employment Scheme	Brochure
Discover WA's marine parks	Poster
Disturbance and recovery of coral communities	Report
Draft dust guidelines	Report
Dryandra Woodland	Brochure

E

EcoEducation Aboriginal Culture Excursions years 8 and 9	Leaflet
EcoEducation Caring for Places Educator and Student resource information flyer	Leaflet
EcoEducation Climate Change – measuring base line biodiversity	Leaflet
EcoEducation Discover Ecosystem Diversity Years 8–10	Leaflet
EcoEducation Fire – A Force of Life Years 10, 11 and 12	Leaflet
EcoEducation Geography Excursion Exploring the Jarrah Forest Ecosystem	Leaflet
EcoEducation Investigate your natural heritage Professional Learning with a difference	Leaflet
EcoEducation Investigating Tuart Woodlands	Leaflet
EcoEducation Join in on World Environment Day	Leaflet
EcoEducation Margaret River Eco Discovery Centre 2008	Leaflet
EcoEducation News – South West, July 07, October 07, February 08, May 08	Newsletter
EcoEducation News – State-wide, July 07, October 07, March 08, May 08	Newsletter
EcoEducation Programs 2008	Booklet
EcoEducation resources	Leaflet
EcoEducation Threatened species program Years 8 and 9	Leaflet
EcoEducation Wellington Discovery Forest	Leaflet
Employee inquiry information: working for DEC	Brochure
Enforcement and Prosecution Policy	Report
Enforcement and Prosecution Policy May 2008	Brochure
Enforcement and Prosecution – Authorisation cards	Card
Environment and Conservation News – 10 editions	Newsletter
Environmental Enforcement Unit Business Plan 2007–2008	Brochure
Environmental Enforcement Unit note book	Book

Environmental field notice book	Booklet
Environote – Halt The Haze Wood heater Replacement Program 2006	Leaflet
Environote No. 6 – Halt the Haze: Wood heater replacement program 2007	Newsletter
Exmouth District park notes	Flyers
Experiencing whale sharks in Ningaloo Marine Park	Brochure
Exploring Parks in the Leeuwin-Naturaliste Ridge	Magpaper
Exploring the Walpole Wilderness and surrounding areas	Brochure
F	
Fees and Charges – a visitor’s guide	Brochure
Fitzgerald River National Park Information and Recreation Guide	Brochure
Francois Peron National Park	Brochure
G	
Glossy-leafed hammer orchid – Endangered flora of Western Australia	Leaflet
Good Neighbour Policy	Booklet
Good Neighbour Policy – Feedback summary	Leaflet
Good Neighbour Policy – Summary of forum feedback	Booklet
Good Neighbour Policy – Survey of neighbours	Booklet
Good Neighbour Policy Premier’s Awards Submission	Booklet
Graduation and Awards ceremony booklet	Booklet
Guide to Western Australia’s Southern forests	Magpaper
Guidelines for generator use at campsites	PDF
H	
Halt the Haze Wood Smoke	Brochure
Halt the haze 2008 wood heater rebate program information brochure	Brochure
Halt the Haze 2008 Wood Heater Rebate Program	Brochure
Have you seen this plant? – Threatened Flora Species cards series	Postcards
Have you seen this plant? <i>Eremophila verticillata</i>	Postcards
Have you seen this arid bronze azure butterfly?	Postcard
<i>Healthy Parks, Healthy People</i> banner	Banner
<i>Healthy Parks, Healthy People</i> Strategic Plan 2008–2011	Booklet
Helping birds on your property	Brochure
Household hazardous waste collection day	Pamphlet
I	
Implementing the Air Quality Management Plan	Report
Information on illegal dumping	Poster
Infringement notice book	Book
International Association of Impact Assessment	Brochure
K	
Karijini National Park brochure	Brochure
Keep Australia Beautiful – Bin your butts education program	Brochure
Keep Australia Beautiful – Learning about litter	Flyer
Keep Australia Beautiful – ‘The Protector’ DVD	DVD
Keep Australia Beautiful – Learning about litter CD-Rom	CD-Rom

Keep Australia Beautiful – Learning about litter. A teacher’s guide	Booklet
Keep Australia Beautiful – Litter and you’re rubbish posters × 3	Poster
Keep Australia Beautiful award certificate	Certificate
Keep Australia Beautiful bin your butt poster	Poster
Keep Australia Beautiful event recycling trailer booking information	Pamphlet
Keep Australia Beautiful information brochure	Brochure
Keep Australia Beautiful Talking Rubbish Newsletter	Newsletter
Keep Australia Beautiful tips for organising a clean-up	Booklet
Keep Australia Beautiful WA information brochure	Brochure
Keep dolphins and sea lions wild and free	Brochure
Kennedy Range National Park	Brochure
Kennedy Range National Park and Proposed Additions 2008 Management Plan No 59	Booklet
L	
Lake McLarty Nature Reserve 2008 Management Plan No 60	Booklet
LANDSCOPE – Spring 07, Summer 07/08, Autumn 08, Winter 08	Magazine
Launch of the draft management plan for Millstream/Chichester	Flyer
Lead Issue Update – Issue 3, September 2007	Newsletter
Lead Issue Update – Issue 4, December 2007	Newsletter
Learning about litter	Booklet
M	
Making decisions for the future: Climate Change	Booklet
Mammals of the South West	Bush Book
Management plan for Barrow, Boodie, Double and Middle islands – Have your say	Brochure
Marine parks and conservation reserves folder	Folder
Marine Parks and Reserves Authority Annual Report 2006–07	Report
Marine parks bookmarks	Bookmark
Marine parks colouring sheets	Flyers
Marine Science Strategy – December 07	Report
Marine Science Strategy – February 08	Report
Marine Technical Report Series – Background quality of the marine sediments off the WA mid-west coast	Book
Marmion Marine Park	Brochure
Mentoring Aboriginal Training and Employment Scheme – Supervisors Instruction Manual 2007	Report
Midland air quality newsletter	Newsletter
Midland air sampling monitoring update	Newsletter
Midland background air quality study – Canister log book	Booklet
Midland background air quality study – Observation log book	Booklet
Midland background air quality study monitoring update	Report
Millstream-Chichester National Park and Mungaroona Range Nature Reserve Draft Management Plan	Report
Monkey Mia Reserve	Brochure
Mount Augustus National Park	Brochure
Muir’s corellas – conserving a threatened species	Booklet

Muir's corellas – Living with Muir's corella information sheet	Flyers
Muir's corellas – minimising the damage and nuisance caused by Muir's corella	Booklet
Muir's corellas – Using Explosive cartirdges (Bird Frite®) to scare Muir's corella from crops	Brochure
Munda Bididi Trail	Brochure
N	
Native vegetation fact sheet 11 – Direct and contributing offsets	Fact sheet
Native vegetation fact sheet 12 – Information for purpose permit holders	Fact sheet
Native vegetation fact sheet 13 – Information for maintaining existing transactions	Fact sheet
Native vegetation fact sheet 14 – Clearing under State Agreements	Fact sheet
Natural wonderland in the Pilbara	
Nearer to Nature – Spring 07, Summer 08, Autumn 08, Winter 08	Booklet
Nearer to Nature folder	Folder
Nearer to Nature group activities	Leaflet
Ningaloo Marine Park brochure	Brochure
Ningaloo Reef and North West Cape – World Heritage Nomination	Brochure
Ningaloo Research Symposium	Report
Nuytsia Vol. 16 No. 2	Book
Nuytsia Vol. 17 No. 1	Book
O	
Office of Climate Change: grant applications	Brochure
Office of Climate Change: guidelines for grant applications	Brochure
Officer's guide – Annual audit compliance report	Flyer
Operation Rangelands Restoration: A 2020 Vision	Booklet
Operational instruction: Global changes to condition	Flyer
Orchids of the South-West	Bush Book
Our environment, your future: DEC international recruitment booklet	Booklet
P	
Parks and Protected Areas Forum: Agenda for Action	Booklet
Parks and Visitor Services Strategy	Report
Parks of the Coral Coast	Brochure
Parks of the Turquoise Coast	Magpaper
Peer Support	Brochure
Penguin Island	Brochure
Perth's Fungi Forever	Brochure
Pilbara and Eighty Mile Beach	Brochure
Pilbara and Eighty Mile Beach 'Big Book'	Book
Pilbara and Eighty Mile Beach display	Display
Pinnacles (Nambung National Park) postcards × 5	Postcards
Planning for proposed marine parks and reserves for the Pilbara and Kimberley	Flyer
Policy Statement-Annual audit compliance report	Flyer
Policy Statement-Environmental protection notice for prescriber premises	Flyer
Program for climate change/bio science colloquium	Booklet
Promotional poster for Community Based Participatory Reaserch Trial	Poster
Purdies donkey orchid – Endangered flora of Western Australia	Flyers

Purnululu National Park World Heritage Area	Brochure
Purnululu National Park World Heritage Area	Magpaper
R	
Receipt book-Halt the Haze rebate program	Booklet
Regional marine planning workshop	Flyer
Return to Faure Island – LANDSCOPE run-on	Brochure
Reveal – The Australian School of Fine Wood exhibition catalogue	Booklet
Reveal – The Australian School of Fine Wood exhibition flyer	Leaflet
Ribbons of Blue school’s competition flyer	Flyer
Robbons of Blue in and out of the classroom – Resource manual	Manual
Rowley Shoals – Your Guide To Rowley Shoals Marine Park	Brochure
S	
Saving Our Species	Booklet
Saving Western Australia’s threatened species – Deadly Protectors	DVD
Science Division – A Strategic Plan for Biodiversity Conservation Research 2008–2017	Report
Science Division: Annual research activity report 2006–2007	Report
Science Division’s Strategic Plan For Biodiversity 2008–2017	Report
Shark Bay Terrestrial Reserves Management Plan	Report
Shark Bay World Heritage notes	Flyers
Shark Bay World Heritage Property Strategic Plan 2008–2020	Report
Shark Bay World Heritage Property Strategic Plan 2008–2020 summary document	Booklet
Shark Bay: Twin bays on the edge	Book
Shoalwater Islands Marine Park brochure	Brochure
Shoalwater Islands Marine Park Management Plan #58 2007–2017	Report
Small butt big impact poster for Keep Australia Beautiful	Poster
Small to medium enterprises air quality management plan	Report
Snakes of Western Australia	Bush Book
South Coast Regional Marine Planning update for January 08 workshops	Flyer
State of the Cockburn Sound	Report
Strategic Review of the Conservation and Resource Values of the Banded Iron Formation of the Yilgarn Craton	Book
Swimming with whale sharks code of conduct	Poster
T	
The best of the North West and South West of Western Australia	Brochure
The Waste Wise Schools Program	Brochure
Tidy Towns Newsletter January 08	Newsletter
Tidy Towns Poster	Poster
Tidy Towns Sustainable Communities	Poster
Tidy Towns sustainable communities project tips book	Booklet
Tidy Towns sustainable communities submission	Brochure
Tidy Towns sustainable communities winners banner	Banner
Tidy Towns sustainable community certificates	Certificate
Tidy Towns Winners Book 2007	Booklet

Tour operator handbook – Marine	Folder and inserts
Tour operator handbook – Terrestrial	Inserts
TravelSmart promotional posters × 3	Poster
TravelSmart workplace 2007–08 certificate	Certificates
U	
Using compost in council parks and gardens	Invitation
V	
Valley of the Giants – Fact File – Construction of the Tree Top Walk	Brochure
Valley of the Giants Tree Top Walk	Brochure
Valley of the Giants Tree Top Walk – Walk through the Tree Tops of our Unique Tingle Forest	Leaflet
Valley of the Giants Tree Top Walk display	Display
W	
WA Environment Award display	Display
WA Environment Awards – Award Certificates	Certificate
WA Environment Awards promotional banner	Banner
WA Environment Awards Winners Book	Booklet
WA on Show: DEC display	Display
WA Sustainable Cities entrants' book	Booklet
WA Sustainable Cities entry form	Form
WA Sustainable Cities Program	Brochure
Wagerup air quality monitoring log-book	Booklet
Walk the Bibbulmun Track	Brochure
Walk the Bibbulmun Track the easy way	Brochure
Walpole and Nornalup Inlets Marine Park	Brochure
Waste and recycling conference 2007	Poster
Waste Management-General soil improvement	Flyer
Waste Management-Urban amenity	Flyer
Waste Management-Vegetable growers	Flyer
Waste Management-Viticulture	Flyer
Waste Wise grants submission booklet	Booklet
Waste Wise Schools Case Studies	Booklet
Waste Wise Schools Program certificates	Certificates
Waste Wise Words	eNewsletter
Waste Wise Words April 08 Edition	Newsletter
Waste Wise Words December 07 Edition	Newsletter
Watching Whales	Brochure
WATSNU newsletter – Summer 07–08, Autumn 08	PDF
West Kimberley District display	Display
Western Wildlife	Newsletter
Whale interaction logbook	Logbook
Whale sharks experience logbook	Logbook
What is Community Based Participatory Research (CBPR)	Flyer
Wild About Walking – Yanchep National Park	Brochure

Wildcare helpline bumper sticker	Stickers
Wildflowers of the South Coast	Bush Book
Wood heater policy options paper	Report
Y	
Yanchep National Park – off-site brochure	Leaflet
Yanchep National Park – visitor brochure	Brochure
Yanchep National Park Aussie Drawcard	Brochure
Yanchep National Park eNewsletter	eNewsletter
Yanchep National Park Tourism Award submission	Booklet
Z	
ZeroWaste survey 2006–07 Preliminary draft report	Report

Scientific publications

- (2007) Ningaloo Marine Park Symposium, 24–25 July 2007. Department of Environment and Conservation, Kensington, WA. 79 p.
- Abbott I (2007) The islands of Western Australia: changes over time in human use. *Early Days* **12**, pp. 635–653.
- Abbott I (2008) Historical perspectives of the ecology of some conspicuous vertebrate species in south-west Western Australia. *Conservation Science Western Australia* **6(3)**, pp. 1–214.
- Abbott I, Burbidge T, Wills A (2007) *Austromerope poultoni* (Insecta: Mecoptera) in south-west Western Australia: occurrence, modelled geographical distribution and phenology. *Journal of the Royal Society of Western Australia* **90**, pp. 97–106.
- Adams PJ, Elliot AD, Algar D, Brazell RI (2008) Gastrointestinal parasites of feral cats from Christmas Island. *Australian Veterinary Journal* **86**, pp. 60–63.
- Agar K, Bettink K, Brown K, Keighery G (2007) Saving our species: a major initiative for environmental weed management across Western Australia (ABSTRACT). In: *EMAPi9: 9th International Conference on the Ecology and Management of Alien Plant Invasions: Program & Abstract Book, 17–21 September 2007, Hyatt Regency, Perth, Western Australia* 37 p. Congress West, Perth.
- Algar D, Angus GJ, Williams MR, Mellican AE (2007) Influence of bait type, weather and prey abundance on bait uptake by feral cats (*Felis catus*) on Peron Peninsula, Western Australia. *Conservation Science Western Australia* **6(1)**, pp. 109–149.
- Armstrong S (2007) Establishment of a long-term monitoring program for the proposed Dampier Archipelago Marine Park: marine science project plan. Department of Environment and Conservation, Kensington, WA. 77 p.
- Armstrong S (2007) Low temperatures cause coral bleaching at Ningaloo Reef, Western Australia (POSTER ABSTRACT). In: *Ningaloo Marine Park Symposium, July 2007* 73 p. Conference Organising Committee, Perth.
- Armstrong S (2007) Ningaloo Marine Park *Drupella* long term monitoring program: results of the 2006 survey. Department of Environment and Conservation, Western Australia, Marine Science Program, Technical Report **NIN/NMP-2007/03**, Department of Environment and Conservation, Kensington, WA. 51 p.
- Armstrong S (2007) Spatial and temporal variations in *Drupella cornus* populations and live hard coral cover over a fourteen year period at Ningaloo Marine Park, Western Australia (ABSTRACT). In: *Ningaloo Marine Park Symposium, July 2007* 51 p. Conference Organising Committee, Perth.

12. Armstrong S (2007) Summary of all research, monitoring and communication management strategies, priorities and responsibilities for Western Australian CALM Act marine protected areas, July 2007. 70 p.
13. Armstrong S, Osborne S, Harrison P, Simpson C (2007) Spatial and temporal variations in *Drupella cornus* populations over a fourteen-year period at Ningaloo Reef, Western Australia (ABSTRACT). In: *Australian Coral Reef Society, 83rd Annual Conference, Fremantle, Western Australia, 9–11th October, 2007: East Meets West: Science and Management of Australia's Coral Reefs* 15 p. Conference Organising Committee, Perth.
14. Armstrong S, van Schoubroeck P (2007) A preliminary list of current and planned marine research, monitoring and communication projects in all CALM Act marine protected areas: current as of July 2007. 31 p.
15. Armstrong S, Webster F, Kendrick A, Mau R, Onton K (2007) Low temperatures and aerial exposure cause coral bleaching at Ningaloo Reef, Western Australia (POSTER ABSTRACT). In: *Australian Coral Reef Society, 83rd Annual Conference, Fremantle, Western Australia, 9–11th October, 2007: East Meets West: Science and Management of Australia's Coral Reefs* 92 p. Conference Organising Committee, Perth.
16. Armstrong S, Webster F, Kendrick A, Mau R, Onton K (2007) Summary of the winter coral bleaching event at Ningaloo Marine Park, July 2006. Department of Environment and Conservation, Western Australia, Marine Science Program, Data Report **NIN/NMP-2007/04**, Department of Environment and Conservation, Kensington, WA. 27 p.
17. Asher J, Marlow N, Brazell R (2007) Taking the bait. *Landscape* **22(4)**, pp. 39–41.
18. Bancroft K, Long S, Kendrick A, Simpson C (2007) A regionally significant reef complex within the Montebello and Barrow Islands Marine Conservation Reserves, northwest Western Australia (ABSTRACT). In: *Australian Coral Reef Society, 83rd Annual Conference, Fremantle, Western Australia, 9–11th October, 2007: East Meets West: Science and Management of Australia's Coral Reefs* 17 p. Conference Organising Committee, Perth.
19. Barber P, Ruthrof K, Archibald R, Behn G, Bougher N, Bowen B et al. [Haswell D, McCaw L] (2007) The severe and disturbing decline of an iconic Mediterranean ecosystem endemic to Western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 13–14. Kings Park & Botanic Garden, West Perth.
20. Barber P, Ruthrof K, Archibald R, Behn G, Bougher N, Bowen B et al. [Haswell D, McCaw L] (2007) The severe and disturbing decline of an iconic Mediterranean ecosystem endemic to Western Australia (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* pp. 45–46. Conference Organising Committee, Perth.
21. Barber P, Ruthrof K, Archibald R, Behn G, Bougher N, Thomas S. et al. [Haswell D, McCaw L] (2007) The severe decline of an iconic Mediterranean ecosystem endemic to Western Australia (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 63 p. Conference Organising Committee, Perth.
22. Barrett S, Cochrane A (2007) Conservation in action: recovery of threatened flora in south west Western Australia (ABSTRACT). In: *The Biodiversity Extinction Crisis: an Australasian and Pacific Response: Final Program: University of New South Wales, Sydney, Australia, 10–12 July 2007* 61 p. Conference Organising Committee, Sydney.

23. Barrett S, Shearer B, Crane C, Cochrane A (2007) The risk of extinction resulting from disease caused by *Phytophthora cinnamomi* to threatened flora species endemic to the Stirling Range National Park, Western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 15–16. Kings Park & Botanic Garden, West Perth.
24. Barrett S, Shearer B, Crane C, Cochrane A (2007) The risk of extinction resulting from disease caused by *Phytophthora cinnamomi* to threatened flora species endemic to the Stirling Range National Park, Western Australia (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 46 p. Conference Organising Committee, Perth.
25. Barrett S, Shearer BL, Crane CE, Cochrane A (2007) The risk of extinction resulting from disease caused by *Phytophthora cinnamomi* to threatened flora endemic to the Stirling Range National Park, Western Australia. In: *Flora Management Course: Porongurups, 17–21 September, 2007* pp. 1–3. Department of Environment and Conservation, Kensington, WA.
26. Barth M (2007) Fire in the Fitz: western ground parrot habitat burns in wildlife. *Western Australian Bird Notes* **121**, 10 p.
27. Barth M (2007) The western ground parrot: recent feeding observations. *Friends of the Western Ground Parrot Newsupdate* **24**, 2 p.
28. Barth M (2007) The western ground parrot recovery project needs volunteers! (PAMPHLET). Department of Environment and Conservation, Albany.
29. Barth M (2007) The western ground parrot recovery project: revealing the secret life of a cryptic bird. *South Coast Threatened Birds News* **11**, 3 p.
30. Barth M (2007) Western ground parrot recovery project: update. *Watsnu* **13(1)**, 1 p.
31. Barth M (2007) The western ground parrot recovery project: update. *Friends of the Western Ground Parrot Newsupdate* **27**, 3 p.
32. Barth M (2007) The western ground parrot recovery project: update. *Friends of the Western Ground Parrot Newsupdate* **28**, pp. 1–2.
33. Barth M (2007) The western ground parrot recovery project: update. *Friends of the Western Ground Parrot Newsupdate* **29**, 1 p.
34. Barth M, Chemello D (2007) The western ground parrot in Waychinicup National Park: they may be gone... *Friends of the Western Ground Parrot Newsupdate* **25**, pp. 2–3.
35. Baxter A, Friend T (2007) Living next door to Boyagin. *Western Wildlife: Newsletter of the Land for Wildlife Scheme* **11(3)**, pp. 10–11.
36. Beaulieu J-P, Albrow M, Bennett D, Brilliant S, Caldwell JAR, Calitz JJ et al. [Martin R, Williams A] (2007) Hunting for frozen super-Earths via microlensing. *Messenger (European Organisation for Astronomical Research in the Southern Hemisphere)* **128**, pp. 33–37.
37. Bennett EM, Shepherd KA (2007) *Lasiopetalum ferricollinum* (Malvaceae s. lat.: Lasiopetaleae), a new species from the ironstone hills near Forrestania, Western Australia. *Nuytsia* **17**, pp. 67–72.
38. Berryman A (2007) The little bird with the big voice. *Wingspan* **17(4)**, pp. 26–27.
39. Berryman A (2007) Noisy scrub-bird vocalisations. *South Coast Threatened Birds News* **11**, 11 p.
40. Berryman A (2008) Western bristlebird translocation to Walpole. *South Coast Threatened Birds News* **12**, pp. 1, 12.
41. Biggs J, Edinger D (2007) Moon over the Murchison: astronomical and botanical explorations at Mount Singleton, 20–26 May, 2007: expedition briefing. Department of Environment and Conservation, Western Australia, Landscape Expeditions 41 p.

42. Birkby J, Parker Q, Miszalski B, Acker A, Frew D (2007) Examples of new evolved planetary nebulae from the SuperCOSMOS H-alpha survey. *Anglo-Australian Observatory Newsletter* **111**, pp. 22–24.
43. Bishop C, Wardell-Johnson G, Shearer B (2007) Resilience of *Banksia* woodlands to *Phytophthora cinnamomi* in the Walpole Wilderness Area, SW Western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 19–20. Kings Park & Botanic Garden, West Perth.
44. Bishop CL, Wardell-Johnson G, Shearer BL (2007) Resilience of *Banksia* woodlands to *Phytophthora cinnamomi* in the Walpole Wilderness Area, SW Western Australia (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* pp. 47–48. Conference Organising Committee, Perth.
45. Bougher N (2007) Conservation of ecosystems to conserve fungi to conserve ecosystems (POSTER ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 48 p. Conference Organising Committee, Perth.
46. Bougher NL (2007) Ectomycorrhizal fungi: vital components of Australia's natural and restored biodiversity. *Australasian Plant Conservation* **15(4)**, pp. 13–15.
47. Bougher NL (2007) Ectomycorrhizal fungi: vital components of Australia's natural and restored biodiversity (ABSTRACT). In: *ANPC National Forum: What lies beneath? the role of soil biota in the health and rehabilitation of native vegetation, CSIRO Discovery Centre, 17–19 April 2007* 2 p. Australian Network for Plant Conservation, Canberra.
48. Bougher N (2007) Flora, fauna and fungi: conservation of ecosystems to conserve fungi to conserve ecosystems: poster presented at MedEcos XI, the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007. Department of Environment and Conservation, Kensington, WA.
49. Bougher NL (2007) Fungi survey: Bold Park 2007: client report to the Botanic Gardens and Parks Authority. Department of Environment and Conservation, Kensington, WA. 13 p.
50. Bougher NL (2007) The genus *Campanella* in Western Australia. *Mycotaxon* **99**, pp. 327–335.
51. Bougher NL (2007) The Hawaiian fungus, *Agaricus rotalis*, in Australia. *Western Australian Naturalist* **25**, pp. 244–246.
52. Bougher N (2007) Native fungi assist the health and rehabilitation of native vegetation. *Buntine-Marchagee Catchment News* **13**, 5 p.
53. Bougher N (2007) Perth's fungi forever. *Landscape* **22(3)**, pp. 20–26.
54. Bougher NL (2007) Perth Urban Bushland Fungi Field Book: a Self Managed Format. 3rd ed. Perth Urban Bushland Fungi Project, Perth. 116 p.
55. Bougher N (2007) Perth Urban Bushland Fungi Project. *Naturalist News* **Jul**, pp. 1–2.
56. Bougher NL, Hart R, de Bueger SJ, Froudast J, Glossop B (2007) Fungi of West Bay Bushland, Augusta, Western Australia: a PUBF report. Department of Environment and Conservation, Kensington, WA. 49 p.
57. Bougher NL, Hart R, de Bueger SJ, Glossop B (2007) Greater Brixton Street Wetlands Reserve fungi report 2007. Department of Environment and Conservation, Kensington, WA. 26 p.
58. Bougher NL, Hart R, de Bueger SJ, Glossop B (2007) Lightning Swamp Bushland fungi report 2007. Department of Environment and Conservation, Kensington, WA. 29 p.
59. Bougher NL, Hart R, de Bueger SJ, Glossop B (2007) Murdoch University Bushland fungi report 2007. Department of Environment and Conservation, Kensington, WA. 34 p.
60. Bougher NL, Hart R, de Bueger SJ, Sarti K, Glossop B (2007) Fungi of Bungendore Park, Perth, Western Australia. Department of Environment and Conservation, Kensington, WA. 32 p.

61. Bougher NL, Hart R, de Bueger S, Glossop B (2007) Perth Urban Bushland Fungi Project: fungi reports 2007. Department of Environment and Conservation, Kensington, WA. 125 p.
62. Bougher NL, Hart R, de Bueger S, Glossop B (2007) PUBF fungi surveys for DEC regional parks: community grant 2007. Department of Environment and Conservation, Kensington, WA. 59 p.
63. Brundrett M, Keighery G, Barrett R (2007) Biodiversity hotspots in WA: what, where and why? (POSTER ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* pp. 50–51. Conference Organising Committee, Perth.
64. Bullen RD, McKenzie NL (2007) Bat wing airfoil and planform structures relating to aerodynamic cleanliness. *Australian Journal of Zoology* **55**, pp. 237–247.
65. Burbidge A (2007) Milestones and stepping stones in Western Australia's nature conservation history. *Landscape* **23(1)**, pp. 12–19.
66. Burbidge AA (2008) Conservation of Australian mammals. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 26–27. Reed New Holland, Sydney.
67. Burbidge AA (2008) Crescent naitail wallaby: *Onychogalea lunata* (Gould, 1841). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 357–359. Reed New Holland, Sydney.
68. Burbidge AA, Fuller PJ (2007) Gibson Desert birds: responses to drought and plenty. *Emu* **107**, pp. 126–134.
69. Burbidge AA, Johnson KA, Fuller PJ, Aitken PF (2008) Central hare-wallaby: *Lagorchestes asomatus* Finlayson, 1943. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 312–313. Reed New Holland, Sydney.
70. Burbidge AA, Johnson PM (2008) Spectacled hare-wallaby: *Lagorchestes conspicillatus* Gould, 1842. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 314–316. Reed New Holland, Sydney.
71. Burbidge A, Kuchling G (2007) The western swamp tortoise: 50 years on. *Landscape* **22(4)**, pp. 24–29.
72. Burbidge AA, McKenzie NL, Fuller PJ (2008) Long-tailed dunnart: *Sminthopsis longicaudata* Spencer, 1909. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 148–150. Reed New Holland, Sydney.
73. Burbidge AA, Short JC (2008) Burrowing bettong: *Bettongia lesueur* (Quoy and Gaimard, 1824). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 289–290. Reed New Holland, Sydney.
74. Burbidge AA, Short J, Fuller PJ (2007) Relict *Bettongia lesueur* warrens in Western Australian deserts. *Australian Zoologist* **34**, pp. 97–103.
75. Burbidge AA, Webb MJ (2008) Scaly-tailed possum: *Wyulda squamicaudata* Alexander, 1919. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 277–278. Reed New Holland, Sydney.
76. Burbidge A (2007) The Jarnadup bristlebird eggs: who dunnit?. *South Coast Threatened Birds News* **11**, 13 p.
77. Burbidge A (2007) What was the Jarnadup bristlebird?. *Records of the Western Australian Museum* **24**, pp. 1–7.
78. Burbidge A, Mather S (eds) (2007) Western Australian bird notes: quarterly newsletter of Birds Australia Western Australia Inc. No. 121, March 2007. 32 p.
79. Burbidge A, Mather S (eds) (2007) Western Australian bird notes: quarterly newsletter of Birds Australia Western Australia Inc. No. 122, June 2007. 40 p.
80. Burbidge A, Mather S (eds) (2007) Western Australian bird notes: quarterly newsletter of Birds Australia Western Australia Inc. No. 123, September 2007. 36 p.

81. Burbidge A, Mather S (eds) (2007) Western Australian bird notes: quarterly newsletter of Birds Australia Western Australia Inc. No. 124, December 2007. 32 p.
82. Burbidge A, Mather S (eds) (2008) Western Australian bird notes: quarterly newsletter of Birds Australia Western Australia Inc. No. 125, January 2008. 40 p.
83. Burbidge AH, Rolfe J, McNee S, Newbey B, Williams M (2007) Monitoring population change in the cryptic and threatened western ground parrot in relation to fire. *Emu* **107**, pp. 79–88.
84. Burrows N (2007) Count shows threat from camels. *Environment and Conservation News* **Oct/Nov**, 3 p.
85. Burrows ND (2008) Linking fire ecology and fire management in south-west Australian forest landscapes. *Forest Ecology and Management* **255**, pp. 2394–2406.
86. Butcher R (2007) Four new conservation-listed species of *Synaphea* (Proteaceae: Conospermineae) from the jarrah forest region of south-west Western Australia. *Nuytsia* **17**, pp. 97–116.
87. Butcher R (2007) New taxa of leafless *Tetradthea* (Elaeocarpaceae, formerly Tremandraceae) from Western Australia. *Australian Systematic Botany* **20**, pp. 139–160.
88. Butcher R (2007) A report on the conservation biology of *Synaphea trifoliosa* R. Butcher ms. (= *Synaphea* sp. *Pinjarra* (R. Davis 6578)) (Proteaceae: Conospermeae), a critically endangered Pinjarra Plain endemic shrub. Department of Environment and Conservation, Kensington, WA. 89 p.
89. Butcher R (2007) *Tetradthea exasperata* and *T. phoenix* (Elaeocarpaceae), two new conservation-listed species allied to *T. setigera*, from south-west Western Australia. *Nuytsia* **17**, pp. 117–126.
90. Butcher R (2007) *Tetradthea pilata* (Elaeocarpaceae), a new and apparently rare species from the Ongerup area of south-west Western Australia. *Nuytsia* **17**, pp. 127–133.
91. Butcher R, Byrne M, Crayn DM (2007) Evidence for convergent evolution among phylogenetically distant rare species of *Tetradthea* (Elaeocarpaceae, formerly Tremandraceae) from Western Australia. *Australian Systematic Botany* **20**, pp. 126–138.
92. Butcher R, Markey AS (2007) *Persoonia manotricha* (Proteaceae: Persoonioideae), a new species associated with banded iron formation ranges in the midwest region, Western Australia. *Nuytsia* **17**, pp. 135–146.
93. Byrne M (2007) The broombush complex. *Western Wildlife: Newsletter of the Land for Wildlife Scheme* **11(4)**, pp. 8–9.
94. Byrne M (2007) Broombush complex. *Buntine-Marchagee Catchment News* **13**, 6 p.
95. Byrne M (2007) Discovering our flora's hidden discovery. *Landscape* **23(2)**, pp. 25–29.
96. Byrne MM (2007) Phylogeography identifies multiple refugia during Pleistocene climatic oscillations in southern Australia (ABSTRACT). *Quaternary International* **167/168 suppl**, 56 p.
97. Byrne M (2007) Phylogeography provides an evolutionary context for the conservation of a diverse and ancient flora. *Australian Journal of Botany* **55**, pp. 316–325.
98. Byrne M (2008) Phylogeny, diversity and evolution of eucalypts. In: *Plant Genome: Biodiversity and Evolution. Volume 1, Part E, Phanerogams-Angiosperm* (eds AK Sharma and A Sharma), pp. 303–346. Science Publishers, Enfield.
99. Byrne M, Elliott CP, Yates C, Coates DJ (2007) Extensive pollen dispersal in a bird-pollinated shrub, *Calothamnus quadrifidus*, in a fragmented landscape. *Molecular Ecology* **16**, pp. 1303–1314.
100. Byrne M, Elliott CP, Yates CJ, Coates DJ (2008) Maintenance of high pollen dispersal in *Eucalyptus wandoo*, a dominant tree of the fragmented agricultural region in Western Australia. *Conservation Genetics* **9**, pp. 97–105.

- 101.** Byrne M, Hopper SD (2008) Granite outcrops as ancient islands in old landscapes: evidence from the phylogeography and population genetics of *Eucalyptus caesia* (Myrtaceae) in Western Australia. *Biological Journal of the Linnean Society* **93**, pp. 177–188.
- 102.** Byrne M, Millar MA, Sampson J (2008) Potential for genetic contamination of remnant native populations from planted stands of woody perennials in fragmented agricultural landscapes. In: *2nd International Salinity Forum, Adelaide, 2008: Salinity, Water and Society, Global Issues, Local Action* pp. 1–4. Conference Organising Committee, Adelaide.
- 103.** Byrne M, Sampson J, Millar M (2007) Pollen dispersal between planted populations and remnant native populations in a fragmented agricultural landscape (ABSTRACT). In: *Abstracts: Genetics Society of Australasia 2007: 54th annual Conference, June 26th–29th, the University of Sydney, Australia: Comparative Genomics Workshop, June 26th–27th* 36 p. Genetics Society of Australasia, Sydney.
- 104.** Byrne M, Yates C, Coates D, Elliott C (2007) Does landscape pollen dispersal rescue small populations from inbreeding? (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 71 p. Conference Organising Committee, Perth.
- 105.** Byrne M, Yates C, Elliott C, Coates D (2007) Impact of fragmentation on reproductive biology, mating system and pollen dispersal in two plant species from the Mediterranean south-western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 31–32. Kings Park & Botanic Garden, West Perth.
- 106.** Byrne M, Yates C, Elliott C, Coates D (2007) Impact of fragmentation on reproductive biology, mating system and pollen dispersal in two plant species from the Mediterranean south-western Australia (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* pp. 51–52. Conference Organising Committee, Perth.
- 107.** Cale DJ (2008) Wetland survey of the Lake Bryde natural diversity recovery catchment; waterbirds, aquatic invertebrates and water chemistry. Department of Environment and Conservation, Woodvale, WA. 40 p.
- 108.** Cargill J, Burrows N, Stock W, van Etten E (2007) Influence of time since fire on geophyte abundance, diversity and composition in jarrah forests of south-west Western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 41–42. Kings Park & Botanic Garden, West Perth.
- 109.** Case AL, Graham SW, Macfarlane TD, Barrett SCH (2008) A phylogenetic study of evolutionary transitions in sexual systems in Australasian *Wurmbea* (Colchicaceae). *International Journal of Plant Sciences* **169**, pp. 141–156.
- 110.** Chapman AR (2007) Database of Robert Brown's Australian botanical specimens available online in FloraBase. *Australian Systematic Botany Society Newsletter* **130**, pp. 12–13.
- 111.** Chapman AR (2007) Mechanisms for coordination and delivery of descriptive data and taxon profiles in the Australasian Biodiversity Federation (ABSTRACT). In: *Biodiversity Information Standards TDWG: the Proceedings of TDWG: Abstracts of the 2007 Annual Conference of the Taxonomic Databases Working Group: 16–22 September 2007, Bratislava, Slovakia* (eds A Weitzman, L Belbin), 45 p. Biodiversity Information Standards (TDWG), St Louis.
- 112.** Chapman AR (2007) Mechanisms for coordination and delivery of taxon profiles in Australia: longitudinal use case scenarios from primary data custodians and roles for data standards: PowerPoint presentation given at Biodiversity Information Standards TDWG: the Proceedings of TDWG: Abstracts of the 2007 Annual Conference of the Taxonomic Databases Working Group: 16–22 September 2007, Bratislava, Slovakia. 14 digital slides.
- 113.** Chapman AR (ed) (2007) *Nuytsia*. Vol 16, no 2. pp. 265–478. Department of Environment and Conservation, Kensington, WA.

114. Chapman A (comp) (2007) Western Australian cryptogam statistics. Available at: <http://florabase.calm.wa.gov.au/index-crypto.php> [Accessed 4 Jul 2007]. pp. 1–2.
115. Chapman A (comp) (2007) Western Australian flora statistics. Available at: <http://florabase.calm.wa.gov.au/statistics/> [Accessed 4 Jul 2007]. pp. 1–2.
116. Chapman AR, Thiele K (2007) Bid to host BIS TDWG 2008 in Fremantle Western Australia: TDWG executive meeting, Sunday 16th September 2007: PowerPoint presentation given at Biodiversity Information Standards TDWG: the Proceedings of TDWG: Abstracts of the 2007 Annual Conference of the Taxonomic Databases Working Group: 16–22 September 2007, Bratislava, Slovakia. 13 digital slides.
117. Chapman A, Whitbread G, Richardson B, Belbin L (comps) (2007) Towards an LSID policy for the Australasian biodiversity federation: recommendations, Canberra LSID Workshop, ANBG, 2–4 April 2007. Biodiversity Information Standards (TDWG), Canberra. 18 p.
118. Chemello D (2007) Latest news from the DEC Ground Parrot Team: recent surveys, Windy Harbour, April 2007; Short Road, May 07. *Friends of the Western Ground Parrot Newsupdate* **26**, pp. 1–3.
119. Chemello D (2008) To suffer in silence. *South Coast Threatened Birds News* **12**, 10 p.
120. Chemello D (2008) Western ground parrot recovery 2007: the year in review. *South Coast Threatened Birds News* **12**, 5 p.
121. Coates DJ, Dixon KW (2007) Current perspectives in plant conservation biology. *Australian Journal of Botany* **55**, pp. 187–193.
122. Coates DJ, Dixon KW, Farrer SL, Iles TM (eds) (2007) Current perspectives in plant conservation biology. *Australian Journal of Botany* **55(3)**, pp. 187–399.
123. Coates DJ, Sampson JF, Yates CJ (2007) Plant mating systems and assessing population persistence in fragmented landscapes. *Australian Journal of Botany* **55**, pp. 239–249.
124. Coates D, Sampson J, Yates C, Byrne M (2007) Plant mating systems and assessing population persistence in fragmented landscapes (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 77 p. Conference Organising Committee, Perth.
125. Coates D, Yates C (2007) Western Australia's flora: origins, endemism, rarity and conservation: copy of PowerPoint presentation. In: *Flora Management Course: Porongurups, 17–21 September, 2007* pp. 1–32. Department of Environment and Conservation, Kensington, WA.
126. Cochrane A (2008) Preserving our flora's future. *Landscape* **23(3)**, pp. 17–21.
127. Cochrane A, Crawford A (2007) Ex situ seed conservation: Flora Management Course, 2007: copy of PowerPoint presentation. In: *Flora Management Course: Porongurups, 17–21 September, 2007* pp. 1–24. Department of Environment and Conservation, Kensington, WA.
128. Cochrane A, Crawford A, Monks L (2007) Achieving Target 8 of the GSPC in Western Australia. *Samara* **13**, pp. 11–12.
129. Cochrane JA, Crawford AD, Monks LT (2007) The significance of *ex situ* seed conservation to reintroduction of threatened plants. *Australian Journal of Botany* **55**, pp. 356–361.
130. Compton T, Troost TA, Kraan C, Pearson GB, Honkoop P, de Goeij P et al. (2007) Diversity of bivalves is not related to the range of sediments at local and global scales: poster presented at BES Annual Symposium, Speciation and Ecology, University of Sheffield, 28–30 March, 2007 (POSTER).
131. Compton T, van der Meer J, Kraan C, Pearson GB, Dekinga A, Lavaleye M et al. (2007) Do tropical bivalves have narrower niches than temperate bivalves?: poster presented at Third Biennial Conference of the International Biogeography Society: Casino Taoro, Puerto de la Cruz, January 9–13, 2007, Tenerife, Canary Islands (POSTER).

132. Compton T, van der Meer J, Kraan C, Pearson GB, Dekinga A, Lavaleye M et al. (2007) Do tropical bivalves have narrower realised niches than temperate bivalves? (POSTER ABSTRACT). In: *Third Biennial Conference of the International Biogeography Society: Casino Taoro, Puerto de la Cruz, January 9–13, 2007, Tenerife, Canary Islands* 57 p. International Biogeography Society, Tenerife.
133. Conn BJ, Shepherd KA (2007) *Prostanthera ferricola* (Lamiaceae), a new species from Western Australia. *Nuytsia* **17**, pp. 147–151.
134. Crane CE, Shearer BL (2007) Hemispherical digital photographs offer advantages over conventional methods for quantifying pathogen-mediated changes caused by infestation of *Phytophthora cinnamomi*. *Australasian Plant Pathology* **36**, pp. 466–474.
135. Cranfield RJ (2007) *Cladonia*, faerie castles. *Flora Scene* **2(2)**, 4 p.
136. Cranfield RJ (comp) (2007) Historical floral images 1901–1907. Department of Environment and Conservation, Manjimup. 134 p.
137. Cranfield RJ, Macfarlane TD (2007) A new species of *Petrophile* (Proteaceae) from south-western Australia. *Nuytsia* **17**, pp. 153–157.
138. Crawford AD, Steadman KJ, Plummer JA, Cochrane A, Probert RJ (2007) Analysis of seed-bank data confirms suitability of international seed-storage standards for the Australian flora. *Australian Journal of Botany* **55**, pp. 18–29.
139. Crosti R, Dixon KW, Ladd PG, Yates CJ (2007) Changes in the structure and species dominance in vegetation over 60 years in an urban bushland remnant. *Pacific Conservation Biology* **13**, pp. 158–170.
140. Davis RW (2007) A rare and geographically restricted new *Ptilotus* (Amaranthaceae) from the Pilbara bioregion of Western Australia. *Nuytsia* **16**, pp. 265–268.
141. Davison EM, Donnelly DJ, Hewett PJ, Tay FCS (2007) Incipient rot and rot in regrowth *Eucalyptus diversicolor*, options for management. In: *Borers and Rots in Eucalypts Conference: Commercial Management Issues: program and papers, 5–7 November 2007* pp. 51–55. Institute of Foresters of Australia, Western Australian Division, Perth.
142. De Tores PJ (2008) Quokka: *Setonix brachyurus* (Quoy and Gaimard, 1830). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 402–404. Reed New Holland, Sydney.
143. De Tores PJ (2008) Western ringtail possum: *Pseudocheirus occidentalis* (Thomas, 1888). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 253–255. Reed New Holland, Sydney.
144. De Tores P, Berry O (2007) Will curiosity kill the cat?. *Landscape* **22(3)**, pp. 49–55.
145. De Tores PJ, Hayward MW, Dillon MJ, Brazell RI (2007) Review of the distribution, causes for the decline and recommendations for management of the quokka, *Setonix brachyurus* (Macropodidae: Marsupialia), an endemic macropod marsupial from south-west Western Australia. *Conservation Science Western Australia* **6(1)**, pp. 13–73.
146. De Tores PJ, Start AN (2008) Woylie: *Bettongia penicillata* Gray, 1837. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 291–292. Reed New Holland, Sydney.
147. DEC (2007) A strategic plan for biodiversity conservation research, 2008–2017. Department of Environment and Conservation, Kensington, WA. 23 p.
148. Dell B, Hardy G, O’Gara E, Dunstan B, Young J, Barrett S et al. [Shearer B] (2007) The impact of *Phytophthora cinnamomi* on ecosystem function and health of Mediterranean forests, woodlands and heathlands in Western Australia (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 61 p. Conference Organising Committee, Perth.

149. Dell B, Hardy G, O’Gara E, Shearer B (2007) The impact of *Phytophthora cinnamomi* on ecosystem function and health of Mediterranean forests, woodlands and heathlands in Western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 69–70. Kings Park & Botanic Garden, West Perth.
150. Diels L (trans BJ Grieve, BB Lamont, EO Hellmuth, ed N Gibson) (2007) The plant life of Western Australia: south of the tropic with an introductory part dealing with the salient features of the vegetation of the whole of Australia: the results of an expedition undertaken during 1901–1902 under the the auspices of the Humboldt Foundation Royal Prussian Academy of Science. *Conservation Science Western Australia* **6(2)**, pp. 1–373.
151. Donaldson FR, Morris KD, Bencini R, Vercoe PE (2007) A case study of threatening processes and management for the boodie, *Bettongia lesueur* (ABSTRACT). In: *The Biodiversity Extinction Crisis: an Australasian and Pacific Response: Final Program: University of New South Wales, Sydney, Australia, 10–12 July 2007* 68 p. Conference Organising Committee, Sydney.
152. Donnelly DJ, Davison EM (2008) Comparison of the occurrence of rot in sawlogs from regrowth and mature stands of *Eucalyptus diversicolor* (karri). *Australian Forestry* **71**, pp. 27–32.
153. Durrant B (2007) How has the environment and evolutionary heritage affected the biogeography of the ground-dwelling spiders of the Pilbara region, Western Australia? (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 86 p. Conference Organising Committee, Perth.
154. Eberhard S (2007) Subterranean fauna extracts: prepared for Department of Environment and Conservation, Western Australia. Subterranean Ecology, Perth. 7 p.
155. Eckert S, McKellar R (2008) Securing rights to carbon sequestration: the Western Australian experience. *Sustainable Development Law & Policy* **8**, pp. 30–33, 85.
156. Edwards A, Bancroft K (2007) Bibliography of marine scientific research relevant to the Rowley Shoals Marine Park and the Mermaid Reef Marine National Nature Reserve. Department of Environment and Conservation, Western Australia, Marine Science Program, Data Report **OOS/RSMP-2007/01**, Department of Environment and Conservation, Kensington, WA. 15 p.
157. Edwards A, Bancroft K (2007) Current and proposed marine research projects relevant to the Rowley Shoals Marine Park and the Mermaid Reef Marine National Nature Reserve. Department of Environment and Conservation, Western Australia, Marine Science Program, Data Report **OOS/RSMP-2007/02**, Department of Environment and Conservation, Kensington, WA. 9 p.
158. Eldridge MDB, Pearson DJ (2008) Black-footed rock-wallaby: *Petrogale lateralis* Gould, 1842. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 376–380. Reed New Holland, Sydney.
159. Farr J (2007) Adaptive ecosystem management: biodiversity studies [printout of PowerPoint presentation given at: Borers and Rots in Eucalypts Conference: Commercial Management Issues]. In: *Borers and Rots in Eucalypts Conference: Commercial Management Issues: Program and Papers, 5–7 November 2007* pp. 95–105. Institute of Foresters of Australia, Western Australian Division, Perth.
160. Finston TL, Johnson MS, Humphreys WF, Eberhard SM, Halse SA (2007) Cryptic speciation in two widespread subterranean amphipod genera reflects historical drainage patterns in an ancient landscape. *Molecular Ecology* **16**, pp. 355–365.
161. Fleming MR, McKenzie NL (2008) Kimberley rock-rat: *Zyomys woodwardi* (Thomas, 1909). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 660–661. Reed New Holland, Sydney.

162. Friedel M, Bastin G, Brock C, Butler D, Clarke A, Eyre T et al. [van Leeuwen S] (2007) Developing a research agenda for the distribution and rate of spread of buffel grass (*Cenchrus ciliaris*) and identification of landscapes and biodiversity assets at most risk from invasion: a report to the Department of the Environment and Water Resources. CSIRO Sustainable Ecosystems, Alice Springs. 28 p.
163. Friend GR, Pearson DJ (2008) Little long-tailed dunnart: *Sminthopsis dolichura* Kitchener, Stoddart and Henry, 1984. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 134–135. Reed New Holland, Sydney.
164. Friend JA (2008) Western barred bandicoot: *Perameles bougainville* Quoy and Gaimard, 1824. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 182–184. Reed New Holland, Sydney.
165. Friend T, Button T (2007) Dibblers at Peniup: the story continues. *Malleefowl Matter* **43**, 2 p.
166. Friend JA (2007) History of western barred bandicoot conservation (ABSTRACT). In: *Proceedings of the Western Barred Bandicoot Symposium, 2007: Senate Conference Room, Murdoch University, 2nd February 2007* pp. 4–8. Conference Organising Committee, Murdoch.
167. Friend T (2007) Quarterly financial report, submitted to South Coast NRM Inc.: period 1 April to 30 June 2007, project ID 053011a, Securing a future for the dibbler: implementation of the Dibbler Recovery Plan. Department of Environment and Conservation, Albany. 8 p.
168. Friend JA (2007) Recovering Gilbert's potoroo: walking a tightrope with Australia's rarest mammal (ABSTRACT). In: *The Biodiversity Extinction Crisis: an Australasian and Pacific Response: Final Program: University of New South Wales, Sydney, Australia, 10–12 July 2007* 27 p. Conference Organising Committee, Sydney.
169. Friend T (2008) Cross-fostering Gilbert's potoroos. *Landscape* **23(3)**, pp. 6–8.
170. Friend JA (2008) Family Myrmecobiidae, numbat. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), 162 p. Reed New Holland, Sydney.
171. Friend JA (2008) Gilbert's potoroo: *Potorous gilbertii* (Gould, 1841). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 297–298. Reed New Holland, Sydney.
172. Friend JA (2008) Numbat: *Myrmecobius fasciatus* Waterhouse, 1836. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 163–165. Reed New Holland, Sydney.
173. Friend JA, Button TA, Hills SDE (2007) The quokkas of Bald Island: population biology and spatial organisation (POSTER ABSTRACT). *Australian Mammal Society Newsletter* **Oct**, 24 p.
174. George N, Henry D, Yan G, Byrne M (2007) Variability in feed quality between populations of *Acacia saligna* (Labill.) H. Wendl. (Mimosoideae): implications for domestication. *Animal Feed Science and Technology* **136**, pp. 109–127.
175. Gibson L, Barrett B, Burbidge AH (2007) Dealing with uncertain absences in habitat modelling: a case study of a rare ground-dwelling parrot. *Diversity and Distributions* pp. 704–713.
176. Gibson N, Coates DJ, Thiele KR (2007) Taxonomic research and the conservation status of flora in the Yilgarn banded iron formation ranges. *Nuytsia* **17**, pp. 1–12.
177. Gioia P (2007) The management of network and communications infrastructure to effectively support core business requirements: a discussion paper. Department of Environment and Conservation, Kensington, WA. 21 p.
178. Glen AS (2007) Mesopredator release: the Australian evidence (ABSTRACT). In: *The Biodiversity Extinction Crisis: an Australasian and Pacific Response: Final Program: University of New South Wales, Sydney, Australia, 10–12 July 2007* 56 p. Conference Organising Committee, Sydney.
179. Glen AS, Dickman CR (2008) Niche overlap between marsupial and eutherian carnivores: does competition threaten the endangered spotted-tailed quoll?. *Journal of Applied Ecology* **45**, pp. 700–707.
180. Glen AS, Dickman CR, Soulé ME, Mackey BG (2007) Evaluating the role of the dingo as a trophic regulator in Australian ecosystems. *Austral Ecology* **32**, pp. 492–501.

181. Glen AS, Gentle MN, Dickman CR (2007) Non-target impacts of poison baiting for predator control in Australia. *Mammal Review* **37**, pp. 191–205.
182. Glen M, Bougher NL, Colquhoun IJ, Vlahos S, Loneragan WA, O'Brien PA et al. (2008) Ectomycorrhizal fungal communities of rehabilitated bauxite mines and adjacent, natural jarrah forest in Western Australia. *Forest Ecology and Management* **255**, pp. 214–225.
183. Gosper C (2007) Fire, fragmentation, weeds and the conservation of plant diversity in wheatbelt nature reserves. Available at: <<http://www.csiro.au/science/WAFireFragment.html>> [Accessed 6 Dec 2007]. 1 p.
184. Gosper CR, Prober SM, Yates CJ (2007) Scrub rolling and burning: altering recruitment of serotinous obligate seeders? (POSTER ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* pp. 191–192. Conference Organising Committee, Perth.
185. Gould JS, McCaw WL, Cheney NP, Ellis PF, Knight IK, Sullivan AL (2007) Project Vesta: fire in dry eucalypt forest: fuel structure, fuel dynamics and fire behaviour. CSIRO, Canberra. 218 p.
186. Gould JS, McCaw WL, Cheney NP, Ellis PF, Matthews S (2007) Field guide: fuel assessment and fire behaviour prediction in dry eucalypt forest. CSIRO, Perth. 82 p.
187. Griffiths K, Bougher NL (2008) Stonemaker fungus: a fire-responsive heavy-weight of the fungus kingdom. *Western Australian Naturalist* **26**, pp. 12–15.
188. Guthrie NA (2007) A new species of *Gnathoxys* (Coleoptera: Carabidae: Carabinae) from an urban bushland remnant in Western Australia. *Records of the Western Australian Museum* **23**, pp. 213–217.
189. Halse SA, Pinder AM (2007) Action benefits from certainty: what certainty is there species are being lost and how can we improve it? (ABSTRACT). In: *The Biodiversity Extinction Crisis: an Australasian and Pacific Response: Final Program: University of New South Wales, Sydney, Australia, 10–12 July 2007* 94 p. Conference Organising Committee, Sydney.
190. Halse SA, Pinder AM (2007) Action benefits from certainty: what certainty is there species are being lost and how can we improve it?: PowerPoint presentation given at Biodiversity Extinction Crisis: An Australasian and Pacific Response: University of New South Wales, Sydney, 10–12 July 2007. 13 digital slides.
191. Halse SA, Scanlon MD, Cocking JS, Smith MJ, Kay WR (2007) Factors affecting river health and its assessment over broad geographic ranges: the Western Australian experience. *Environmental Monitoring and Assessment* **134**, pp. 161–175.
192. Harding D (ed) (2007) Conservation science Western Australia. Vol 6, no 1, July 2007. Department of Environment and Conservation, Kensington, WA. 176 p.
193. Harding D (ed) (2007) Conservation science Western Australia. Vol 6, no 2, November 2007. Department of Environment and Conservation, Kensington, WA. 373 p.
194. Harding D (ed) (2008) Conservation science Western Australia. Vol 6, no 3, February 2008. Department of Environment and Conservation, Kensington, WA. 214 p.
195. Hayward MW, de Tores PJ, Dillon MJ, Banks PB (2007) Predicting the occurrence of the quokka, *Setonix brachyurus* (Macropodidae: Marsupialia), in Western Australia's northern jarrah forest. *Wildlife Research* **34**, pp. 194–199.
196. Hilmer S, Algar D, Angus J, Schleucher E (2007) Impact of long term captivity on the physiology of the feral cat (*Felis catus*) (ABSTRACT). In: *24th Annual Meeting of the Australian and New Zealand Society for Comparative Physiology and Biochemistry, University of Western Australia and Curtin University, Perth, December 1–2, 2007* 46 p. Curtin University of Technology, Department of Environmental Biology, Perth.
197. Hislop M (2007) A new species and a new combination in *Acrotriche* (Ericaceae: Styphelioideae: Styphelieae), with keys to the Western Australian members of the genus and its closest relative *Lissanthe*. *Nuytsia* **16**, pp. 285–297.

198. Hislop M, Chapman AR (2007) Three new and geographically restricted species of *Leucopogon* (Ericaceae: Styphelioideae: Styphelieae) from south-west Western Australia. *Nuytsia* **17**, pp. 165–184.
199. Hollister C, Lander N (2007) Western Australian Proteaceae: interactive identification & information retrieval: *Banksia & Dryandra, Conospermum, Grevillea, Hakea, Isopogon & Petrophile* (CDROM). Western Australian Herbarium, Kensington, WA. 1 CD-ROM.
200. Huisman JM (2007) The Dampierian province. In: *Algae of Australia: Introduction* (eds PM McCarthy, AE Orchard), pp. 543–549. CSIRO Pub., Collingwood.
201. Huisman JM (2007) Marine plants of Western Australia's shelf-edge atolls (ABSTRACT). In: *ASPAB Conference Program and Abstracts, Hobart, Jan 2007* 15 p. Australasian Society of Phycology and Aquatic Botany, Hobart.
202. Huisman JM, Abbott IA, Smith CM (2007) Hawaiian reef plants. University of Hawai'i Sea Grant College Program, Honolulu. 264 p.
203. Huisman JM, Entwistle TJ (2007) A bibliography of Australian algae. In: *Algae of Australia: Introduction* (eds PM McCarthy, AE Orchard), pp. 158–197. CSIRO Pub., Collingwood.
204. Huisman JM, Entwistle TJ (2007) Glossary. In: *Algae of Australia: Introduction* (eds PM McCarthy, AE Orchard), pp. 623–693. CSIRO Pub., Collingwood.
205. Huisman JM, Entwistle TJ (2007) A guide to the identification of algae. In: *Algae of Australia: Introduction* (eds PM McCarthy, AE Orchard), pp. 129–157. CSIRO Pub., Collingwood.
206. Huisman JM, Kraft GT (2007) Rhodophyta: Florideophyceae. In: *Algae of Australia: Introduction* (eds PM McCarthy, AE Orchard), pp. 217–223. CSIRO Pub., Collingwood.
207. Huisman J, Morrison S (2007) Life in isolated oases: Western Australia's shelf-edge atolls. *Landscape* **22(4)**, pp. 32–38.
208. Huisman JM, Saunders GW (2007) Phylogeny and classification of the algae. In: *Algae of Australia: Introduction* (eds PM McCarthy, AE Orchard), pp. 66–103. CSIRO Pub., Collingwood.
209. Hussey BMJ, Keighery GJ, Dodd J, Lloyd SG, Cousens RD (2007) Western weeds: a guide to the weeds of the Western Australia. 2nd ed.. Weeds Society of Western Australia, Victoria Park. 294 p.
210. Jackson J, Moro D, Mawson P, Lund M, Mellican A (2007) Bait uptake and caching by red foxes and nontarget species in urban reserves. *Journal of Wildlife Management* **71**, pp. 1134–1140.
211. Jacob J, Hinds LA, Singleton GR, Sutherland DR, Ylönen H (2007) Is the reproductive potential of wild house mice regulated by extrinsic or intrinsic factors?. *Austral Ecology* **32**, pp. 202–209.
212. Jayasekera AU, McComb JA, Shearer BL, Hardy GE St J (2007) *In planta* selfing and oospore production of *Phytophthora cinnamomi* in the presence of *Acacia pulchella*. *Mycological Research* **111**, pp. 355–362.
213. Jayawardene B, White G, Blank D, Hons A, Verveer A, Biggs J (2007) Planet hunting, transit-style. *Mercury* **36(2)**,
214. Johnson B, Thomson-Dans C (2007) Mammals of the South-West. Bush Books Department of Environment and Conservation, Kensington, WA. 72 p.
215. Johnson KA, Burbidge AA (2008) Pig-footed bandicoot: *Chaeropus ecaudatus* (Ogilby, 1838). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 172–173. Reed New Holland, Sydney.
216. Johnson KA, Burbidge AA (2008) Rufous hare-wallaby: *Lagorchestes hirsutus* Gould, 1844. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 317–319. Reed New Holland, Sydney.
217. Keighery BJ, Keighery GJ, Webb A, Longman VM, Griffin EA (2008) A floristic survey of the Whicher Scarp. Department of Environment and Conservation, Perth. 272 p.

218. Keighery GJ (2007) Current and potential geophyte weeds of south-western Australia (ABSTRACT). In: *EMAP19: 9th International Conference on the Ecology and Management of Alien Plant Invasions: Program & Abstract Book, 17–21 September 2007, Hyatt Regency, Perth, Western Australia* 21 p. Congress West, Perth.
219. Keighery GJ (2007) Discussion. In: *Managing Sharp Rush (Juncus acutus): proceedings of a workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006* (ed V Longman), pp. 58–61. Department of Environment and Conservation, Kensington, WA.
220. Keighery G (2008) A new species of *Lomandra* (Lomandraceae) from the Whicher Range, Western Australia. *Western Australian Naturalist* **26**, pp. 16–20.
221. Keighery GJ, Gibson N, van Leeuwen S, Lyons MN, Patrick S (2007) Biological survey and setting priorities for flora conservation in Western Australia. *Australian Journal of Botany* **55**, pp. 308–315.
222. Keighery G, Keighery B (2007) Australian hollyhock by any other name. *Western Australian Wildflower Society Newsletter* **45(2)**, 22 p.
223. Keighery G, Keighery B (2007) Biology and weed risk of *Euphorbia terracina* in Western Australia. In: *Geraldton Carnation Weed (Euphorbia terracina): workshop and field day: proceedings from a Skills for Nature Conservation Workshop held at Naragebup Rockingham Regional Environment Centre (Inc.), Peron, Western Australia, Thursday 21 June 2007* pp. 1–6. Department of Environment and Conservation, Kensington, WA.
224. Keighery G, Keighery B (2007) The claws are out, *Calothamnus* (Myrtaceae): a cautionary tale. *Western Australian Wildflower Society Newsletter* **45(1)**, pp. 22–23.
225. Keighery GJ, Keighery BJ (2007) Current status and potential spread of *Juncus acutus*. In: *Managing Sharp Rush (Juncus acutus): proceedings of a workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006* (ed V Longman), pp. 26–37. Department of Environment and Conservation, Kensington, WA.
226. Keighery G, Keighery B (2007) *Juncus acutus*: where to in WA? (ABSTRACT). In: *Managing Sharp Rush (Juncus acutus): PowerPoint Presentations From the Workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006* (CDROM) Department of Environment and Conservation, Kensington, WA. 6 digital slides.
227. Keighery G, Keighery B (2007) *Juncus* in Western Australia (ABSTRACT). In: *Managing Sharp Rush (Juncus acutus): PowerPoint Presentations From the Workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006* (CDROM) Department of Environment and Conservation, Kensington, WA. 13 digital slides.
228. Keighery GJ, Keighery BJ (2007) Native and naturalised *Juncus* in Western Australia. In: *Managing Sharp Rush (Juncus acutus): proceedings of a workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006* (ed V Longman), pp. 9–18. Department of Environment and Conservation, Kensington, WA.
229. Keighery G, Keighery B (2008) Less weeds, more natives: the *Oxalis corniculata* complex in Western Australia. *Wildflower Society of Western Australia Newsletter* **46(1)**, pp. 31–32.
230. Keighery G, Keighery B, Gibson N (2008) Floristics of reserves and bushland areas of the Whicher Scarp. 1, flora and vegetation of Dardanup forest block. *Western Australian Naturalist* **26**, pp. 42–66.
231. Keighery GJ, Keighery BJ, Longman VM, Clarke KA (2007) The vegetation and vascular flora of System 6 recommendation C53 (Coolup Reserves) and adjacent bushland, Shire of Waroona: a report for Swan Bioplan, Department of Environment and Conservation, Western Australia. Department of Environment and Conservation, Woodvale, WA. 43 p.
232. Kellermann J, Rye BL, Thiele KR (2007) *Blackallia*, *Serichonus* and *Papistylus*: three closely related genera of Rhamnaceae (Pomadereae) from south-western Australia. *Nuytsia* **16**, pp. 299–316.

233. Kern S, Jasper R, True D (2008) Floristic survey of the Ravensthorpe Range, 2007: report prepared for the Department of Environment & Conservation. Department of Environment and Conservation, Woodvale, WA. 376 p.
234. Kitchener DJ, Friend, JA. (2008) Broad-faced potoroo: *Potorous platyops* (Gould, 1844). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 301–302. Reed New Holland, Sydney.
235. Krauss SL, Hermanutz L, Hopper SD, Coates DJ (2007) Population-size effects on seeds and seedlings from fragmented eucalypt populations: implications for seed sourcing for ecological restoration. *Australian Journal of Botany* **55**, pp. 390–399.
236. Lander N (2007) FloraBase demonstration (ABSTRACT). In: *EMAPI9: 9th International Conference on the Ecology and Management of Alien Plant Invasions: Program & Abstract Book, 17–21 September 2007, Hyatt Regency, Perth, Western Australia* 41 p. Congress West, Perth.
237. Lander N (2007) Plant identification: the WA Herbarium and its online plant information system, FloraBase: copy of PowerPoint presentation. In: *Flora Management Course: Porongurups, 17–21 September, 2007* pp. 1–7. Department of Environment and Conservation, Kensington, WA.
238. Liddelow G, Cranfield R, Brennan K (2007) Desert tracks: plants and animals of the Canning Stock Route, 13–24 August, 2007: expedition briefing. Department of Environment and Conservation, Western Australia, Landscape Expeditions 43 p.
239. Llorens TM, Coates DJ, Byrne M, Yates CJ (2007) Assessing genetic connectivity across a fragmented landscape (POSTER ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 199 p. Conference Organising Committee, Perth.
240. Long S, Armstrong S, Fabricius K, Field I, Cook K, Colquhoun J et al. [Huisman J] (comps) (2008) Comparative marine biodiversity survey of the Rowley Shoals, 1–17 Dec 2007: metadata report. Department of Environment and Conservation, Kensington, WA. 14 p.
241. Long S, Smith L, Simpson C (2007) Long-term stability, disturbance and recovery of coral communities at Ningaloo Reef, Western Australia (ABSTRACT). In: *Australian Coral Reef Society, 83rd Annual Conference, Fremantle, Western Australia, 9–11th October, 2007: East Meets West: Science and Management of Australia's Coral Reefs* 58 p. Conference Organising Committee, Perth.
242. Long S, Smith L, Simpson C (2007) Stability, disturbance and recovery of reefs in Bill's Bay over a 17-year period (ABSTRACT). In: *Ningaloo Marine Park Symposium, July 2007* 52 p. Conference Organising Committee, Perth.
243. Longman V (comp) (2007) Managing sharp rush (*Juncus acutus*): PowerPoint presentations from the workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006. Department of Environment and Conservation, Kensington, WA. 1 CD-ROM.
244. Longman V (ed) (2007) Managing sharp rush (*Juncus acutus*): proceedings of a workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006. Department of Environment and Conservation, Kensington, WA. 61 p.
245. Lyons MN (2007) The current distribution of *Juncus acutus* and aspects of its occurrence in the SW agricultural zone. In: *Managing Sharp Rush (Juncus acutus): proceedings of a workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006* (ed V Longman), pp. 19–25. Department of Environment and Conservation, Kensington, WA.
246. Lyons M (2007) *Juncus acutus* occurrence in the wheatbelt (ABSTRACT). In: *Managing Sharp Rush (Juncus acutus): PowerPoint Presentations From the Workshop held at Wollaston College Conference Centre, Mt Claremont, Perth, Western Australia, Friday 4 August 2006 (CDROM)* Department of Environment and Conservation, Kensington, WA. 11 digital slides.
247. Lyons MN, Dunlop JA (comps) (2007) Western Australia agricultural zone biodiversity survey database. Department of Environment and Conservation, Kensington, WA. 1 CD-ROM.

- 248.** Lyons MN, Halse SA, Gibson N, Cale DJ, Lane JAK, Walker CD et al. [Mickle DA] (2007) Monitoring wetlands in a salinizing landscape: case studies from the wheatbelt region of Western Australia. *Hydrobiologia* **591**, pp. 147–164.
- 249.** Lyons MN, Keighery GJ (2007) A new species of *Hypoxis* (Hypoxidaceae) from saline wetland margins in Western Australia. *Nuytsia* **16**, pp. 317–320.
- 250.** Macfarlane TD (2007) A new species of *Neurachne* (Poaceae) from Western Australia. *Nuytsia* **17**, pp. 215–222.
- 251.** Macfarlane TD, Case AL (2007) *Wurmbea inflata* (Colchicaceae), a new species from the Gascoyne region of Western Australia. *Nuytsia* **17**, pp. 223–228.
- 252.** Macfarlane TD, Hearn RW (2007) Occurrence and status of *Pentapogon quadrifidus* (Poaceae) in Western Australia. *Nuytsia* **16**, pp. 469–471.
- 253.** Macfarlane T, Williams AR (2007) *Agrostis castellana* (Poaceae) mis-identified as *A. capillaris* var. *aristata* in Western Australia. *Nuytsia* **16**, 472 p.
- 254.** Malesani D, Thoene CC, Williams A, Fynbo JPU, Jaunsen AO, Vreeswijk PM (2007) GRB 070509: Objects inside XRT error circle. *GCN Circular* **6410**, 1 p.
- 255.** Martin P, Martinez-Ansemil E, Pinder A, Timm T, Wetzel MJ (2008) Global diversity of oligochaetous clitellates (Oligochaeta: Clitellata) in freshwater. *Hydrobiologia* **595**, pp. 117–127.
- 256.** Martin R (2007) Supernova 2007bl in ESO 239-G1. *Central Bureau for Astronomical Telegrams, Electronic Telegrams* **935**, 1 p.
- 257.** Martin R (2007) Supernova 2007bm in NGC 3672. *Central Bureau for Astronomical Telegrams, Electronic Telegrams* **936**, 1 p.
- 258.** Martin R (2007) Supernova 2007bn in NGC 7408. *Central Bureau for Astronomical Telegrams, Electronic Telegrams* **940**, 1 p.
- 259.** Maslin BR (2007) The *Acacia bivenosa* group of wattles on Airlie & Thevenard islands, Pilbara region, W.A.: a report produced for Apache Energy & Chevron Australia. Department of Environment and Conservation, Kensington, WA. 36 p.
- 260.** Maslin BR (2007) *Acacia burrowsiana* (Leguminosae: Mimosoideae), a new arid zone species from near Mt Magnet, Western Australia. *Nuytsia* **17**, pp. 241–246.
- 261.** Maslin BR (2007) *Acacia cockertoniana* (Leguminosae: Mimosoideae), a new species from banded ironstone ranges of the south-west arid zone, Western Australia. *Nuytsia* **17**, pp. 247–252.
- 262.** Maslin BR (2007) Three new wattles (*Acacia*: Mimosoideae) from the Kalannie region, Western Australia. *Nuytsia* **17**, pp. 229–239.
- 263.** Maslin BR, Buscumb C (2007) Two new *Acacia* species (Leguminosae: Mimosoideae) from banded ironstone ranges in the midwest region of south-west Western Australia. *Nuytsia* **17**, pp. 263–272.
- 264.** Maslin BR, Buscumb C (2007) Two new species of *Acacia* (Leguminosae: Mimosoideae) from the Koolanooka Hills in the northern wheatbelt region of south-west Western Australia. *Nuytsia* **17**, pp. 253–261.
- 265.** Maslin BR, Wilson PG (2007) (1787) Proposal to conserve the name *Acacia cyclops* against *A. eglandulosa* (Leguminosae). *Taxon* **56**, pp. 961–962.
- 266.** Mast AR, Thiele K (2007) The transfer of *Dryandra* R.Br. to *Banksia* L.f. (Proteaceae). *Australian Systematic Botany* **20**, pp. 63–71.
- 267.** Matheny PB, Vellinga EC, Bougher NL, Ceska O, Moreau P-A, Neves MA et al. (2007) Taxonomy of displaced species of *Tubaria*. *Mycologia* **99**, pp. 569–585.
- 268.** Matthews S, McCaw WL, Neal JE, Smith RH (2007) Testing a process-based fine fuel moisture model in two forest types. *Canadian Journal of Forest Research* **37**, pp. 23–35.

269. McCaw L (2007) *Callitris* in the woodlands and shrublands of southern Western Australia: ancient landscapes, contemporary issues: paper for presentation at the Australian and New Zealand Institutes of Foresters Conference, Coffs Harbour, 3–7 June 2007. Department of Environment and Conservation, Manjimup. 9 p.
270. McCaw L (2007) Contribution of prescribed fire to the management of conservation lands and multiple-use forests in Western Australia (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* pp. 125–126. Conference Organising Committee, Perth.
271. McCaw L (2008) Wildfire: a century of failed forest policy: George Wuertner (ed.), Foundation for Deep Ecology by arrangement with Island press, 2006, 350 pages, paperback, ISBN 1-59726-070-3, \$89.95 from CSIRO Publishing, <<http://www.publish.csiro.au>> (BOOK REVIEW). *Australian Forestry* **70**, pp. 276–277.
272. McCaw L, Cranfield R, Liddelow G, Ward B, van Heurck P, Bain K et al. [Middleton T] (2007) Post-fire response of tall eucalypt forest in southern Western Australia (POSTER ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 89 p. Conference Organising Committee, Perth.
273. McCaw WL, Gould JS, Cheney NP (2008) Existing fire behaviour models under-predict the rate of spread of summer fires in open jarrah (*Eucalyptus marginata*) forest. *Australian Forestry* **71**, pp. 16–26.
274. McCaw L, Marchetti P, Elliot G, Reader G (2007) Bushfire weather climatology of the Haines Index in south-western Australia. *Australian Meteorological Magazine* **56**, pp. 75–80.
275. McCaw L, Robinson R (2008) ForestCheck: monitoring biodiversity in jarrah (*Eucalyptus marginata*) forest managed for timber harvesting (ABSTRACT). In: *Old Forests, New Management: an International Scientific Conference on the Conservation and Use of Old-Growth Forests in the 21st Century: Program and Abstracts* 1 p. Conference Design, Hobart.
276. McCaw L, Round-Turner R (comps) (2007) Blackwood district fire 29: Leeuwin Naturaliste National Park 6 & 7 April 2006: narrative. Department of Environment and Conservation, Manjimup. 33 p.
277. McKellar R (2007) Implications of climate change on biodiversity. *Bushland News* **62**, 4 p.
278. McKellar R, Abbott I, Coates D, Gioia P, Keighery G, Maslin B et al. [Williams M, Yates C] (2007) Detailed editorial review of 'The implications of climate change for land-based nature conservation strategies by Odile Pouliquen-Young and Peter Newman, Murdoch University, 1999': prepared for the Australian Greenhouse Office. Department of Environment and Conservation, Kensington, WA. 49 p.
279. McKenna S (2008) Conserving Ningaloo a priority. *Environment and Conservation News* **Apr**, 2 p.
280. McKenna S (2008) DEC funds Chinese ornithologists. *Environment and Conservation News* **Jan/Feb**, 5 p.
281. McKenna S (2008) Scientific research at Rowley Shoals. *Environment and Conservation News* **Jan/Feb**, 6 p.
282. McKenna S (2008) Western Australian history in Kew Gardens' herbarium. *Environment and Conservation News* **Mar**, 2 p.
283. McKenzie NL (2008) Western long-eared bat: *Nyctophilus* sp.. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 528–529. Reed New Holland, Sydney.
284. McKenzie NL, Bullen RD (2008) Beccari's free-tailed bat: *Mormopterus beccarii* Peters, 1881. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 486–487. Reed New Holland, Sydney.
285. McKenzie NL, Bullen RD (2008) South-western free-tailed bat: *Mormopterus* sp.. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 496–497. Reed New Holland, Sydney.

- 286.** McKenzie NL, Burbidge AA, Baynes A, Brereton RN, Dickman CR, Gordon G et al [Gibson LA, Williams MR] (2007) Analysis of factors implicated in the recent decline of Australia's mammal fauna. *Journal of Biogeography* **34**, pp. 597–611.
- 287.** McKenzie NL, Churchill SK (2008) Northern long-eared bat: *Nyctophilus arnhemensis* Johnson, 1959. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 516–517. Reed New Holland, Sydney.
- 288.** McKenzie NL, Cole JR (2008) Lesser hairy-footed dunnart: *Sminthopsis youngsoni* McKenzie and Archer, 1982. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 160–161. Reed New Holland, Sydney.
- 289.** McKenzie NL, Dickman CR (2008) Wongai ningai: *Ningai ridei* Archer, 1975. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 117–118. Reed New Holland, Sydney.
- 290.** McKenzie NL, Kerle JA (2008) Golden-backed tree-rat: *Mesembriomys macrurus* (Peters, 1876). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 593–595. Reed New Holland, Sydney.
- 291.** McKenzie NL, Kitchener DJ (2008) White-tailed dunnart: *Sminthopsis granulipes* Troughton, 1932. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 140–141. Reed New Holland, Sydney.
- 292.** McKenzie NL, Milne DJ (2008) Northern pipistrelle: *Pipistrellus westralis* Koopman, 1984. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 549–550. Reed New Holland, Sydney.
- 293.** McKenzie NL, Morris KD, Dickman CR (2008) Golden bandicoot: *Isodon auratus* (Ramsay, 1887). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 176–178. Reed New Holland, Sydney.
- 294.** McKenzie NL, Parnaby H (2008) Central long-eared bat: *Nyctophilus* sp.. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 525–526. Reed New Holland, Sydney.
- 295.** MedEcos XI (2007) Conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007. (eds D Rokich, G Wardell-Johnson, C Yates et al.), Kings Park & Botanic Garden, West Perth. 279 p.
- 296.** MedEcos XI (2007) Conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007. Conference Organising Committee, Perth. 131 p.
- 297.** Meissner RA, Markey AS (2007) Two new Western Australian species of *Drummondita* (Rutaceae: Boronieae) from banded ironstone ranges of the Yilgarn Craton. *Nuytsia* **17**, pp. 273–280.
- 298.** Meyer CP, Black RR, Tolhurst KG, McCaw L, Cook G, Symons R et al. (2007) An emission budget for dioxins from crop and bush fires in Australia. *Organohalogen Compounds* **69**, pp. 2419–2422.
- 299.** Meyer CP, Black RR, Tolhurst KG, McCaw L, Cook G, Symons R et al. (2007) Emission of dioxins from bush fires in Australia. *Organohalogen Compounds* **69**, pp. 307–310.
- 300.** Millar MA, Byrne M (2007) Characterisation of polymorphic microsatellite DNA markers for *Acacia saligna* (Labill.) H.L.Wendl. (Mimosaceae). *Molecular Ecology Notes* **7**, pp. 1372–1374.
- 301.** Millar MA, Byrne M (2007) Pollen contamination in *Acacia saligna*: assessing the risks for sustainable agroforestry. In: *Ecosystems and Sustainable Development. VI WIT Transactions on Ecology and the Environment* **106**, pp. 101–110. WIT Press, Southampton.
- 302.** Millar M, Byrne M, Nuberg I, Sedgley M (2008) High outcrossing and random pollen dispersal in a planted stand of *Acacia saligna* subsp. *saligna* revealed by paternity analysis using microsatellites. *Tree Genetics and Genomes* **4**, pp. 367–377.
- 303.** Milne DJ, Armstrong KN, McKenzie NL (2008) Western little free-tailed bat: *Mormopterus loriae cobourgiana* Johnson, 1959. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 488–489. Reed New Holland, Sydney.

- 304.** Mitchell S, Armstrong S (2007) Snail threat to Ningaloo Marine Park?. *Landscape* **23(2)**, pp. 6–8.
- 305.** Monks LT, Coates DJ (2007) Assessing translocation success for the critically endangered *Lambertia orbifolia* subsp. *orbifolia* (POSTER ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 200 p. Conference Organising Committee, Perth.
- 306.** Monks L, Crawford A (2007) Translocation of threatened flora: copy of PowerPoint presentation. In: *Flora Management Course: Porongurups, 17–21 September, 2007* pp. 1–15. Department of Environment and Conservation, Kensington, WA.
- 307.** Moore N, Barrett S, Bowen B, Shearer B, Hardy G (2007) The role of fire in *Phytophthora* dieback disease caused by the root pathogen *Phytophthora cinnamomi* in the Stirling Range National Park, Western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 165–166. Kings Park & Botanic Garden, West Perth.
- 308.** Moore N, Barrett S, Bowen B, Shearer B, Hardy G (2007) The role of fire in *Phytophthora* dieback disease caused by the root pathogen *Phytophthora cinnamomi* in the Stirling Range National Park, Western Australia (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 90 p. Conference Organising Committee, Perth.
- 309.** Moore T (2007) Western ringtail possum, *Pseudocheirus occidentalis*: preference for nest boxes and nest box use after translocation. Thesis (BScHons) – Murdoch University. 69 p.
- 310.** Moretti S, Tomaselli S, Puckett T, Guido E, Newton J, Gorelli R et al. [Martin R.] (2007) Supernovae 2007be–2007bz. *International Astronomical Union, Circular* **8834**, 1 p.
- 311.** Morris KD (2008) Ash-grey mouse: *Pseudomys albocinereus* (Gould, 1845). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 611–613. Reed New Holland, Sydney.
- 312.** Morris KD, Christensen P (2008) Western brush wallaby: *Macropus irma* (Jourdan, 1837). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 340–341. Reed New Holland, Sydney.
- 313.** Morris KD, McKenzie NL (2008) Gilbert’s dunnart: *Sminthopsis gilberti* Kitchener, Stoddart and Henry, 1984. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 138–139. Reed New Holland, Sydney.
- 314.** Morris KD, Robinson AC (2008) Shark Bay mouse: *Pseudomys fieldi* (Waite, 1896). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 627–628. Reed New Holland, Sydney.
- 315.** Muir K, Byrne M, Barbour E, Cox MC, Fox JED (2007) High levels of outcrossing in a family trial of Western Australian sandalwood (*Santalum spicatum*). *Silvae Genetica* **56**, pp. 222–230.
- 316.** Neish P, Richardson B, Whitbread G (2007) New standards from old: reconciling HISPID with ABCD (ABSTRACT). In: *Biodiversity Information Standards TDWG: the Proceedings of TDWG: Abstracts of the 2007 Annual Conference of the Taxonomic Databases Working Group: 16–22 September 2007, Bratislava, Slovakia* (eds A Weitzman, L Belbin), 75 p. Biodiversity Information Standards (TDWG), St Louis.
- 317.** Neish P, Richardson B, Whitbread G (2007) New standards from old: reconciling HISPID with ABCD: PowerPoint presentation given at Biodiversity Information Standards TDWG: the Proceedings of TDWG: Abstracts of the 2007 Annual Conference of the Taxonomic Databases Working Group: 16–22 September 2007, Bratislava, Slovakia. 19 digital slides.
- 318.** Nikulinsky P, Edinger D, Blood D, Muir B, Nikulinsky A, Page C (2007) A brush with nature: the art of the flower hunters: Woolgorong, Murchison region, Western Australia, 10–19 September, 2007: expedition briefing. Department of Environment and Conservation, Western Australia, Landscape Expeditions 46 p.

- 319.** Nowicki A (2007) Analysis of capture data: a case study using Program MARK for analysis of brushtail possum trapping data and its relevance to conservation management of the western ringtail possum. Thesis (BScHons) – Murdoch University. 132 p.
- 320.** O'Donnell A, McCaw L, Boer M, Grierson P (2007) Reconstructing the fire history of an unmanaged semi-arid landscape: the Lake Johnston region, Western Australia (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 135 p. Conference Organising Committee, Perth.
- 321.** O'Meara SJ, Amorim A, Keen RA, Morris CS, Frew DJ, Hornoch K (2007) Comet C/2006 P1 (McNaught). *International Astronomical Union, Circular* **8796**, 2 p.
- 322.** Paap T, Burgess TI, McComb JA, Shearer BL, Hardy GE St J (2008) *Quambalaria* species, including *Q. coyrecup* sp. nov. implicated in canker and shoot blight diseases causing decline in *Corymbia* species in the southwest of Western Australia. *Mycological Research* **112**, pp. 57–69.
- 323.** Palmer R, Story G, Story P (2007) Does boom always mean bust for the greater bilby?: unravelling complex predator-prey interactions in the Mitchell grasslands (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 137 p. Conference Organising Committee, Perth.
- 324.** Pavey CR, Burwell CJ, McKenzie NL (2008) Dusky leafnosed-bat: *Hipposideros ater* Templeton, 1848. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 457–459. Reed New Holland, Sydney.
- 325.** Pearce A, Frew DJ, Drummond J, Souza W (2007) Comet C/2006 P1 (McNaught). *International Astronomical Union, Circular* **8802**, 3 p.
- 326.** Pearson D (2007) Pilbara olive python, *Liasis olivacea barroni* (Smith, 1981). In: *Keeping and Breeding Australian Pythons* (ed M Swan), pp. 173–181. Mike Swan Herp Books, Lilydale.
- 327.** Pearson D (2007) Report on a survey for nabarleks in the Northern Territory, June/ July 2007. Department of Environment and Conservation, Woodvale, WA. 16 p.
- 328.** Pearson D (2007) Snakes of Western Australia. Bush Books Department of Environment and Conservation, Kensington, WA. 72 p.
- 329.** Pearson D, Bonnet X (2007) L'île des serpents: a twisted tale of tigers, Frenchmen and seagulls. *Landscape* **22(3)**, pp. 40–47.
- 330.** Pearson DJ, Burbidge AA, Lochman J, Start AN (2008) Monjon: *Petrogale burbidgei* Kitchener and Sanson, 1978. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 367–368. Reed New Holland, Sydney.
- 331.** Pearson DJ, Churchill SK (2008) Sandhill dunnart: *Sminthopsis psammophila* Spencer, 1895. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 156–158. Reed New Holland, Sydney.
- 332.** Pearson DJ, Eldridge MDB (2008) Rothschild's rock-wallaby: *Petrogale rothschildi* Thomas, 1904. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 389–390. Reed New Holland, Sydney.
- 333.** Pearson DJ, McKenzie NL (2008) Hairy-footed dunnart: *Sminthopsis hirtipes* Thomas, 1898. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 143–145. Reed New Holland, Sydney.
- 334.** Pearson D, Miller J, Butler M, Butler M, Brennan K, Thompson W (2007) Learning about country. *Landscape* **23(2)**, pp. 10–17.
- 335.** Pekin B, Boer M, Macfarlane C, Wittkuhn R, McCaw L, Grierson P (2007) Fire history, productivity and diversity in the jarrah forest (POSTER ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 204 p. Conference Organising Committee, Perth.

336. Pekin B, Boer M, Macfarlane C, Wittkuhn R, McCaw L, Grierson P (2007) The relationship of fire to productivity in the jarrah forests of south-western Australia (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 98 p. Conference Organising Committee, Perth.
337. Penniford M (2007) Avon River pool invertebrate survey: report to the Species and Communities Branch, Department of Environment and Conservation. Department of Environment and Conservation, Woodvale, WA. 9 p.
338. Perth Observatory (2007) Stars and telescopes: Perth Observatory visitor activities, September 2007 to August 2008 (PAMPHLET). Department of Environment and Conservation, Kensington, WA.
339. Pinder J (2008) Western ground parrot project welcomes new technical officer. *South Coast Threatened Birds News* **12**, 11 p.
340. Powell R, Williams AAE (2007) Butterflies recorded on islands off southern Western Australia. *Newsletter of the Western Australian Insect Study Society* **Aug**, pp. 1–5.
341. Prentis PJ, White EM, Radford IJ, Lowe AJ, Clarke AR (2007) Can hybridization cause local extinction: a case for demographic swamping of the Australian native *Senecio pinnatifolius* by the invasive *Senecio madagascariensis*?. *New Phytologist* **176**, pp. 902–912.
342. Prince RIT, Richards JD (2008) Banded hare-wallaby: *Lagostrophus fasciatus* (Péron and Lesueur, 1807). In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 407–408. Reed New Holland, Sydney.
343. Prober S, Thiele K, Lunt I (2007) Effects of fire frequency on composition and diversity of temperate grassy woodlands: a 12 year study (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 142 p. Conference Organising Committee, Perth.
344. Prober SM, Thiele KR, Lunt ID (2007) Fire frequency regulates tussock grass composition, structure and resilience in endangered temperate woodlands. *Austral Ecology* **32**, pp. 808–824.
345. Probert R, Adams J, Coneybeer J, Crawford A, Hay F (2007) Seed quality for conservation is critically affected by pre-storage factors. *Australian Journal of Botany* **55**, pp. 326–335.
346. Radford IJ, Dickinson KJM, Lord JM (2007) Functional and performance comparisons of invasive *Hieracium lepidulum* and co-occurring species in New Zealand. *Austral Ecology* **32**, pp. 338–354.
347. Radford IJ, Grice AC, Abbott BN, Nicholas DM, Whiteman L (2008) Impacts of changed fire regimes on tropical riparian vegetation invaded by an exotic vine. *Austral Ecology* **33**, pp. 151–167.
348. Radford I, White K (2008) Fire in the Kimberley: natural phenomenon or natural disaster?. *Landscape* **23(3)**, pp. 22–28.
349. Reeves JM, de Deckker P, Halse SA (2007) Groundwater ostracods from the arid Pilbara region of northwestern Australia: distribution and water chemistry. *Hydrobiologia* **585**, pp. 99–118.
350. Reinhold L, Thomas N (2007) Bernier and Dorre: islands of marsupials, mice and men. *Landscape* **22(4)**, pp. 46–52.
351. Richards J, Algar D (2008) Controlling feral animals in the rangelands. *Landscape* **23(3)**, pp. 52–58.
352. Richardson J (2007) Ecosystem Prioritisation Workshop report. Department of Environment and Conservation, Kensington, WA. 15 p.
353. Richardson J, Gamblin T, Glossop B, Hogben J (2007) The biodiversity of the Avon NRM region: towards prioritisation for conservation: draft. Department of Environment and Conservation, Kensington, WA. 177 p.

- 354.** Robinson R (2007) *Armillaria luteobubalina* in regrowth karri stands in Western Australia. In: *Borers and Rots in Eucalypts Conference: Commercial Management Issues: program and papers, 5–7 November 2007* pp. 31–39. Institute of Foresters of Australia, Western Australian Division, Perth.
- 355.** Robinson R (2007) Fungi in abundance following bushfires in WA. *Fungimap Newsletter* **31**, pp. 4–5.
- 356.** Robinson R (2007) Post-fire fungi bloom in south-west. *Environment and Conservation News* **Apr**, 4 p.
- 357.** Robinson R, Fielder J, Maxwell M, Bougher N, Sicard W, Wayne A (2007) Preliminary survey of hypogeous fungi in the upper Warren region. Department of Environment and Conservation, Manjimup. 21 p.
- 358.** Robinson RM, Tunsell V (2007) Preliminary list of macrofungi recorded in burnt and unburnt *Eucalyptus diversicolor* regrowth forest in the south-west of Western Australia: 1998–2002. *Conservation Science Western Australia* **6(1)**, pp. 75–96.
- 359.** Robinson RM (2007) Assessing the risk of fire assists fungal survey in the southwest of Western Australia. In: *Proceedings: 16th Biennial Australasian Plant Pathology Society Conference: Back to Basics, Managing Plant Disease, incorporating the 9th Annual Australasian Mycological Society Meeting, Adelaide, 2007, Adelaide Convention Centre, South Australia, 24–27 September 2007* 86 p. Conference Organising Committee, Adelaide.
- 360.** Rudall PJ, Sokoloff DD, Remizowa MV, Conran JG, Davis JI, Macfarlane TD, Stevenson DW (2007) Morphology of Hydatellaceae, an anomalous aquatic family recently recognized as an early-divergent angiosperm lineage. *American Journal of Botany* **94**, pp. 1073–1092.
- 361.** Rye BL (2007) *Micromyrtus trudgenii* (Myrtaceae: Chamelaucieae), a new species from the Blue Hill Range area of south-western Australia. *Nuytsia* **17**, pp. 325–330.
- 362.** Rye BL (2007) New species and keys for *Cryptandra* and *Stenanthemum* (Rhamnaceae: Pomaderreae) in Western Australia. *Nuytsia* **16**, pp. 325–382.
- 363.** Rye BL (2007) A review of the sectional classification of *Dicrasyllis* (Lamiaceae: Chloantheae) and four new arid zone species from Western Australia. *Nuytsia* **17**, pp. 289–324.
- 364.** Sadler R, Boer M, Pekin B, Wittkuhn R, Grierson P (2007) Characterising fire regimes for ecological site comparison (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 108 p. Conference Organising Committee, Perth.
- 365.** Sage LW, Shepherd KA (2007) Five new conservation-listed species of *Goodenia* (Goodeniaceae) from southern Western Australia. *Nuytsia* **17**, pp. 331–346.
- 366.** Sampson J, Millar MA, Byrne M (2007) Pollen dispersal between planted populations and remnant native populations in a fragmented agricultural landscape. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 221–222. Kings Park & Botanic Garden, West Perth.
- 367.** Sampson J, Millar M, Byrne M (2007) Pollen dispersal between planted populations and remnant native populations in a fragmented agricultural landscape (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* pp. 108–109. Conference Organising Committee, Perth.
- 368.** Science Division, DEC (2007) Science Division annual research activity report, 2006–2007. Department of Environment and Conservation, Kensington, WA. 241 p.

- 369.** Scott P, Eslick H, Barber P, Hardy G, Calver M, Shearer B (2007) Phosphite application as an explorative tool for understanding and controlling *Eucalyptus gomphocephala* (tuart) decline in southwest Western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 235–236. Kings Park & Botanic Garden, West Perth.
- 370.** Scott P, Eslick H, Barber P, Hardy G, Calver M, Shearer B (2007) Phosphite application as an explorative tool for understanding and controlling *Eucalyptus gomphocephala* (tuart) decline in southwest Western Australia (POSTER ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 112 p. Conference Organising Committee, Perth.
- 371.** Scott P, Shearer B, Barber P, Hardy G (2007) The potential role of *Phytophthora* species in *Eucalyptus gomphocephala* (tuart) decline in southwest Western Australia. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 233–234. Kings Park & Botanic Garden, West Perth.
- 372.** Scott P, Shearer B, Barber P, Hardy G (2007) The potential role of *Phytophthora* species in *Eucalyptus gomphocephala* (tuart) decline in southwest Western Australia (POSTER ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 112 p. Conference Organising Committee, Perth.
- 373.** Shearer BL, Crane CE, Barrett S, Cochrane A (2007) Assessment of threatened flora susceptibility to *Phytophthora cinnamomi* by analysis of disease progress curves in shadehouse and natural environments. *Australasian Plant Pathology* **36**, pp. 609–620.
- 374.** Shearer BL, Crane CE, Barrett S, Cochrane A (2007) *Phytophthora cinnamomi* invasion, a major threatening process to conservation of flora diversity in the south-west botanical province of Western Australia. *Australian Journal of Botany* **55**, pp. 225–238.
- 375.** Shearer B, Crane C, Dunne C (2007) Plant disease diagnosis and management for south-western Australian flora: copy of PowerPoint presentation. In: *Flora Management Course: Porongurups, 17–21 September, 2007* pp. 1–25. Department of Environment and Conservation, Kensington, WA.
- 376.** Shearer BL, Fairman RG (2007) Application of phosphite in a high-volume foliar spray delays and reduces the rate of mortality of four *Banksia* species infected with *Phytophthora cinnamomi*. *Australasian Plant Pathology* **36**, pp. 358–368.
- 377.** Shearer BL, Fairman RG (2007) A stem injection of phosphite protects *Banksia* species and *Eucalyptus marginata* from *Phytophthora cinnamomi* for at least four years. *Australasian Plant Pathology* **36**, pp. 78–86.
- 378.** Shepherd KA (2007) *Pityrodia iphthima* (Lamiaceae), a new species endemic to banded ironstone in Western Australia, with notes on two informally recognised *Pityrodia*. *Nuytsia* **17**, pp. 347–352.
- 379.** Shepherd KA (2007) *Tecticornia indefessa* (Chenopodiaceae: Salicornioideae), a new mat samphire (formerly *Tegicornia*) from north of Esperance, Western Australia. *Nuytsia* **17**, pp. 367–374.
- 380.** Shepherd KA (2007) Three new species of *Tecticornia* (formerly *Halosarcia*) (Chenopodiaceae: Salicornioideae) from the Eremaean botanical province, Western Australia. *Nuytsia* **17**, pp. 353–366.
- 381.** Shepherd KA, Rye BL, Meissner RA, West JG (2007) Two new Western Australian species of *Dodonaea* (Sapindaceae) from northern Yilgarn ironstones. *Nuytsia* **17**, pp. 375–383.
- 382.** Shepherd KA, van Leeuwen SJ (2007) *Tecticornia bibenda* (Chenopodiaceae: Salicornioideae), a new C4 samphire from the Little Sandy Desert, Western Australia. *Nuytsia* **16**, pp. 383–391.

- 383.** Shepherd KA, Wilson PG (2007) Incorporation of the Australian genera *Halosarcia*, *Pachycornia*, *Sclerostegia* and *Tegicornia* into *Tecticornia* (Salicornioideae: Chenopodiaceae). *Australian Systematic Botany* **20**, pp. 319–331.
- 384.** Sim L (2007) ND001 Avon baselining: wetland component: brief report on progress, January 2007. Department of Environment and Conservation, Woodvale, WA. 7 p.
- 385.** Simpson CJ (2007) A science-based approach to the management of WA coral reefs: focus on Ningaloo Reef (ABSTRACT). In: *Australian Coral Reef Society, 83rd Annual Conference, Fremantle, Western Australia, 9–11th October, 2007: East Meets West: Science and Management of Australia's Coral Reefs* 78 p. Conference Organising Committee, Perth.
- 386.** Simpson C (2007) Science for management (ABSTRACT). In: *Ningaloo Marine Park Symposium, July 2007* 13 p. Conference Organising Committee, Perth.
- 387.** Simpson CJ (2007) Marine science strategy: what did we learn?, who did we tell?, what difference did it make? (PAMPHLET). Department of Environment and Conservation, Kensington, WA.
- 388.** Smith B, Halse S, Pinder A (2007) South-west forest biodiversity monitoring: forest management plan 2004–2013, key performance indicator 20: year 2 summary report. Department of Environment and Conservation, Woodvale, WA. 21 p.
- 389.** Smith JA, Wright LJ, Johnson BW (2007) BiblioHeathMouse: the heath mouse, *Pseudomys shorridgei* (Thomas, 1907), a subject-specific bibliography. *Conservation Science Western Australia* **6(1)**, pp. 151–157.
- 390.** Sokoloff DD, Remizowa MV, Macfarlane TD, Rudall PJ (2008) Classification of the early-divergent angiosperm family Hydatellaceae: one genus instead of two, four new species and sexual dimorphism in dioecious taxa. *Taxon* **57**, pp. 179–200.
- 391.** Start AN, McKenzie NL (2008) Western false pipistrelle: *Falsistrellus mackenziei* Kitchener, Caputi and Jones, 1986. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 541–542. Reed New Holland, Sydney.
- 392.** Start AN (2008) Western pebble-mound mouse: *Pseudomys chapmani* Kitchener, 1980. In: *Mammals of Australia. 3rd ed* (eds S van Dyck, R Strahan), pp. 621–622. Reed New Holland, Sydney.
- 393.** Start T, Burbidge A, McKenzie N, Palmer C (2007) The status of mammals in the north Kimberley, Western Australia. *Australian Mammalogy* **29**, pp. 1–16.
- 394.** Stewart A, Bencini R, Friend T (2007) Nutrient inputs from seabirds affect the population dynamics of mammals on islands in Western Australia (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* pp. 157–158. Conference Organising Committee, Perth.
- 395.** Stewart AG, Bencini R, Friend T (2007) Nutrient inputs from seabirds affect the population dynamics of mammals on islands in Western Australia (ABSTRACT). In: *The Biodiversity Extinction Crisis: an Australasian and Pacific Response: Final Program: University of New South Wales, Sydney, Australia, 10–12 July 2007* 78 p. Conference Organising Committee, Sydney.
- 396.** Stone LM, Byrne M, Virtue JG (2008) An environmental weed risk assessment model for Australian forage improvement programs. *Australian Journal of Experimental Agriculture* **48**, pp. 568–574.
- 397.** Stone LM, Byrne M, Virtue JG (2008) Identifying and managing environmental weed risk posed by perennial pastures developed for dryland salinity mitigation. In: *2nd International Salinity Forum, Adelaide, 2008: Salinity, Water and Society, Global Issues, Local Action* pp. 1–4. Conference Organising Committee, Adelaide.

398. Stone LM, Virtue JG (2007) Environmental weed risk management in pasture improvement programs: recent initiatives to minimise pasture species escape into natural ecosystems using the CRC for Plant-Based Management of Dryland Salinity as an example (ABSTRACT). In: *EMAPi9: 9th International Conference on the Ecology and Management of Alien Plant Invasions: Program & Abstract Book, 17–21 September 2007, Hyatt Regency, Perth, Western Australia* 25 p. Congress West, Perth.
399. Stukely MJC, Crane CE, McComb JA, Bennett IJ (2007) Field survival and growth of clonal, micropropagated *Eucalyptus marginata* selected for resistance to *Phytophthora cinnamomi*. *Forest Ecology and Management* **238**, pp. 330–334.
400. Stukely M, Webster J, Ciampini J (2007) Vegetation Health Service: annual report, 2006–2007, *Phytophthora* detection. Department of Environment and Conservation, Kensington, WA. 11 p.
401. Stukely MJC, Webster JL, Ciampini JA, Burgess TI, White D, Dunstan WA et al. (2007) Molecular testing uncovers new *Phytophthora* taxa from natural ecosystems in Western Australia (POSTER ABSTRACT). In: *Fourth Meeting of the International Union of Forest Research Organizations (IUFRO) Working Party 7.02.09: Phytophthoras in forests & natural ecosystems, Asilomar Conference Center, Monterey, CA, USA, August 26–31, 2007* pp. 65–66. Conference Organising Committee, Monterey.
402. Stukely MJC, Webster JL, Ciampini JA, Burgess TI, White D, Dunstan WA et al. (2007) Molecular testing uncovers new *Phytophthora* taxa from natural ecosystems in Western Australia: poster presented at Fourth Meeting of the International Union of Forest Research Organizations (IUFRO) Working Party 7.02.09: *Phytophthoras in forests & natural ecosystems, Asilomar Conference Center, Monterey, CA, USA, August 26–31, 2007* (POSTER). Department of Environment and Conservation, Kensington, WA.
403. Stukely MJC, Webster JL, Ciampini JA, Kerp NL, Colquhoun IJ, Dunstan WA et al. (2007) A new homothallic *Phytophthora* from the jarrah forest in Western Australia. *Australasian Plant Disease Notes* **2**, pp. 49–51.
404. Sutherland DR (2007) Do goannas respond to introduced predator control in the northern jarrah forest? (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 160 p. Conference Organising Committee, Perth.
405. Taggart DA, Schultz D, Smith I, Friend T (2007) Marsupial cross-fostering & pouch isolation techniques: tools for threatened species management (ABSTRACT). In: *The Biodiversity Extinction Crisis: an Australasian and Pacific Response: Final Program: University of New South Wales, Sydney, Australia, 10–12 July 2007* 42 p. Conference Organising Committee, Sydney.
406. Thiele KR (2007) Two new species of Australian *Stenanthemum* (Rhamnaceae), with a conspectus and key to species outside Western Australia. *Journal of the Adelaide Botanic Gardens* **21**, pp. 63–70.
407. Thiele K (2007) WA's national parks: home to a Noah's Ark of flora. *Landscape* **23(1)**, pp. 32–38.
408. Thiele KR, Brown AP (2007) Recombinations in Western Australian Orchidaceae. 1. *Nuytsia* **16**, pp. 473–474.
409. Thiele KR, Mast AR (2007) Further recombinations of *Dryandra* into *Banksia*. *Nuytsia* **16**, 475 p.
410. Thoene CC, Fynbo JPU, Williams A (2007) GRB 070508: Multicolor optical observations and possible redshift limit. *GCN Circular* **6389**, 1 p.
411. Thomas N (2007) Return to *Dryandra* (ABSTRACT). In: *Proceedings of the Western Barred Bandicoot Symposium, 2007: Senate Conference Room, Murdoch University, 2nd February 2007* pp. 13–14. Conference Organising Committee, Murdoch.
412. Thomson-Dans C, Armstrong S (2008) Science in the sea. *Landscape* **23(3)**, pp. 46–51.

413. Tovar FJ, Burgess T, Robinson RM, Hardy GE (2007) Investigating basal rot in *Eucalyptus globulus* coppice stumps in south-western Australia. In: *Borers and Rots in Eucalypts Conference: Commercial Management Issues: program and papers, 5–7 November 2007* pp. 23–28. Institute of Foresters of Australia, Western Australian Division, Perth.
414. Van Leeuwen S (2007) Pilbara Biological Survey: community engagement and progress, September 2007 [printout of PowerPoint presentation given at the Parks & Protected Areas Forum: a Sense of Place, for all People, for all Time, 23–26 September 2007, Esplanade Hotel, Fremantle, Western Australia]. Department of Environment and Conservation, Kensington, WA. 18 p.
415. Van Leeuwen S (2007) The Pilbara Biological Survey: preliminary outcomes and community engagement. In: *Parks & Protected Areas Forum: a Sense of Place, for all People, for all Time: program and proceedings (includes papers and abstracts), 23–26 September 2007, Esplanade Hotel, Fremantle, Western Australia* pp. 61–63. Promaco Conventions, Perth.
416. Vaughan RJ, Vitali SD, Eden PA, Payne KL, Warren KS, Forshaw D et al. [Friend JA] (2007) Cryptococcosis in Gilbert's and long-nosed potoroo. *Journal of Zoo and Wildlife Medicine* **38**, pp. 567–573.
417. Vincent B, Plummer J, Cochrane A (2007) The life history and germination ecology of *Stachystemon vinosus* (Euphorbiaceae). In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 263–264. Kings Park & Botanic Garden, West Perth.
418. Vincent B, Plummer J, Cochrane A, Barrett S, Lee A (2007) The life history and germination ecology of *Stachystemon vinosus* (Euphorbiaceae) (POSTER ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 118 p. Conference Organising Committee, Perth.
419. Ward B (2007) Feral camel distribution and abundance of the Warburton central ranges and northern Great Victoria Desert. Department of Environment and Conservation, Manjimup. 11 p.
420. Ward B, Burrows N (2007) Evaluating the effectiveness of an operation to cull feral camels in the western Little Sandy Desert. Department of Environment and Conservation, Manjimup. 8 p.
421. Wardell-Johnson GW, Williams MR, Mellican AE, Annells A (2007) Floristic patterns and disturbance history in karri (*Eucalyptus diversicolor*: Myrtaceae) forest, south-western Australia. 2, origin, growth form and fire response. *Acta Oecologica* **31**, pp. 137–150.
422. Wayne A, Ward C, Maxwell M, Vellios C, Wilson I, Wayne J et al. [Swinburn M, Ward B, Morris K] (2007) Diagnosing the recent woylie (*Bettongia penicillata*) collapse in south-western Australia (ABSTRACT). In: *ESA 2007, Program and Abstracts: Perth Convention and Exhibition Centre, Perth, Australia, 2007, Monday 26th November to Friday 30th November 2007* 167 p. Conference Organising Committee, Perth.
423. Wege JA (2007) *Allocasuarina hystricosa* (Casuarinaceae): a new species from south-west Western Australia, with notes on related species. *Nuytsia* **17**, pp. 403–414.
424. Wege JA (2007) New species and new circumscriptions in *Stylidium* (Stylidiaceae). *Nuytsia* **17**, pp. 415–432.
425. Wege JA, Coates DJ (2007) Observations on the rare triggerplant *Stylidium coroniforme* (Stylidiaceae) and the description of two allied taxa of conservation concern. *Nuytsia* **17**, pp. 433–444.
426. Wege JA, Keighery GJ, Keighery BJ (2007) Two new triggerplants (*Stylidium*: Stylidiaceae) from the eastern margin of the Swan Coastal Plain, Western Australia. *Nuytsia* **17**, pp. 445–451.
427. Wege JA, Lepschi BJ (2007) A new species of *Arabidella* (Brassicaceae) from Western Australia. *Nuytsia* **17**, pp. 453–458.

- 428.** Wege JA, Shepherd KA, Butcher R (eds) (2007) *Nuytsia*. Vol 17 (2007). pp. 1–492. Department of Environment and Conservation, Kensington, WA.
- 429.** Wege JA, Shepherd KA, Butcher R (2007) Preface. *Nuytsia* **17**, i p.
- 430.** Wheeler JR, Marchant NG (2007) A revision of the Western Australian genus *Agonis* (Myrtaceae) and two new segregate genera *Taxandria* and *Paragonis*. *Nuytsia* **16**, pp. 393–433.
- 431.** Wheeler MA, Calver M, Stukely M (2007) Reproductive traits show differences between clones and wild trees of *Eucalyptus marginata* in south-western Australia (POSTER). In: *Seed Ecology II: the 2nd International Society for Seed Science Meeting on Seeds and the Environment, Perth, Western Australia, Sunday 9–Thursday 13 September 2007: conference proceedings* (eds S Turner, D Merritt, S Clarke, L Commander, K Dixon), 98 p. Conference Organising Committee, Perth.
- 432.** Wheeler MA, Calver M, Stukely M (2007) Variation in reproductive success and insect predation in clones and wild trees of *Eucalyptus marginata* (jarrah) (POSTER). In: *Seed Ecology II: the 2nd International Society for Seed Science Meeting on Seeds and the Environment, Perth, Western Australia, Sunday 9–Thursday 13 September 2007: conference proceedings* (eds S Turner, D Merritt, S Clarke, L Commander, K Dixon), 99 p. Conference Organising Committee, Perth.
- 433.** Whitbread G, Chapman AR, Richardson B (2007) LSID policy and implementation in Australia (ABSTRACT). In: *Biodiversity Information Standards TDWG: the Proceedings of TDWG: Abstracts of the 2007 Annual Conference of the Taxonomic Databases Working Group: 16–22 September 2007, Bratislava, Slovakia* (eds A Weitzman, L Belbin), pp. 28–29. Biodiversity Information Standards (TDWG), St Louis.
- 434.** Whitbread G, Chapman AR, Richardson B (2007) LSID policy and implementation in Australia: PowerPoint presentation given at Biodiversity Information Standards TDWG: the Proceedings of TDWG: Abstracts of the 2007 Annual Conference of the Taxonomic Databases Working Group: 16–22 September 2007, Bratislava, Slovakia. 21 digital slides.
- 435.** Whitford KR, Manning EJ, Wills AJ (2007) Baseline wandoo crown condition: preliminary report of wandoo crown decline surveys, 2006. Department of Environment and Conservation, Manjimup. 11 p.
- 436.** Whitford KR, Manning EJ, Wills AJ (2008) Wandoo crown condition: report of wandoo crown decline surveys, 2007. Department of Environment and Conservation, Kensington, WA. 5 p.
- 437.** Wilkins CF, Chappill JA (2007) Five new species of *Eutaxia* (Leguminosae: Mirbelieae) from south-western Australia. *Nuytsia* **17**, pp. 469–482.
- 438.** Wilkins CF, Chappill JA (2007) Three new species of *Aotus* (Leguminosae: Mirbelieae) from south-western Australia. *Nuytsia* **17**, pp. 459–467.
- 439.** Wilkins CF, Chappill JA (2007) Three new species of *Latrobea* (Leguminosae: Mirbelieae) from south-western Australia. *Nuytsia* **17**, pp. 483–492.
- 440.** Wilkins CF, Vincent BJ, Crawford AD, Ladd PG, Sage LW (2007) Conservation biology of a naturally rare but critically endangered shrub *Lasiopetalum pterocarpum* (Malvaceae s.l.): report to DEC, February 2007. University of Western Australia, School of Plant Biology, Crawley. 22 p.
- 441.** Williams M (2007) Production of publications by Science Division, 1997–2006. Department of Environment and Conservation, Kensington, WA. 175 p.
- 442.** Williams M, Lamont B (2007) Butterflies in remnant bushland: factors affecting species richness. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 271–272. Kings Park & Botanic Garden, West Perth.
- 443.** Williams M, Lamont B (2007) Butterflies in remnant bushland: factors affecting species richness (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* 120 p. Conference Organising Committee, Perth.

- 444.** Williams M, Mellican A (2007) Productivity of biologists in Science Division: an update. Department of Environment and Conservation, Kensington, WA. 23 p.
- 445.** Wills A (2008) Earwig flies? ancient and mysterious insects. *Western Wildlife: Newsletter of the Land for Wildlife Scheme* **12(1)**, 5 p.
- 446.** Wittkuhn R, McCaw L (2007) Studying fire regimes and biodiversity in southwestern Australia for improved land management. In: *MedEcos XI: conference proceedings: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* (eds D Rokich, G Wardell-Johnson, C Yates et al.), pp. 275–276. Kings Park & Botanic Garden, West Perth.
- 447.** Wittkuhn R, McCaw L (2007) Studying fire regimes and biodiversity in southwestern Australia for improved land management (ABSTRACT). In: *MedEcos XI: conference program, information & summary abstracts: the International Mediterranean Ecosystems Conference, Perth, Western Australia, Australia, Sunday 2–Wednesday 5 September 2007* pp. 121–122. Conference Organising Committee, Perth.
- 448.** Wright LJ (comp) (2008) Science communications. No 23, Jan 2008. Department of Environment and Conservation, Woodvale, WA. 19 p.
- 449.** Wright LJ, Smith JA, Richardson J (2007) BiblioRingtailPossum: the western ringtail possum, *Pseudocheirus occidentalis* (Thomas, 1888): a subject-specific bibliography. *Conservation Science Western Australia* **6(1)**, pp. 159–176.
- 450.** Yates CJ, Coates DJ, Elliott C, Byrne M (2007) Composition of the pollinator community, pollination and the mating system for a shrub in fragments of species rich kwongan in south-west Australia. *Biodiversity and Conservation* **16**, pp. 1379–1395.
- 451.** Yates CJ, Elliott C, Byrne M, Coates DJ, Fairman R (2007) Seed production, germinability and seedling growth for a bird pollinated shrub in fragments of kwongan in south-west Australia. *Biological Conservation* **136**, pp. 306–314.
- 452.** Yates CJ, Ladd PG, Coates DJ, McArthur S (2007) Hierarchies of cause: understanding rarity in an endemic shrub *Verticordia staminosa* (Myrtaceae) with a highly restricted distribution. *Australian Journal of Botany* **55**, pp. 194–205.

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