

MANAGER
WILDLIFE BRANCH



DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

annual report.....

1998-1999.....

CALM'S MISSION

We conserve and manage Western Australia's native plants and animals, and the lands, waters and resources entrusted to CALM for the benefit of present and future generations.

WHAT WE DO

Western Australia has a beautiful, diverse and supportive natural environment which provides material, aesthetic and spiritual benefits. It is an essential part of Western Australians' livelihood and quality of life.

In keeping with our mission, the Department of Conservation and Land Management has the following objectives.

Conservation: To conserve indigenous plants, animals and ecological processes in natural habitats throughout the State.

Value and Use of Resources: To optimise the value and economic return to the community of wildlife, lands, waters and resources entrusted to CALM without compromising conservation and other management objectives.

Recreation and Tourism: To identify and provide opportunities and services to the community which allows them to enjoy and value the wildlife, lands, waters and resources entrusted to CALM without compromising conservation and other management objectives.

Knowledge: To seek and provide an up-to-date and sound scientific and information basis for CALM's conservation and land management activities.

Community Support: To promote community awareness and appreciation of the values of the wildlife, lands, waters and resources entrusted to CALM, and to develop community understanding and support for CALM's conservation and land management activities.

CALM People: To recruit, develop, reward and retain knowledgeable and talented staff, and to provide a stimulating, safe, productive and supportive work environment where staff can pursue individual goals consistent with those of CALM.

Corporate Efficiency: To optimise the efficiency, effectiveness and responsiveness of CALM in the achievement of conservation and other management objectives.



CALM is committed to developing a range of services which meet the needs of our many customers, and at the same time are consistent with our responsibilities for conservation and land management in WA.

**Department of Conservation
and Land Management**

17 Dick Perry Avenue
KENSINGTON WA 6151
Telephone (08) 9334 0333

Web site: <http://www.calm.wa.gov.au/>

HON MINISTER FOR THE ENVIRONMENT

In accordance with Section 62 of the Financial Administration and Audit Act 1985, I submit for your information and presentation to Parliament the annual report of the Department of Conservation and Land Management.

Syd Shea
EXECUTIVE DIRECTOR
30 August 1999

HIGHLIGHTS

- ☆ Acquisition of more than 1.4 million hectares of land for addition to the State conservation reserve system (p. 11 and pp. 46-47).
- ☆ Launch of Western Everlasting, an initiative to save threatened flora: translocation of 912 seedlings of six critically endangered plant species (p. 8).
- ☆ RFA signed by Premier and Prime Minister (p. 17)
- ☆ WA leads nation in plantation establishment (p. 21)
- ☆ The 963 km Bibbulmun Track was officially opened on 13 September 1998 (p. 30)
- ☆ Successful local and international promotion and interpretation of the rare annular solar eclipse that traversed the State on 16 February 1999 (p. 35)

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PARTNERS IN CONSERVATION

1998-99

Western Australia is one of the few biological diversity 'hot spots' remaining on Earth. The State — including some of our nearby islands — is the sole bastion for wild populations of several native faunal species that once abounded across much of continental Australia. Woylies and numbats are but two examples. The diversity of our native flora is truly in the 'mega' class, with several of our native parks containing more endemic species than entire countries. Our landforms are among the oldest, and we are host to a civilisation with a cultural heritage spanning more than 30,000 years and possibly as many as 60,000.

Managing such a diversity clearly presents many challenges, particularly in terms of coming to grips with the impact of human activities such as resources development and agriculture — which have provided most of us with an extremely high standard of living compared with some other parts of the world. However, perhaps one of the greatest challenges is gaining an understanding of 'conservation' and its context within that mission.

All too often, there is a perception that preservation is more important than conservation. It is that perception which appears to have become particularly fashionable during the year under review, and which has been the cause of so much passion in the media.

Preservation means to leave things undisturbed. It has two inherent risks. First, we forego using our natural resources for fear of depriving future generations of their choice; second, we may well leave those future generations without the opportunity to make a choice for themselves.

Our environment and its ecosystems are not something we can simply capture on video-camera so that we can 'freeze-frame' them and thereby preserve them for all time.

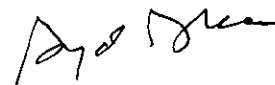
Conservation, on the other hand, means achieving a balance that allows us to use our natural resources while at the same time protecting the integrity of the ecological processes that sustain them.

Conservation hinges on **integration**, so that the community works together to identify, and deal with, the causes of our environmental problems. In this way, the various parts of the ecosystem can be managed to provide the greatest total sustainable benefits. This approach involves constructive interaction among all parts of the system, including the community, while at the same time recognising that there are limits to the capacity of the environment. Essentially, we must allow our ecosystems to dictate how we use our natural resources rather than trying to dictate how those ecosystems will work. Perhaps it could be best summed up as 'conservation through partnerships'.

During 1998-99, and indeed for several years past, CALM's Western Shield and Western Everlasting programs, and the planting of commercial tree crops on cleared farmland to combat environmental degradation as a result of salinity, have all focussed on 'partnerships' between our natural environment and the community.

Through such partnerships, we will ensure that we have ecologically sustainable development that meets the needs of today's generation without compromising the opportunity for future generations to make their choice.

Perhaps one of the greatest partnerships CALM has is with its own staff and the thousands of CALM volunteers who, despite sometimes unfair criticism from some quarters, continue to be dedicated to their task. It is their commitment, which is making a positive contribution to the conservation of Western Australia's lands and waters and the wildlife they sustain, that will ensure we will meet the challenge of the mission.



Syd Shea
EXECUTIVE DIRECTOR
30 August 1999

THAT WAS THE YEAR ...

1998-99

The Output sections in this annual report describe some of CALM's achievements in detail. Here is a review of some of the highlights of the year that was 1998-99.

WA'S CONSERVATION ESTATE: AN EVER-GROWING RESOURCE

More than 1.4 million hectares was added to Western Australia's conservation estate during the past year. This significant increase was made possible through an allocation of funds under the State Gascoyne-Murchison Rangelands Strategy and the Commonwealth National Reserve System Program (NRSP) of the Natural Heritage Trust.

Since its inception in 1997, the NRSP has provided much-valued financial support to the State to buy freehold and leasehold lands of high conservation value for addition to the national reserve system. Commonwealth funding assistance under this program was provided on a two-for-one basis.

In the past year, four pastoral leases in the Gascoyne-Murchison Strategy area were purchased — Pimbee, Muggon, Earahedy and Mooloogool. These leases extend over one million hectares and bring into the conservation reserve system 18 vegetation types that currently are unreserved and a further 18 that are under-represented.

A further 63,000 hectares was bought from pastoral lessees next to the Kennedy Range National Park for inclusion in the park. In the Pilbara, two stations were added to the reserve system — Mt Minnie and Meentheena. The 111,000-hectare Mt Minnie lease adds considerably to the adjoining proposed Cane River Conservation

CALM is an integrated agency which manages lands and waters to conserve the native plants and animals they sustain, for the recreation and tourism they can support, and for the renewable resources they provide.

Park. The 225,700-hectare Meentheena lease is representative of vegetation and geological units not currently found in the reserve system.

Four parcels of land on the Swan Coastal Plain also were acquired. A 74-hectare property near Gingin supports the only known surviving occurrence of the Gingin ironstone association, a critically endangered plant community. Similarly, an example of the endangered Muchea limestone community was acquired, covering an area of 64 hectares. The third parcel of land adjoins the Chandala Nature Reserve (between Gingin and Muchea), creating a buffer to Lake Chandala and providing protection for a population of endangered flora. A further small area on the Vasse Estuary within the Shire of Busselton was included for its seasonal importance for a variety of waterbird species.

In the Wheatbelt, a 400-hectare parcel of remnant vegetation where malleefowl have been recorded, was bought using funds under the State's Salinity Action Plan and through the NRSP.

The above purchases cover a combined total area of over 1.4 million hectares for an outlay of Commonwealth and State funds of more than \$3.4 million. Negotiations for a further 10 parcels of land of high conservation value are due to be settled next financial year.

CALM's primary responsibility is to manage these lands and waters on an ecologically sustainable basis so that the needs of the present are met without compromising the choices of future generations.

A FOREST ACCORD

The Regional Forest Agreement (RFA) — an agreement between the Commonwealth and State Governments for the management and use of the south-west native forests — was signed by Prime Minister John Howard and WA Premier Richard Court on 4 May 1999.

The aims of the RFA are:

- to protect environmental values in a reserve system of national parks and other reserves, based on nationally agreed criteria;
- to encourage job creation and growth in forest-based industries, including wood products, tourism and minerals; and
- to manage all native forests in a sustainable way.

The WA Agreement aimed to provide a forest conservation reserve system that met or exceeded national targets for the protection of biodiversity and old growth. It also aimed to provide resource security for forest-based industries.

Under the Agreement, the area of formal conservation reserves was increased by 150,885 hectares (12 per cent), bringing the total area protected in reserves in the south-west to 1,047,200 hectares. The Agreement allowed for 12 new national parks and extensions to 25 existing ones.

A total of 232,800 hectares of old growth forest were included in formal reserves (an increase of 45,700 hectares). This meant that 67 per cent of all old growth were set aside in the national forest reserve system. The inclusion of old growth in road, river and stream reserves meant that 71 per cent of old growth in the south-west was set aside in the conservation reserve system. In ecosystems where old growth was rare or depleted, 100 per cent was reserved where possible.

As part of the Agreement, a \$41.5 million industry development scheme was provided to help the timber industry adjust to the new measures. There also was a \$17.5 million package for tourism in the region. Tourism developments proposed include three new forest eco-lodges, camping and chalet sites, a scenic drive around Pemberton, tourist roads near Nannup, purchase of land around Wellington Dam, and recreation and tourism facilities in the Donnelly River valley and at Wellington Dam.

TREE PLANTING TACKLES GREENHOUSE GASES

In January, CALM and British Petroleum (BP) entered a history-making partnership to explore the feasibility and management of tree plantations for carbon sequestration as well as landcare and biodiversity. This is the first tree-planting program specifically aimed at offsetting Greenhouse gas emissions and marks the beginning of the first pilot study in Australia to examine the potential of tree plantations as carbon sinks.

Since the signing of the Kyoto Protocol, which defined strict limits to the total quantity of Greenhouse gas emissions from each country, significant international interest has developed in establishing tree crops to create carbon sinks to offset emissions.

CALM's 'Tree Crops on Farms' program – which has been leading Australia in terms of expansion (see below) – has been attracting attention from local and international companies alike. This program is well placed to implement rapid broadscale tree-planting programs capable of significant carbon sequestration.

In the past 12 years, more than 120,000 hectares of tree crops have been established by CALM and the private sector. These tree crops have the capacity to sequester a carbon sink of more than 200 million tonnes over the next 30 to 40 years — equivalent to 800 million tonnes of carbon dioxide emissions.

Because CALM's 'Tree Crops on Farms' project was also designed to capitalise on the increasing domestic and international demand for wood fibre, the cost of sequestering carbon will be offset by the return from timber products. In addition, the creation of carbon sinks will provide many environmental benefits, particularly in reversing land degradation and helping restore biodiversity in areas such as the Wheatbelt region.

The pilot study involves establishing tree crops on cleared farmland in partnership with farmers. The main species will be maritime pine, which is well suited to the medium rainfall zone (between 400 and 600 mm a year), and native species including the highly valued sandalwood (*Santalum spicatum*).

The study paves the way for WA to quantify its potential to create carbon sinks sufficient to offset annual emissions of carbon dioxide in time for the assessment of national Greenhouse gas emissions under the Kyoto Protocol.

WA LEADS IN TREE CROPS ON FARMS

Western Australia is leading the nation in establishing tree crops on farms.

A Bureau of Resource Sciences report released during the year reveals that between 1994 and 1998, the area of tree crops in Western Australia grew from 130,845 hectares to 212,304 hectares, an increase of 81,459 hectares. This means the State's tree crops program is progressing three times faster than the average of other States and Territories.

The report shows that Western Australia's tree crops program has expanded by an average of 20,365 hectares a year over the past four years, compared with an average annual increase across all States and Territories of around 7,000. It also means that WA is well on the way to achieve more than its share of the national '2020 Vision' to treble the area of tree crops by the year 2020.

This growth reflects the growing recognition among farmers that commercial tree crops are vital to combat land degradation, particularly soil and stream salinity.

CALM TREE SEEDLINGS: THE RECORDS CONTINUE

CALM's tree seedling production reached a record 27.4 million at the Department's nurseries in Manjimup and Narrogin. The seedlings, used for planting in farms and native forests, included 12 million Tasmanian bluegums, 6 million maritime pines, 2 million radiata pines, 4.5 million karri, 700,000 oil mallees and more than 2 million other native species.

Work continued on the first stage of an \$8 million expansion at the Manjimup nursery that will increase seedling

production to around 55 million a year within three years. This expansion is part of the State Government's Salinity Action Plan to establish 150,000 hectares of maritime pines on cleared farmland over the next 10 years.

This will be the forerunner to the long-term aim of at least 500,000 hectares of maritime pines in the medium rainfall zone. In addition, a further 50,000 hectares will be revegetated with native species to help restore the natural biological diversity of the region.

LONG-DISTANCE DREAM BECOMES A REALITY

The Bibbulmun Track – for many people the ultimate 'long-distance dream' – became a reality when a ribbon was cut at the track's terminus in Albany in September to mark the official opening of the southern half of the 960km trail.

The track winds from Kalamunda to Albany through the south-west native forests and across the spectacular southern coastline. The southern portion of the track extends from the Brockman Highway to Walpole and along the south coast to Albany.

The Building a Better Bibbulmun Project was funded by almost \$2 million in sponsorship and grant funds and approximately \$3 million of 'in kind' contributions from CALM, the Ministry of Justice, DEET programs, bush walking clubs, volunteer groups, service clubs, the Army Reserve and individuals.

Sponsors include the Ministry of Justice, Trails West, the Friends of the Bibbulmun Track, Alcoa of Australia, Regional Development Commissions, Employment Training programs, Worsley Alumina, Griffin Coal, Hedges Gold, Random Access, CSBP and

Farmers, Mountain Designs, BP Australia, Alpha West, Midland Brick, Cullity Timbers and the Gordon Reid Foundation (Lotteries Commission). The Federal Government's Regional Development Program contributed \$1.38 million through the Southern Province Projects Group over two years for the program.

Since work began on the new track four years ago, there have been major improvements to facilities. Forty-eight new campsites — with sleeping shelters, toilets, rainwater tanks, discreet tent areas and tables — have been created.

CALM also produced a new series of coloured maps which, along with other CALM publications such as the BushBooks field guides, help walkers interpret the many different aspects of the forest they discover along the track. New track guides for the northern and southern sections also have been released.

The partnership between CALM and the Ministry of Justice was a crucial element of the successful completion of the Bibbulmun Track and was recognised when the project was awarded the Premier's Award for the Provision of Services to Regional WA.

WESTERN SHIELD: FAUNA RECOVERY

More than 800 native animals have been returned home to their former ranges because of predator control and fauna recovery measures under the wildlife recovery program Western Shield.

The program's objective is to bring native animals back from the brink of extinction by controlling the threat of introduced predators, foxes and feral cats, on more than 3.5 million hectares of CALM-managed lands.

Since the project began in 1996, it has surpassed all expectations. Fox control has been achieved through comprehensive baiting programs in many areas of the State from as far north as Karratha, inland to the Wheatbelt region to the far south coast near Esperance.

Aircraft, equipped with global positioning systems that allow very precise navigation, distribute '1080' dried meat baits over 3.5 million hectares of conservation lands throughout Western Australia. The baiting technique is an adaptation of the system CALMfire uses in creating strategically located tracts of conservation lands in which the fuel loadings have been reduced to mitigate the impact of unwanted bushfires. Aerial baiting is conducted four times a year and is supplemented by ground baiting of smaller reserves in the Wheatbelt region.

Native animal numbers have increased dramatically in areas of the State where fox-control has been achieved. Scientific research and monitoring of areas where fox numbers have been reduced by baiting have shown a significant increase in native animal numbers.

Trap success rates for medium-sized mammals in Kingston block, near Manjimup, show numbers have increased more than seven-fold since baiting began in 1992. Only nine per cent of traps in August 1992 yielded any native mammals, while almost 77 per cent of traps in August 1998 held native species.

Similarly in Batalling block, near Collie, monitoring shows an increase in woylie capture rates from less than one per 100 traps in December 1990, just prior to fox-baiting, to nearly 70 per cent in October 1998. Monitoring

at Julimar Conservation Park, near Mundaring, shows that chuditch numbers have increased nearly five-fold since their reintroduction in 1992 following fox control. The quenda population at Dongolocking Nature Reserve in the Wheatbelt region has also had a ten-fold increase since quenda were first reintroduced in 1994.

To further complement the success with fox control experienced during the past year, CALM embarked on a number of historic translocations and reintroductions of threatened native animal species:

- Numbats, WA's faunal emblem, were reintroduced into the southern coast region, 62 years after the species was last recorded there.
- Dibblers were translocated to Escape Island, off the coast of Jurien Bay — the first dibbler translocation introduction under Western Shield and the first since the dibbler, once thought to be extinct, was rediscovered in 1967.
- Mala from the Tanami Desert in the Northern Territory were introduced to feral-predator-free Trimouille Island, located in the Montebellos Islands group.
- A second release of the once-thought-extinct noisy scrub bird species to the Darling Range was undertaken following the success of the first release in 1997.
- Bilbies also made a comeback with the release of captive-bred bilbies in a feral-predator-proof enclosure at Dryandra, the first release of the threatened species in the State.

To ensure further increases in populations of other native animals and restore wildlife to areas of their former home ranges, CALM staff also carried out a number of other translocations during the year. Populations of chuditch and woylies were released into Mt Lindesay National Park; tammar wallabies were released at privately owned Karakamia Sanctuary

and Julimar Conservation Park; woylies were released at Batalling State forest in cooperation with Muja Power Station; western swamp tortoises were released at Twin Swamps Nature Reserve in cooperation with the Perth Zoo; and numbats were released in the northern jarrah forest.

To complement the wildlife recovery being achieved through fox-baiting and reintroductions on WA's conservation lands, CALM has embarked on several captive breeding programs for endangered native species whose populations are too low in the wild to naturally regenerate. These species include malleefowl, bilby, chuditch, numbat, western-barred bandicoot and rufous hare wallaby.

These breeding programs have been very successful with a number of young born and released during the year. Much of this success has been due to the partnerships CALM has with Kanyana Native Fauna Centre and the Perth Zoo.

More than 50 native endangered animals have also been captive-bred under the wildlife conservation initiative Project Eden in the World Heritage Listed Shark Bay region. Endangered species such as the bilby, western barred bandicoot and banded hare wallaby have been successfully bred in innovative captive breeding programs located in Francois Peron National Park.

Much of Western Shield's success to date had been due to the cooperation and support of the community. The support and generous sponsorship of Alcoa Australia and Cable Sands Pty Ltd for the Operation Foxglove and Coastal Storm components of the program were significantly bolstered by corporate sponsorship of \$120,000 from Westralian Sands. The sponsorship, to be spread over three years, funds the New Dawning component of the project.

CALM RECREATION PROJECTS WIN WA TOURISM AWARDS

The Valley of the Giants Tree Top Walk has cemented its reputation as one of Western Australia's greatest tourism attractions by winning its second WA Tourism Award — the second year in a row.

The innovative nature-based tourism facility, along with the Building a Better Bibbulmun Track Project, received accolades at the 1999 Western Australian Tourism Awards.

The Valley of the Giants Tree Top Walk won the prestigious Significant Regional Attractions Category of the awards, while the Building a Better Bibbulmun Track project won the Tourism Development Projects Category.

The awards recognise CALM's ability to successfully integrate tourism and recreation with conservation. The Tree Top Walk has ensured conservation of the State's sole red tingle forest without impeding, but rather fostering, nature-based tourism. The walk has provided a unique means for people to interact with nature.

Since its opening in 1996, the Valley of the Giants Tree Top Walk has become one of the nation's most popular tourism attractions, with more than 200,000 people visiting it each year.

WESTERN EVERLASTING: SAVING OUR THREATENED FLORA

The future prospects of hundreds of threatened plant species in Western Australia were enhanced under a new conservation program — Western Everlasting. The project is one of three key initiatives launched during the year to assist the recovery of threatened flora species and communities. Western Everlasting promotes conservation on several fronts,

including the preparation of threatened flora management programs for each region or district in the south-west botanical province from Shark Bay to Israelite Bay.

Other aims of Western Everlasting are to reduce the impact of threats such as *Phytophthora* and weeds, and to establish new populations of threatened species in suitable habitat. CALM's Threatened Flora Seed Centre will be upgraded and expanded as part of the initiative.

Other initiatives include *FloraBase*, a detailed database of plants available on CALM's *NatureBase* internet site, and the publication of a book that lists the threatened species and provides detailed colour photographs to help raise community awareness of the need for flora conservation.

Publications such as CALM's new book, *Western Australia's Threatened Flora*, provide people with comprehensive information on threatened species, as well as the steps being taken to save them.

Similarly, *FloraBase*, administered by CALM's Western Australian Herbarium, means that people throughout the world have instant access to the latest information on 12,500 flowering plant species. The launch of *FloraBase* was the culmination of a great deal of work by past and present CALM staff, volunteers and consultants, and a network of community members and local, national and international botanists.

NATURE CONSERVATION

OUTPUT 1

Outcome

The conservation of indigenous plants, animals and ecological processes in natural habitats.

Output Description

The production and implementation of management plans and programs for flora and fauna conservation, for threatened species and ecological communities and for commercially exploited species according to the principles of ecological sustainability, for the acquisition, conservation and protection of representative ecosystems and for conducting emergency actions to save wildlife, minimising adverse effects of fire, weeds, feral animals and disease and developing public awareness, understanding and support for the nature conservation programs, services and policies.

Note: CALM uses the National Strategy for the Conservation of Australia's Biological Diversity definition of 'conservation', i.e. 'the protection, maintenance, management, sustainable use, restoration and enhancement of the natural environment.'

The Output performance can be best measured in three key areas:

1. Wildlife and habitat management.
2. Wildlife utilisation.
3. Threatened species management.

The Roadside Conservation Committee operates within the overall Nature Conservation Program to coordinate and promote the conservation and effective management of native vegetation on road and rail reserves for the benefit of the environment and the people of Western Australia. CALM meets the cost of servicing the

HIGHLIGHTS

- ☆ Acquisition of more than 1.4 million hectares of land for addition to the State conservation reserve system (p. 11 and pp. 46-47).
- ☆ Launch of Western Everlasting, an initiative to save threatened flora: translocation of 912 seedlings of six critically endangered plant species (p. 8).
- ☆ The WA Herbarium launched its innovative new computer database FloraBase that can be accessed on-line via CALM's webpage (p. 12).
- ☆ Selection of Lake Bryde as the fourth natural diversity recovery catchment under the Salinity Plan (p. 8).

Committee and obtains contributions towards the Committee's operations from Main Roads Western Australia and Westrail.

SALINITY ACTION PLAN

The Salinity Action Plan is a major environmental and social initiative of the Western Australian Government to protect the economic and ecological assets of the agricultural zone.

The area is a major repository of the biodiversity of south Western Australia, itself a recognised mega-diverse region, and covers all or significant parts of six (Geraldton Sandplains, Swan Coastal Plain, Avon-Wheatbelt, Jarrah Forest, Mallee, Esperance Sandplains) of the eight biogeographic zones recognised in temperate Western Australia.

Rising saline groundwater and flooding of low-lying areas caused by the removal of deep-rooted native plants is a major threat to the rich animal and plant communities now confined to scattered remnants throughout the region.

The aim of the Salinity Action Plan biological survey is to elucidate biogeographic patterns in the plants and animals of the region and to

recommend areas to be established as recovery catchments to protect this diversity. The project was divided into four study areas:

- flora (terrestrial and wetlands);
- fauna (terrestrial);
- wetland fauna; and
- wetland monitoring.

The area was divided into four zones for the purposes of the survey: northern, central, southern and eastern bands. Sampling has occurred in the first three.

Quarterly updates on the progress of the survey are provided to the State Salinity Council and are frequently used in their newsletter. Some significant results:

- A flora checklist of the region is being prepared with an estimated vascular plant flora of 4,000 species, of which over 60% are endemic to the area. One presumed extinct species (*Hydatella leptogyne*) was rediscovered during the survey.
- Revegetation: Of these plant species over 850 are found only in fresh or naturally saline lowlands, which are directly threatened by

rising groundwater and salinity. Several hundred other species are found only in woodland sites and will be under threat in the longer term. One of the outcomes of the plant survey is to identify native species of potential for regeneration.

- Recovery catchments – Muir-Unicup Recovery Catchment: A report with vegetation maps, flora lists (976 vascular plant species), rare flora, wetland vertebrates and invertebrates. Forty-seven monitoring sites have been prepared.
- Terrestrial fauna – spiders: Over 600 species of spider have been identified in a third of the region so far, compared to WA Museum records of 200 species for the whole region.
- Community involvement: Approximately 200 extra flora sites established on private and Shire lands by members of the Western Australian Wildflower Society will be available for inclusion in the study.
- Wetlands: Approximately 150 wetlands have been sampled for plants, birds and invertebrates. As well as being a centre for diversity in plants, the south-west has a very high diversity in wetland micro-invertebrates.
- The fourth natural diversity catchment, Lake Bryde, has been nominated and approved.

CONSERVATION OF WILDLIFE

Carnarvon Basin Survey

A biogeographic survey of the Carnarvon Basin, coordinated by CALMScience Division and carried out in collaboration with the WA Museum, has been finalised and results will be published shortly. Over 2000 native plant species, almost 500 aquatic invertebrates, numerous terrestrial invertebrates, 14 frogs, 144 reptiles, 247 non-marine birds and 59 mammals

are known from the 750,000 km² region. The region is rich in biogeographic complexity and a number of species are endemic to the area. This feature is quite marked in the reptiles — the total of 29 endemic reptiles makes the Carnarvon Basin rich on an international scale. The survey has also highlighted the fact that WA is a centre of diversity of aquatic microinvertebrates.

Analysis of the survey results allowed the identification of five main types of wetland habitat and 13 species assemblages (communities) of terrestrial plants and animals. Further analysis has allowed development of procedures to identify important habitats not represented in the reserve system.

Results of the survey are being used in various ways to address conservation issues in the area. For example, the survey has revealed that 22 (48%) of the terrestrial mammals known from the region are extinct, but results of the survey provide a regional context for Project Eden as well as other conservation projects focussed on the Carnarvon Basin.

Partly because of the biogeographic complexity, only 77% of the plants and 55% of terrestrial animals are known from the existing conservation reserve system. This is being addressed in part through CALM's input to the Gascoyne-Murchison Rangelands Strategy, where use of the outcomes from the Carnarvon Basin survey will lead to major improvements in the conservation reserve system.

Western Everlasting

Recent advances in flora recovery research include the use of DNA based molecular markers to identify conservation units, and to assess the effects of recent fragmentation and reduction in population size on genetic diversity levels in populations of critically endangered species. These

markers are also being used to determine patterns of mating and inbreeding within populations of these species, and how significant these events are in relation to pollinator behaviour, reproductive output and recruitment.

Understanding patterns of seed production and seedling recruitment in populations of critically endangered plants is vital if current populations are to be adequately managed. This research has recently begun on six critically endangered *Acacia*, six *Verticordia* and six orchid species. These data are also vital for assessing the success of reintroductions. This year CALM began the translocation of seven critically endangered plant species. Some 200 seedlings of *Daviesia bursaroides*, 216 seedlings of *Lambertia orbifolia*, 106 seedlings of *Grevillea calliantha* and 90 seedlings of *Lambertia echinata* subsp. *echinata* were translocated to secure, relatively undisturbed sites to form the basis of new populations for these species. A small number of seedlings of *Lambertia echinata* subsp. *occidentalis* were also translocated to a secure site in State forest. The planting of some 300 seeds each from *Acacia aprica* and of *Acacia cochlocarpa* subsp. *cochlocarpa* provided the basis for new populations of these species; and further plantings, later this year, of over 200 seedlings of each species will further enhance these new populations.

CALM's Threatened Flora Seed Centre continues to provide a vital focus for the Department's flora recovery programs. Translocations of critically endangered flora are based on seed collected and stored in the Centre. Currently the Centre genebank holds collections from 630 populations of rare and threatened flora, with 65 of the 95 critically endangered flora represented. The Centre also organised a week-long course on the establishment of a seed-based genebank with participants from around Australia.

RABBIT CALICIVIRUS DISEASE

In October 1995, Rabbit Calicivirus Disease (RCD) escaped from field trials on Wardang Island, South Australia and spread rapidly across the continent. Intensive monitoring sites were established in all States and the Northern Territory under the auspices of the Australian and New Zealand Environment and Conservation Council. In Western Australia, sites located at South Stirling (adjacent to Stirling Range National Park) and on the Nullarbor Plain sought to examine the effects of RCD-reduced rabbit numbers on indigenous fauna and flora.

RCD spread rapidly across the Nullarbor, where it reduced rabbit numbers by up to 90%. The virus is now established there and recurring epidemics have sustained the reduction. At South Stirling, the initial outbreak caused a decline of about 65% in rabbit populations; but this was not sustained, and the disease did not recur until June 1999. Similar experiences in eastern Australia suggest that for some time RCD will be an effective control agent in arid areas that support rabbits. This is important because it is in those areas that rabbits most seriously threaten biodiversity and conservation values. They are also the areas where conventional control is impractical and myxomatosis is ineffective. In wetter areas, RCD may complement myxomatosis and other control agents periodically but it is unlikely to be a primary control mechanism.

Significant observations on the Nullarbor include the following:

- Feral predator numbers have crashed. Fox, cat and dingo skeletal remains were found along with numerous rabbit remains soon after the disease first swept the area. These feral animals are very rarely seen on spotlight transects now.

- Rabbits formed the staple diet of wedge-tailed eagles. There are fewer eagles than before RCD, but they are still present. As there will be less competition with rabbits for food, kangaroo numbers (and thus food for eagles) may increase.
- Rabbits selectively seek the seedlings of several long-lived trees and shrubs. Western myall, for example, has not recruited young plants to replace ageing trees since rabbits arrived about 100 years ago. However, most seedlings that germinated just before RCD arrived continue to grow, undamaged.
- Changes to the composition and abundance of small vertebrates, forbs and grasses are likely but it will take a long time before new equilibria are discernible because rapid seasonal response to rainfall masks early trends.

Threatened Wildlife

Changes to the lists of threatened flora and fauna under the Wildlife Conservation Act, recommended by the Threatened Species Scientific Committee at its March 1998 meeting were gazetted on 14 July 1998. With respect to flora they included 15 additions, 20 deletions, two transfers from the 'presumed extinct' category to the 'extant' category, and seven nomenclatural changes. A further 54 taxa were added to CALM's Priority flora list and 23 taxa were deleted from the Priority list on the basis of further survey.

This year, two flora taxa were recommended for removal from the 'presumed extinct' list. Both were rediscovered during field surveys. These taxa will now be the focus for field surveys to confirm their status in the wild. There are currently 328 taxa of declared rare flora, 23 presumed extinct and 1990 priority flora taxa. With respect to fauna the approved changes to the Threatened Fauna list included 24 additions, 15 deletions, and one nomenclatural change. A further

two taxa were added to CALM's Priority fauna list and two taxa were deleted from the list on the basis of further survey. There are currently 116 taxa listed as threatened with extinction, 13 presumed to be extinct, 30 bird species specially protected because of their listing under the Japan and Australia Migratory Bird Agreement and the China and Australia Migratory Bird Agreement, and 11 otherwise specially protected.

Flora and Fauna and Communities Recovery Teams

During the year implementation of recovery plans continued for the following species of threatened fauna: Gilbert's potoroo, chuditch, numbat, dibbler, western ringtail possum, djoongari (Shark Bay mouse), south coast threatened birds (including noisy scrub-bird, western bristlebird and western ground parrot), western swamp tortoise, Lancelin Island skink, and orange-bellied and white-bellied frogs. The State Network for the Malleefowl continues to meet irregularly, with frequent direct contact between individual members.

Regional and District Threatened Flora Recovery Teams coordinated the recovery of threatened flora, and in some cases threatened ecological communities, in the Central Forest, Southern Forest and Swan Regions, and the Geraldton, Merredin, Albany, Moora and Narrogin Districts. Recovery teams covered Toolibin Lake, sedgeland in Holocene dune swales, thrombolites of Lake Richmond, aquatic root mat community of caves of the Swan Coastal Plain and montane thickets (Stirling Range). A new Management Advisory Committee has been set up to coordinate the recovery of two critically endangered communities which occur in the Cape Range area — Cameron's Cave and Cape Range remipede community (Bundera Sinkhole) — and all species of threatened fauna that occur on North West Cape.

There are currently over 100 plant taxa ranked as 'critically endangered' in WA. Implementation of recovery actions for 59 of these are currently being carried out with funding from the Natural Heritage Trust Endangered Species Program and CALM.

Interim Recovery Plans approved by the Director of Nature Conservation during the year were: dibbler, *Parentachinus apicalis* (No. 18), Minnivale trapdoor spider (No. 19), Wongan Gully wattle, *Acacia pharangites* (No. 20), and western woolly Cyphanthera, *Cyphanthera odgersii* subsp. *occidentalis* (No. 21). More than 30 Interim Recovery Plans for 'critically endangered' flora are in preparation.

A new Bush Book titled *Threatened and Rare Birds of Western Australia* has just been released. The book discusses all declared threatened species and sub-species of birds in WA, and lists all priority taxa as well.

Translocations

In the past 12 months the Director of Nature Conservation has approved 20 translocations of threatened flora and fauna. Translocations are carried out in accordance with CALM Policy Statement 29. All translocations were carried out by CALM (sometimes in association with community groups), except for Djoongari and Wopilkara to Heirisson Prong.

Twenty-nine posters depicting 'critically endangered' flora have been prepared with funds from the BankWest LANDSCOPE Conservation Visa card. These can be downloaded from NatureBase, CALM's Internet web site

A new book depicting all of WA's threatened flora was published during the year (*Western Australia's Threatened Flora*, edited by Andrew Brown, Carolyn Thomson-Dans and Neville Marchant).

Ecological Communities Recovery Teams

Two three-year projects, funded by the National Heritage Trust (NHT), helping to identify and conserve Threatened Ecological Communities in Western Australia, are now in their second year.

One project is called 'Conserving Threatened Ecological Communities in Agricultural Areas' and is being conducted in close collaboration with the biological survey project being funded under the Salinity Action Plan.

This project involves many landholders of the central Wheatbelt.

The second project is 'Conserving Threatened Ecological Communities Throughout WA' (particularly within the pastoral and mining regions). Close contact with pastoral lessees, mining companies and local communities is also a key part of this project.

Funding has also been obtained from the NHT for a project (Implementing Interim Recovery Plans for Critically Endangered Ecological Communities) that has just begun.

Translocation of threatened flora and fauna as at 30-06-99	
Species	Source and destination
<i>Grevillea calliantha</i>	Seed sourced from original population and raised at Kings Park & Botanic Garden to Water Reserve, Cataby
<i>Lambertia echinata</i> subsp. <i>occidentalis</i>	Seed sourced from original population and raised at Kings Park & Botanic Garden to Treeton Block
<i>Lambertia orbifolia</i>	Seed taken from population 2 and raised at Kings Park & Botanic Garden to Narrikup Nature Reserve
<i>Daviesia bursarioides</i>	Seed collected and raised by Kings Park & Botanic Garden to gravel pit near Three Springs
<i>Lambertia echinata</i> subsp. <i>echinata</i>	Seed from population 1a and seedlings raised at Kings Park & Botanic Garden to gravel pit Cape Le Grande NP
<i>Acacia cochlocarpa</i> subsp. <i>cochlocarpa</i>	Seed from translocation site, raised at Kings Park & Botanic Garden to Gunyidi Nature Reserve
<i>Acacia aprica</i>	Seed from population 5 raised at Kings Park & Botanic Garden to Carnamah Shire Recreation Reserve
<i>Verticordia fimbriolepis</i> subsp. <i>fimbriolepis</i>	Cuttings taken from Population 3 located at Timber Reserve 1736 and then propagated at Kings Park & Botanic Garden to timber reserve near Beaufort
Western Swamp Tortoise	Perth Zoo to Twin Swamps and Ellen Brook Nature Reserves
<i>Fulingia</i> sp. (Trigwell Bridge)	Phase 2. Propagated plants to Trigwell Nature Reserve
Dibbler	Perth Zoo (founders from Boullanger and Whitlock Islands) to Escape Island, Jurien Bay
Numbat	Animals sourced from Dryandra Woodland, Boyagin Nature Reserve and Perth Zoo
Djoongari (Shark Bay Mouse)	Captive colony Perth Zoo (founders from Bernier Island) to Heirisson Prong, Shark Bay
Djoongari (Shark Bay Mouse)	Captive colony Perth Zoo to North West Island, Montebellos
Chuditch	Captive colony Perth Zoo to Mt Lindesay area
Chuditch	Captive colony Perth Zoo to Kalbarri National Park
<i>Grevillea christineae</i>	Source plants from Mortlock River Goomalling Shire Reserve to private property nearby
<i>Dryandra ionthocarpa</i>	Seedlings raised at Kings Park & Botanic Garden to Kalgan Plains Nature Reserve
Greater Stick-nest Rat	Salutation Island to Heirisson Prong, Shark Bay
Western Bristlebird	Two Peoples Bay/Fitzgerald River National Park to Walpole-Nornalup NP

Land Acquisitions

Acquisitions of land containing endangered ecological communities for addition to the conservation reserves system were:

- 64 hectares of the 'critically endangered' Muchea limestone community. The area is adjacent to an already purchased nature reserve of six hectares. This area is the largest block of the Muchea limestone community in existence and its acquisition is a major step towards its conservation.
- 24 hectares containing the 'critically endangered' community, 'shrublands on southern ironstone' near Busselton, will make the second nature reserve including this community. This is an excellent example of the community, supporting several species of 'declared rare' flora, and its acquisition will bring to almost 50% the proportion of the community in public ownership.
- A significant area of the 'endangered' community '*Banksia attenuata* over species-rich dense shrubland' is to be acquired as a part of a 163-hectare acquisition adjoining Chandala Nature Reserve.
- Negotiations are in train over nine hectares of banksia scrub and wetland at Bullsbrook containing an occurrence of the 'critically endangered' tumulus spring community. If and when this acquisition is completed, two of the three known surviving occurrences of this community will be in nature reserves.

These acquisitions have been assisted by funding from the National Reserve System Program of the Natural Heritage Trust.

The purchase of five hectares of 'herb rich saline shrublands on clay pans' at Gingin is currently being negotiated. Although only classified as 'vulnerable' the community continues to face considerable threats and is poorly

represented in reserves. This is an unusual example of the community with an overstorey of *Casuarina obesa*.

Commercial Use of Wildlife

Management of the commercial harvesting of kangaroos continued throughout the year, with input from the Kangaroo Management Advisory Committee. Kangaroo management operated under the management plans approved by the State and Federal Ministers for the Environment for the period 1998–2002. Under these programs, commercial harvest quotas were set for each species for the 1999 calendar year. During 1998 aerial kangaroo population surveys were undertaken over an area approximately one third of the rangeland area normally surveyed in triennial surveys (the northern survey zone). This will approximate the previous triennial surveys. As euros are difficult to count from the air, a baseline population estimate using air survey estimates corrected by trial ground truthing has been calculated. The revised population estimates for the three harvested species of kangaroo based on 1997 and 1998 surveys are shown opposite, along with the 1998 commercial harvest quotas, 1998 commercial harvest, and the quotas set for 1999.

The management program for saltwater crocodiles and freshwater crocodiles in Western Australia continued. The management program covers all aspects of crocodile management, including crocodile population surveys and regulation of crocodile harvests, farming, processing and export.

Under the management program, commercial harvests of live crocodiles for farm breeding stock development,

and limited harvest of eggs and hatchlings, can be approved. For management purposes these harvests are primarily restricted to the Cambridge Gulf area, where monitoring ensures that the wild crocodile populations are conserved. Surveys were again undertaken of saltwater crocodile and freshwater crocodile populations in the Cambridge Gulf–Lake Argyle area during the year. The resulting population estimates are presented below (based on late winter surveys).

Population estimates for non-hatchling (*non-h*) *C. porosus*, from spotlight and helicopter surveys undertaken by G. Webb Pty. Ltd in July 1992 and Wildlife Management International Pty Ltd in July of each year 1992–1999 inclusive.

Year	West Arm non-h	East Arm/ Ord River non-h	Total non-h
1992	198	379	577
1993	153	410	563
1994	100	370	470
1995	173	422	595
1996	139	382	521
1997	161	422	583
1998	150	400	550
1999	270	394	664

A total of 6,190 fauna (other than damage) licences were issued during the year, a decrease of 1.7% from the previous year (see Appendix 15). The decrease was due to general variability in licence issue, and could not be attributed to any specific factor. The number of commercial flora licences issued increased by 1.0% during the same period.

The management program for the commercial harvesting of protected flora in Western Australia 1998–2003 was approved by the Commonwealth

Management of Commercial Harvesting of Kangaroos

KANGAROO SPECIES	Red	Western Grey	Euro
1998 population estimate	1,935,000	509,000	>168,000
1998 quota	180,000	74,000	10,000
1998 commercial harvest	116,303	45,654	4,957
1999 quota	350,000	74,000	10,000

Minister for the Environment under the 'controlled specimens' provisions of the Federal legislation. A management program for *Banksia hookeriana* was developed and implemented this year. The management program was developed as *B. hookeriana* is geographically restricted in an area of approximately 400 km² between Eneabba and Arrowsmith. The number of people harvesting this species from Crown land has increased from 38 to 58, and the annual harvest has increased from just below one million stems to more than three million in the last few years. The management program will ensure that the number of pickers and the amount being harvested is controlled and harvested sustainably.

Intensive management of *Boronia megastigma*, *Stirlingia latifolia*, *Verticordia nitens* and *Dryandra formosa* continued this year. A further three species (*Melaleuca uncinata*, *Boronia purdieana* and *Andersonia caerulea*) are being more closely monitored to determine what effects flora harvesting has on these species and what level of harvesting is sustainable.

There are currently four flora industry management teams: Southern, Swan Region, Central Forest and Northern Sandplains. These groups meet as is necessary to coordinate and discuss industry management issues. The Western Australian Flora Industry Advisory Committee (WAFIAC) met twice during the year.

THE WA HERBARIUM

Minister for the Environment Cheryl Edwardes launched the WA Herbarium's flagship *FloraBase* in November 1998. *FloraBase* is a world leader in databasing and presenting biological information in a manner readily available to the widest audience, including scientists, teachers, horticulturalists, other professionals, students and the community generally.

The *FloraBase* URL is www.calm.wa.gov.au/science/florabase.html. Alternatively, it can be accessed through the 'Science Matters' link on the *NatureBase* web page. *FloraBase* integrates information from the WA Census and WA Herbarium Specimen databases, and it incorporates descriptive material and images from the Descriptive Catalogue of WA Plants database.

The Herbarium has continued to develop its network of Community Regional Herbaria, adding a further 27, bringing the total to 80 at this stage, extending from Esperance in the south to Murchison in the north of the State. This project relies on support from Natural Heritage Trust funds through the Bushcare program. *The Plant Press*, the newsletter of the Regional Herbaria program, has increased its circulation to 400 copies and six curation workshops have been run from Ravensthorpe to Geraldton. Approximately 6,700 specimens have been processed through regional herbaria to 30 June 1999.

The Herbarium's enthusiastic band of over 70 volunteers continue to provide invaluable support and were instrumental in mounting a further 17,544 specimens. They also continue to assist with imaging, identification, training new regional herbaria staff and assisting on field trips.

To add to our comprehensive database records, over 3,000 images have been scanned, bringing the total to 11,400. The State Collection has increased by 23,688 to 463,530 specimens as at June 1999. The State Collection currently comprises:

Algae	4,900
Mosses	4,383
Liverworts	988
Fungi	6,356
Lichens	4,839
Ferns	2,628
Gymnosperms (Pines, Cycads)	1,501
Flowering Plants (Monocots)	72,974
Flowering Plants (Dicots)	364,961
Total number of databased specimens	463,530

Added to our State Collection this year were 1,202 'priority' flora and 250 'declared rare' flora specimens, bringing the total collection of 'priority' and 'declared rare' flora to 27,118 specimens. The public access Reference Herbarium comprises some 12,193 specimens vouchered and linked to a databased specimen in the main Herbarium collection. The reference Herbarium is extensively used by both amateur and professional botanists for flora identification and verification.

There were 4,636 loans of WA specimens to other institutions and we received 7,439 loans from other herbaria. The WA Herbarium received 1,895 exchanges from other institutions to add to our collection and distributed 1,940 specimens for the benefit of others.

The Herbarium continues to publish, with two issues of *Nuytsia* providing up-to-date information on botanical matters to the scientific and broader communities, and *Flora of the South West Forest* shortly to be published.

ENVIRONMENTAL PROTECTION

Mining

Liaison with the mining industry continued through the Mining and Environment Group. Staff reviewed numerous annual reports for mining CALM-managed lands and assisted other agencies to review reports and proposals that impacted on conservation values off reserves.

Environmental Protection Branch commented on 21 formal assessments by the EPA. A total of 147 mining tenement applications were processed in consultation with the NPNC and LFC, and appropriate mining conditions imposed.

The Department continues to pursue conservation opportunities by identifying land to replace/offset mined land and bringing these to the

attention of mining companies. A total of \$3.116 million was received in mining compensation payments.

Rangelands

CALM has been purchasing pastoral leases as a means of extending the reserve system in the rangelands in response to the recognition that there are major gaps in the conservation estate in this vast area of the State. These leases are destocked and managed for the conservation of wildlife and the restoration of the land and habitats where degradation has occurred as a result of past management practices.

CALM has purchased four pastoral leases (Earaheedy, Muggon, Pimbee and Mooloogool: 1.13 million hectares in total) under the Gascoyne-Murchison Rangelands Strategy using funds obtained from the State and the Commonwealth through the National Reserve System Program. The pastoral leases are now managed for conservation but also include a range of other activities such as tourism and recreation, education and research. CALM's activities in the rangelands will involve a broad range of people from the community with interests in conservation, including pastoralists, mining companies, Aboriginal people, conservation groups and the tourism and recreation industry.

There are also opportunities to manage land for conservation purposes on leasehold and other land through voluntary agreements with land holders. CALM has developed co-operative management of pastoral leases covered by mining tenements. The Department has continued to make a significant contribution to goat control programs in the pastoral region in conjunction with Land Conservation District Committees.

During the year the Minister for the Environment approved the release of the State Environmental Weed Strategy and its database (*Weedbase*).

Work has commenced on a State Weed Plan to cover both agricultural and environmental weeds.

Western Shield – Fauna Recovery

The need for a low-cost but effective fox bait has seen the commencement of research into another sausage bait. Trials are currently under way to determine whether the new bait is as attractive to foxes as the dried meat bait currently in use, whether the sausage bait will last as long in the field, and whether non-target species, particularly the chuditch, are affected.

CALM's predator control program Western Shield has expanded to more than 3.5 million hectares of CALM-managed lands being baited to control foxes and cats, and over 700,000 poison baits are used annually. This program incorporates the 550,000 hectares which was covered under Operation Foxglove, and Alcoa Australia Limited continue their generous support of this program in the northern jarrah forest with funding of \$120,000 per annum. Other companies sponsoring CALM's predator control programs include Cable Sands Pty Ltd, which sponsors the 200,000 hectare Coastal Storm for \$60,000 per annum, and Westralian Sands, which sponsors the 100,000-hectare New Dawning for \$40,000 per annum.

The objective of Western Shield is to control introduced predators so that populations of native fauna can recover naturally, or through reintroductions of fauna back into their natural habitat. During the past year a population of chuditch was reintroduced to Mt Lindesay National Park, dibblers were introduced to Escape Island off the Jurien coast and woylies were reintroduced to Walpole-Nornalup National Park, St John's Forest, Denmark Forest, Centaur Forest and Giants Forest. Numbats were reintroduced to Stirling Range National Park, and tammar wallabies to Karakamia Sanctuary, Bennelaking Forest and Julimar Forest. Shark Bay

mice were introduced to North West Island in the Montebello Island group. Additional malleefowl were reintroduced to Francois Peron National Park (after captive rearing).

As part of the Western Shield program an education package was developed for primary schools in 1997. This education package is now being used by more than 10,000 students and 600 teachers State-wide. Six hundred and twenty school students and 30 teachers participated in excursions related to Western Shield and a further 227 students, 16 teachers and 19 support staff attended camps where fauna conservation was the main theme. More than 350 teachers also attended conferences and seminars where Western Shield themes were promoted.

New populations of the threatened red-tailed phascogale and the tammar wallaby (a priority species), were discovered in the Wheatbelt Region during the year.

Development of a feral cat control bait progressed well over the last 12 months. A sausage bait containing minced kangaroo meat, attractants and an ant deterrent has been developed, and uptake rates of 80–100% have been obtained in some arid areas of WA. This, together with the effective cat trapping technique developed earlier, will allow feral cat control in the arid zone and allow the Western Shield fauna recovery program to expand into the majority of WA.

GENERAL WILDLIFE MANAGEMENT AND RESEARCH

Departmental officers attended 19 reported whale and dolphin strandings throughout the year, involving both live and dead animals. These strandings involved 19 individual animals, representing six species, including humpback, fin and sperm whales, and spinner, bottlenose and Risso's dolphins. The most commonly stranded cetacean was the bottlenose dolphin.

Officers also attended 15 pinniped strandings throughout the year, including seven sub-Antarctic fur seals, three New Zealand fur seals, one leopard seal, and four Australian sea lions. In most cases, these animals were ill or injured. One New Zealand fur seal and one sub-Antarctic fur seal were rehabilitated successfully, tagged and released.

CALM staff conducted a survey of New Zealand fur seal numbers along the southern coastline of Western Australia during January 1999, the first such survey since the 1989-90 breeding season. Of the 17 breeding sites now known in Western Australia, 16 were surveyed and pup production had increased at all but one. The estimated overall increase in pup production in Western Australia was 113.3% between surveys. Total annual pup production has increased to 3,090. The estimate of absolute abundance of New Zealand fur seals in Western Australia is now 15,100, in contrast to the 7,100 estimated for the 1989-90 season.

Wildlife Interactions, Licences and Compliance with Legislation

The Department 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.

A total of 85 whale-watch boat-tour operators are licensed State-wide, a decrease of 20% on last year. A total of 35,341 passengers were conveyed by licensed operators from various centres around the State, but principally from Perth (67.6%), an increase of 1% from last year. While these tours were primarily based on humpback whales, southern right whales are the focus of whale watching activities in the Albany area. There were also 23 boat-based dolphin interaction licences, three in-water dolphin interaction licences and five boat-based dugong interaction licences issued.

The total number of damage licences issued for birds was 217, a decrease of 2.4% from 1997-98 (see Appendix 16).

Seven reports of problem crocodiles were received by officers in the Kimberley. Licences to remove two saltwater crocodiles from the wild were issued because of the threat they posed to public safety.

During the year, the Department provided guidance to a large number of people. Verbal warnings were issued as appropriate, and 280 offences under the Wildlife Conservation Act and Regulations were the subject of written reports. To date, action in 93 matters has been completed. A summary of reported offences is presented below (see also Appendix 17 for further details of offences).

	1997-98 Reported Offences		1998-99 Reported Offences	
	30-6-98	Revised	As at 30-6-99	
Total Offences Reported	457	536	Total Offences Reported	575
Convictions	44	74	Convictions	51
Dismissals	0	1	Dismissals	0
Letters of Warning	86	269	Letters of Warning	135
No Further Action	107	151	No Further Action	24
Pending	220	41	Pending	365
Total Fines	\$12,050	\$18,500	Total Fines	\$17,575
Total Costs	\$1,970	\$6,172	Total Costs	\$3,507

Note 1: Figures for 1997-98 reported offences are updated from those included in last year's report under the Revised column.

Note 2: See Appendix 17 for details of 1998-99 offences.

Note 3: Wildlife Protection Section also processed 199 offences under the CALM Act and Regulations for various offences.

Marine Conservation

Significant progress has been made in the planning and management of marine conservation reserves from the North West Shelf around to the waters of the south coast. Planning for the proposed Jurien Bay marine reserve has reached a stage where there is now broad support. The planning process was initiated for the proposed Dampier Archipelago/Cape Preston and the Montebello/Barrow Islands marine reserves. Preliminary consultations have begun for the proposed Geographe Bay/Capes/Hardy Inlet and the Walpole/Nornalup Inlet marine reserve areas.

The Marine Parks and Reserves Authority (MPRA) met seven times and undertook a systematic prioritisation of the 70 areas identified by the 1994 report of the Marine Parks and Reserves Selection Working Group as being worthy of consideration as marine conservation reserves. In addition to the existing areas for which marine reserve conservation planning is currently under way, the MPRA identified a further 10 areas for consideration as the second tier of priority areas.

CALM's Marine Parks and Reserves Scientific Advisory Committee (MPRSAC) held four meetings and discussed a wide range of issues. These included no-take zones in marine reserves, criteria for selecting areas as either marine parks or marine management areas and, for the proposed Jurien Bay marine reserve, the issue of its overall size. The MPRSAC met jointly with the MPRA to discuss priorities for marine conservation reserves in Western Australia.

The Jurien Bay Marine Reserve Advisory Committee met a number of times throughout the year and made significant progress in the marine conservation reserve planning phase, nearing the completion of a Notice of Intent. The committee also reached

broad agreement on a notional zoning plan for the proposed marine conservation reserve area.

The Marine Conservation Branch (MCB) undertook a major survey of benthic habitats at over 400 sites between the Leeuwin and Naturaliste capes. Follow-up biological surveys, to detail the richness and abundance of the area's floral and faunal species, were also undertaken by the MCB, in collaboration with local and interstate universities.

The Commonwealth's Natural Heritage Trust funded a number of marine reserve planning and management initiatives.

During the year the MCB undertook monitoring of the ecological characteristics and impacts associated with human activities in the Shark Bay and Ningaloo Marine Parks. In addition, intensive water quality and oceanographic surveys were undertaken in the waters surrounding Monkey Mia, in order to quantify background water quality and better understand the circulation and mixing of these waters. Many of these exercises involved the collaboration of CALM's regions and districts and funding from Environment Australia (Natural Heritage Trust). Collaborations and alliances for research and monitoring of existing and proposed marine conservation reserves were also forged with national research agencies and universities, such as the CSIRO, the Australian Institute of Marine Science, the universities of Western Australia and New South Wales, and Murdoch and Edith Cowan universities. The WA Museum has also collaborated with the MCB in many marine conservation activities.

The year also saw the formal gazettal of marine park zones in the Shark Bay and Marmion marine parks and the signing of a Memorandum of Understanding for joint management of the Rowley Shoals Marine Park and

Mermaid Reef Marine National Nature Reserve by the State and Commonwealth Governments.

The Marine Community Monitoring Program was a major public participation initiative undertaken by the MCB, Australian Marine Conservation Society, Marine Education Society of Australia and the WA Museum, with funding from the Commonwealth's Coastwest/Coastcare program. Phase I resulted in the development and production of the award-winning CD-ROM based marine identification guide, entitled *Marine Life in Western Australia*. This CD enables easy identification of 400 of the State's most common marine fauna and flora and, through its widespread use by the community, contributes to the State's database on marine life, with the information feeding directly into management. The CD was followed with the initiation of Phase II of the program, by the MCB and AMCS, which will provide the community with procedures for conservation and management of the marine environment.

The need to streamline CALM's boating procedures and operations saw the development of a draft departmental manual for this aspect of the Department's activities. In addition, CALM became a member of the newly formed Marine Operations Council, which co-ordinates marine operational activities between CALM, Fisheries WA, Department of Transport and WA Police.

MCB staff continued to participate in strategic initiatives aimed at facilitating a better technical understanding and more effective management of existing and proposed marine conservation reserves. The MCB assisted in the formation of the WALIS Marine Group, which aims to co-ordinate the capture and management of marine data across all government sectors having an interest in the use of such data, such as

bathymetry, habitats and oceanographic parameters. The MCB also continued to chair the Western Australian Physical Oceanography Co-ordinating Group and the Marine Working Group of the State Liaison Committee on Remote Sensing.

The MCB is a member of both the Steering Committee and Technical Group of the Department of Environmental Protection's North West Shelf Marine Environmental Management Study. During the year, the study was formally linked to the CSIRO study of the ecology of the North West Shelf and MCB staff were also involved in CSIRO's strategic planning exercises for this study. These important initiatives will result in a comprehensive technical information base for the North West Shelf and will have direct relevance to CALM's marine conservation reserve planning and management functions for the area in the future.

CALM also continued its strong collaborative links with the Australian Institute of Marine Science, through research and monitoring of the biology and oceanography of the Ningaloo Marine Park and North West Shelf. CALM also participated in a major workshop held at AIMS, Townsville, at which future research and monitoring for the oceanography for the North West Shelf were discussed and planned.

The MCB participated as a member of ANZECC Task Force on Marine Protected Areas, which produced a Strategic Plan of Action for a National Representative System of Marine Protected Areas.

Off-reserve Conservation

The principal aim of the voluntary Land for Wildlife Scheme is to increase the area of wildlife habitat under private management. To achieve this, private landowners 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 allow property owners to manage their land using sound ecological methods. Advice is also provided to allow landholders to obtain assistance in fencing, replanting and managing wildlife habitats. To date 258 applications have received full registration (22,378 ha of land), 50 applications have been given interim registration (617 ha) and 133 properties have yet to be assessed (441 applications in total). There are now 10 Land for Wildlife staff (5.2 FTEs) employed to administer the program. Staff gave talks to 41 community groups during the year, attended 12 agricultural shows and presented four field days.

ROADSIDE CONSERVATION COMMITTEE (RCC)

A notable feature of current roadside surveys has been the desire by local

community groups to map the occurrence of environmental weeds on roadsides. This is now an integral part of all roadside surveys and provides a good overview of the individual species present as well as an overview of the extent of weed infestation.

During the past year a reprint of the *Roadside Handbook*, which was first published by the RCC in 1998, has been necessary due to the heavy demand for it. This booklet provides road managers, private contractors and other agencies that work in the roadside environment with roadside conservation guidelines for all road maintenance and construction operations.

Throughout the year the RCC provided a number of static displays at events such as Dowerin Field Day and Wagin Woolarama. The importance of salmon gums on road and rail reserves as

nesting habitat for the white-tailed black cockatoo is a current theme being used in these static displays.

Training

During the last year there has been a strong demand for training by local government and community groups on matters pertaining to roadside conservation matters. As a result of this the RCC has collaborated with C Y O'Connor TAFE College and the South Metropolitan TAFE College to develop suitable courses. C Y O'Connor have developed a Level 4 certificate course for local government workers and this is now being provided to local government on demand. It is anticipated that South Metro TAFE course in Natural Resource Management, which includes a subject on roadside conservation, will be available at the start of 2000.

Performance Measures			Output 1
	1998-99 Target	1998-99 Actual	Explanation of significant variation
Quantity			
Nature Conservation area managed (hectares)	16.6 million	21.6 million	Area managed revised to take into account the fact that there are nature conservation outputs on all lands and waters managed by CALM.
Quality			
Threatened Species	425	432	Increases to threatened fauna species due to new species being described and listings of island invertebrates. Total number of threatened flora species declined.
Change in number of Threatened Species	-3	+4	
Timeliness			
Completion of Management Plans within specified timeframes	100%	100%	
Cost			
Cost per hectare managed	\$2.38	\$1.85	Revision of area managed (refer above).

NATIVE FOREST MANAGEMENT

OUTPUT 2

Outcome

Long term maintenance of the forest ecosystem and provision of sustainable wood production.

Output Description

The sustainable regeneration, protection, management and harvesting of native forests while maintaining or enhancing nature conservation, water, recreation, landscape and other values in the long term, management of the sandalwood industry on Crown land and developing public awareness, understanding and community support.

FOREST MANAGEMENT

The Regional Forest Agreement (RFA) was completed and signed by the Premier and Prime Minister on 4 May 1999. This agreement sets the framework for forest management for the next 20 years.

The RFA delivers a comprehensive, adequate and representative reserve system that meets or exceeds national targets for the protection of biodiversity and old growth forest, wherever possible. Under the agreement, more than 150,000 ha will be added to the conservation reserve system. Twelve new national parks, 25 additions to existing national parks and overall some 90 additions to the conservation estate will be established. Many areas of local or general community attachment will be added to the reserve system.

An additional 45,700 ha of old growth forest will be reserved, bringing the total area of old growth in reserves to 245,500 ha. This is 71% of old growth in the region. The Regional Forest Agreement has achieved the protection

of between 60% and 98% of old growth in 12 forest ecosystems, and the protection of all old growth forest in the other seven forest ecosystems.

A comprehensive \$59 million industry development plan includes assistance for both the timber and tourism industries. The \$41.5 million timber package includes low-cost loans to install value-adding equipment and new technology, expand local manufacturing, and provide assistance with marketing, as well as money for redundancy packages and business compensation. The tourism industry will be boosted by \$17.5 million with eco-tourism developments, a scenic drive around Pemberton, tourism roads near Nannup, and recreation and tourism facilities at Wellington Dam.

The State and Commonwealth Governments have agreed that Western Australia's forest management systems, as amended by the RFA, provide for ecologically sustainable forest management. Improvements to forest management systems include the establishment of an environmental management system, a new Forest Management Plan to implement commitments, reporting on the monitoring of indicators of sustainability, improvements to consultation and planning processes, fauna data management and assessment, and improvements to the structure and function of CALM and its controlling bodies.

HIGHLIGHTS

- ☆ RFA signed by Premier and Prime Minister (p. 17)
- ☆ New markets established for low grade timber (p. 18)

STATE FOREST RESOURCES BUSINESS UNIT

The State Forest Resources Business Unit is responsible for the commercial harvesting, associated regeneration and commercial sales of log timber from State forests and timber reserves in accordance with the Forest Management Plan 1994–2003.

In 1998, 19,250 ha of jarrah forest were harvested with the following silvicultural objectives:

	Hectares
Thinning	1,030
Release of regeneration	5,400
Establishment of regeneration	8,310
Single tree selection	1,840
Selective	2,400
Other	270
Total	19,250

Regeneration of approximately 670 ha of the above area was achieved through commercial harvesting operations. Silvicultural objectives for a further 9,690 ha harvested in this or previous years were achieved by follow-up treatment.

In 1998, 1,970 ha of karri forest were clearfelled or cut to seed trees and 320 ha were thinned. Regeneration was completed on 1,470 ha harvested in either this or previous years.

Post-disturbance data continues to be collected and collated for the Kingston Project, a study investigating the

impacts of timber harvesting on jarrah forest ecosystems. The study, which began in 1994, has demonstrated that fox control is a critical management tool for conservation of medium-sized mammals, either in the presence or absence of timber harvesting, and that disturbance from harvesting and post-harvest burning has little impact on medium-sized mammal population sizes.

DISEASE IN NATIVE FOREST

The presence of dieback disease (*Phytophthora cinnamomi*) and its predicted impact on the forest is mapped prior to operations such as harvesting, mining and the provision of public utilities such as roads, reservoirs and powerlines. Mapping is done either from interpretation of large-scale colour photographs or from intensive ground survey. In both cases interpretation is supported by laboratory analysis of plant and soil samples. With this information and the implementation of strict hygiene measures, operations can proceed with minimal spread of the disease. Because of the potential of the disease to spread naturally, the maps have a limited reliable life. In some instances areas mapped several years earlier must be re-mapped before operations begin.

During 1998–99, CALM staff mapped the presence of *Phytophthora cinnamomi* disease symptoms and defined protectable areas on 54,298 ha of forest and rechecked the boundaries of 14,025 ha previously mapped. Interpreters under contract to Alcoa of Australia mapped or rechecked the boundaries on 7,577 ha. CALM staff monitored the interpretation and mapping standards of this work. A further 214 ha were mapped on a recoup basis for mining companies and other agencies.

During 1998–99, 22,900 ha of CALM land were photographed under shadowless conditions for dieback interpretation purposes.

SILVICULTURE

The Jarrah Forest

Harvesting in the jarrah forest is undertaken using a variety of silvicultural objectives (silviculture is the art and science of establishing and tending forests). Where there is a predominance of vigorously growing trees, the stand is thinned; where this is not the case the stands are harvested with the object of regenerating them. This is achieved either by harvesting in a way that will release existing lignotubers to grow unimpeded into saplings; or, where there are inadequate lignotubers, harvesting to create a shelterwood under which seedlings are established. The proportion of each area that is harvested to each of these objectives, and the degree of intermixing, vary according to the existing stand structure and condition.

In many areas the desirable silvicultural objective is achieved completely or nearly completely by the harvesting operation itself. A proportion of the remainder is completed by silvicultural tending operations one or two years after harvesting. In more marginal forest types harvesting is done by selective cutting. In some areas harvesting precedes clearing for mining or the construction

of public utilities such as reservoirs or power lines. Cleared areas are not regenerated immediately but where possible are rehabilitated later.

The Karri Forest

Karri forest harvesting is also dependent on the structure and age of the existing forest, though it is less complex than jarrah harvesting. Patches of even-aged and vigorously growing forest which are greater than two hectares in size are identified for thinning. When the stand is old enough to yield saleable products, it is thinned to an appropriate density by commercial harvesting. No further tending is necessary.

Mature forests and forests of mixed structure created by past logging activities are harvested under a clearfelling system. Regeneration following harvesting is achieved within the following year or two by means of temporarily retained seed trees, by planting with nursery raised seedlings, or by broadcast seeding. Seed trees are the preferred method, but planting is used in the years when there are inadequate seed crops available in the karri forest. Broadcast seeding is only used to a limited extent.

WOOD UTILISATION

CALM Timber Technology has continued to promote and support adding value to WA timber through research and development, information and education, market promotion and limited fee-for-service operations.

Drying timber correctly, as a prerequisite for most value-added products, continues to be a focus of CALM Timber Technology's work. There is now a significantly greater understanding in the WA industry of the need for and techniques of timber drying.

The furniture manufacturing sector is continuing to assist industry in its

efforts to maximise the value-adding potential of the State's native hardwood timber resource. The furniture industry is establishing new markets for low grade timber in the Eastern states of Australia, the United Kingdom and the United States. Furniture manufacturers are using jarrah and marri to produce 'natural feature grade' furniture, utilising what was previously considered to be poor quality timber of low value. Fire marks, wormholes, gum veins and other interesting features are now considered attractive in natural feature grade furniture. A BIS Sharpnel report of July 1998 anticipated the natural feature grade furniture sector in WA would grow at a rate of 17 per cent per annum.

An auction of specialty logs in March 1999 demonstrated that there is considerable interest in the use of the unique timbers from our arid lands. A full-time marketing assistant is now based at Harvey, and much of his work is the promotion of these timbers. Research into the wood properties and drying characteristics of targeted arid land species continued during the year.

Work on laminating plantation eucalypts continued, with support for an externally funded project focussing on very young trees.

CALM Timber Technology continued to support the Department's investigation of bole harvesting with the start of a substantial project involving the cooperation of six sawmills.

A new area of research and development for CALM Timber Technology began with work on the density of maritime pine (*Pinus pinaster* *ait.*) timber.

LOG TIMBER SALES

The total of log timber harvested from Crown land in 1998-99 was 2,121,958 tonnes (see Appendix 7). Of this amount, 1,534,765 tonnes (72 per cent) were harvested from the State's native forests, and 587,193 tonnes (28 per cent) from State-owned plantations. A further 29,243 tonnes of log timber were harvested by CALM from private property during 1998-99.

Note that the tables included in this section detail production of log timber by CALM only. The tables no longer include production of log timber from non-CALM-managed operations.

Native Hardwood Sawlog and Veneer Log Production by CALM from Crown Land and Private Property 1998-99

Species	High Quality Sawlogs (m ³)	1 st & 2 nd Grade Sawlogs (m ³)	Bole Logs (m ³)	Other Sawlogs (m ³)	Total (m ³)
Jarrah	6,534	325,778	3,794	13,998	350,104
Karri	1,115	209,120		15,863	226,098
Marri	103	0		10,165	10,268
Other Species	1,497	1,497		286	3,240
Total	9,249	536,355	3,794	40,312	589,710
	(tonnes)	(tonnes)	(tonnes)	(tonnes)	(tonnes)
Jarrah	8,560	428,398	4,990	17,355	459,303
Karri	1,383	258,528		19,670	279,581
Marri	136	0		12,605	12,741
Other Species	1,549	1,904		301	3,754
Total	11,628	688,830	4,990	49,931	755,379

* includes logs from Crown land sold under Forest Produce Licences

SANDALWOOD BUSINESS UNIT

The total amount of sandalwood harvested from Crown land in 1998-99 was 1,730 tonnes. Of this amount 923 tonnes was deadwood and the remaining 807 tonnes green wood. Demand for sandalwood from traditional markets remained steady in line with the continuing depressed economic situation in most East Asian countries. Exports for 1998-99 totalled 1,130 tonnes.

The establishment of *Santalum spicatum* in the Wheatbelt region continues to be supported and assisted by CALM with the publication of an information kit for growers in conjunction with AgWest. Sandalwood tree crop establishment, in association with the Maritime Pine Project, is anticipated to reach 50 ha during the 1999 winter.

The Sandalwood Business Unit continues to broaden the market for sandalwood products. The signing of a ten-year supply contract with Mount Romance Australia, which began in October 1998, will see WA become one of the world's largest suppliers of sandalwood oil. This contract represents considerable potential to create employment and revenue to a regional area of WA and provides a foundation for future industry development in both the cosmetic and pharmaceutical industries.

The publication of a Code of Conduct for the harvesting of forest produce or flora and for apiary site permits on pastoral leases, in September 1998, demonstrated the ongoing liaison work carried out by the Sandalwood Business Unit in the rangelands. The Code of Conduct will be reviewed in September 1999 in conjunction with industry bodies and stakeholders.

Fuelwood Production by CALM (tonnes)

Log Type	1997-98	1998-99
Firewood	54,595	56,085
Charcoal	75,417	68,433
Total	130,012	124,518

Sandalwood Production (tonnes) ex Crown Land

	1995-96	1996-97	1997-98	1998-99
green	926	1,029	925	807
dead	974	742	728	923
Total	1,900	1,771	1,653	1,730

	Crown Land 1997-98		Crown Land 1998-99	
	(m ³)	(tonnes)	(m ³)	(tonnes)
<i>Marri Logs:-</i>				
bolewood	413,327	507,883	317,544	391,044
branchwood	0	0	52	64
<i>Karri Logs:-</i>				
bolewood	179,826	217,615	189,123	227,336
branchwood	7,973	9,887	7,882	9,773
<i>Other Logs:-</i>				
bolewood	0	0	27	33
branchwood				
Total	601,126	735,385	514,628	628,250

	1998-99 Target	1998-99 Actual	Explanation of significant variation
Quantity			
Tonnes harvested	1,725,300	1,533,974	Mainly due to market constraints.
Hectares regenerated	17,300	11,360	Due to environmental and operational constraints.
Quality			
Satisfaction of contractual log 'quality' specifications	100%	100%	
Compliance with regeneration standards	100%	100%	
Timeliness			
Satisfaction of contractual harvesting obligations	100%	100%	
Satisfaction of programmed regeneration	100%	100%	
Cost			
Cost per tonne harvested	\$26.65	\$27.99	
Cost per hectare regenerated	\$249.91	\$360.35	Reflects environmental and operational constraints.
Ratio of harvesting cost to revenue	1:1	0.94:1	
Ratio of management cost to revenue	0.66:1	0.73:1	Reduced revenue due to market constraints.

PLANTATION MANAGEMENT

OUTPUT 3

Outcome

Long term maintenance of the forest ecosystem and provision of sustainable wood production.

Output Description

The establishment, regeneration, protection, management and harvesting of plantations while maintaining or enhancing nature conservation, water, recreation, landscape and other values in the long term, and developing public awareness, understanding and community support for plantations.

On 15 January 1999 the State Government entered into a history-making partnership with British Petroleum (BP) to explore the feasibility and management of tree plantations for carbon sequestration as well as landcare and biodiversity. The pilot study will pave the way for Western Australia to quantify its potential to create carbon sinks sufficient to offset annual emissions of carbon dioxide in time for the assessment of national greenhouse gas emissions under the Kyoto Protocol. The signed agreement marked the beginning of the first pilot study in Australia to examine the potential of tree plantations as carbon sinks. CALM has been actively involved with a number of other industrial and mining companies which are also looking into the feasibility of similar projects.

A report released by the Bureau of Rural Sciences has reported that Western Australia is leading the nation in establishing tree crops on farms. The report, *The Interim Update of the National Plantation Inventory*, revealed that between 1994 and 1998, the area of tree crops in Western Australia grew from 130,845 ha to 212,304 ha (an increase of 81,459 ha).

HIGHLIGHTS

- ☆ *WA leads nation in plantation establishment (p. 21)*
- ☆ *CALM/BP agreement on carbon sequestration (p. 21)*

This means that Western Australia's tree crops program was progressing three times faster than the average of other States and Territories.

For the first time, CALM has appointed an all-inclusive contractor, Pinetec Treefarms, to establish sharefarms for the Maritime Pine Program. The contractor will mainly work in the Esperance region and to the north of Perth. This will allow Departmental officers to concentrate more on research and attracting further landowners into the Maritime Pine Program.

CALM ESTATE PLANTATIONS UNIT

CALM Estate Plantations Unit was created this financial year and is an amalgamation of the former Softwood Business Unit and CALM Estate Sharefarms Unit.

In 1998 a total of 69 ha of CALM Estate coniferous plantation was established. This comprised 61 ha of *P. radiata* and 8 ha of *P. pinaster* and other coniferous species.

First commercial thinning of coniferous plantations is continuing to run to schedule. The Department began to harvest *E. globulus* again on CALM sharefarms during the second half of the year.

As part of the Department's ongoing strategy to optimise value and growth on its existing estate, 11,928 ha of coniferous plantation were fertilised during 1998–99.

The local demand for *E. globulus* is expected to increase during 1999–2000. The demand for softwood industrial wood logs and pine rounds, while initially strong, has decreased over the second half of the year. Alterations to the logging plan have taken account of these changes and reduced the production of rounds and industrial wood.

The softwood sawlog market has remained steady during the 1998–99 period. The first half of the period saw a small increase in the softwood sawlog stumpage rate but this has dropped slightly in the second half of the period to give a slight overall increase in stumpage revenue.

Note that the tables included in this section detail production of log timber by CALM only. The tables no longer include production of log timber from non CALM-managed operations.

CALM SHAREFARMS UNIT

Following the launch of the Maritime Pine Project around Perth in 1996–97, the Project was extended to Albany in 1997 and to the Collie, Katanning and Narrogin areas in 1998. In 1998 the total area planted to softwood under the Maritime Pine Project was 1,981 ha. This brings the total area of softwood planted for the Project to 4,004 ha. In 1999 the Project was again extended to cover the Esperance Region.

In addition, approximately 169 ha of native species were established under the Maritime Pine Project to reduce salinity and erosion. This included establishment of acacias for commercial plantings of sandalwood.

The Maritime Pine Project was also enhanced by the establishment of a pilot project to plant maritime pine for BP Refinery (Kwinana) Pty Ltd. The project will be managed through a Deed of Agency and Indemnity to establish maritime pine for environmental and commercial reasons.

In 1998 CALM established 5,352 ha of *Eucalyptus globulus* plantations on behalf of investors: Albany Plantations Forest Company of Australia Pty Ltd (APFL), Hansol Australia Pty Ltd and Bunbury Treefarms Pty Ltd (BTP). In addition, 83 ha were established on CALM-owned sharefarms. During 1998–99 CALM completed the assignment of 1,078 ha of *E. globulus* plantations to APFL. This brings the total area of *E. globulus* plantations managed by CALM to 33,092 ha.

FARM FORESTRY UNIT

The Farm Forestry Unit's role is to develop new tree crop opportunities for farmland and to provide information on all aspects of farm forestry.

The Farm Forestry Unit continued its support for the developing oil mallee industry. The Oil Mallee Association planted an additional two million mallees in winter 1997 to bring the total planted over five years to nine million. The Association and its processing arm, the Oil Mallee Company, made good progress on developing the harvest and processing sectors of the industry. Prefeasibility work indicated that a combined production of eucalyptus oil, activated carbon and electricity from oil mallee feedstock might be viable. This aroused considerable interest and a detailed commercial feasibility investigation commenced with funds supplied from the Rural Industries R&D Corporation,

Western Power, CALM and the Oil Mallee Company.

The Farm Forestry Unit promotes adoption of farm forestry throughout the agricultural areas. A further three 'Master Tree Growers' courses were conducted for some 60 farmers with major input by CALM. The course graduates now form an effective local interest group and create a strong 'grass roots' confidence in farm forestry in the main forestry areas of the south-west. Another course designed to introduce farm forestry to key service providers was featured in the winter edition of *LANDSCOPE*. Farm Forestry Unit promotional activity provided coordination and leadership for all stakeholders and service providers. This has reinforced commitment to key State and national initiatives such as the Salinity Action Plan and Plantations Vision 2020.

MANJIMUP PLANT PROPAGATION CENTRE

During the 1998–99 propagation season, the Manjimup Plant Propagation Centre raised over 26 million plants to meet orders for afforestation programs throughout the south-west of WA and parts of south-eastern Australia.

This record level of production comprised species and plant types ordered as follows:

Number of seedlings and cuttings raised 1998–99	
Hardwood	
<i>E. globulus</i>	10,520,000
<i>E. diversicolor</i>	4,444,400
Western Bluegum	1,992,700
Mixed species	1,125,700
Softwood	
<i>P. radiata</i> (container seedlings)	329,000
<i>P. radiata</i> (open rooted)	1,553,000
<i>P. pinaster</i> (container seedlings)	3,347,400
<i>P. pinaster</i> (container cuttings)	1,700,300
<i>P. pinaster</i> (open rooted)	1,618,400
Other pine species (container)	22,000
TOTAL	26,652,900

Construction of a major new nursery facility designed primarily to grow maritime pine seedlings began at the Manjimup site during the year. Earthworks and the initial stages of infrastructure have been progressed, with completion of Phase 1 of the development scheduled for November 1999. A large number of movable racks and growing trays were acquired to enable seedling production to meet the year 2000 maritime pine establishment program.

To provide for future expansion of the cuttings component of the Maritime Pine Project, approximately 140,000 new genetically superior seedlings were added to the mother plant bank at the nursery.

GENETIC DEPLOYMENT UNIT

During 1998–99 the Unit ran a number of successful projects. National Heritage Trust funding for the development of *Pinus pinaster* deployment provided the opportunity to initiate somatic embryogenic callus from an immature embryo, establish the first clonal micropropagated trial in Australia, continue the development of the mini-cutting system for the new nursery and establish 10 trials investigating the propagation effects on plant quality.

A one-stop method for *E. globulus* control pollinations was developed that can also be used to make reciprocal crosses for hybrid production. Two trials were established to test a range of *E. globulus* hybrid material, one involving a research relationship with Toyota Australia Pty Ltd.

Third-generation breeding families of *Pinus pinaster* were generated and established in low rainfall areas. *Pinus brutia* was recognised as a potential species for low rainfall areas and a breeding program initiated. Four Western Bluegum yield trials were established to demonstrate genetic gains, two in Victoria and two in south-western Australia.

SEED CENTRE

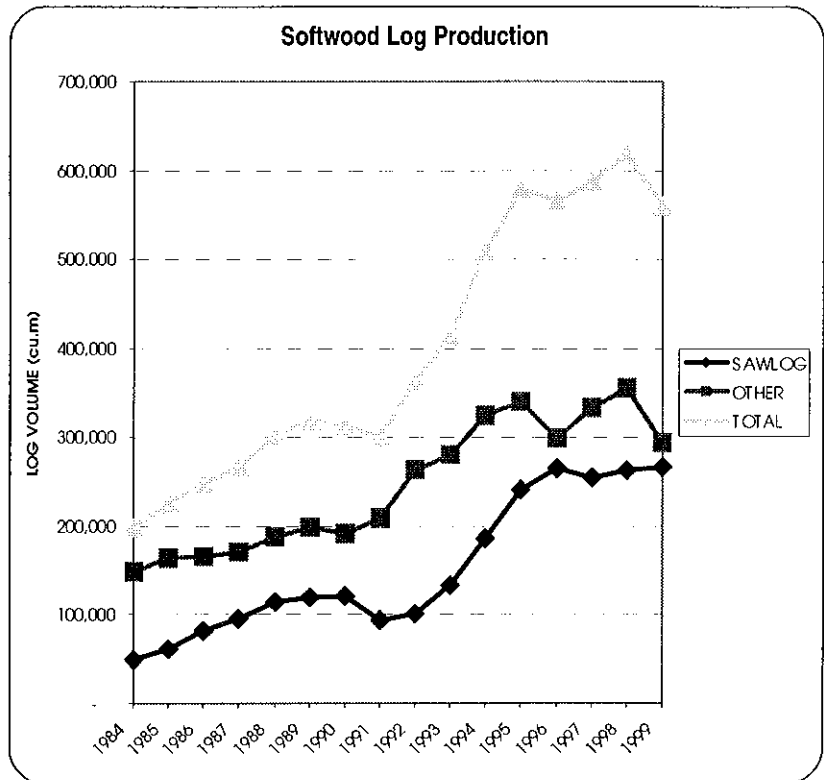
Seeds of the principal species needed for CALM's plantations, rehabilitation and conservation projects, as well as for public sales, were acquired, processed and stored at the Manjimup Seed Centre. A total of 580 native and exotic species totalling 3,600kg are stored at the Centre.

A total of 1,965 kg of seed (424 orders) was despatched from the Centre in 1998-99, mostly within Western Australia. Some small quantities were despatched to other Australian States and to other countries, including Denmark and New Zealand.

A total of 2,465.2 kg of seed was acquired through collection and purchase:

<i>Corymbia</i> species*	75.6
<i>Eucalyptus diversicolor</i> *	58.0
<i>Eucalyptus globulus</i>	478.8
<i>Eucalyptus globulus</i> (Western Bluegum)*	85.2
<i>Eucalyptus marginata</i> *	278.9
Other <i>Eucalyptus</i> species*	149.5
<i>Leguminaceae</i> species	264.0
<i>Pinus pinaster</i>	686.7
<i>Pinus radiata</i>	132.8
<i>Quercus suber</i>	123.0
<i>Santalum spicatum</i>	69.1
Other species	63.6
*Seed and chaff weight	

The Seed Centre is currently managing various seed orchards totalling an area of 131.6 ha. During 1998-99, a new Control Pollinated Seedling Seed Orchard of *Eucalyptus globulus* was established. Also, extension to the Dieback Resistant *Eucalyptus marginata* seed orchard was made.



Planning has taken place to initiate control pollination of the *Pinus pinaster* seed orchards in Manjimup and Nannup for next financial year.

The *Pinus pinaster* seed orchard at Manjimup yielded 509 kg of seed in 1998-99.

TROPICAL PLANTATIONS UNIT

CALM continues to support the commercial development of sandalwood (*Santalum album*) on the Ord River Irrigation area through the Tropical Plantations Unit. The Unit provides the sandalwood seed requirements for two companies planting sandalwood as well as providing advice when required. The 1999 planting will be in the vicinity of 300 ha and indications are that planting will continue into 2000.

The CALM nursery was used to produce a range of seedlings for research as well as demonstration. Production included sandalwood, a range of long-term hosts, as well as some timber species for demonstration on different soil types.

A trial plantation of 600 pedigree teak trees was established at the Frank Wise Institute of Agriculture Western Australia.

Overseas species, including three species of African mahogany, Spanish cedar (*Cedrela odorata*) from Central America, and black bean (*Castanospermum australe*) from eastern Australia, will be tested for their ability to produce sawlogs.

Softwood Production by CALM from Crown Land and Private Property 1998-99

SPECIES	SAWLOGS					Sub-Total Sawlogs	Industrial Wood*1	Wood chips*2	Pine Rounds	Grand Total
	By mid. Diam.class	Premium Grade	2nd Grade	3rd Grade	Small					
RADIATA										
m ³	195,926	310	10,091	76	28,141	234,544	191,776	5,724	21,622	453,666
tonnes	195,926	310	10,091	76	28,141	234,544	191,776	5,724	21,622	453,666
PINASTER										
m ³	19,981	3	2,271		20,291	42,546	6,380	86,003	1,285	136,214
tonnes	19,981	3	2,271	0	20,291	42,546	6,556	95,397	1,285	145,784
TOTAL										
m ³	215,907	313	12,362	76	48,432	277,090	198,156	91,727	22,907	589,880
tonnes	215,907	313	12,362	76	48,432	277,090	198,332	101,121	22,907	599,450

*1 including particleboard logs

*2 including bark product

Note: This table includes softwood logs from Crown land sold under Forest Produce Licences.
In addition 2,067 Christmas trees were sold.

Plantation Hardwood Production by CALM 1998-99

SPECIES		Sawlogs	Chiplogs*	Firewood	Fencing	TOTAL
Globulus	m ³	133	14,210			14,343
	tonnes	159	14,753			14,912
Yellow Stringybark	m ³	95	289		116	500
	tonnes	113	338		138	589
Mallet	m ³	249		906	87	1,242
	tonnes	296		906	104	1,306
TOTAL	m ³	477	14,499	906	203	16,085
	tonnes	568	15,091	906	242	16,807

*includes chipwood derived from inforest chipping

Performance Measures

Output 3

	1998-99 Target	1998-99 Actual	Explanation of significant variation
Quantity			
Tonnes harvested	686,192	615,676	Reduced demand for timber.
Hectares managed	77,835	81,061	
Quality			
Satisfaction with log quantity output	100%	100%	
Compliance with plantation Code of Practice	100%	97%	
Timeliness			
Satisfaction of log targets	100%	100%	
Cost			
Cost per cubic metre produced	\$27.67	\$27.31	
Cost per hectare managed	\$193.00	\$206.30	

TOURISM AND RECREATION

OUTPUT 4

Outcome

Community enjoyment of wildlife, lands and waters without compromising conservation and other management objectives.

Output Description

Dealing with recreation in the natural environment on lands and waters managed by the Department, including preparing and implementing management plans and the provision, management and maintenance of appropriate access, recreation opportunities and facilities, protecting visitors and facilities from fire, training of staff and Conservation and Land Management volunteers, involvement of Aboriginal people, designing and initiating educational information and activities concerning tourism and recreation in the natural environment, and developing public awareness, understanding and support for the tourism and recreation services and policies.

RECREATION PLANNING AND DESIGN

Area and Regional Management Plans

Section 33 of the CALM Act requires that the Department manage all land to which the Act applies, according to a 'management plan'. A management plan contains a statement of the policies or guidelines proposed to be followed, as well as a summary of the proposed operations. The CALM Act also specifies that the public is given an opportunity to contribute to the content of management plans. CALM achieves this through public workshops, advisory committees, newsletters and invitations to comment on draft plans.

HIGHLIGHTS

- ☆ *The 963 km Bibbulmun Track was officially opened on 13 September 1998 (p. 30)*
- ☆ *Regional Parks unit expanded and managing seven parks (p. 33)*
- ☆ *Best Computerised Recreation Tourism Information System implemented (p. 30)*
- ☆ *Collaboration with volunteers, Ministry of Justice and community groups increases (p. 34)*
- ☆ *Karijini National Park Council established with Karijini Aboriginal Corporation (p. 25)*

Priorities for plan preparation are guided by six principles: threats to the area, tourism potential, the presence of exceptional features or poorly conserved habitat, the need to develop different approaches to planning, existing commitments, and government directions.

During the past year, final management plans were gazetted for Leschenault Peninsula, the Esperance Lakes Nature Reserves, Nambung National Park and Karijini National Park. The latter plan in particular is a notable achievement and, with the Purnululu National Park Management Plan, provides a model for formal participation of traditional Aboriginal owners in policy making and park

management. The four plans released during the year brings the tally of formally approved management plans to 39. Two draft management plans were also released for public comment: Shark Bay Terrestrial Reserves and the Perup-Uncup Nature Reserves. Work continues on 24 management plans.

Approximately 72 per cent of visits to CALM-managed estate were to areas covered by either approved or draft management plans (excluding regional parks).

The following tables list the area of each tenure category managed by CALM for which plans are now completed, and the status of plans in preparation or already approved as at 30 June 1999.

Areas Covered by Management Plans

Tenure classification	Area covered by plan (ha)	Total tenure area (ha)	% covered
National Park	1,597,120	4,874,282	32.8
Nature Reserve	111,849	10,772,680	1
Marine Reserve	1,115,799	1,145,940	97.4
Other Recreation/ Conservation Reserves	88,231	263,079	33.5
Total CALM Conservation Estate	2,912,999	17,055,981	17.1

Management Plans as of 30 June 1999

Final Management Plans (completed and approved)	Region	Effective from
Mooradung Nature Reserve	Swan	21/2/86
Nature Reserves in the Shire of Wyalkatchem	Wheatbelt	21/2/86
Forrestdale Lake Nature Reserve (5 year term)	Swan	10/7/87
Nature Reserves in the Shire of York-Northam	Swan	10/7/87
Lane Poole Reserve	Swan, Central Forest	14/12/90
Shannon Park - D'Entrecasteaux National Park	Southern Forest	8/1/88
Benger Swamp Nature Reserve (5 year term)	Central Forest	12/2/88
Cape Range National Park	Pilbara	23/3/90
Northern Forest Region	Swan	12/2/88
Central Forest Region	Central Forest	12/2/88
Southern Forest Region	Southern Forest	12/2/88
Ningaloo Marine Park	Pilbara	24/11/89
Leeuwin-Naturaliste National Park	Central Forest	21/4/89
Yanchep National Park	Swan	29/9/89
Fitzgerald River National Park	South Coast	19/7/91
Dampier Archipelago Nature Reserves	Pilbara	31/8/90
Waroona Reservoir and Catchment Area	Central Forest	16/3/90
Logue Brook Reservoir and Catchment Area	Central Forest	16/3/90
Shoalwater Islands Nature Reserves	Swan	20/10/92
Walpole-Nornalup National Park	Southern Forest	3/7/92
Marmion Marine Park	Swan	15/5/92
South Coast Region	South Coast	13/3/92
Matilda Bay Reserve	Swan	21/5/93
John Forrest National Park	Swan	19/8/94
Goldfields Region	Goldfields	24/2/95
West Cape Howe National Park	South Coast	4/8/95
Yalgorup National Park	Central Forest	15/8/95
Dryandra Woodland	Wheatbelt	14/11/95
Lesueur National Park - Coomallo Nature Reserve	Midwest	13/10/95
Two Peoples Bay Nature Reserve	South Coast	7/6/96
Purnululu National Park and Conservation Reserve	Kimberley	5/3/96
Shark Bay Marine Reserves	Midwest	7/3/97
Wanjarri Nature Reserve	Goldfields	2/7/96
Canning River Regional Park	Swan	5/12/97
Nambung National Park, Wanagarren, Nilgen and Southern Beekeepers Nature Reserves	Midwest	11/9/98
Leschenault Peninsula Conservation Park	Central Forest	8/1/99
Esperance Lakes Nature Reserves	South Coast	11/5/99
Karijini National Park	Pilbara	13/6/99
Final Management Plans (being prepared)		Submission Period
Jurabi, Bundegi Reserves - Muiron Islands	Pilbara	12/6/98 - 21/8/98
Monkey Mia Reserve	Midwest	29/10/93 - 6/1/94
Perup Forest and Lake Muir-Unicup Nature Reserves	Southern Forest	29/10/98 - 15/1/99
Serpentine National Park	Swan	24/9/97 - 28/11/97
Shark Bay Terrestrial Reserves	Midwest	28/10/98 - 19/3/99
Shoalwater Islands Marine Park	Swan	27/10/95 - 29/12/95
Stirling Range National Park - Porongorup National Park	South Coast	16/4/97 - 20/6/97
Swan Estuary Marine Park and Adjacent Nature Reserves	Swan	4/3/97 - 4/5/97
Draft Management Plans (in preparation)		
Beeliar Regional Park	Swan	
Yellagonga Regional Park	Swan	
Herdsmen regional Park	Swan	
Woodman Point Regional Park	Swan	
Jandakot Regional Park	Swan	
Rockingham Lakes Regional Park	Swan	
Millstream-Chichester National Park - Mungaroona Range NR	Pilbara	
Kimberley Region	Kimberley	
Rowley Shoals Marine Park	Kimberley	
Lower Ord and Parry Lagoons Nature Reserve	Kimberley	
Shark Bay WHA Strategic Plan	Midwest	
Jurien Marine Park	Midwest	
Kalbarri National Park	Midwest	
Wheatbelt Region	Wheatbelt	
Rowles Lagoon Nature Reserve	Goldfields	(awaiting release)
Shannon-D'Entrecasteaux National Park (revision)	Southern Forests	

Recreation Site and Facility Plans

Recreation and Tourism Master Plans were produced for the coastal recreation zone in Kalbarri National Park (Midwest Region); Wellington Forest (Mornington District); Burrup Peninsula (Pilbara Region); Deep Reach, Millstream-Chichester National Park (Pilbara Region); Gnarang Park (Perth District); Eastern Area of D'Entrecasteaux National Park (Walpole District); Lane Poole Reserve (Dwellingup District); Circular Pool (Walpole District); Toolibin Lake (Wheatbelt Region); Wedge and Grey (Moora District); Savannah Camp, Karijini National Park (Pilbara Region); Karlkurla Bushland Park (Goldfields Region); Main Recreation Area, Walyunga National Park (Mundaring District).

Site Development Plans were completed for park headquarters and Kurrajong tour operators camp – Purnululu National Park (East Kimberley District); Kalamina Spring, Weano Recreation Area and the new visitor centre in Karijini National Park (Pilbara Region); Hearson Cove, Deep Gorge, Withnell Bay, Conzinc Beach and Conzinc Creek on Burrup Peninsula (Pilbara Region); Red Bluff, Mushroom Rock, Rainbow Valley, Pot Alley, Eagle Gorge, Island Rock, Natural Bridge and Shellhouse-Grandstand in Kalbarri National Park (Geraldton District); Cape Peron, Bottle Bay, Gregories, South Gregories, Hamelin Pool and Red Bluff in Peron National Park (Gascoyne District); Molah Hill Lookout and Nilgen Recreation Area (Moora District); Walyunga Pool and Boongarup Pool in Walyunga National Park; Avon Valley Group Camp Site in Avon Valley National Park; Animal Feeding Project in Hills Forest and National Park Falls Bridge in John Forrest National Park (Mundaring District); Cygnet Hall precinct in Matilda Bay (Perth District); Leonard Drive and Wellington Dam Kiosk Area (Mornington District); Barrabup Pool (Blackwood District); Crystal Springs,

Mottrums Hut and Banksia Camp (Walpole District); Pallarup Lake picnic site (Katanning District).

Design and/or Construction

Documentation drawings were prepared for modular staff accommodation structures (West Kimberley District); public information building in Denham (Gascoyne District); proposed district office building and a vista platform at Bloodwood Creek (Exmouth District); entry station/office at Contos Field (Capes District); facilities portfolio for Ministry of Justice; trail head shelters for Bibbulmun Track (multiple); National Park Falls bridge (John Forrest); toilet buildings (Walyunga National Park) and new toilets, tables and other furniture (various).

Planning and design consultancies

which were initiated or actively supported include the Nambung Visitor Facilities and Services Master Plan (Nambung National Park); Safari Camp Site Suitability Assessment report (Cape Range National Park); Tamala Carrarang Coastal Recreation Study (Midwest Region).

Support and advice on recreation and tourism projects were provided to CALM staff throughout the year. Formal training was provided at the Advanced Recreation Planning and Management Course in July 1998. Lectures were provided during the year for Notre Dame University and TAFE Joondalup. Representation on the Standards Australia working party resulted in a draft standard for Walking Track Classification and Infrastructure Design.

TOURISM AND RECREATION OPPORTUNITIES

Regional Achievements

South Coast: The Minister for the Environment opened a new Visitor Centre on Woody Island, Esperance and improvements were carried out at Cape Le Grande and Stokes National Parks.

Worked commenced via a Coastcare grant for the wilderness walk in Fitzgerald River National Park and a new Visitor Information Centre opened at Two Peoples Bay.

The Minister for the Environment officially opened the Bibbulmun Track in Albany in September 1998 and Green Corps and Pardelup Prison continued with track maintenance throughout the year.

Southern Forest: Beedelup Falls Redevelopment was initiated with 2 km of access road realigned and widened and major earthworks undertaken for a new carpark.

Pt D'Entrecasteaux redevelopment comprising a totally accessible Walk Trail and Coastal Walk Trail between Point D'Entrecasteaux and Tookalup was almost completed. A site master plan and interpretation plan focusing on Aboriginal culture and heritage was completed.

Bibbulmun Track, Gloucester Tree, Boorara Tree, Shannon Camp Grounds and Lane Poole Falls were improved through capital works projects.

Old Vasse Road was upgraded through Warren National Park and park fees were introduced at D'Entrecasteaux National Park.

A review of the Shannon D'Entrecasteaux National Park Management Plan was initiated and liaison continued with Northcliffe and Pemberton Tourist Centres.

Visitor risk assessments were conducted of limestone cliffs in D'Entrecasteaux National Park and various reviews on visitor impacts were conducted by graduate students.

Central Forest: A systematic Visitor Risk Management process has been implemented.

The hazards and degree of risk that visitors may be exposed to at

designated recreation sites are now documented. All Districts have undertaken action to reduce risks at sites where risks were significant. Notable examples include tree risks at Wrights Bridge, Warner Glen, and Honeymoon Pool campsites; and coastal risks within Leeuwin-Naturaliste National Park.

The 'Wellington Dam Experience', a joint project with the South West Development Commission, was completed. The 'Experience' comprises a series of signs, linked by pathways, interpreting cultural history of the dam precinct.

Picnic sites in the lower Collie Valley were improved. Two picnic sites, Rapids and Long Pool, were redeveloped. Works included providing safe access to the river, pathways, parking areas and new furniture. Several other sites were closed and rehabilitated for public safety and environmental reasons.

The Wellington Forest Recreation & Tourism Master Plan was revised and updated to include the proposed Wellington National Park, Wellington Discovery Forest, and the Lake Wellington 'eco resort'. The plan sets a strategic direction for the long-term development and management of recreation and tourism, so that visitors can continue to enjoy the Forest without compromising its conservation, landscape and catchment values.

Development and upgrade of facilities continued in the St John's Brook area.

A new jetty and swimming platform was constructed at Barabup Pool. Stream bank stabilisation works have also been completed.

A 15 km walk trail following the old rail formations, and passing several historic trestle bridges, is nearing completion.

The trail will include two Bibbulmun Track style campsites, each with views over the tranquil pools of the Brook.

Giants and Calgardup Caves: The program to protect the cave's conservation values and enhance visitor experiences has continued. A cave guide hut was built at Giants with the support and voluntary labour of the local caving fraternity.

Fifty metres of additional elevated walkways were installed.

A new toilet block, using a composting system for effluent treatment, was completed at Calgardup. The use of this system ensures there is no leakage into the groundwater or caves. An experienced Cave Manager was appointed to look after all caves in the National Park.

Visitors to Giants and Calgardup caves can now enjoy the 'adventure' experience with the assurance that experienced guides are available for their safety and protection of the caves. A major redevelopment of the Warner Glen camping area was completed. Includes improved access and layout, additional campsites, new facilities and protection of the fragile river banks.

A permanent water supply was installed at the Cape Leeuwin water wheel. This will protect this historic structure from further deterioration.

Redevelopment and expansion of the Conto's camping area has continued with the installation of an additional water supply, entry station, three additional camping loops, and construction of a large maintenance shed.

Dune rehabilitation in Leeuwin-Naturaliste National Park was undertaken with the assistance of the local communities at Rabbits (near Yallingup), Boodjidup and Hamelin Bay.

At Hamelin Bay stairs and an elevated board walk were completed. This permits safe access for walkers on the Cape to Cape trail and visitors seeking views from the cliff top.

Injidup beach access was completed. At Canal Rocks Bridge a new walkway and footbridge were completed permitting access for all to a vantage point where the canals can be viewed, and access across one canal for fishers.

Work continues on the Cape to Cape Track, with the formation of an active Friends group and the winning of external funding Greencorp for completion of section 2, signs and bridges.

Swan Region: The implementation of the Lane Poole Reserve master plan began with the construction of a new single point entry station. This has proven to be highly successful in achieving the set objectives of controlling anti-social behaviour and associated problems of excess alcohol and irresponsible use of off-road vehicles. Visitor numbers were up on last year, and included a significant proportion of repeat visitors since the changes were introduced.

More than 300 people attended the 'Classical Forest' evening in John Forrest National Park in March, which heralds the development and delivery of a wider range of activity programs and events for this Park.

The Festival of Animals event at the Hills Forest was the most successful in four years, with more than 2,200 people attending. This year the number of people attending the activity programs at the Hills Forest increased to 24,500 with about 60 per cent attending the innovative and curriculum-linked schools programs.

The Greencorp project to construct wildlife observation sites and a rare and endangered flora garden was completed. This will allow released fauna in the area a better rate of survival and a greater chance of being seen by visitors to the Hills Forest Activity Centre.

<p>Stage 1 of the upgrade of the Walyunga National Park was completed and included refurbishment of a toilet block and an upgrade of the ticket office. Future works will concentrate on the Walyunga Pool recreation area.</p>	<p>Midwest: The final management plan for Nambung National Park and Wanagarren, Nilgen and Southern Beekeepers Nature Reserves was released by the Minister for the Environment.</p>	<p>management plan for the area with the involvement of all known stakeholders. Upgrading of visitor information facilities, staff facilities and roads continues in Purnululu National Park.</p>
<p>Stacey's Walk in Jarrahdale was reopened with the construction of a large steel and timber bridge as part of a local community project.</p>	<p>The draft Shark Bay Terrestrial Reserves management plan was released for public comment while the preparation of a draft management plan for Kalbarri National Park has begun.</p>	<p>A major review of the Geikie Gorge tour boat operations was undertaken.</p>
<p>A first step in the upgrading of the Serpentine National Park was achieved in June when water pipes were removed from the Falls area. The eyesore of many years was finally replaced by an improved system upstream.</p>	<p>Pedestrian boardwalks were completed on Lancelin Island using Coastcare funding.</p>	<p>Tourism Licences</p>
<p>Wheatbelt: Dryandra Woodland Identity Package and merchandising program continued to be developed with requests for use of the logo, through licensing, as an identity for the Greater Dryandra Area. This logo has been successfully used on a range of merchandise and postcards that are available at Dryandra and other local outlets.</p>	<p>New information panels relating to the Shark Bay World Heritage Property were completed for Denham and refurbishment of the Peron Homestead is continuing in Francois Peron National Park. A new bore has been established at Peron Homestead to provide water for visitor services and the Project Eden native animal captive breeding program.</p>	<p>All commercial tour operators conducting activities on lands and waters vested in the National Parks and Nature Conservation Authority (NPNCA) or the Marine Parks and Reserves Authority (MPRA) and managed by CALM are required to obtain a licence in accordance with the CALM Act 1984 and Regulations 1993. All tourism activities are required to be consistent with approved management plans, or in the absence of a management plan, to be either compatible or necessary operations as specified in the CALM Act.</p>
<p>Work was carried out on Tomingley, Kwana, Gura and Dryandra Village roads, while several cottages were refurbished by the Lions Club of Western Australia, which manage the village.</p>	<p>A draft master plan for redevelopment of Grey and Wedge Squatter Settlements was completed and is ready for release for public comment.</p>	<p>As of 30 June 1999, a total of 290 commercial tour operators were licenced to operate on CALM estate with a further 41 applications being assessed. This represents a 4 per cent increase in operators being licenced for the financial year.</p>
<p>Three 'Wonders of the Woodland' programs were successfully run during July, September and April.</p>	<p>Agreement has been reached over Ministry of Justice Wartime Work Camp involvement in the implementation of a site development plan at Coomallo Conservation Park in collaboration with the Shire of Dandaragan,</p>	<p>CALM has continued its commitment to sustainable nature-based tourism by developing opportunities for the involvement of the private sector on CALM-managed land and waters.</p>
<p>A survey of all potential areas of remnant bush across the Narrogin District was completed in conjunction with the various Local Authorities. This will be used to determine long-term recreational development throughout the district.</p>	<p>Kimberley: Volunteers have again performed well mainly as campground hosts (Mitchell Plateau) and assistants in the visitor information and registration activities at Purnululu National Park as well as to help run the 'shop'.</p>	<p>During the year the following licence activities occurred:</p> <ul style="list-style-type: none"> • Ningaloo Marine Park – issued the fifteen whale shark interaction tour licences, for a five-year period; • Cape Range National Park - issued a walk in safari camp licence, for a two-year period; • Nambung National Park – issued a helicopter tour licence; • Shoalwater Islands Marine Park – issued the Penguin Island Ferry Service and the Shoalwater Bay Tour Service, for a five-year period;
<p>Goldfields: Maintenance to three dwellings at Goongarrie Station were completed and the inaugural promotion of Goongarrie Station Stays undertaken.</p>	<p>Operations at the Mitchell Plateau under a Memorandum of Understanding with the mining company have been consolidated and a process is in place to come up with a recreation</p>	

- Dampier Archipelago - called for expressions of interest for commercial tourist accommodation and associated activities for the Section 5(g) reserves;
- Cape Range National Park – called for expressions of interest for an all year boat service for Yardie Creek; and
- Cape Le Grand – called for expressions of interest for a mobile kiosk.

CALM's computerised Recreation and Tourism Information System (RATIS) continues to be updated providing commercial tour operators information to the regions, districts and branches through the intranet system. This system assists operational staff to monitor and manage the commercial tour operators that provide services within CALM-managed land and waters of Western Australia.

Tour operator information regarding contact details can also be found on *NatureBase*, CALM's internet website at <http://www.calm.wa.gov.au>.

Leases

During the year 14 leases were issued by CALM. There are now 258 leases being managed with a further 83 leases being prepared. Some of these are at a preliminary stage, while others are about to be executed. A considerable number of the leases to be issued are to replace expired leases or to formalise arrangements authorised under other forms of agreement.

Significant leases executed during the financial year include Lake Brockman Tourist Park, Woody Island Tourist Development, Sporting Shooters Association Complex, Australian Bowhunters Complex, a public recreation and aquatic sports lease at Lake Towerinning and a lease for development and use of a gravitational observatory.

Apiary Site Management

At 30 June 1999 there are 2,892 current apiary site permits issued on CALM-managed land and Crown land throughout Western Australia. During 1998–99 CALM processed 50 apiary site applications, relocated 10 apiary site permits, transferred 59 permits and cancelled 39 apiary site permits.

Most of the available beekeeping resource is covered by permits.

Beekeepers Consultative Committee

The Beekeepers Consultative Committee provides industry input to CALM on beekeeping matters and consists of representatives from the WA Apiarist Society, Wescobee Pty Ltd, Swan Settlers Beekeepers, WA Farmers Federation and WA Beekeepers Association, as well a member each from Agriculture WA and NPNCA. The committee dealt with the following major issues:

- apiary sites in the Pilbara Region;
- apiary sites and pastoral leases;
- apiary sites in Disease Risk Areas;
- Regional Forest Agreement – impact on Beekeeping;

Total Number of Current Apiary Sites in Relation to Land Tenure as at 30-06-99

Land tenure	Apiary sites
State Forest	1,017
Vacant Crown land	655
National Parks	199
Nature Reserves	220
Conservation Parks	88
Timber Reserves	63
Shire and Other Reserves	353
Pastoral Leases	258
Freehold	15
Special Leases	25

- National Competition Policy – proposals and how they may affect beekeepers' use of Crown land;
- research into the effects of honeybees on the native biota;
- water catchment conditions for apiary sites;
- clearing conditions for apiary sites on CALM-managed estate;
- Gngangara park management plan;
- washdown ramps; and
- Beekeepers' Code of Practice.

Bibbulmun Track Project

The redevelopment of the Bibbulmun Track was completed in 1998. On 13 September the 48 new campsites, 963 kilometres of trail, nearly one kilometre of boardwalk and 21 major footbridges which comprised the upgrade were officially opened to the public. To assist and encourage walkers a set of two guidebooks and four maps for the southern half, to complete the Track's eight-map set, were also released. Bibbulmun Track Project Office, Southern Forest and South Coast staff put in a mammoth effort in the months leading up to opening day in an effort to complete all major tasks.

To celebrate the Track opening, the Bibbulmun Track Project Office initiated Bibbulmun Walk '98 as an end-to-end walk of the Track involving individuals, corporate teams and section walkers. It conducted all of the operational planning, liaison with districts, communications, safety planning, supply coordination, backup

Total Number of Apiary Site Permits in each CALM District

CALM District	Permits issued	Permits cancelled
Karratha	14	0
Geraldton	174	0
Moora	508	5
Kalgoorlie	284	2
Narrogin	114	0
Merredin	124	3
Katanning	8	0
Perth	174	7
Mundaring	386	5
Dwellingup	17	1
Mornington	214	4
Blackwood	41	3
Busselton	69	2
Manjimup	86	2
Pemberton	178	0
Walpole	71	1
Albany	82	5
Esperance	148	10
Total	2,892	50

and *NatureBase* updates for the event. It employed a consultant to source other funding, undertake detailed planning and marketing and to handle communications with event participants. Districts provided staff, vehicles and communications for the time the walkers were in their district. The event attracted huge amounts of positive media coverage for the Track and CALM's role in its construction and maintenance, which was sustained over a period of two months.

With completion of the Track upgrade the focus has been shifted to continuous improvement and maintenance.

Volunteer maintenance programs are now in place in six out of the eight districts through which the Track passes. Most districts now have in place effective works programs for ongoing Track maintenance.

Staff have worked closely with the Friends of the Bibbulmun Track on a number of projects, including a Bibbulmun Track promotional brochure and a booklet on accommodation and services on the Track; displays at various tourism trade shows; presentations to community and tourism industry groups; and articles and photographic images for various media outlets.

Track signs and interpretation in all forms continue to provide a cohesive and identifiable image for the whole Bibbulmun Track. Trailhead interpretive shelters have been designed and are being constructed in prison workshops. Interpretive signs have been produced and are being installed where there is public vehicular access to the Track.

Two crews from Pardelup Prison Farm (north of Albany), one based at the farm the other at the Walpole work camp, worked on the Track until January 1999 when the Pardelup based crew finished. The Walpole crew continue to spend half of their time

working on the Track and half in the community. The Ministry of Justice final contribution to the Project was calculated at \$1.43 million with an estimate of \$100,000 spent since project completion, mostly in Walpole.

Visitor Interpretation Services

Visitor communication planning is an essential component of CALM's management planning process. Officers provided interpretive perspectives into the preparation of management plans, recreation site development plans and interpretive projects. Of particular note are the Gnangara Plan, Nambung National Park and Purnululu National Park Visitor Centres.

A workshop was held in Denham for stakeholder involvement in the preparation of the communication plan for interpreting Shark Bay World Heritage values

Interpretive design is intrinsic to the recreation development plans prepared by CALM. Interpretation officers were involved with the provision of interpretive facilities and services within recreation development plans.

CALM's Sign Design Studio prepared signs and displays for 162 projects.

Interpretive activity programs were conducted in key areas for concentrations of visitors towards enriching their experience while minimising visitor impacts and maximising understanding and support for sound management of our heritage.

Training and Professional Development

CALM's nationally accredited *Designing Interpretive Activities* Workshop was conducted in collaboration with the University of Notre Dame.

The Gascoyne Development Commission in collaboration with the Gascoyne Business Enterprise Centre contracted CALM to conduct the

Designing Interpretive Activities Workshop in Carnarvon for local people interested in getting into the tour guiding business.

A new book *Developing Ecotours and Other Interpretive Activities Programs: A Guidebook for Planning, Designing, Promoting and Conducting Ecotours*, was prepared for publishing to support the nature-based tourism industry.

The Leader's Manual for the *Designing Interpretive Activities* Workshop is now available for purchase by tertiary education institutions and registered training providers to conduct this Workshop, which meets tourism industry competency standards approved by the Tourism and Travel Review Panel.

The Visitor Interpretation Services section provided lectures in interpretation to students of Edith Cowan University, University of Notre Dame and Curtin University.

Presentations were made to the Ecotourism Association of Australia at the annual conference held at Margaret River, and to the Interpretation Australia Association at the Heritage Interpretation International Conference held in Manly, Sydney.

PROGRAM INITIATIVES AND ACHIEVEMENTS

Training

During the year, Departmental staff conducted a week-long training course on recreation planning and management in natural areas for recent field officer recruits and other CALM staff at the Ministry for Sport and Recreation's Point Walter Conference Centre. This marks the twelfth year this nationally accredited training program has been conducted. A similar course was also conducted at the invitation of the University of Notre Dame during the second term for undergraduate students enrolled in the University's Environmental Science

program. Staff also presented lectures on various aspects of recreation resource planning and management and landscape design to students at Curtin, Edith Cowan and Murdoch Universities.

Recreation and Tourism Information System (RATIS)

Work continued on the development and further refinement of CALM's computerised Recreation and Tourism Information System (RATIS), which is linked to the Department's intranet. Several new information modules were added during the year and the system now includes a number of corporate databases covering such aspects as CALM volunteers, commercial activity licensing and leases, and RecData, which contains a State-wide inventory of the Department's recreation and tourism areas and facilities and a detailed register of assets.

Visitor Risk Management

Work continued during the year on the identification, assessment and mitigation of visitor risks on CALM-managed lands and waters around the State in accordance with the Department's policy and guidelines on visitor risk management. A comprehensive training program on visitor risk management has also been developed by CALM staff.

As part of its involvement in the ANZEEC Working Group on National Parks and Protected Areas Management, the Department also led and coordinated a national benchmarking and best practice program review to determine best practice for visitor risk management.

The results of this review of conservation agencies in Australia and New Zealand has been documented in a report which was recently forwarded to the ANZEEC Standing Committee on Conservation.

Tread Lightly! Australia and Track Care WA

CALM hosted a workshop organised by Tread Lightly! Australia on the management of motorised recreational vehicles. The primary aim was to bring government representatives, industry groups and recreational users together to discuss management issues of mutual concern. The Department also mounted a display at the Western Australian 4WD Show in South Perth in association with Tread Lightly.

Nature-Based Recreation and Tourism Research

A Nature-Based Recreation and Tourism Research Reference Group has been established by the Department with the primary aim of fostering cooperative research between Western Australia's tertiary institutions and CALM.

In particular, the aims of the Reference Group are to:

- identify potential research studies of relevance and importance to the planning, development, management, monitoring, marketing and financing of sustainable recreation and tourism opportunities in natural areas;
- act as 'research brokers' by finding and allocating these studies to tertiary students and/or faculty members who are interested in pursuing a particular topic or field of inquiry; and
- help disseminate the results of these studies to CALM's regions, districts and specialist units and to other interested parties.

The Group is chaired by Associate Professor Ross Dowling of Edith Cowan University and also includes representatives from other tertiary institutions including Murdoch University and the University of Western Australia. To date, nearly 40 projects have been identified and submitted to the Reference Group for

consideration. These proposals have subsequently been assessed and a number are currently being pursued.

Visitor Information and Statistics

A review of the Department's Visitor Information and Statistics (VISTAT) Program was initiated during the year. The VISTAT Program, which has been in place for over 10 years, seeks to provide accurate information on visitor needs and expectations and on levels and patterns of use throughout CALM-managed lands and waters. This information is essential in making informed decisions on the provision and management of nature-based recreation and tourism opportunities and the ongoing monitoring of visitor activities.

As part of this review, the Department has recently purchased a number of new traffic classifiers and pedestrian counters. These will be deployed in CALM regions and districts throughout the State to help in monitoring use levels. Work has also been undertaken on the development of a new customer satisfaction questionnaire form which is to be used in future visitor surveys.

Visitor Use Monitoring

The visitor use monitoring program continued, with 149 sites monitored by traffic counters, observation surveys and ticket sales in national parks, State forest areas and reserves throughout the State.

There were a total of 8.7 million visits to CALM-managed lands and waters throughout the State during the year. This represents an increase from the previous year's 8.1 million visits. This increase is, in part, due to increased visits to CALM areas as well as due to more areas monitored during the year and reflects a continuous interest that the public have shown in visiting CALM-managed areas.

Total visits to CALM-managed Lands and Waters		
Year	No. Data collection sites	Total No. visits (million)
1994-95	128	5.8
1995-96	129	6.0
1996-97	137	6.4
1997-98	144	8.1
1998-99	149	8.7

Regional Parks

The progressive transfer of management responsibilities of regional parks to CALM continued in 1998-99. In July 1999 management of the last of the eight Perth Regional Parks was transferred from the Ministry for Planning (MfP) to CALM.

Regional parks are areas of regional open space, which have been identified as having outstanding conservation, recreation and landscape amenity values.

The eight regional parks are Yellagonga, Herdsman Lake, Canning River, Woodman Point, Beeliar, Jandakot, Rockingham Lakes and Darling Range. Each of these parks is unique in terms of conservation and recreation values. The Regional Parks Unit, comprising a Co-ordinator, Senior Planner, Operations Manager, Planner, Landscape Architect and Administrative Assistant, continues to co-ordinate the management tasks within the Parks. Works within the parks is accomplished by purchasing services from the private sector and from staff employed through the CALM districts.

Regional parks in the Perth metropolitan area cover more than 33,000 hectares.

Although CALM has the co-ordinating management role, some lands within regional parks will be managed by local governments.

Canning River Regional Park Management Plan was released in 1997

and is currently being implemented by the City of Canning and CALM to manage the Park. Management plans for each of the seven other parks are in various stages of preparation. All of the management plans involve staff from the relevant local governments (as part of the planning teams) and regular community input through the appropriate community advisory committees. Under the CALM Act the draft plans will also be available for public comment.

The Minister for the Environment has approved Community Advisory Committees for each of the Coastal Plain Regional Parks. The Darling Range Regional Park Interim Advisory Committee, established by the MfP, will be administered by CALM until it is replaced by a community advisory committee appointed by the Minister for the Environment. The advisory committees comprise a range of people from local communities who are capable of advocating on behalf of the various stakeholders, including conservationists, scientists, friends groups and recreational users.

The Government is committed to funding CALM's ongoing management costs of \$2.35 million per annum for regional parks from the Consolidated Fund of Treasury.

Aboriginal Tourism, Education and Training

The Aboriginal Tourism, Education and Training Unit provides people with the opportunity to experience Aboriginal heritage in the natural environment as well as providing training and educational services to encourage the development of cultural heritage and tourism projects on CALM estate. The unit aims to develop cultural heritage programs that have the potential to provide employment opportunities for Aboriginal people.

A very successful cultural heritage education program for schools is conducted at the Hills Forest, Walyunga

National Park and other locations around Perth. Additionally, presentations in schools continue to be popular.

The unit operates as a business unit and conducts activities on a cost-recovery basis. Once an activity is developed and viability established the unit aims to train local Aboriginal people to take over the operation. Two examples of this can be found with the Aboriginal heritage walk in Fremantle and the Aboriginal heritage programs at New Norcia Education Centre, which aims to develop a program specialising in Aboriginal Studies for visiting schools.

Cultural tourism programs are a priority in Yanchep National Park. The unit has established the Balga Mia Village and is currently formulating a marketing and development program that will re-brand Yanchep National Park as a cultural tourist destination.

One Aboriginal heritage officer trainee completed his training and has been placed at Yanchep National Park. Two additional trainees have been acquired by the unit and plans are being made for a further two to be trained at Yanchep National Park. It is intended that they demonstrate to visitors the cultural significance of land to Aboriginal people and the traditional and contemporary ways of caring for the land.

Advisory Committees

Advisory committees continue to assist CALM as prime liaison bodies with the general public for the management of the CALM estate. The advisory committees are established as a means of participation by local communities in the management proposals for local situations. The committees meet regularly to discuss items of concern and issues of interest to CALM and the community, to assist in information exchange between CALM and the community and to advise the Department about management proposals.

The membership of the committees is made up of local representatives and Government and local Government officers, selected by the Minister for the Environment.

There are more than 34 advisory committees relating to the management and the flora and fauna of CALM lands and waters.

Volunteers

The contribution made by the Department's Community Involvement volunteer program has continued to grow and remains a cost-effective means of incorporating the support of the general public into CALM's management programs.

The contribution provided by volunteers included ongoing major projects such as wildlife carers, campground hosts, flora and fauna surveys, plant curation, Bibbulmun Track construction and maintenance

and involvement with The Hills Forest programs. Over and above these ongoing projects the introduction of 20 new volunteer projects this year has led to a further expansion of an extremely successful program.

A major review of CALM's volunteer database register was completed, resulting in a reduction in the total number of volunteers registered. This reduction in numbers provides a more accurate indication than was previously available of the number of volunteers who assist in CALM's programs. The review indicates that of 2,400 volunteers 1,232 people were volunteering for the first time this year.

Over the year 835 volunteers had the opportunity to assist CALM. Each contributed on average 130 hours, with volunteers contributing a total of 108,630 registered hours. This total does not take into account the significant contribution made by many

groups, such as the 538 wildlife carers, whose contributions cannot be accurately measured.

The WA Government has asked CALM to contribute to its two-year Plan for Women. As part of this, CALM has initiated an analysis of the volunteer database by gender/age program. This will provide a starting point from which CALM can target specific groups for its volunteer program, determine preferences currently existing for types of projects being developed, and improve existing volunteer projects.

Year	Number registered	Hours contributed
1990-91	980	31,000
1991-92	900	40,000
1992-93	1,260	40,000
1993-94	1,773	44,000
1994-95	1,921	38,000
1995-96	2,677	58,000
1996-97	3,293	84,000
1997-98	4,966	105,000
1998-99	2,400	108,630

Performance Measures			Output 4
	1998-99 Target	1998-99 Actual	Explanation of significant variation
Quantity			
Visits to sites managed	7,000,000	8,668,000	Ongoing improvements in CALM's Visitor Information Statistics (VISTAT) Program and continued growth in nature-based recreation and tourism activity throughout WA.
Sites managed	675	901	Inclusion in CALM's Recreation & Tourism Information System asset register of the new Bibbulmun Track camping areas and main trailheads (57 sites in total) and a number of other CALM-managed sites (including 95 regional park sites).
Quality			
New Nature-Based recreation areas and facilities complying with approved management plans and guidelines	100%	100%	
Visitor satisfaction with their visit overall	90%	88%	
Timeliness			
Activity programs/visitor services delivered within advertised timeframes	100%	100%	
Construction/visitor services contracts completed within approved timeframes	98%	NA	This measure proved to be mainly conditional upon external influences or factors (e.g. planning approvals, availability of funding and staff resources, etc.) outside the Department's control and therefore is impractical to record or report.
Cost			
Cost per visit	\$3.87	\$4.01	
Ratio of Total Cost of Services to Operating Revenues	3.37:1	2.75:1	Increase in visits to managed sites and higher than expected increases in revenue.

ASTRONOMICAL SERVICES

OUTPUT 5

Outcome

Astronomical information and services for the benefit of the Community.

Output Description

Providing public information and awareness directly beneficial to the Western Australian community, and contributing to scientific research in astronomy by cooperating with national and international institutions in the acquisition, analysis, interpretation and dissemination of information.

Perth Observatory made a variety of contributions to assist the public and professional astronomers witness the astronomical highlight of the year: the annular solar eclipse of 1999, on 16 February. Along a track about 30km wide that extended from just south of Geraldton to north of Cairns, the sun, moon and earth were completely aligned for about 30 seconds. Also, because the moon did not completely cover the sun, the outer edge of the sun appeared as a bright ring (or annulus) around the moon.

Such events are quite rare and attract professional and amateur astronomers from all around the world. Local interest was very keen and kept astronomy in the news in Western Australia for a fortnight. Front-page headlines a few days before the event carried a warning from the Perth Observatory and the Lions Eye Institute concerning the dangers of directly viewing the sun, while encouraging the public to witness the event safely by using simple projection equipment.

Perth Observatory mounted an expedition to witness the eclipse from the historic Hampton Arms Inn at Greenough (400km north of Perth),

which was conveniently located in the path of annularity, and enjoyed cloudless skies for the whole day. Telescope and projection equipment were erected for the dual purpose of scientifically recording the event as well as safely displaying it for members of the public who were participating in either of the Observatory's or the Department's *LANDSCOPE* eclipse expeditions. Several overseas astronomers also benefited from Perth Observatory's planning and took part in its expedition. Local TV stations broadcast live coverage of the event using expert commentary from Observatory staff, and Internet websites broadcast images from Greenough, and also from Perth.

Perth Observatory also assisted the public and various organisations conduct a successful repeat of the 1962 'Perth — City of Lights' lighting display for US Senator John Glenn in his space shuttle *Discovery* flight. At around 3:00am on 30 September 1998, Western Australians were invited to turn on their lights so that Perth could once again be viewed by Senator Glenn as he passed overhead. The Observatory served as a point of contact, providing updates of the space shuttle's location

for the public, mass media, government and business organisations who wished to participate in the event.

The University of Western Australia's historic 16-inch-aperture telescope was formally donated to the Observatory and will be refurbished, as workshop time allows, and employed in the public star viewing sessions. The telescope has been removed from its enclosure and a new purpose-built one will be erected in the future.

The empty enclosure is now dedicated to the *ASTRONET* project. This project will enable participating students from around the world to acquire astronomical observations during their class time. For example, the operation of a telescope in Perth enables students in the US to observe in their day time, and reciprocal arrangements will exist for WA students to enable them to observe with similar facilities in Ohio, USA. In due course other telescopes around the world will become involved. The 12-inch telescope donated by Kent State University for the project was erected and operated successfully, much to the satisfaction of the visiting project

HIGHLIGHTS

- ☆ *Successful local and international promotion and interpretation of the rare annular solar eclipse that traversed the State on 16 February 1999 (p. 35)*
- ☆ *Assisted the public and various government and business organisations to participate in a repeat of the 1962 'Perth — City of Lights' lighting display for US Senator John Glenn in his space shuttle *Discovery* flight of September, 1998 (p. 35)*
- ☆ *Donation of an historic 16-inch-aperture telescope by The University of Western Australia (p. 35)*
- ☆ *Category 'A' Heritage Listing by the Shire of Kalamunda (p. 36)*

leader from Kent State University. However, full-time operation of this system awaits the thorough testing of the completed dome automation system and completion of World Wide Web (WWW) software that facilitates student access to the system. It is anticipated that limited operation of the Perth Observatory system will begin before December 1999, and that the Perth Observatory WWW software will become the standard used for project ASTRONET worldwide.

Plans have been finalised and minor site works begun for the new enclosure that will house our modern 16-inch Meade LX200 Schmidt-Cassegrain telescope. This telescope has been temporarily housed in one of the visitor's observing facility enclosures. The new facility should be ready for use in the next star viewing season that begins in October. In due course, additional equipment will be added to this instrument to facilitate its use in scientific programs when not required for visitors' star viewing.

People continued to use the Observatory's educational and information programs in large numbers. More star viewing nights were scheduled over the summer months, but attendance was badly affected by unseasonal inclement weather over this period. In January, when the weather was more typical, a new monthly record was set with 757 visitors attending this activity. Their level of satisfaction was as high as in previous years, with more than 97 per cent satisfied with their visit.

People's awareness of the Observatory also remains high. The number of people who visited us, called our information service (around 7,000), attended talks, or attended an astronomy field night, increased from last year to more than 23,400. One of

the notable talks hosted by Perth Observatory was presented by the current Young Australian of the Year, Dr Bryan Gaensler, who only recently finished his astrophysics PhD and was then engaged on a whirlwind tour of Australia promoting the Australia Day Council (and astronomy). Also, Observatory staff informed the public of astronomical events in 122 radio and 13 television interviews, and 64 newspaper articles.

Astronomy services were delivered off the Observatory site to rural and metropolitan areas. Staff provided telescope viewing at many schools and encouraged participation in astronomy festivals such as the Yanchep National Park 'Sun and Stars' Festival and the Western Australian AstroFest. All up, a new record of more than 7,800 people viewed the stars with Observatory telescopes transported to their locality for one of these 'astronomy field nights'.

A diverse range of astronomical research continued this financial year. One supernova (SN1998ca) was discovered and its position accurately determined. Also, the light variation of SN1998A (discovered last financial year) was published after monitoring revealed it to be unlike similar objects, with the notable exception of the very bright and nearby SN1987A. Our ongoing participation in the PLANET collaboration (round-the-clock brightness monitoring of gravitational microlensing candidates) continues to bear fruit. Two scientific papers have been published this year describing the initial 1995 observing campaign and the unusual light variation from the star associated with the Macho 98-SMC-1 event.

Other successful observations recently conducted include photometric (brightness) observations of Comet

Hale-Bopp. This object is now quite distant, much further away than planet Jupiter, so such observations are quite rare and attest to this object's continuing interest to the astronomical community. Also, along with 11 other observatories world-wide, Perth Observatory participated in the multi-site campaign to observe the Delta Scuti star 38 Eri during November 1998.

Workshop staff have been busy as usual supporting these activities. More specifically, they have upgraded the Observatory's major instrument, the Lowell Telescope, by creating a tracking camera for it that dramatically assists long exposure observations by circumventing imperfections in its mechanical drive system. They also added a video camera to our solar projection telescope in order to facilitate safe viewing of the eclipse on a remote projection screen. (This method ensures the safety of the observers and also allows recording of these observations on video tape.) The Observatory's time system was upgraded from an old electro-mechanical arrangement to a computer-based one with input from GPS satellites and Internet time signals.

In February 1999, Perth Observatory was awarded a Category 'A' Heritage Listing by the Shire of Kalamunda in recognition of our scientific and cultural significance to the local area.

Volunteers contributed over 1,200 hours (approximately 0.6 FTE) of assistance this year in a range of volunteer programs associated with the star viewing sessions, the Observatory archives and general assistance. The continued growth in the Observatory output is partly due to this volunteer effort as well as the dedicated work from permanent staff.

Performance Measures

Output 5

	1998-99 Target	1998-99 Actual	Explanation of significant variation
Quantity			
Tour visitors	9,000	7,817	Cancellation of a substantial number of night tours due to inclement weather and the possible impact of full-cost recovery charges.
Enquiries	17,400	18,738	
Refereed scientific papers	5	3	Complex and protracted nature of this output, the collaboration required with external individuals and/or organisations, and the relatively small number of papers involved each year.
Quality			
Positive responses to 'quality' measures in visitors surveys	61%	99%	The lower 'Target' reflected lack of initial benchmark information.
Submitted research papers published in international refereed journals	100%	100%	
Timeliness			
Satisfaction of information requests as they occur	95%	98%	
Timely publication of research papers in international refereed journals	100%	100%	
Effective study of astronomical targets as they occur	50%	57%	The lower 'Target' reflected lack of initial benchmark information.
Cost			
Cost per tour visitor	\$16.53	\$13.63	Cancellation due to inclement weather of a number of more costly night tours.
Cost per enquiry	\$32.12	\$30.92	
Cost of research activities per refereed research paper	\$69,300	\$111,389	Ongoing nature of the output and the lower number of refereed papers published in 1998-99 (refer Output Quantity - Refereed scientific papers above).
Cost of research activities per 1,000 head of WA population	\$194	\$188	

FACTS AND FIGURES

GENERAL INFORMATION

The Department is in the portfolio of the Minister for the Environment. It is headed by an Executive Director, who is also a member of the Lands and Forest Commission, a member of the National Parks and Nature Conservation Authority, and Chairman of the Forest Production Council. In keeping with the varied interests of CALM there is also a Corporate Executive, which consists of eight directors working with and reporting to the Executive Director. Regional, branch and other specialist officers often attend meetings of the Corporate Executive.

The Department gives responsibility to its staff whenever possible, depending on skills and potential. Provided there is opportunity, there is no impediment to the progress of a capable individual in the organisation.

The detailed structure of divisions, regions and branches is shown in Figure 1. The names and qualifications of the officers occupying senior positions are shown on the page opposite the figure.

REGIONAL ACTIVITIES

CALM is committed to regionalisation. There are nine regions which, according to the intensity of activity, are subdivided into districts. Accordingly, the Department is spread over many locations. The map over shows CALM regional boundaries and the location of regional offices, as well as the types of lands and waters the Department manages.

Management structures are in place at nine regional, 18 district and six local offices. Within the regions there are national park rangers at 32 other

WHAT STANDARD OF SERVICE CAN OUR CUSTOMERS EXPECT?

While fulfilling our conservation and land management responsibilities, CALM places a great deal of importance on community and customer relations. We aim to increase our customer focus and provide a range of services that meet customer needs. Our customers can expect:

- ☆ *positive, courteous and friendly service;*
- ☆ *competent and efficient assistance;*
- ☆ *timely and accurate information; and*
- ☆ *confidentiality where commercially sensitive issues are concerned.*

More specifically, our customers can expect that:

- ☆ *CALM staff will be well trained, competent and helpful; will wear name badges when in direct contact with the community; and will identify themselves by name when answering the telephone.*
- ☆ *Requests for information or assistance will be met directly or referred to the appropriate person for answering as soon as possible.*
- ☆ *Telephone calls to our main offices will be answered on average within six rings. Telephone messages will normally be returned by the next business day.*
- ☆ *A contact name, address and telephone number will be given in all correspondence for future enquiries. Where it is not possible to respond to correspondence fully, an acknowledgement will be sent, advising of the current situation and when a reply may be expected.*
- ☆ *Brochures and other information materials will be easily understandable, accurate and up-to-date.*
- ☆ *Recreational facilities in national, conservation and marine parks, reserves and State forests will be well maintained and kept clean.*

locations, and a district wildlife officer at one other.

Because of community concern for protection of the natural environment and an increasing desire to experience its values, the roles of regional managers and their staff are most important. Satisfactory experiences for the 8.7 million visits (1998-99 estimated figures) to CALM-managed lands and waters, drawn from interstate and overseas as well as from all over Western Australia, are largely in their hands. Regional staff are also

responsible for the conservation of native flora and fauna within regional boundaries. The three forest regions in the south-west of the State have a large commitment to manage wood resources, and to regenerate and protect the forests for a wide range of other values. The Goldfields region (and to some extent the Midwest) has a similar commitment to sandalwood resources, as have the South Coast and Wheatbelt regions to economic tree crops that can be integrated into farming practice.

Regional managers have a degree of autonomy. Each is responsible under corporate direction for developing the region's annual works program, and for managing the region's budget allocation. Liaison with local groups, especially Aboriginal communities, other Government agencies and the community in general, is extensive. There are often advisory committees established with a focus on parts of CALM-managed lands and waters. The committees make input into the preparation of management plans and, after their approval, advise on management. It is mostly the regional managers and their staff who are responsible for this important interface with the local community.

SPECIALIST AND SERVICE ACTIVITIES

CALM's operations are directed by the Corporate Executive and supported by specialist and service staff. Their responsibilities are as follows:

CALMScience provides up-to-date, scientifically sound information to uphold effective conservation and land management in Western Australia. Three science groups address CALM's scientific needs: to discriminate and document the biota, ecological processes and biological resources of the State; to conserve threatened species and ecological communities by minimising inimical processes; and to ensure that lands, waters and biological resources are used sustainably.

Perth Observatory is a group within CALMScience. It has three astronomy-based core functions: research, information services and educational services.

Corporate Relations directs the knowledge and information-sharing infrastructure within CALM, for corporate planning, and internal and external communications, marketing, advertising and community education.

The Division initiates, develops and implements communication strategies to address major issues of conservation and land management, produces publications, displays and multimedia productions, designs and stages special events, coordinates CALM's media activities, provides the community with an information service, and conducts market research.

CALMfire sets fire management standards, coordinates the preparation of fuel reduction and suppression plans, provides detection communications, aircraft and other fire support services, and conducts fire training.

CALMpeople Services Branch provide strategic planning, policy development and formulation, advice and coordination in the management of the Department's human resources. Services are provided by the Branch in the functional areas of personnel, payroll, labour relations, training and development, and risk management.

CALM Timber Technology conducts research and develops commercial applications which increase the value-adding and utilisation of the State's timber resources.

Environmental Protection Branch prepares guidelines and procedures for protection from dieback, weeds and feral animals, evaluates mining and development proposals, and advises on rehabilitation of CALM-managed lands and waters, and on environmental protection generally.

Financial Services Branch provides advice to operational managers on purchasing and fleet management, manages accounts receivable and accounts payable processes and asset records, coordinates remote area housing, consolidates Department budgets, maintains core financial software that is shared by all parts of the Department, and produces management, tax and statutory reports.

Forest Management Branch carries out resource inventories, disease mapping, and database maintenance for the Native Forests and Plantation Business Units. It maintains corporate resource information and GIS databases relating to forest areas in the South West and prepares strategic resource plans.

Forest Resources Services Branch provides administrative services for the State Forest Resources, Plantations and Sandalwood Business Units, including management of tenders and auctions, contract preparation and control of systems for recording and management of commercial transactions involving log timber. It provides a timber inspection service for CALM and the timber industry.

Information Management Branch plans, coordinates and implements CALM's information systems support, and is responsible for corporate document and records management. The Branch maintains CALM's Geographic Information System (GIS), and provides a land-related information service.

Management Audit Branch reports to the Executive Director, providing systematic audits of management systems to advise on their effectiveness, efficiency, economy and compliance with legislation, policies and procedures.

Marine Conservation Branch provides policy, strategic and scientific advice for marine conservation and management, and advises marine reserves planning teams.

Park Policy and Tourism Branch develops policies and strategies for recreation and tourism, including business development, leases and licences, external funding and community involvement. It coordinates policies and programs concerning Aboriginal and other special interests, and visitor research and surveys.

Planning and Visitor Services Branch incorporates land administration, management plans, recreation planning and design, landscape management, and visitor interpretation.

Plantations Business Unit develops silvicultural guidelines and practices for coniferous and broadleaved plantations and advises on their implementation. It manages CALM nurseries and seed supplies.

Sandalwood Business Unit manages the sandalwood industry including research into plantation development for Western Australian and Indian sandalwood.

State Forest Resources Business Unit manages the silvicultural practices, regeneration, and harvesting of native forest, and the sale of log timber. It advises on timber quality, wood technology, and marketing.

Threatened Species and Communities Unit coordinates and assists with Departmental programs for threatened species and communities, including preparation and implementation of recovery plans.

Wildlife Branch develops policies and provides information and advice on wildlife protection and management throughout the State, administers wildlife licences and permits, enforces the Wildlife Conservation Act and Regulations, maintains and manages databases on wildlife resources and conservation status, and ensures compliance with legislation and licence conditions.

CALM DISABILITY SERVICES

The main focus of CALM's Disability Service Plan is to ensure that people with disabilities can use and enjoy the State's natural areas and the associated facilities, services and programs provided for the benefit of the entire community. Implementation of the Plan's objectives has continued during the year.

CUSTOMER FOCUS 1998-99

Everyone knows when they've received good customer service: it leaves you feeling positive about the experience; it is often delivered by staff who are down to earth and helpful; it is polite, often casual, and always efficient.

Our Customer Service Charter sets out a statement of the services provided by CALM and the standards of service CALM's wide range of customers can expect from us. It explains how to find out more about CALM and its services, and how to give feedback on our performance.

During 1998-99, CALM continued to take steps to improve its customer focus.

A range of customer satisfaction surveys were conducted and the results used to guide policy and resource allocation decisions within the department.

Staff training (to increase their skills in customer relations, in understanding what customers want, and in using customer feedback to provide responsive services) was conducted.

Initiatives to improve access to information and services included several new customer services on CALM's internet site NatureBase: CALM ParkFinder, a searchable database of national parks and CALM-managed recreation areas, where customers can find the park or recreation area meet their needs; CALM TourFinder, a searchable database of CALM-licensed tour operators that operate in national parks and other CALM-managed recreation areas, where customers can find a tour a tour that meets their needs; and FloraBase, which provides on-line access to the latest information on 12,500 Western Australian flowering plants.

Facilities at the Matilda Bay Reserve at Crawley have been improved, with particular attention paid to providing universal access. Picnic tables were designed to disability standards and paving laid to allow use by people in wheelchairs, and access was provided to the pathways within the Reserve.

Access to CALM's Crawley and Como offices was improved. Steps were removed and ramp access provided to the ground floor of the Crawley office, and a new ramp entry to the main conference facility at Como was constructed. In addition, ramps were constructed to provide universal access to all Como offices, some of which were previously only accessible using steps.

CALM has accepted an invitation to be involved as a major sponsor for the first national conference on universal design. The conference will be held in Perth in July 1999.

As a result of work experience opportunities provided to people with disabilities in 1998-99, a traineeship was offered to one person. That person successfully completed the traineeship at the end of June 1999.

Other CALM initiatives during the year included improved wheelchair access and construction of accessible picnic facilities at the Kalgoorlie Arboretum, completion of the Canal Rocks bridge and boardwalk which provides universal access, and construction of an accessible walk trail and interpretation facility at the Point D'Entrecasteaux Lighthouse. Engineers of the 13th Brigade, an Army Reserve formation, constructed a new road and observation platform at the mouth of Mandu Creek in the Exmouth Region. The observation platform was built to CALM specifications and provides access for people in wheelchairs.

External Funding

Grants and sponsorship remain the two major sources of CALM's external funding. The majority of commonwealth funding is provided through the Natural Heritage Trust (NHT). The NHT provides grants for environmental, natural resources and sustainable agricultural programs. It is administered jointly by Environment Australia (EA) and the new department of Agriculture, Fisheries and Forestry Australia (AFFA – previously Department of Primary Industries and Energy). Programs fall under a 'one-stop-shop package' which includes most of the terrestrial programs (including Bushcare, National Reserve Systems, Wetlands, Farm Forestry) and the Coast and Clean Seas initiative (including Coastcare and Marine Species Protection). CALM is lead agency for several of these Programs (including Farm Forestry and National Wetlands) and for these has the responsibility of administering other state government and community projects. The five-year life of the Natural Heritage Trust formally concludes in 1999–2000 and it is yet unclear how and if it will be replaced. Support from other Commonwealth sources includes the Australian Biological Resources Study, Bureau of Rural Sciences, Co-operative Research Centres and Land and Water Resources Research and Development Corporation.

In 1998–99 Commonwealth grants totalled \$9.68 million.

Commonwealth Grants

Year	Amount (million \$)
1993–94	3.98
1994–95	4.95
1995–96	4.80
1996–97	5.14
1997–98	8.67
1998–99	9.68

The above figure includes several projects for which CALM is a joint proponent, particularly the community-focused program Coastcare.

The Green Corps Grant Program administered by the Australian Trust for Conservation Volunteers (ATCV) continued to provide accredited 26-week employment programs to young Australians to work on high-priority conservation projects. CALM was approved for one program for the Cape to Cape Track Development.

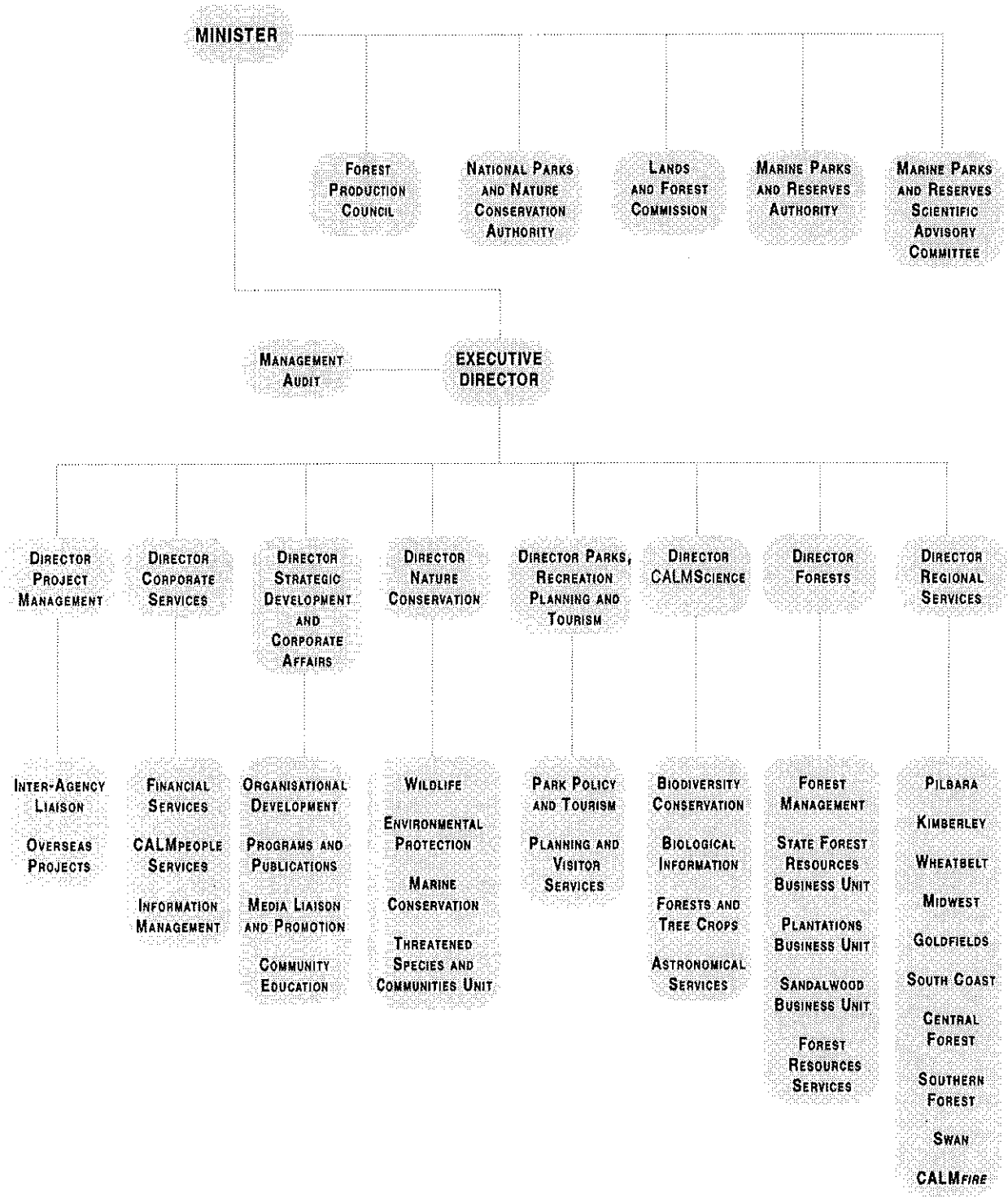
\$1.8 million from Treasury was received for the ongoing management of Perth's Regional Parks. Regional Parks are areas of regional open space which have been identified by planning investigations as having outstanding conservation, landscape and recreation values.

CALM received funding for special purpose grants from State Government agencies. Main Roads Western Australia was the major contributor with more than \$2 million.

The BankWest *LANDSCOPE* Visa card raised approximately \$18,500 for endangered species and ecological communities conservation. Projects funded during the year include 'Radio-tracking of Gilbert's Potoroo' and 'Revegetation of buffer area to Tumulus Mound Springs Community'.

CALM continued to receive valued support through corporate sponsorship for conservation, education and infrastructure projects. The following provide an example of projects supported. The Western Shield campaign received major support from Cable Sands (WA) Pty Ltd and Westralian Sands Pty Ltd. Australian Geographic sponsored an anaesthetic machine for marine research. Woodside Petroleum Ltd and Kailis M.G. Group supported CALM's turtle research program. Hamersley Iron Pty Ltd supported CALM's work programs in the Pilbara Region. Alcoa continued to be a major supporter of recreation and tourism projects within the Swan and Central Forest Regions. BP commenced a partnership with CALM to explore the feasibility and management of tree plantations to create carbon sinks as an offset to the company's greenhouse gases.

ORGANISATIONAL STRUCTURE



CORPORATE EXECUTIVE

EXECUTIVE DIRECTOR

S R Shea BSc, MSc, PhD

DIRECTOR, REGIONAL SERVICES

A W Walker BSc For (Hons)

DIRECTOR, NATURE CONSERVATION

K J McNamara B Nat Res (Hons)

DIRECTOR, PARKS, RECREATION PLANNING & TOURISM

J R Sharp B Ed, Dip PE, M Ed

DIRECTOR, FORESTS

D J Keene Dip For, BSc

DIRECTOR, CALMScience

N D Burrows BSc For, PhD

DIRECTOR, PROJECT MANAGEMENT

F H McKinnell Dip For, BSc, PhD

DIRECTOR, CORPORATE SERVICES

J C Byrne MBA, PhD, FCPA

DIRECTOR, STRATEGIC DEVELOPMENT
AND CORPORATE AFFAIRS

R A Kawallak BA, FPRIA

OTHER SENIOR STAFF

REGIONAL MANAGER, CENTRAL FOREST

R Chandler BSc

REGIONAL MANAGER, GOLDFIELDS

I G Kealley BSc

REGIONAL MANAGER, KIMBERLEY

C C Done BSc

REGIONAL MANAGER, MIDWEST

K Gillen BSc (Hons)

REGIONAL MANAGER, PILBARA

C Muller Dip For, BSc For

REGIONAL MANAGER, SOUTH COAST

J R Watson BSc, Grad Dip Rec, PhD

REGIONAL MANAGER, SOUTHERN FOREST

P Keppel Cert For Mngmt

REGIONAL MANAGER, SWAN

B E Harvey BSc For

REGIONAL MANAGER, WHEATBELT

K J Wallace Dip Ed, BSc (Hons)

MANAGER, BIODIVERSITY CONSERVATION GROUP

K D Morris BSc, MSc

MANAGER, BIOLOGICAL INFORMATION GROUP

N G Marchant BSc (Hons), PhD

MANAGER, CALMfire

R Sneeuwjagt BSc, MSc

MANAGER, CALM TIMBER TECHNOLOGY

I D Rotheram BSc For, MSc Nat Res

MANAGER, ENVIRONMENTAL PROTECTION BRANCH

F E Batini Dip For, BSc, MSc

MANAGER, FINANCIAL SERVICES BRANCH

M J Neilson BA, MAcc, CPA

MANAGER, FORESTS AND TREE CROPS GROUP

J F McGrath BSc (Hons), PhD

MANAGER, FOREST MANAGEMENT BRANCH

M Rayner* BSc For (Hons), PhD

MANAGER, FOREST RESOURCES

J H Murch BSc (Hons)

MANAGER, FOREST RESOURCES SERVICES

J D Clarke BSc For

MANAGER, CALMpeople SERVICES BRANCH

C W Gillam BA (Hons), MA, PG Dip Bus, AFAHRI

MANAGER, INFORMATION MANAGEMENT BRANCH

C J Pearce BSc (Hons), PhD

MANAGER, MANAGEMENT AUDIT BRANCH

P Jones BSc For

MANAGER, MARINE CONSERVATION BRANCH

C J Simpson B App Sci (Biol), G Dip Nat Res, PhD

MANAGER, PARK POLICY AND TOURISM BRANCH

C B Ingram B App Sc

MANAGER, PLANNING & VISITOR SERVICES BRANCH

A J Williamson Dip For, BSc, M For, MSc

MANAGER, PLANTATIONS BUSINESS UNIT

G M Butcher BSc For

MANAGER, PROGRAMS & PUBLICATIONS

R F Bailey BA (Hons), PhD

MANAGER, STATE FOREST RESOURCES BUSINESS UNIT

M Buckton BSc For (Hons)

MANAGER, WILDLIFE BRANCH

G J Wyre B Nat Res (Hons)

SCIENCE ADVISER

I J Abbott BSc (Hons), PhD, DSc

GOVERNMENT ASTRONOMER

J Biggs BSc (Hons), PhD

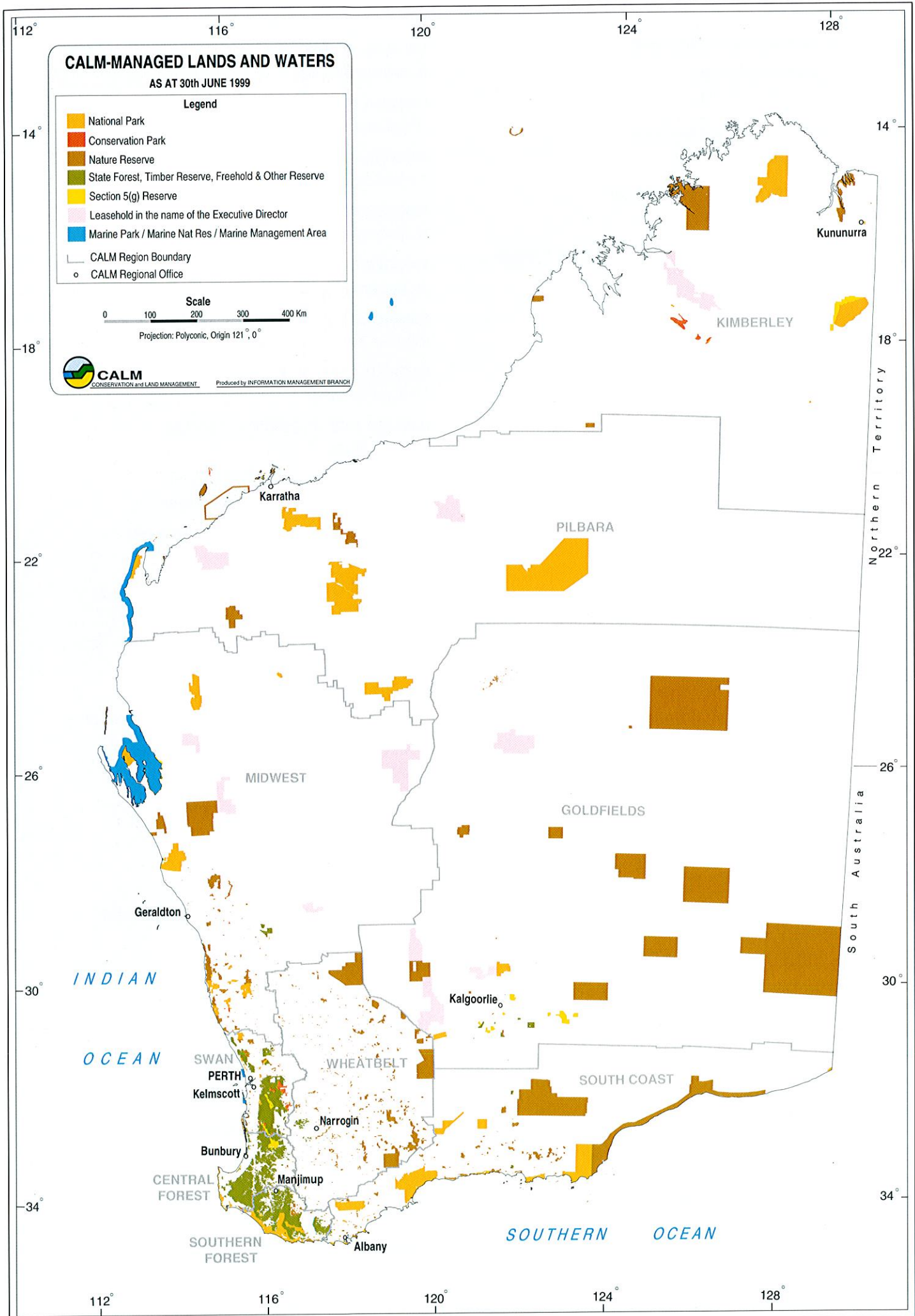
DIRECTOR, WA THREATENED SPECIES & COMMUNITIES UNIT

A A Burbidge BSc, PhD

PROJECT CONSULTANT

P G Lilleyman B Bus, G Dip Acc, M Bus, FCPA

* Acting



CALM-MANAGED LANDS AND WATERS

Total Estate

As at June 1999 the total area under CALM's care was 21,606,474 ha, an increase of 1,341,808 ha during 1998-99.

The terrestrial area (i.e. not including marine reserves) is approximately 8.1% of the land area of Western Australia.

The table below provides a summary of all tenure classifications.

National Parks

National parks are for wildlife and landscape conservation, scientific study, preservation of features of archeological, 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 63 national parks at the 30 June 1999 remained at 4,874,282 ha.

Conservation Parks

Conservation parks have the same purpose as national parks, but they do not have the same national or international significance. They have significant local or regional value for conservation and recreation.

The area of conservation parks at 30 June 1999 was 117,324 ha. There were no changes during the year.

Nature Reserves

Nature reserves are for wildlife and landscape conservation, scientific study, and preservation of features of archeological, historic or scientific interest. Recreation which does not harm natural ecosystems is allowed.

The area of nature reserves at 30 June 1999 was 10,772,680 ha, an increase of 409 ha in 1998-99. Notable was the creation of a new nature reserve resulting from the purchase of 152 ha 18 km south of Moora near Koojan. Other new nature reserves include areas at Kwolyin (86 ha), near Dattening (56 ha), 18 km east of Wandering adjacent to the Hotham River (53 ha) and 24 km north of Boyup Brook (52 ha).

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 1999 was 1,727,508 ha, a decrease of 6 ha in 1998-99.

Timber Reserves

Timber reserves declared under the CALM Act are managed on the same basis as State forests. The category is transitional; as reserves are evaluated they may be changed to a more appropriate tenure, e.g. State forest or nature reserve.

The area of timber reserves at 30 June 1999 was 141,550 ha. There were no changes during the year.

Marine 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 and terrestrial flora and fauna and their habitats. Fishing and collecting are not permitted.

The area of marine parks at 30 June 1999 was approximately 1,013,940 ha. The area of marine nature reserves at 30 June 1999 was approximately 132,000 ha. There were no changes during the year.

**CALM-Managed Lands and Waters (ha) by Region
as at 30 June 1999**

Tenure Classification	Central Forest	Goldfields	Kimberley	Midwest	Pilbara	South Coast	Southern Forest	Swan	Wheatbelt	Total
National Park	27,458	86,397	696,876	504,845	2,396,627	891,810	223,898	45,079	1,292	4,874,282
Conservation Park	581	405	54,670	3,643	1,466	-	-	56,559	-	117,324
Nature Reserve	9,682	6,267,610	809,497	732,083	250,520	1,585,323	32,846	49,866	1,035,253	10,772,680
Marine Park	-	-	23,250	748,735	225,564	-	-	16,391	-	1,013,940
Marine Nature Reserve	-	-	-	132,000	-	-	-	-	-	132,000
Marine Management Area	-	-	-	-	-	-	-	-	-	-
State Forest	656,456	781	-	-	-	4,055	547,212	490,938	28,066	1,727,508
Timber Reserve	33,765	28,576	-	26,338	-	5,231	19,139	28,501	-	141,550
Sect 5g Reserve	30,364	81,617	79,623	2,316	8,130	-	634	27,358	332	230,374
Miscellaneous Reserve	354	<1	61	517	1,779	3,813	470	5,941	15	12,951
Freehold (Exec Dir)	21,479	<1	<1	<1	<1	63	4,922	3,662	<1	30,128
Leasehold (Exec Dir)	-	897,805	427,729	743,730	484,473	-	-	-	-	2,553,737
Totals	780,139	7,363,192*	2,091,707*	2,894,207	3,368,559	2,490,295	829,121	724,295	1,064,959*	21,606,474

Note: 1.0 ha has been added in for <1 for totals shown* (ie. totals do not add to sum of columns).

Source: Information Management Branch (TENIS)

7/4/00

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1,013,940
132,000
1,727,508
141,550
230,374
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2,553,737

21607,2
25

National Parks Vested in the National Parks and Nature Conservation Authority

NAME	AREA (ha)	NAME	AREA (ha)	NAME	AREA (ha)
Alexander Morrison	8,500	Greenmount	58	Scott	3,273
Avon Valley	4,366	Hassell	1,265	Serpentine	4,360
Badgingarra	13,121	<i>Hidden Valley</i>	2,068	Shannon	52,598
Beedelup	1,786	John Forrest	2,676	Sir James Mitchell	497
Boorabbin	26,000	Kalamunda	375	Stirling Range	115,920
Brockman	49	Kalbarri	183,004	Stokes	9,726
Cape Arid	279,382	Karijini	627,442	Tathra	4,322
Cape Le Grand	31,801	Kennedy Range	141,660	Torndirrup	3,936
Cape Range	50,581	Leeuwin-Naturaliste	19,037	Tuart Forest	2,049
Collier Range	235,162	<i>Lesmurdie Falls</i>	56	<i>Tunnel Creek</i>	91
D'Entrecasteaux	116,686	Lesueur	26,966	Walpole-Nornalup	15,861
Drovers Cave	2,681	Millstream-Chichester	199,736	<i>Walyunga</i>	1,812
Drysdale River	448,264	Moore River	17,540	Warren	2,982
<i>Eucla</i>	3,560	Mount Augustus	9,168	Watheroo	44,474
Fitzgerald River	329,882	Mount Frankland	30,830	<i>Waychinicup</i>	3,982
Francois Peron	52,587	Nambung	18,362	<i>West Cape Howe</i>	3,517
Frank Hann	67,550	Neerabup	1,060	William Bay	1,734
Geikie Gorge	3,136	Peak Charles	39,959	Windjana Gorge	2,134
Gloucester	875	Porongurup	2,621	Wolfe Creek Crater	1,460
Goongarrie	60,397	Purnululu	239,723	Yalgorup	13,001
Gooseberry Hill	33	Rudall River	1,283,706	Yanchep	2,842
				TOTAL	4,874,282

* Names shown in italics are not yet gazetted

Marine Management Areas will 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.

As yet no Marine Management Areas have been proclaimed.

5(g) Reserves

Within the meaning of the CALM Act, land categorised as 5(g) reserve is land reserved under the Land Administration Act 1997, which is vested in the NPNCA or the LFC. These reserves are not national park, conservation park, nature reserve or marine reserve. Immediately before the commencement of the CALM Act some were vested in, or under the control and management of, the National Parks Authority but not as a national park, e.g. Matilda Bay Reserve. They have a predominantly conservation/recreation purpose.

The area of 5(g) reserves at 30 June 1999 was 230,374 ha, a net decrease for the year of 134 ha due to a tenure change and recalculation of area.

Miscellaneous Reserves

There are some remaining reserves managed by CALM 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 1999 was 12,951 ha, a net decrease of one hectare for the year.

Other Land

The area of freehold land held by the Executive Director at 30 June 1999 was 30,128 ha, a net decrease of 726 ha during the year. The major portion of this land is committed to commercial softwood forestry.

The area of pastoral leases held by the Executive Director at 30 June 1999 was

2,553,737 ha, representing increases of 321,818 ha in the Goldfields region, 683,822 ha in the Midwest region and 336,626 ha in the Pilbara region.

Conservation Land Acquisitions

The Department acquired a number of significant parcels of land during the year for future addition to the conservation estate. The priorities are to obtain good examples of ecosystems that are not adequately represented in the existing conservation reserve network, and also to add to existing reserves land that would greatly improve their diversity or facilitate their management.

Funds for conservation land acquisition in 1998-99 were obtained from four sources: the Department's annual capital allocation; an allocation under the Gascoyne-Murchison Strategy; the National Reserve System Program of the Natural Heritage Trust; and some funding from the Crown reserves component of the State Salinity Action Plan.

With funds allocated under the Gascoyne-Murchison Strategy, the following pastoral leases in the Strategy area were bought during the year: Pimbee, Muggon, Earahedy and Mooloogool. The leases cover a combined total area of more than a million hectares. An additional area of 63,000 hectares was acquired from pastoral leases adjoining the Kennedy Range National Park with the intention that the land be added to the National Park.

Acquisitions outside the Gascoyne-Murchison Strategy area included the following: two pastoral leases in the Pilbara (Meentheena, 225,700 ha, and Mt Minnie, 111,000 ha); a 74-hectare parcel of land in the Shire of Gingin supporting the only known occurrence of the Gingin Ironstone community, a critically endangered plant community; about 163 hectares adjoining the Chandala Nature Reserve in the Shire of Chittering; an area of 64 hectares in the Shire of Gingin representing the Muchea Limestone Threatened Ecological Community; an area of 1.8 hectares providing important waterbird habitat adjoining the Vasse River in the Shire of Busselton; and about 400 hectares of remnant vegetation in the wheatbelt shire of Nungarin.

CALM gratefully acknowledges the significant contribution made by the Commonwealth Government through the National Reserve System of the Natural Heritage Trust who supported the majority of the above purchases. The contribution from the National Reserve System Program this year has amounted to over \$1.8 million. This support has provided a major boost towards the development of a comprehensive, adequate and representative conservation reserve system in Western Australia.

CORPORATE SERVICES

Financial Services Branch

In addition to normal services, Financial Services Branch staff

PUBLIC SECTOR STANDARDS AND CODE OF CONDUCT

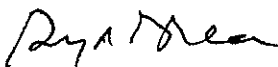
The Department of Conservation and Land Management has adopted guidelines and processes supporting the public sector standards in human resource management. The Performance Management policy is currently under review.

Policies and supporting procedures are in the CALMpeople Manual, which is accessible in on-line, CD-ROM and hard copy formats.

Individual managers are responsible for ensuring compliance to the Departmental Policies and Code of Conduct, with the Manager CALMpeople Services Branch playing a monitoring and advisory role. In addition, staff in the personnel area monitor all transactions for recruitment and selection, secondment, transfer, and performance management to ensure current Departmental policy is adhered to. Staff in the Employee Relations section are responsible for monitoring all disciplinary cases.

The CALM Code of Conduct is made available to all new staff via a comprehensive Induction package accessible on the intranet. Existing staff have all received a hard copy.

There were two applications lodged for a review of the Recruitment, Selection and Appointment Standard during 1998-99, neither of which was sustained.



Syd Shea
Executive Director
30 August 1999

undertook the following projects in 1998-99:

- completed an upgrade of the Oracle financial system to a year 2000 compliant version;
- began preparing for the 1 July 2000 introduction of the GST;
- carried out a number of maintenance inspections on fleet units in remote areas;
- issued updates to the Department's Accounting and Supply Procedure Manuals;
- reviewed the Department's Parliamentary budgeting format and received a favourable report from the State Treasury; and
- provided strategic financial forecasts to Department executives.

CALMpeople Services Branch

Excellence in customer service remains a priority. To that end an executive information system was

purchased during the year that will allow greater use of the human resources database to help develop accurate management reporting. CALMpeople (formerly Human Resources Branch) is also participating in a pilot benchmarking program with a number of other public sector agencies to establish parameters across 20 human resource indicators.

Some 13 initiatives relating to CALM's involvement in the Government Two-Year Plan For Women 1999-2001 have been developed. These cover a broad range of the organisation's activities.

Fifty-six salaried staff achieved career advancement through promotion via advertised vacancies. Twenty-seven salaried staff were reclassified into higher level positions, and five achieved advancement through criteria progression.

The CALMpeople Reference Group has been working on strategic outcomes

for a key project developing links between good people management and superior business performance in CALM. The group has also undertaken a number of initiatives to develop ways to recognise and reward staff. Linkages have been strengthened with the Executive Director, individual Directors and key groups in CALM, such as the Peer Support Team.

Employee Relations

CALM has continued with workplace reform during the year.

New workplace agreements were approved and made available for Australian Workers Union Construction and Maintenance employees and National Park Rangers (August), Public Service Officers (December), Mechanics (March) and Pilots (May).

The Australian Liquor, Hospitality and Miscellaneous Workers Union sought an award interpretation from the Western Australian Industrial Relations Commission on overtime entitlements for National Park Rangers. This was the only matter referred to an industrial tribunal for determination in the course of the year.

Staff Development

A Performance Development Steering Committee has been working on policy and the framework for an individual performance development system for CALM.

A Training and Development Reference group was established to provide a forum and a strategic focus for training.

An interactive induction learning program has been developed and placed on the intranet. It provides a comprehensive introduction to CALM for new employees.

A new EEO/Diversity management plan has been completed, replacing the previous EEO plan. The plan provides

strategic focus for addressing Diversity issues.

Continuous Learning

Fifteen field officer recruits graduated in 1999 after completion of 14 weeks of competency-based training delivered over a two-year period. Fourteen of the graduating officers have since achieved permanent appointments within CALM, and one has resigned.

Nineteen CALM people were successful in four internal scholarship programs:

- Executive Director's Scholarship. The 1999 recipients were Vince Hilder of Kirup and Russell Wornes of Walpole.
- Dr George Malajczuk Post Graduate Scholarship. The 1999 recipient was Nick D'Adamo of Fremantle.
- Seamus Mulholland Scholarship. The 1999 recipient was Peter Dans of Fremantle.
- Executive Director's Undergraduate Scholarship (made available to all permanent CALM people to assist them financially in relevant undergraduate study programs). There are 15 recipients of this scholarship located throughout the State.

Twenty-five CALM people have successfully completed the internationally recognised Certificate IV Effective Manager course. Nine of these graduates have articulated their studies into the Diploma of Management course. A further 14 CALM people have now enrolled in the Certificate IV Effective Manager course.

An Assistant Training Officer has been appointed to the CALMpeople Services Branch to co-ordinate and facilitate the enrolment of CALM people into programs leading to post-secondary education qualifications. Since this appointment 22 wages employees have enrolled in the Certificate IV in Conservation and Land Management Course.

Risk Management

The identification and management of risk are recognised as a fundamental part of sound organisation administration and customer service, and are an integral component of operational and line management responsibilities in CALM.

To facilitate this an Executive Risk Management Committee has been established to determine and communicate policy objectives, procedures and guidelines. This Committee directs and monitors the implementation, practice and performance of risk management throughout CALM. Practice and procedure guidelines have been developed and will be provided by the Committee to assist the implementation of the risk management policy within CALM.

Occupational Safety and Health

A total of 117 work groups across CALM achieved their safety performance targets during the reporting period and were presented with awards marking their achievement under the IFAP/GIO Safeway Award Scheme. CALM, for the fifth consecutive year, was the most successful participating organisation.

The effectiveness of the safety and health and the injury management programs operating within CALM is again reflected in the continuing downward trend in total working days lost and average days lost as a result of workplace injury. These indicators showed further reductions by 48% and 50% respectively.

Occupational Safety & Health Performance Indicators		
	1998-99	1997-98
Lost Time Injury Frequency Rate	11	11
All Injury Frequency Rate	47	51
Number of Lost Time Incidents	33	32
Number of Days Lost	363	702
Average Days Lost per (LTI) Annual Workers'	11	22
Compensation Premium	\$911,305	\$869,674

Information Management Branch

Information Services Section upgraded the data communications infrastructure to provide secure access to CALM's intranet by staff throughout the State, and additional services were made available via the web, including access to financial, wildlife licensing and kangaroo management information systems. Other activities included an extensive project to ensure year 2000 preparedness throughout the entire Department, and the migration of corporate information systems to an upgraded computing environment.

Corporate Information Section extended implementation of the Keyword Classification Thesaurus, together with other strategies aimed at providing more client-focused services and meeting anticipated changes to government records legislation. These included the start of a project to provide better access to research data sets, and commencement of work on a new Retention and Disposal Schedule for the management of inactive records. The second stage of an Archival Project was completed, resulting in the provision of better preservation conditions for records of long-term historical or research value.

Geographic Information Services Section continued to develop the SmartCOG intelligent mapping system for CALM regions and districts, as well as an integrated plantation information system, in accordance with a new Corporate Geographic Information Systems (GIS) Plan.

The Section played a major role in data assembly, analysis and presentation for the development of the Regional Forest Agreement, winning two professional awards for cartography and data management. It also provided GIS analysis and maps for the Gnaragara

Park concept planning, for other Regional Parks, Western Shield, the CALM Bush Rangers Project, the Bibbulmun Track (eight maps and two booklets) and a new edition of *Wild Places, Quiet Places*. The Section also published five new Land Management Series map sheets, and produced revised editions of three others.

The Regional Operations Graphics coverage was completed over the whole State, and a program begun to produce atlases for CALM regions and districts. The Section continued to provide a remote sensing analysis service to the Department, including the mapping and classification of woodland in the Kimberley, and participation in the Land Monitor Project under the Salinity Action Plan.

Year 2000: The 'Millennium Bug'

CALM has been addressing its Year 2000 position for some years. A formal project was established in early 1998. A Business Impact Assessment was performed on the Department, indicating the major systems and equipment that may be influenced by the Year 2000 date change. As a result of this assessment the Department devised a Year 2000 project plan, which has involved analysing, testing and fixing equipment and major computer hardware and software as well as developing contingency plans. The contingency plans have been designed to deal, as far as possible, with any issues that might arise.

At present all indications show that CALM's Year 2000 compliance project is running on schedule, with the Department expecting to be trading as normal on 1 January 2000.

For more information on CALM's preparation for the Year 2000 problem, please visit http://www.calm.wa.gov.au/calm_y2k.html.

Mapping Kimberley Forests

With funding assistance from the National Forest Inventory, a new system for mapping forest cover in remote areas was developed using Landsat imagery. A revision of current forest maps was made necessary by a change in the definition of forest made to bring Australia into line with international standards.

An extensive series of ground validation plots was established across representative vegetation types in the Kimberley region in order to calibrate the satellite images. For the first time we now have accurate and reproducible estimates of forest cover in the Kimberley, which will serve as a baseline for future studies of changes. The map identifies a total of 3,084,689 ha of forest.

The new forest map of the region will be a valuable aid to reserve planning and management, as well as for estimating carbon sequestration in the tropical part of the State.

INTELLECTUAL PROPERTY MANAGEMENT

No CALM activities during the current year resulted in the commercialisation of a particular aspect of intellectual property (IP). However specifications relating to IP were included in relevant contracts for services.

The 1998 CALM workplace agreement includes a clause to the effect that all works, items, material or information produced or developed in the course of employment with CALM is property of the Crown in right of the State of Western Australia. This includes tangible material as well as industrial or intellectual property rights such as copyright.

ELECTORAL ACT 1907

In accordance with the requirements of Section 175ZE of the Western Australian Electoral Act 1907, CALM incurred the following expenditures in the financial year ended 30 June 1999:

Advertising agencies: \$25,490 (Effective Advertising & Design Pty Ltd).

Market research organizations: \$5,500 (The Bosche Group).

Media advertising organizations: \$366,043 (Marketforce Productions) and \$69,224 (Media Decisions WA).

There was no expenditure in the Direct Mail and Polling areas by the Department.

Total expenditure was \$435,270.

CALMfire MANAGEMENT

Wildfires

The summer fire season in south-western Western Australia was very dry, but daily conditions were generally mild and fire danger levels were well below average. As a result there were few large damaging fires on CALM-managed lands throughout the area. There was a high incidence of fires in the Perth District, however, particularly within pine plantations north of Wanneroo. While most of these 207 fires were deliberately lit, they were all rapidly contained by CALM fire crews with assistance from local volunteer bushfire brigades and fire crews from the Fire and Emergency Services Authority (FESA).

Dry autumn conditions in the south-west were responsible for several large fires that escaped from burns on private property. CALM forces attended several large fires emanating from private lands near Avon Valley National Park, Flynn's Block east of Mundaring, Serpentine near Millbrooke Estate, Boranup Forest near Karridale, Greenbushes and north of Molloy

Island (north-east of Augusta).

Elsewhere in the State CALM crews attended large fires in the Fitzroy River Valley in the Kimberley, Karijini National Park, and the areas surrounding Cape Range National Park near Exmouth. A lightning strike within the Stirling Range National Park was rapidly suppressed before it could burn out large sections of the western part of the Park.

Operation Firebird

The fire agencies aerial suppression program covering the Perth outer metropolitan area again proved very successful in summer 1998-99 with many notable saves. In particular the 'water-bombers' were effective in suppressing the Serpentine fire on 7 February 1999, which had the potential to threaten the Millbrooke Estate and the Jarrahdale townsite as well as damage important areas near metropolitan forests and parks. Due to the difficult terrain and poor access it was only contained by continuous aerial drops of foam combined with the rapid deployment of CALM and volunteer bushfire brigade firefighters.

Wildfire Investigation

CALM's Wildfire Investigation Program was implemented in 1989-99. It aims to accurately determine the origin, cause, circumstances and those responsible for fires affecting CALM-managed lands. CALM's Fire Investigation Coordinator was assisted by 19 specially trained investigators. Achievements included representation on the Interagency Wildfire Investigation Action Team, the development of Manuals on Wildfire Cause Investigation and Wildfire Investigation Call-Out Procedures, and the preparation of Fire Cause Indicators for Western Australian forests. During the 1998-99 fire season, 12 formal fire investigations were conducted, and two investigations were done on behalf of local government authorities.

Prescribed Burning

The long periods of very dry weather during the main burning months between October and December 1998 and March to May 1999 meant that there were few days available to complete prescribed burning in CALM's south-western forests without significant risk of escape. The prescribed burning program was further constrained by the high incidence of unfavourable wind and atmospheric conditions conducive to smoke accumulation in Perth and other regional centres. These weather constraints resulted in CALM Forest Districts achieving less than 50 per cent of the planned annual prescribed burning program. The 1998-99 burn program achieved in the forest area was the lowest since 1961. The backlog of uncompleted burns that has accumulated over the past three years has become a matter of serious concern, as there are currently large sections of forest that have accumulated dangerous levels of highly flammable ground fuels.

Plant and Equipment

CALMfire completed the construction of 10 new heavy duty fire pumpers as part of its fire truck-pumper replacement program. A total of 52 new fire trucks have now been constructed in the past five years. CALM also delivered a new heavy duty fire truck to the South Kwinana Brigade as part of an agreement for brigades to assist in fire protection of the reserves in the Beeliar Regional Park. Six trailer-mounted fast-attack fire units have been constructed for the Kimberley Region. CALM's aerial detection fleet was boosted by the purchase of two additional new single-engined Champion Scout aircraft from America. There are now four new Champion Scouts as well as five Piper Super Cubs in CALM's aerial fire detection fleet. The latter will be gradually replaced over the next three years.

Liaison

CALM hosted the Western Australian component of the 1999 Canadian/USA Fire Management Study Tour of Australia and New Zealand in April 1999. The delegation of 11 comprised Fire Chiefs from the US Forest Service and National Parks Service and Parks Canada. The Group examined strategic planning, fire prevention systems including prescribed burning operations and detection, and fire research in south-western forests, parks and reserves.

The Fire Interagency Executive Group (CALM and FESA) continued to meet regularly during the year with the objective of integrating fire prevention, operations, training and community relations fire services in Western Australia. Major achievements included the preparation of State Plans for Bushfire Response and Community Relations, cooperative aerial water bombing in the outer-metropolitan area of Perth, the completion of Wildfire Threat Analysis for Perth's rural-urban interface, collaboration on the provision of integrated mapping systems, the development of a State approach to reducing community impacts from bushfires and the commencement of integrated fire training programs.

Research

CALM and the CSIRO's Forestry and Forest Products completed the field component of the Project Vesta Experimental Research Program. The project aims to investigate fire behaviour and the spread of high intensity bushfires in dry eucalypt forests with different fuel ages and forest understorey structures. The

analysis of the data will focus on the factors influencing rapid fire development and the production of improved fire behaviour prediction systems and management guidelines for firefighter safety.

CALM and the University of Western Australia Honours Program piloted a project aimed at transferring forest fire history data from the mid-1930s previously held on microfiche records to a Geographic Information System. Methods were developed and tested in a study of Manjimup District fire records for 19 years between 1954-55 and 1973-74. In particular the study provides a basis for identifying changes in fire regimes and the possible impacts on biodiversity. All fire history maps on microfiche have now been transferred onto compact disc media.

Planning Systems

CALM in association with FESA completed a strategic assessment of bushfire threats in the fire-prone urban-rural interface of the Darling Scarp between Mundaring and Dwellingup. The results of the Wildfire Threat Analysis will lead to better targeted and improved coordination of fire prevention programs with local government authorities. CALM completed initial development of SmartCOG¹ software that will allow interagency fire managers and other CALM users to prepare and print maps for specific operational and strategic planning needs. CALM completed the transfer of master burning plan data and information to a MapInfo® desktop mapping environment. This planning tool significantly improves integrated planning with timber harvesting and silviculture. It also provides thematic

mapping and predictive modelling capabilities for testing the use of fire to meet land use objectives and community protection standards.

Training

CALMfire has conducted a large number of fire training courses over the year covering a number of topics including the Incident Control System, Fire Management for new CALM recruits, Logistics Management, Operations Management, Incident Planning, Fire Control Line Construction with Machines² and CALM Fire Management. A number of these courses were attended by personnel from outside CALM including FESA staff. CALMfire firefighting courses for CALM crews and contract personnel were run by Districts and Regional staff. Many of the existing CALMfire courses were reviewed and updated. Course development has progressed in Prescribed Burning and Sector Commander training in cooperation with FESA. Promotion of common training systems and material between fire agencies within Western Australia was actively pursued as was the exchange of training material from other States. Liaison on training development at the national level has been maintained and CALM has provided significant input into the development of the Australian Public Safety Competency Standards and the National Fire Training curriculum material.

¹ SmartCOG is software allowing customised display of 'Operational Graphics' maps used in fire management.

² Newly developed courses.

CALMfirePERFORMANCE INDICATORS FOREST REGIONS 1998-99

Key Effectiveness Indicators

1. Prescribed Burning

The reduction of fuels in Priority 1 zones to a satisfactory condition in 75% of designated areas and in Priority 2 zones in 60% of designated areas.

Notes

The base data have been collected manually from region and district plans and from CALM's Fire Support System and associated MS Access relational database programs.

The Performance Indicators assume (i) jarrah to be tolerant to prescribed fire from age 10 years and karri from age 25 years, and that (ii) 80% of jarrah fire-tolerant regrowth exceeding 10 years, and 50% of karri fire-tolerant regrowth exceeding 25 years, is returned to prescribed burning programs.

The Performance Indicators exclude areas that are not available for burning because of (i) fire-sensitive regeneration and mining rehabilitation, (ii) hardwood and softwood plantations, (iii) stream reserves and temporary exclusion zones, and (iv) No Planned Burn and scientific study reference areas.

Region	Priority 1 (%)			Priority 2 (%)		
	1996-97	1997-98	1998-99	1996-97	1997-98	1998-99
Swan Region	45.6	43.9	41.1	45.8	37.9	31.4
Central Forest Region	82.8	73.8	63.8	77.3	66.6	50.9
Southern Forest Region	67.7	59.0	56.5	68.9	69.4	58.1

Prescribed burning achievements relative to CALM's Wildfire Threat Analysis (WTA) benchmarks were influenced in 1998-99 by increased burn complexity, the need to maintain the excluded mosaic of fire free areas, adherence to the State's air quality management criteria and lack of suitable safe burning days in both spring/early summer and autumn.

Definitions:

Priority 1 refers to 'essential prescribed burns' necessary for the protection of human life, community values and rare, threatened and fire vulnerable species of flora and fauna and major forest plantations.

Priority 2 refers to 'important prescribed burns' necessary for the protection of broad nature conservation values.

Satisfactory condition means forest fuels available for burning will not exceed 7.5 to 8.5 tonnes per hectare in jarrah and 15.0 to 19.0 tonnes per hectare in karri. Under these fuel conditions headfire attack will be successful on days except when the fire danger in very high or extreme.

The 75% and 60% fuel reduction limits provide the minimum level considered necessary for the protection of community and nature conservation values.

Designated areas are forests where prescribed burning is an allowed land use and where areas are available for burning. The need to protect jarrah and karri regeneration after timber harvesting renders these areas unavailable for prescribed burning for between 10 and 25 years.

2. Fire Suppression

In 95% of fires attended under 95 percentile weather conditions, the commencement of attack with effective suppression forces, before fires exceed 1 hectare in Priority 1 areas and 2 hectares in Priority 2 areas.

Definitions:

Suppression forces are prescribed in CALM's Red Book Dispatch Tables for fire crews and equipment and by Wildfire Threat Classes.

The 95 percentile weather conditions are days when fire danger is below very high and extreme. Firefighters work safely and effectively under these conditions in standard forest fuels.

Region	Priority 1 (%)			Priority 2 (%)		
	1996-97	1997-98	1998-99	1996-97	1997-98	1998-99
Swan Region	100	100	98	100	100	100
Central Forest Region	100	100	100	100	100	95
Southern Forest Region	100	100	100	100	100	100
CALM Average	100	100	99	100	100	98

LEGISLATION & COMPLIANCE

1998-99

ACTS ADMINISTERED

- *Conservation and Land Management Act 1984*
- *Sandalwood Act 1929*
- *Wildlife Conservation Act 1950*

On behalf of the people of Western Australia, the Department manages national parks, conservation parks and marine parks, State forests and timber reserves, nature reserves and marine nature reserves, other reserves and lease areas and any associated fauna, flora and forest produce. It is also responsible for conserving flora and fauna throughout the State.

The *Conservation and Land Management Act 1984* (CALM Act) established CALM and provides for five controlling bodies: the Lands and Forest Commission, the National Parks and Nature Conservation Authority, the Marine Parks and Reserves Authority, the Marine Parks and Reserves Scientific Advisory Committee and the Forest Production Council. All are responsible to the Hon Minister for the Environment. Their functions are described in separate annual reports.

MINING AND GOVERNMENT AGREEMENTS ACTS

The CALM Act does not generally protect land managed by the Department from mining or development projects. Section 4 of the CALM Act states that nothing in the Act shall take away from the operation of any Act relating to minerals or petroleum or any Agreement Act for a development project (except in Marine Nature Reserves and certain zones in Marine Parks which are protected from petroleum drilling and production).

Agreement Acts (e.g. the *Alumina Refinery Agreement Act 1961*) are administered by the Minister for Resources Development. The CALM Act cannot impose restrictions on mining or on development projects subject to an Agreement Act. The requirements for mining and development projects with respect to land managed by the department are stated in the *Mining Act 1978* and the individual Agreement Acts. The requirements of the *Environmental Protection Act 1986* also need to be satisfied with such projects on land managed by the Department.

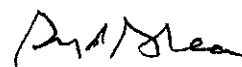
The following mining and petroleum Acts prevail over the CALM Act: *Mining Act 1978*; *Petroleum Act 1967*; *Petroleum Pipelines Act 1969*; *Petroleum (Submerged Lands) Act 1982*.

Agreement Acts which involve clearing land managed by CALM, or which require access to forest resources, also include specific responsibilities for the department. The bauxite and coal operations predominantly require permission to be given by the Department for the companies to harvest the timber before mining.

The Agreement Acts with specific departmental responsibilities include: *Alumina Refinery Agreement Act 1961*; *Alumina Refinery (Worsley) Agreement Act 1973*; *Collie Coal (Griffin) Agreement Act 1979*; *Collie Coal (Western Collieries) Agreement Act 1979*; *Dardanup Pine Log Sawmill Agreement Act 1992*; *Silicon (Kemerton) Agreement Act 1987*; *Wesply (Dardanup) Agreement Authorisation Act 1975*; *Wood Chipping Industry Agreement Act 1969*.

Statement of Compliance with written law 1998-99

We have attempted to comply with the requirements of relevant written law, as originally enacted and as curiously amended. Steps have been taken to rectify minor errors and omissions detected during 1998-98. The relevant Acts and amendments are noted in this section of the annual report.



Syd Shea
Executive Director
30 August 1999

The *Mineral Sands (Eneabba) Agreement Act 1975* affects the Department's management of the land involved in the project.

The establishment of hardwood plantations by way of timber sharefarming agreements with CALM under section 34B of the CALM Act have been ratified by the following Agreement Acts: *Albany Hardwood Plantation Agreement Act 1993*; *Bunbury Treefarm Project Agreement Act 1995*; and the *Collie Hardwood Plantation Agreement Act 1995*.

OTHER RELEVANT ACTS

The *Bush Fires Act 1954*, which has important requirements for the Department with respect to fires on land managed by the Department.

Other State Acts which have relevance to CALM's operations and role as an employer include: *Aboriginal Heritage Act 1972*; *Aerial Spraying Control Act 1966*; *Agriculture and Related Resources Protection Act 1976*;

Agriculture Protection Board Act 1950; Beekeepers Act 1963; Control of Vehicles (Off-Road Areas) Act 1978; Country Areas Water Supply Act 1947; Dividing Fences Act 1961; Energy Corporation's (Powers) Act 1979; Electricity Corporation Act 1994; Environmental Protection Act 1986; Equal Opportunity Act 1984; Explosive and Dangerous Goods Act 1961; Financial Administration and Audit Act 1985; Fish Resources Management Act 1994; Freedom of Information Act 1992; Government Employees Housing Authority Act 1964; Health Act 1911; Heritage of Western Australia Act 1990; Industrial Relations Act 1979; Labour Relations Amendment Act 1997; Land Acquisition and Public Works Act 1902; Land Administration Act 1997; Local Government Act 1995; Long Service Leave Act 1958; Metropolitan Water Supply, Sewerage and Drainage Act 1909; Minimum Conditions of Employment Act 1993; Misuse of Drugs Act 1981; Mutual Recognition (Western Australia) Act 1995; Occupational Safety and Health Act 1984; Occupiers Liability Act 1985; Public Sector Management Act 1994; Soil and Land Conservation Act 1945; State Employment and Skills Development Authority Act 1990; State Supply Commission Act 1991; Swan River Trust Act 1988; Timber Industry Regulations Act 1926; Titles Validation Act 1995; Town Planning and Development Act 1928; Water Agencies Restructure (Transitional and Consequential Provisions) Act 1995; Water and Rivers Commission Act 1995; Water Corporation Act 1995; Water Services Coordination Act 1995; Workers' Compensation and Rehabilitation Act 1981; Workplace Agreements Act 1993.

Commonwealth Acts relevant to the Department's activities: *Arts, Territories and Environment Act 1975; Endangered Species Protection Act*

1992; Environment Protection (Impact of Proposals) Act 1974; National Parks and Wildlife Conservation Act 1975; Native Title Act 1993; Superannuation Guarantee Act 1990; Training Guarantee Administration Act 1990; Whale Protection Act 1980; Wildlife Protection (Regulation of Exports and Imports) Act 1982; Workplace Relations Act 1996; World Heritage Properties Conservation Act 1983.

International agreements relevant to the Department's activities: *Agreement between the Government of the People's Republic of China and the Government of Australia for the Protection of Migratory Birds and their Environment; Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment; Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Agreement); Convention on International Trade in Endangered Species of Wild Fauna and Flora; Convention for the Protection of the World Cultural and Natural Heritage; Convention on the Conservation of Migrating Species of Wild Animals; Convention on Biological Diversity.*

CHANGES IN LEGISLATION

Marine Conservation Reserves

Major amendment and addition was made to the provisions of the CALM Act applying to marine conservation reserves, including the establishment of a Marine Parks and Reserves Authority, a Marine Parks and Reserves Scientific Advisory Committee, a new multiple-use reserve category (the 'marine management area'), and new consultation and planning procedures applying before reservation is effected. These changes were made by the *Acts*

Amendment (Marine Reserves) Act 1997, which also amended five other Acts in relation to the Government's marine conservation reserve policy.

Land Administration

Amendment to the CALM Act was made by the *Acts Amendment (Land Administration) Act 1997* by substitution of references to the repealed *Land Act 1933* with *Land Administration Act 1997* and the concept of 'vesting' of reserves with that of placement of the 'care, control and management' of reserves in a controlling body. The Amendment Act also made consequential changes to the *Wildlife Conservation Act 1950*.

Minor Admendments to Acts

Minor amendments effecting repeals, removal of anomalies and correction of inconsistencies were made to the CALM Act and the *Wildlife Conservation Act 1950* by the *Statutes (Repeals and Minor Amendments) Act 1997* and the *Statutes (Repeals and Minor Amendments) Act (No.2) 1998*.

Apiary Site Management

The *Forest Management Amendment Regulations 1998* increased the number of Crown land apiary sites, which can be held by beekeepers according to their hive numbers. Apiary site permit fees were increased and administrative fees were introduced or adjusted.

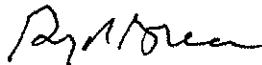
Matilda Bay Reserve

Parking fees on the Matilda Bay Reserve were increased by the *Conservation and Land Management Amendment Regulations 1998*. An increase in parking fees has also been made by the University of Western Australia and the City of Subiaco for areas under their control immediately adjoining the reserve.

PERFORMANCE INDICATORS

OUTPUTS 1-5

I certify that these performance indicators are based on proper records and fairly represent the performance of the Department of Conservation and Land Management for the year ended 30 June 1999.



Syd Shea
Executive Director
13 August 1999

OUTPUT 1

NATURE CONSERVATION

Outcome

The conservation of indigenous plants, animals and ecological processes in natural habitats.

Output Description

The production and implementation of management plans and programs for flora and fauna conservation, for threatened species and ecological communities and for commercially exploited species according to the principles of ecological sustainability, for the acquisition, conservation and protection of representative ecosystems and for conducting emergency actions to save wildlife, minimising adverse effects of fire, weeds, feral animals and disease and developing public awareness, understanding and support for the nature conservation programs, services and policies.

Note: CALM uses the National Strategy for the Conservation of Australia's Biological Diversity definition of 'conservation', ie. 'the protection, maintenance, management, sustainable use, restoration and enhancement of the natural environment.'

The Output performance can be best measured by effectiveness and

efficiency indicators in three key areas:

1. Wildlife and habitat management.
2. Wildlife utilisation.
3. Threatened species management.

Key Effectiveness Indicators

1. *Wildlife and Habitat Management.*

Land is set aside for the management of wildlife and habitat. Management strategies are developed to ameliorate threatening agents, such as fire, pests, weeds and diseases, which can impact on the functioning of native ecosystems, and threaten the survival of species.

Performance Indicator

Example population estimates of native fauna following control of a threatening process.

Notes

Research by CALM scientists demonstrated in 1988 that fox predation was a major cause of small fauna decline in the south west of Western Australia. This led to the baiting for foxes in selective areas of CALM estate which resulted in the recovery of several species of threatened fauna at those sites. In 1994 the baiting program was extended as Operation Foxglove, where

500,000 ha of the northern jarrah forest was baited on a regular basis. In 1996, this program was further expanded as Western Shield and now over 3.4 million hectares of the State is baited.

If baiting for foxes is successful in reducing fox predation as a threatening process, then it would be expected that fauna in the size range susceptible to fox predation would firstly stabilise, and then recover to an equilibrium level for the area of suitable habitat in a bushland locality. To monitor the implementation of Western Shield, monitoring sites are being established across the range of the baiting program.

Measure

Population estimates for native fauna susceptible to fox predation in areas where fox baiting is occurring, as shown by monitoring sites in each CALM region where Western Shield is operating.

Note: The full Western Shield program commenced in 1996, and hence only three years of monitoring data is available for CALM Regions where baiting was not previously undertaken. An example set of data from an area baited under Western Shield is presented over.

The graph opposite shows the recovery following fox baiting, of medium-sized mammals that are prone to fox predation, from the 107,812 ha Lake Magenta Nature Reserve in CALM's Katanning District, southeast of Lake Grace. Prior to fox baiting, low levels of medium-sized mammals were known from the reserve, with Quenda and Brushtail Possum not being recorded at all. Following fox baiting the medium-sized fauna diversity of the area has increased, with populations of Quenda and Brushtail Possums being recorded, and increasing significantly in 1999. This response to fox baiting is typical of the response over the range of fox baiting activity. Further examples of monitoring from other regions have been presented in previous annual reports.

2. Wildlife Utilisation.

Species such as kangaroos, crocodiles and a number of flora species (excluding timber) are commercially utilised and must be managed to ensure the use is sustainable.

Performance Indicator

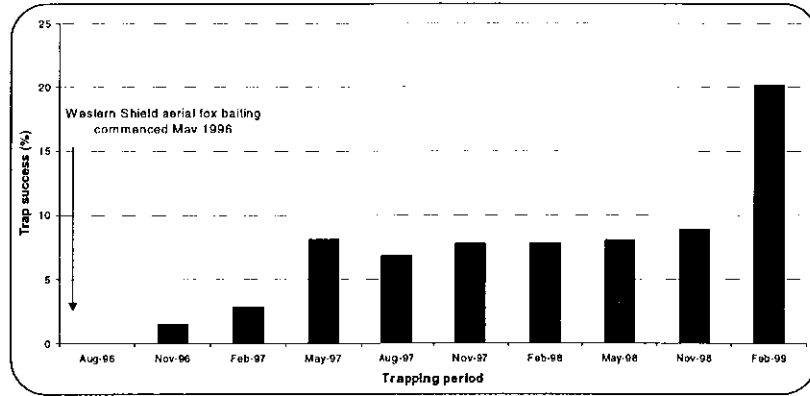
Example population levels of harvested wildlife.

Notes

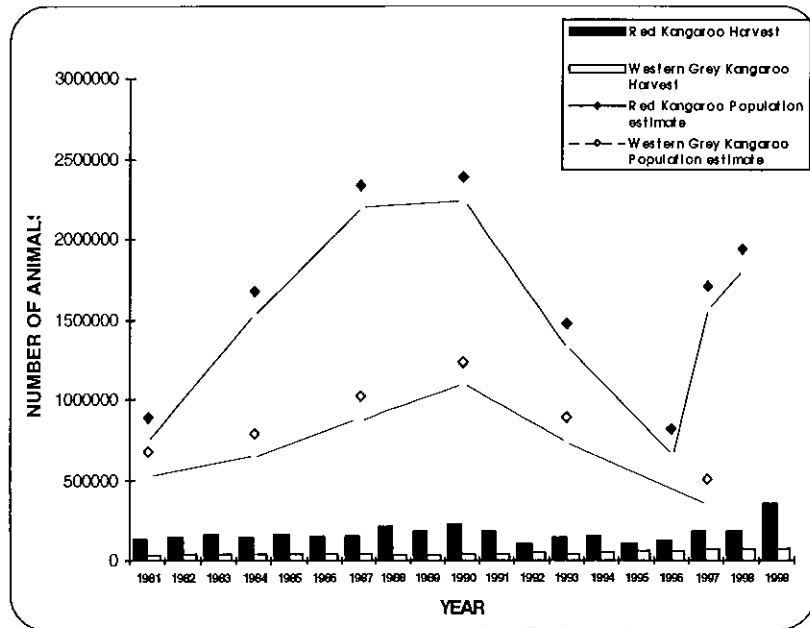
The management of flora is based on the non-destruction of the harvested plants and is therefore sustainable. Limited harvesting of breeding crocodiles, eggs and hatchlings occurs from the wild. Kangaroo harvesting, however, involves the taking of larger numbers of animals from the wild, and must, therefore, be managed in a manner that does not threaten the wild populations.

The management programs for red and western grey kangaroo harvesting were first published in 1973. These programs outline the basis of sustainable harvesting using population estimates and harvest quotas.

Trap Success Rates for Medium Size Mammals at Lake Magenta Nature Reserve



Population Estimates and Harvest Levels for Managed Kangaroo Populations in Western Australia



From 1981 to 1993, triennial aerial surveys were undertaken for red and western grey kangaroos over the pastoral region of Western Australia. Since 1995 the surveys have been done annually, covering one third (one million km²) of the pastoral region. These data are used to estimate the populations of these species which are subject to commercial harvest.

Annual population estimates of red kangaroos are calculated from the survey data, with the estimates for the between-survey areas being extrapolated using population trend information, while western grey kangaroo populations are only recalculated when the southern pastoral region, where this species mainly occurs, is surveyed. Sustainable harvest quotas have been determined

from historical monitoring, and are set at a maximum of around 25% of the population estimate, with the actual quota based on:

- current population trends;
- seasonal conditions;
- review of previous harvests;
- the proportion of the habitat and population not subject to harvesting;
- current land use practice and trends in land use; and
- significance of the take outside the commercial quota.

Measure

The graph above illustrates the management of harvest levels that allow for the maintenance of kangaroo populations in areas where commercial harvesting occurs.

Note: As from 1998 population estimates for kangaroos have been corrected for temperature. This gives a more realistic estimate of kangaroo numbers. Previous years' population data has also been recalculated using the temperature correction.

The variations observable in the populations of the kangaroo species mainly reflect rangeland condition, primarily as determined by rainfall. As a natural feature of kangaroo population data, these fluctuations are taken into account over the longer term in setting sustainable harvest levels.

3. Threatened species management.

A management system is in place to identify, protect and recover flora and fauna that is threatened with extinction or otherwise in need of special protection.

Performance Indicator

The identification and management of wildlife taxa that are threatened or requiring special conservation attention.

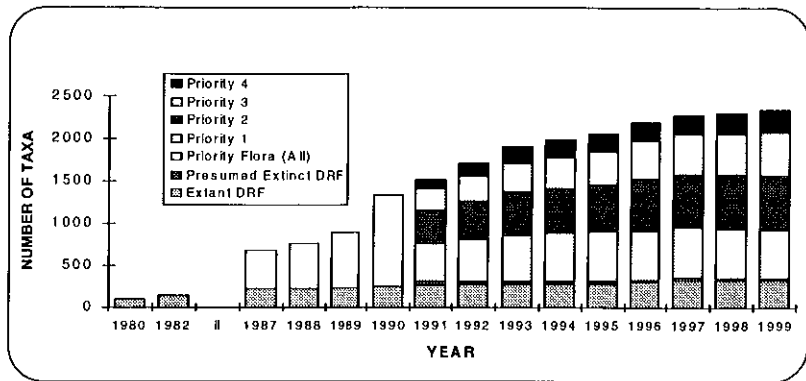
This indicator may be addressed through two management phases: The management of threatened taxa for their conservation in Western Australia is based firstly on the identification and listing of these taxa in appropriate categories as determined by the level of threat and the level of available knowledge.

a) The number of the State's wildlife taxa listed as either threatened or requiring special conservation attention, compared to previous years.

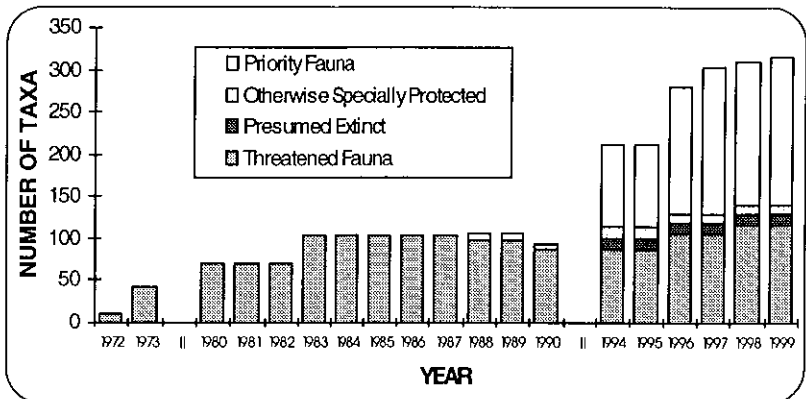
Note

As from 1998-99 the measure relates to actual listing changes to the declared lists of specially protected fauna and flora made by the Minister for the Environment and the lists of priority fauna and flora prepared by CALM. Recommendations made by the Threatened Species Scientific

Number of Declared Rare (DRF) and Priority Flora Taxa



Number of Threatened, Otherwise Specially Protected and Priority Fauna Taxa



Committee, but not yet declared by the Minister, are not included.

Measure

As shown in the graphs above, at 30 June 1999 a total of 2,657 taxa (2,341 flora and 316 fauna) were declared to be specially protected, or included on the Department's priority flora and fauna lists. This represents an increase of 1.5% in the number of taxa listed as requiring special conservation status compared to 1997-98.

A total of 54 flora and 6 fauna taxa were added, and 23 flora and no fauna taxa were deleted from the lists during the year. Additions were due to further scientific study of the State's flora and fauna revealing additional taxa that appear to warrant special conservation attention, while deletions were due either to taxonomic studies revealing taxa that were inappropriately listed, or surveys revealing that taxa were more common than previously thought, and therefore no longer warranting special conservation attention.

Notes: Migratory bird species listed under Schedule 3 of the fauna notice are not included in the numbers of taxa requiring special protection as most are not Western Australian species.

A taxon (plural taxa) is a term for any classificatory group of organisms, including species, subspecies and varieties. The indicator refers to the number of the State's wildlife taxa that are either;

- declared to be specially protected by the Minister for Environment under the Wildlife Conservation Act 1950, that is, taxa that are considered to be either rare, likely to become extinct, or otherwise in need of special protection; or
- listed by the Department as priority flora or fauna, that is, taxa that are either poorly known but potentially in need of special protection based on the information available, or rare but not currently threatened and in need of monitoring. Full definitions were presented in the Department's 1997-98 Annual Report.

The increase in the number of taxa listed is a reflection of the Department attaining a better knowledge base of the State's wildlife through taxonomic revision, curation of collections, databasing of information, and field investigations, and does not in itself represent a change in the conservation status of the State's wildlife.

The objective of threatened taxa management is to enable threatened taxa to be de-listed or re-listed in less threatened categories, and to obtain the necessary information for poorly known taxa to categorise them properly.

Given the probabilistic nature of the categories of threat, and the long term nature of threatened taxa recovery, significant management actions may occur before a taxon moves from one category to a lower risk category. The measure of such movements therefore will occur over long time periods.

b) The recovery of threatened taxa as a consequence of specific management actions as demonstrated through case examples.

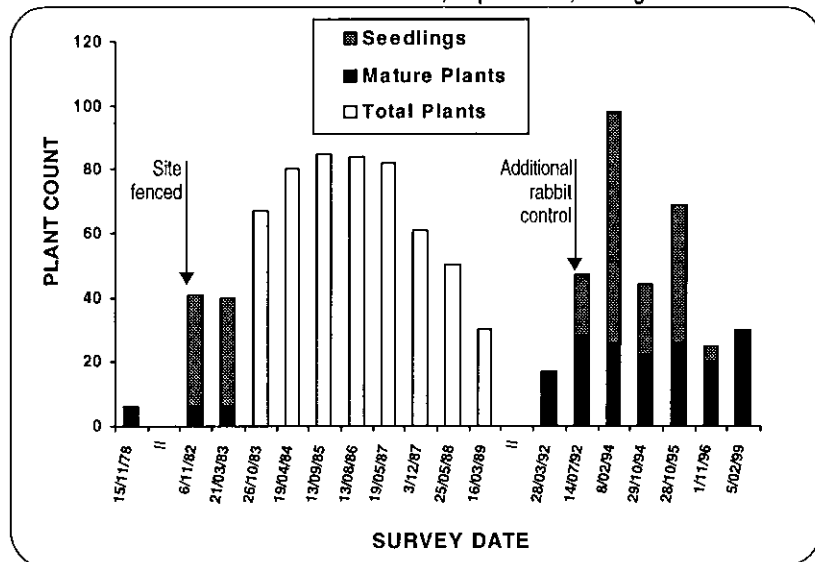
Note

The following examples of the recovery of threatened taxa are typical of the type of response achievable with properly planned habitat management and fauna translocations. Further examples have been presented in previous annual reports.

Measures

- i) *Darwinia carnea* was first discovered near Mogumber in 1922. It was last seen at this locality in 1970 and presumed extinct there until 1990, when it was rediscovered in two areas. A third small population was discovered near Narrogin, 250 kilometres from Mogumber, in the early 1970s. This population is slightly different to the Mogumber populations, and is referred to as the Narrogin Bell. It may be described as a different subspecies.

Darwinia carnea Plant Counts, Population 1, Narrogin



Darwinia carnea was declared as rare flora in 1980, and ranked as critically endangered in 1995. An Interim Recovery Plan was prepared in 1996.

Prior to the rediscovery of the Mogumber populations, the conservation of this species was dependent on the Narrogin population. The conservation of this population is still a priority given the disjunct nature of the populations, and the observed difference in the plants between these two sites.

The Narrogin population occurs on a small, exposed bush remnant on private property. Extensive surveys have occurred for new populations in the Narrogin area, but no further populations have been located.

The small size of the remnant in which it occurs, the lack of statutory control over the land and adjacent land use, an observed decline in the supporting vegetation, edge effects to the bushland, and the threat of a single event destroying the population, all contribute to the critically endangered nature of this population and the survival of this plant in the wild. Management measures were, therefore, developed and implemented to

assist in the conservation of this population.

A major threat was determined to be rabbit grazing preventing the establishment of seedlings. The initial management action was to fence the population to prevent grazing, including by rabbits. Additional rabbit control was introduced later to achieve further plant recovery.

The graph above shows the success of these management actions in achieving seedling establishment and survival through to adult plants.

Action is being taken to establish a new population on protected lands, using plants grown from cutting material collected from the site.

- ii) Medium-sized mammals in the south west of the State have generally declined in their population size and range due to loss of habitat and predation by foxes. While fox control under the Western Shield program has assisted the recovery of these species in many areas, in other areas some species have become locally extinct. In such situations translocation programs, in conjunction with fox control, may be implemented to re-establish the species in secure conservation reserves.

The graphs opposite show the results of two translocation programs (of the Chuditch *Dasyurus geoffroii* and Woylie *Bettongia penicillata ogilbyi*) into the Julimar State Forest (proposed Conservation Park), with supporting fox control. The translocations have been successful in establishing replicating, viable populations of these species in the reserve, as shown by the increase in the numbers of animals originating from the original translocated stock.

As a result of its recovery through fox control, the establishment of new populations through translocations, and habitat management, the Woylie was removed from the list of threatened fauna in 1996. It is, however, still regarded as being conservation dependent, that is dependent on continuing conservation actions such as those reported here.

The Chuditch is listed as a threatened species. Fox control, habitat management, captive breeding and the establishment of new populations in protected areas are strategies included in the published Recovery Plan for this species.

Key Efficiency Indicators

1. Wildlife and habitat management.

The cost per hectare managed.

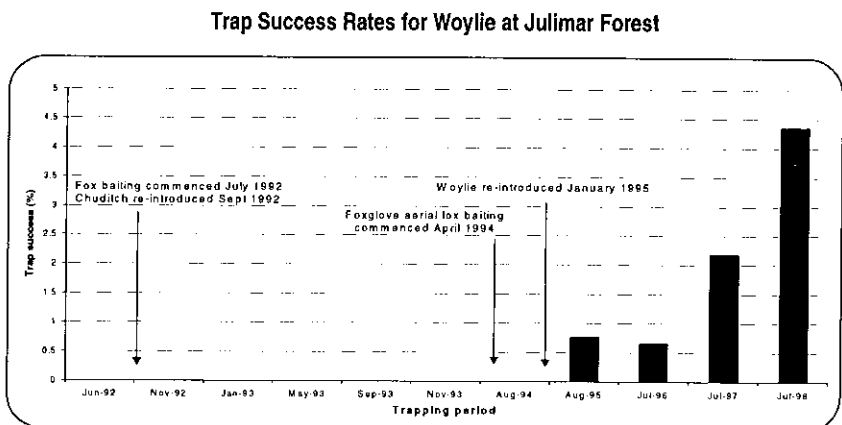
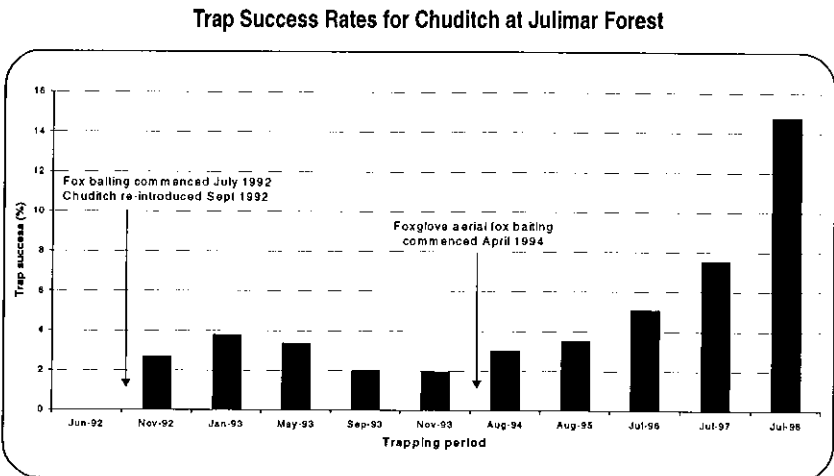
Note

This measure provides an indicative comparison on a per hectare basis of the total cost, exclusive of revenues, of managing nature conservation on CALM-managed lands and waters.

Measure

1997-98	\$2.12 per hectare
1998-99	\$1.85 per hectare

The 1998-99 cost represents a decrease of \$0.53 on the "Target" cost of \$2.38 in the 1998-99 Budget Statements.



This reduction mainly reflects the revision of the area managed to include all lands and waters for which CALM has nature conservation outputs. *Note: In previous years this cost was reported on a per 1,000 hectare basis, e.g. "\$1,852 per 1,000 hectares".*

2. Wildlife utilisation.

The accrual basis net cost after revenue of managing the harvesting and utilisation of wildlife per licence issued.

Note

This measure mainly comprises the direct and overhead costs associated with the conservation management of the kangaroo, aviculture, and flora industries, and marine mammal interaction; expressed on a per licence issued basis (2,601 licences in 1997-98, 2,482 in 1998-99).

Measure

1996-97	\$388 per licence
1997-98	\$430 per licence
1998-99	\$456 per licence

3. Threatened species management.

The accrual basis net cost after revenue of management per taxon that is threatened or otherwise requires special conservation attention.

Note

This measure mainly comprises the direct and overhead costs associated with species conservation, science services, fox control and the management of threatened flora and fauna; expressed on a per taxon basis (2,619 taxon at 30 June 1998, 2,657 at 30 June 1999).

Measure

1996-97	\$3,079 per taxon
1997-98	\$2,671 per taxon
1998-99	\$2,606 per taxon

OUTPUT 2

NATIVE FOREST MANAGEMENT

Outcome

Long term maintenance of the forest ecosystem and provision of sustainable wood production.

Output Description

The sustainable regeneration, protection, management and harvesting of native forests while maintaining or enhancing nature conservation, water, recreation, landscape and other values in the long term, management of the sandalwood industry on Crown land and developing public awareness, understanding and community support.

Key Effectiveness Indicators

1. The harvest from the native hardwood forest will be maintained at a sustainable level.

a) Quantity of log timber harvested.

Notes

The sustainable level is the average quantity of timber available for harvest each year which can be continued in the long term.

Forest areas available for timber harvesting are measured using specially designed inventory plots to determine the quantity of timber available and the rate at which it is growing.

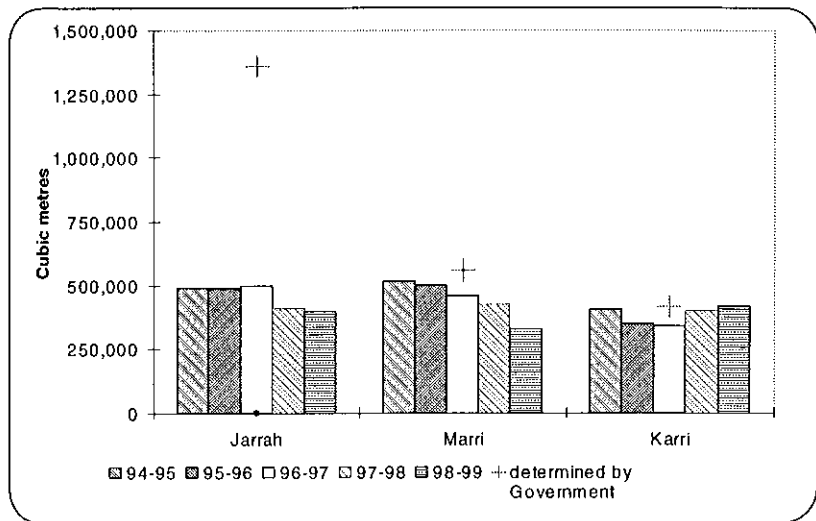
Based on independent analysis of this information, the Government determined the estimated sustainable level of harvest for the term of the current Forest Management Plan.

Harvest means the commercial extraction and sale of log timber for processing and value-adding.

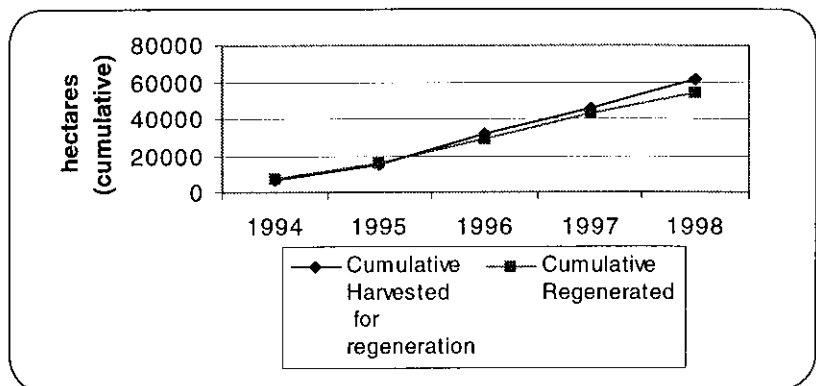
Measure

The quantity of log timber harvested compared with the estimated sustained yield determined by Government.

Log Timber Harvest



Cumulative Area Regenerated



Quantities harvested for this year were jarrah 397,963 m³, marri 329,732 m³ and karri 421,608 m³. Five-year trends are shown in the top graph above. The variations between jarrah yield and harvest volumes mainly reflect market constraints.

b) Area of forest regenerated.

Notes

Forest is harvested using a variety of silvicultural prescriptions, some of which involve thinning to increase growth, and others which involve removal of trees and renewing those areas of forest by regeneration.

Regeneration takes place over a period of time and regeneration actually completed in any one year may include

parts of areas harvested over a number of preceding years.

In order to remain sustainable over the long term, the area of forest regenerated should be equal to or greater than the area harvested.

Measure

The area of forest actually regenerated compared with the area of forest harvested for regeneration.

The area of forest harvested for regeneration this year was 15,680 ha, while a total of 11,360 ha was regenerated from this or previous year's cutting. Cumulative trends since 1994 are shown in the lower graph above. The recent variation in hectares regenerated reflects environmental and operational constraints.

2. The quantities of sawlogs harvested each year will be regulated by contractual agreements.

Notes

Regulate means to control the average quantity of log timber sold such that the available sustainable resource is not exceeded over a period of time.

The Government determined the estimated sustainable level of harvest for the term of the current Forest Management Plan.

The quantity of timber harvested is controlled by sale contracts. In order to maintain the sustainable levels, harvested timber must be equal to or less than sales contracts.

Measure

The actual quantities of sawlogs harvested compared with the quantities specified in sale contracts. Quantities for this year were jarrah 350,104 m³, marri 10,268 m³, and karri 226,098 m³. Five-year comparisons for each species are shown in the top graph opposite.

The variations in jarrah and marri volumes mainly reflect market constraints and industry restructuring.

Key Efficiency Indicators

1. Ratio of harvesting cost to revenue.

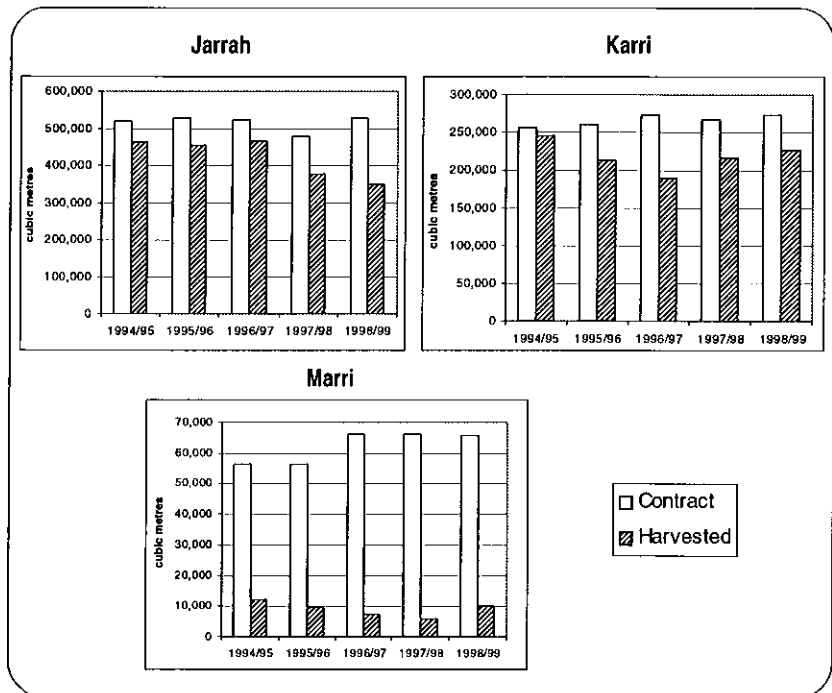
Note

Harvesting costs incurred in managing the harvesting, delivery and sales of log timber compared with the related revenue generated.

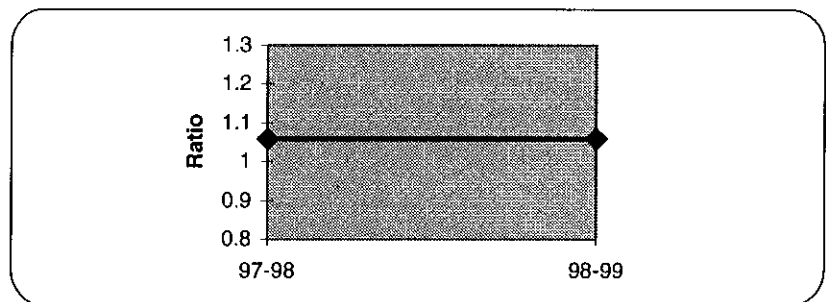
Measure

With expenditure of \$46,052,000 for harvesting and sales (in-forest costs, roading, administration, harvesting and delivery) and revenue of \$48,773,000, the ratio for 1998-99 was 0.94:1, a variation of 0.06 on the on the "Target" ratio of 1:1 in the 1998-99 Budget Statements. The trend of the converse ratio (i.e. revenue to

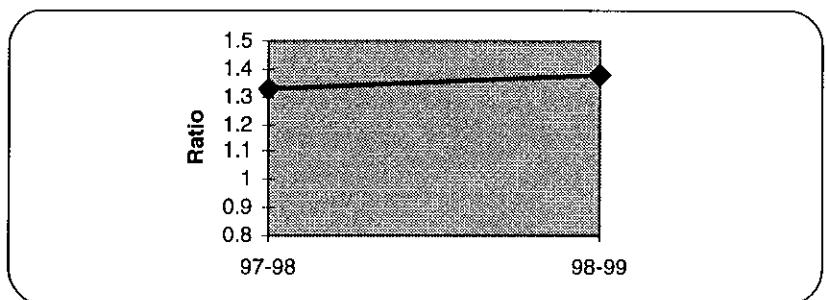
Sawlogs Contracted / Harvested



Revenue : Harvesting Cost



Revenue : Management Cost



harvesting cost, a ratio of 1.06:1) is shown in the centre graph above.

2. Ratio of management cost to revenue.

Note

Revenue comprises royalties which are the value per unit of log timber which recoups the management cost i.e. the cost of managing, growing and protecting the forest.

Measure

With revenue from royalties of \$39,634,000 and expenditure of \$28,752,000, the 1998-99 ratio was 0.73:1, an increase of 0.07 on the "Target" ratio of 0.66:1 in the 1998-99 Budget Statements; mainly reflecting reduced revenue due to market constraints. The trend of the converse ratio (i.e. revenue to management cost, a ratio of 1.38:1) is shown in the bottom graph above.

3. Profit on total revenue.

Notes

The profit before abnormal items on an accrual basis compared with total revenue. This indicator represents; (i) total revenue comprising the sales of log timber which includes royalties and other log timber charges related to harvesting, delivery and log sales, and any allocated revenues from government; and (ii) total expenditure comprising the costs of managing, growing and protecting the native forest, the cost of harvesting, delivering and sales of log timber, and corporate overheads.

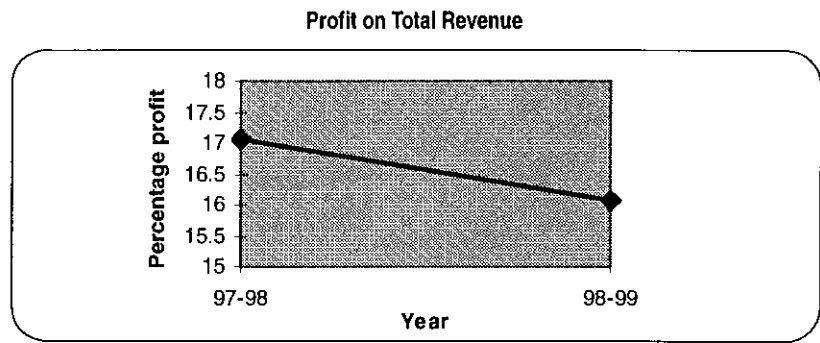
Measure

Profit for the year before abnormal items was \$14,334,000 or 16.1% on revenue of \$89,137,000. This represents a decrease of \$2,975,000 on 1997-98, mainly due to reduced operating revenue reflecting market constraints and industry restructuring. The trend is shown in the graph above.

4. Cost of harvesting.

Note

The accrual basis gross cost per tonne of harvesting all species of native forest



logs. The major elements of this cost relate to payments to contractors for harvesting and delivery, and road construction and maintenance.

Measure

The cost per tonne harvested was \$27.99, an increase of \$1.34 per tonne on the "Target" cost of \$26.65 in the 1998-99 Budget Statements.

5. Cost per hectare managed.

Note

The accrual basis gross cost per hectare of managing the native forest which totalled 1.869 million hectares at 30 June 1999. The major elements of this cost relate to regeneration and tending of the forest.

Measure

The cost per hectare managed was \$15.39, a decrease of \$0.46 on the 1997-98 cost of \$15.85.

6. Cost per hectare regenerated.

Note

The accrual basis gross cost per hectare of silvicultural management e.g. seedlings and site preparation, associated with regenerating the forest.

Measure

The 1998-99 cost per hectare regenerated was \$360.35, an increase of \$110.44 on the "Target" cost of \$249.91 in the 1998-99 Budget Statements. The increase mainly reflects the impact of environmental and operational constraints.

OUTPUT 3

PLANTATION MANAGEMENT

Outcome

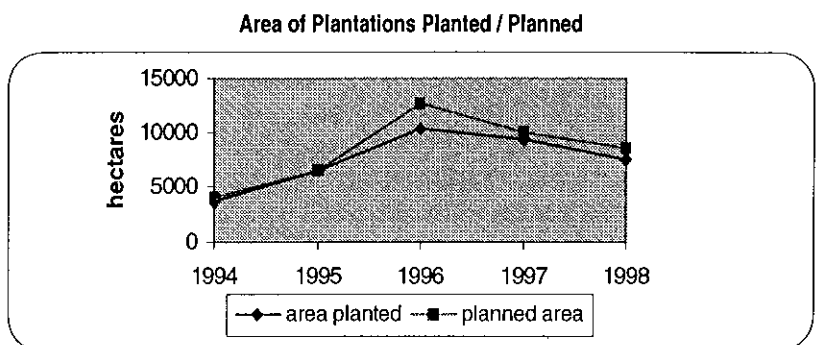
Long term maintenance of the forest ecosystem and provision of sustainable wood production.

Output Description

The establishment, regeneration, protection, management and harvesting of plantations while maintaining or enhancing nature conservation, water, recreation, landscape and other values in the long term, and developing public awareness, understanding and community support for plantations.

Key Effectiveness Indicator

- 1. The area of plantations established will meet the defined outcome.



Note

Plantations are established on both Crown and private land directly for the Government and acting as agents for private companies.

The establishment of plantations helps the provision of sustainable wood production.

Measure

Area of plantations planted compared with planned planting.

Total area planted for the last complete planting year to 31 December 1998 was 7,518 ha compared with a target of 8,466 ha, mainly reflecting a shortfall in suitable land becoming available for sharefarm planting. Five-year trends are shown in the graph above.

Key Efficiency Indicators

1. Cost of harvesting and sales compared with revenue generated.

Note

These are costs incurred in managing the harvesting delivery and sales of plantation timber and should be fully recouped from the revenue generated, equating to a ratio of not less than 1.0.

Measure

Ratio of revenue to expenditure for harvesting and sales (plantation costs, roading, administration, harvesting and delivery).

Revenue for this year was \$16,403,000 compared with expenditure of \$16,532,000, a ratio of 0.99:1. The trend is shown in the top graph opposite.

2. Cost of management compared with revenue from stumpages.

Note

Stumpages are the value per unit of plantation timber by which the plantation owner recoups the cost of managing, growing and protecting the plantation while achieving a profitable rate of return over time.

Measure

The ratio of revenue from stumpages to expenditure on managing, growing and protecting the plantations.

Revenue for this year was \$31,604,000 compared with expenditure of \$33,373,000, a ratio of 0.95:1. The trend is shown in the centre graph above.

3. Profit on total revenue.

Note

The profit before abnormal items on an accrual basis compared with total

revenue. This indicator represents: (i) total revenue comprising the sales of log timber which includes stumpages and other log timber charges related to harvesting, delivery and log sales, recoupable works, sale of nursery produce and any allocated revenue from government; and (ii) total expenditure comprising the costs of establishing, managing, growing and protecting plantations, and the costs of harvesting, delivering and sales of plantation timber.

Measure

Profit for the year before abnormal items was \$3,127,000 or 5.9% on revenue of \$53,031,000.

This represents an increase of \$8,130,000 on 1997-98, reflecting mainly a reduction in operating expenses and an increase in allocated revenue from government. The trend is shown in the bottom graph opposite.

4. Cost of harvesting.

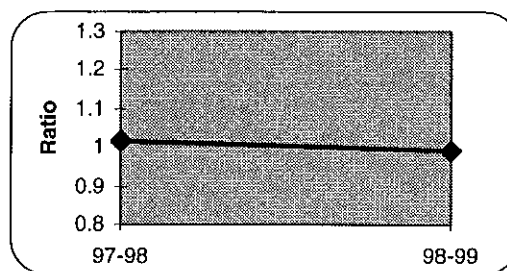
Note

Accrual basis gross cost of harvesting expressed as: (a) per tonne harvested, and (b) per m³ produced, for all species of plantation timber. The major elements of the costs comprise payments to contractors for harvesting and delivery, and roading.

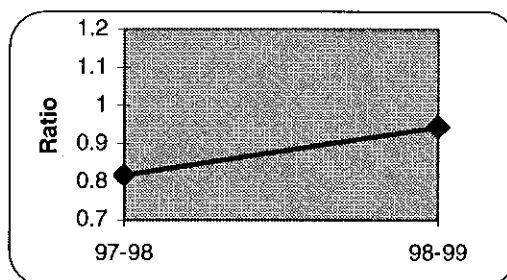
Measures

- a) The cost per tonne harvested was \$26.85, an increase of \$0.93 on the 1997-98 cost of \$25.92.
- b) The cost per cubic metre produced was \$27.31, a decrease of \$0.36 on the "Target" cost of \$27.67 in the 1998-99 Budget Statements.

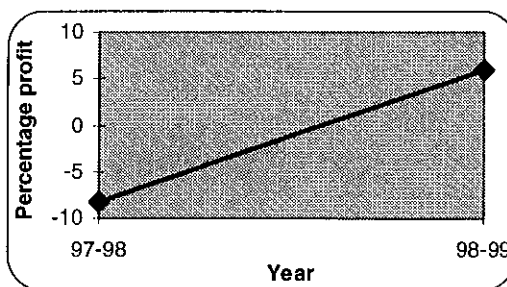
Revenue : Cost of Harvesting and Sales



Revenue : Cost of Management



Profit on Total Revenue



5. Cost per hectare managed.

Note

The accrual basis gross cost per hectare of managing plantations. The major elements of this cost relate to the establishment and maintenance of plantations.

Measure

The cost per hectare managed was \$206.30, an increase of \$13.30 on the "Target" cost of \$193.00 in the 1998-99 Budget Statements.

OUTPUT 4 **TOURISM AND RECREATION SERVICES**

Outcome

Community enjoyment of wildlife, lands and waters without compromising conservation and other management objectives.

Output Description

Dealing with recreation in the natural environment on lands and waters managed by the Department, including preparing and implementing management plans and the provision, management and maintenance of appropriate access, recreation opportunities and facilities, protecting visitors and facilities from fire, training of staff and Conservation and Land Management volunteers, involvement of Aboriginal people, designing and initiating educational information and activities concerning tourism and recreation in the natural environment, and developing public awareness, understanding and support for the tourism and recreation services and policies.

Key Effectiveness Indicators

- The extent to which the community is satisfied with the condition and standard of CALM-managed recreation areas, facilities and services.**

Notes

CALM continued its annual program of surveying visitors to areas under its management. These surveys are designed to assess and monitor the overall level of satisfaction and relative importance that visitors placed on the areas they visited, as well as the recreation services and facilities provided by the Department. This information is also important in planning new nature-based recreation and tourism opportunities and for ensuring an equitable balance is achieved between the need to protect resource values while satisfying increasing public demands for access and use.

The 1998–99 survey program involved the distribution of nearly 3,000 questionnaire forms to visitors in various CALM managed areas throughout Western Australia. A total of 955 forms were returned from 27 separate parks, reserves and forest areas around the State and these were subsequently analysed.

Survey respondents were asked to indicate their residence or place of origin, with 55% coming from Western Australia, 29% from interstate and the remaining 16% from overseas. Each State was represented in the following proportions: 31% from Victoria, 30% from New South Wales, 24% from Queensland, 7% from South Australia, 4% from the Northern Territory and 2% from both the Australian Capital Territory and Tasmania. Visitors from overseas countries included America, Austria, Belgium, Canada, China, Denmark, Germany, Holland, Hong Kong, Japan, Malaysia, Mexico, New Zealand, South Africa, Switzerland, Taiwan, Tanzania and the United Kingdom.

Note: At a 95% confidence level the survey results reported below have a

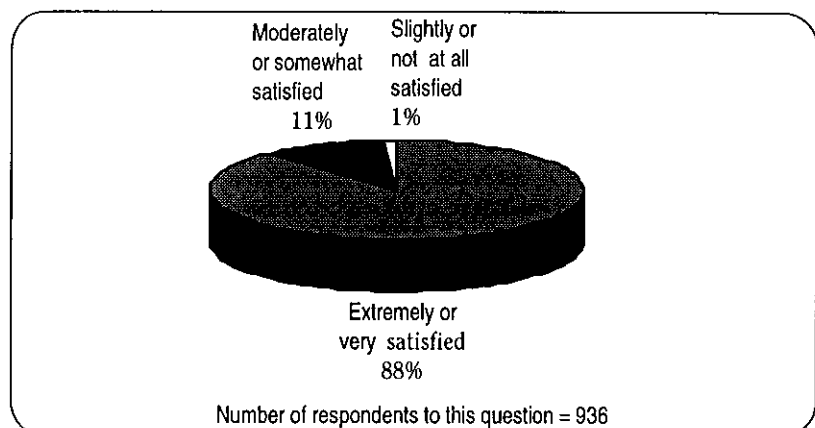
standard error within the range of ± 2.6%.

Measures

As illustrated in the **Respondents Overall Level of Satisfaction** chart below, 88% (89% in 1997–98) of all visitors who responded to the question on satisfaction indicated they were either extremely or very satisfied with their visit overall while a further 11% (9% in 1997–98) were moderately or somewhat satisfied. Only one percent of visitors surveyed indicated they were slightly or not at all satisfied with their visit.

As shown in the **Aspects of the Visit** table below, the three most important issues that respondents were most satisfied with were ‘the natural attractiveness of the areas visited’, ‘the location of facilities’ and ‘the standard/condition of day use facilities’. Of the small number of visitors who expressed any dissatisfaction, the three main issues of concern were ‘the provision of Aboriginal information and interpretation’, ‘the standard/condition of roads’ and ‘the provision of information, interpretation, signs and maps’. As in 1997–98, these results indicate a sustained level of visitor satisfaction.

Respondents Overall Level of Satisfaction



Aspects of the Visit

Most Satisfying	Least Satisfying
Natural attractiveness of the area	Provision of Aboriginal information and interpretation
Location of facilities	Standard/condition of roads
Standard/condition of facilities	Provision of information, interpretation, signs and maps

2. The extent to which the public has shown interest/support for CALM-managed areas, facilities and services.

Note

The level of volunteer involvement indicates continued public support for CALM's management programs and the Department's ability to balance competing land uses to aid public enjoyment and protect conservation values.

Measure

Twenty new community volunteer projects were initiated in 1998-99. As illustrated in the **Volunteer Involvement** graph opposite, the number of volunteer hours spent on tourism and recreation and nature conservation projects this year totalled 108,634, an increase of nearly 4% on the previous year's figures. The number of registered volunteers currently stands at 2400. This decline from the previous year's reported figure of 4966 volunteers is primarily due to a recently completed review of the status of all registered CALM volunteers and the development of a new computerised volunteer data base.

3. The number of visits to CALM-managed areas.

Note

The number of visits to CALM-managed areas is based on data from the Department's Visitor Information and Statistics (VISTAT) Program.

Measures

As illustrated in the **Visitor Use Levels** graph opposite, VISTAT data indicates that the number of visits to CALM-managed lands and waters for 1998-99 totalled 8,668,000. This figure, which comprises both recorded numbers of visits as obtained from traffic counter devices, surveys and other data sources as well as estimated numbers of visits based on field observation, represents an increase of 6% over the 1997-98 figure of 8,163,000 visits (which comprised

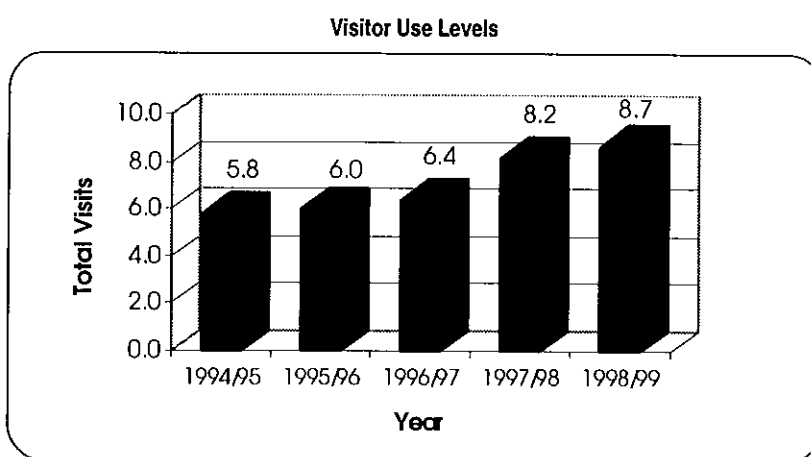
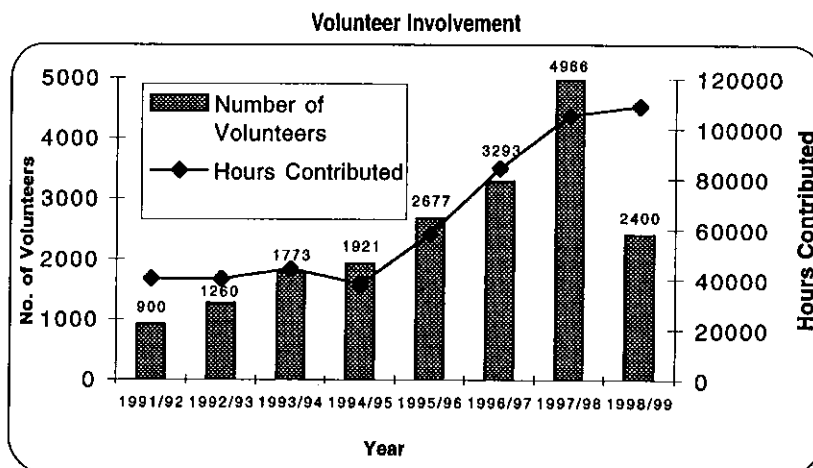
7,115,000 recorded plus 1,048,000 estimated visits).

The continued growth in visitation levels is due to several factors including extended coverage of CALM's VISTAT Program and improved visitor counting techniques as well as the community's ongoing interest in and desire to access and experience Western Australia's natural attractions. While some areas experienced a slight drop in visitor numbers, public visitation to most areas throughout the State continued to grow.

To more accurately monitor trends in visitor use levels and patterns over time, the Department has selected

three 'indicator parks', Cape Le Grand, Nambung and Purnululu. These parks were selected because they represent, by WA standards, low, medium and high levels of visitation and all have controlled entry points and effective visitor recording systems in place.

As indicated in the **Trends in Visitor Numbers to Three National Parks** table below, all three of these parks have experienced an increase in visitor numbers over the previous 12 months. The most significant increase occurred in Nambung, where the number of visits rose from 157,000 in 1997-98 to 191,000 in 1998-99, an increase of nearly 22%. The increases for Cape Le Grand and Purnululu, by comparison, were more modest.



National Parks	1996-97	1997-98	1998-99
Cape Le Grand	57,000	65,000	72,000
Nambung	146,000	157,000	191,000
Purnululu	14,000	14,000	17,000

Key Efficiency Indicators

1. *Cost per visit.*

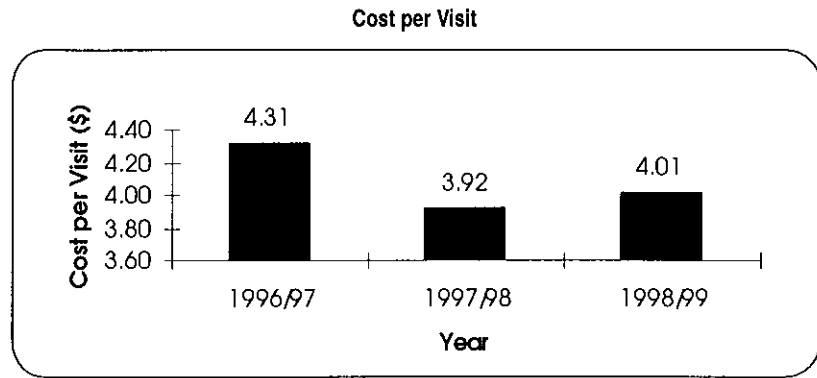
Note

The accrual based total cost of services for Tourism and Recreation Services expressed on a per total number of visits to CALM-managed lands and waters basis.

Measure

The 1998–99 gross cost per visit based on the total cost of services was \$4.01. As shown in the **Cost per Visit** graph above, this represents an increase of \$0.09 on the 1997–98 cost of \$3.92, and an increase of \$0.14 on the “Target” cost of \$3.87 in the 1998–99 Budget Statements.

Note: In previous years this indicator was reported on a net cost (excluding



Government Grants revenue) per recorded visit basis. For comparative purposes, the 1997–98 and 1998–99 costs on that basis are \$3.18 and \$3.21 respectively.

2. *Ratio of total cost of services to operating revenues.*

Note

The accrual based total cost of providing Tourism and Recreation

Services expressed as a ratio of operating revenue from those services.

Measure

With total expenditure of \$34,738,000 and operating revenue of \$12,621,000 the 1998–99 ratio was 2.75:1. This ratio is a favourable reduction of 0.62 on the “Target” ratio of 3.37:1 in the 1998–99 Budget Statements; mainly due to an increase in visits to managed sites and higher than expected increases in revenue.

OUTPUT 5

ASTRONOMICAL SERVICES

Outcome

Astronomical information and services for the benefit of the Community.

Output Description

Providing public information and awareness directly beneficial to the Western Australian community, and contributing to scientific research in astronomy by co-operating with national and international institutions in the acquisition, analysis, interpretation and dissemination of information.

Key Effectiveness Indicators

1. *The level of customer satisfaction with the services provided by the Observatory.*

Note

During 1998–99, 7,817 people visited the Observatory, 3,091 people used the recorded information line, and 14,131 people telephoned seeking information.

Five hundred and sixty-one customer survey questionnaires were distributed to Observatory night tour visitors between October 1998 and May 1999.

Notes:

- i) *During the 1999–2000 period visitors on all tour types will be surveyed.*
- ii) *At a 95% confidence level the survey responses reported below have a standard error within the range of ± 1.5%.*

Measure

The results shown in the **Overall Satisfaction with Perth Observatory** table opposite, were determined by the 518 (92.3%) responses to the survey question “How satisfied were you with the services provided by Perth Observatory?”

2. *The extent to which visitors perceive the information presented during their tour of the Observatory increased their knowledge and awareness of Astronomy.*

Note

This indicator relates to the educational role of the Observatory in meeting the demand by the community for information on astronomy and measures the extent to which that demand is met.

Measure

The **Increased Knowledge and Awareness of Astronomy** table opposite illustrates visitors' perception as measured by the customer survey described above. The results relate to the 494 (88.1%) responses to the question “To what extent do you agree that the information presented on the tour increased your knowledge of and awareness of astronomy?”

3. *Research findings published in internationally recognised journals.*

Note

One of the aims of Perth Observatory is to further scientific research in

astronomy. One method of measuring the contribution to scientific research is to determine the number of articles published in internationally recognised scientific journals. The publishers of these journals independently evaluate articles submitted to ensure they meet appropriate standards and criteria. To have articles published in these journals would indicate that the Observatory is adding to the body of scientific knowledge and therefore furthering scientific research.

Measure

During 1998–99, the Observatory had 29 (32 in 1997–98) articles published. Of these, 3 (3 in 1997–98) were scientific papers in internationally recognised journals. The other articles were papers related to scientific data on astronomical objects, articles in educational journals or popular magazines, newsletters or internal reports.

Key Efficiency Indicators

1. Cost per tour visitor.

Note

The Perth Observatory conducts an on-site educational program through tours for school groups, tourists and the general public. This indicator provides the average accrual cost per tour visitor based on 1998–99 tour participation totalling 7,817 i.e. night tours – 4,098 visitors, day tours – 2,860 and Sunday afternoon tours – 859.

Measure

The cost per tour visitor in 1998–99 was \$13.63, a reduction of \$2.90 on the “Target” cost of \$16.53 in the 1998–99 Budget Statements. This reduction is mainly due to the cancellation of a number of the more costly night tours because of inclement weather.

Note: In previous Annual Reports an average cost per tour visitor per tour type on a cash basis has been reported.

Overall Satisfaction with Perth Observatory

Response	1992–93 %	1993–94 %	1994–95 %	1995–96 %	1996–97 %	1997–98 %	1998–99 %
Very satisfied	68.1	68.0	70.1	75.2	69.6	68.7	71.3
Satisfied	30.3	31.0	25.2	23.1	26.8	29.9	26.4
Neither satisfied or dissatisfied	1.2	1.0	2.9	1.7	3.0	1.2	2.3
Dissatisfied	0.4	0.0	1.3	0.0	0.4	0.2	0.0
Very dissatisfied	0.0	0.0	0.5	0.0	0.2	0.0	0.0

Increased Knowledge and Awareness of Astronomy

Response	1992–93 %	1993–94 %	1994–95 %	1995–96 %	1996–97 %	1997–98 %	1998–99 %
Strongly agree	55	46	45.3	50.4	48.7	45.4	52.6
Agree	43	52	51.3	47.9	46.1	50.9	45.5
Neither agree or disagree	2	2	2.6	1.7	4.2	3.5	1.9
Disagree	0	0	0.5	0	1.0	0.2	0
Strongly disagree	0	0	0.3	0	0	0	0

For comparative purposes the 1997–98 and 1998–99 costs on that basis are:

	1997–98 \$	1998–99 \$
Day Tour	1.31	1.25
Night Tour	1.76	1.57
Weekend Tour	2.57	3.79

2. Cost per enquiry.

Note

The average accrual cost relating to the Observatory receiving and responding to enquiries about Astronomical information by way of the information line, telephone calls and attendance at Astronomy talks and field nights.

Measure

Based on a total of 18,738 enquiries in 1998–99, the cost per enquiry was \$30.92. This is a reduction of \$1.20 on the “Target” cost of \$32.12 in the 1998–99 Budget Statements.

2. Cost of research activities per refereed research paper.

Note

This indicator provides the average accrual cost of the Observatory’s research activities which support and relate to the Observatory’s refereed scientific research papers.

Measure

In 1998–99 the average cost per paper of the research activities supporting the three refereed scientific research papers was \$111,389, an increase of \$42,089 on the “Target” cost of \$69,300 in the 1998–99 Budget Statements.

This increase reflects the ongoing, protracted and complex nature of the research output, the external collaboration required and the relatively small number of papers involved each year.

4. Cost of research activities per 1,000 head of WA population.

Note

The accrual cost of the Observatory’s research activities expressed as an average cost per 1,000 head of WA population.

Measure

The cost of research activities per 1,000 head of WA population was \$188 in 1998–99, a reduction of \$6 on the “Target” cost of \$194 in the 1998–99 Budget Statements.



Auditor General

To the Parliament of Western Australia

**DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
PERFORMANCE INDICATORS FOR THE YEAR ENDED JUNE 30, 1999**

Scope

I have audited the key effectiveness and efficiency performance indicators of the Department of Conservation and Land Management for the year ended June 30, 1999 under the provisions of the Financial Administration and Audit Act 1985.

The Executive Director is responsible for developing and maintaining proper records and systems for preparing and presenting performance indicators. I have conducted an audit of the key performance indicators in order to express an opinion on them to the Parliament as required by the Act. No opinion is expressed on the output measures of quantity, quality, timeliness and cost.

My audit was performed in accordance with section 79 of the Act to form an opinion based on a reasonable level of assurance. The audit procedures included examining, on a test basis, evidence supporting the amounts and other disclosures in the performance indicators, and assessing the relevance and appropriateness of the performance indicators in assisting users to assess the Department's performance. These procedures have been undertaken to form an opinion as to whether, in all material respects, the performance indicators are relevant and appropriate having regard to their purpose and fairly represent the indicated performance.

The audit opinion expressed below has been formed on the above basis.

Audit Opinion

In my opinion, the key effectiveness and efficiency performance indicators of the Department of Conservation and Land Management are relevant and appropriate for assisting users to assess the Department's performance and fairly represent the indicated performance for the year ended June 30, 1999.

A handwritten signature in cursive script, appearing to read 'D D R Pearson'.

D D R PEARSON
AUDITOR GENERAL
September 29, 1999

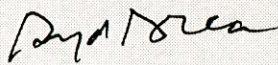
FINANCIAL STATEMENTS

1998-99

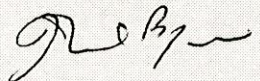
The accompanying financial statements of the Department of Conservation and Land Management have been prepared in compliance with the provisions of the Financial Administration and Audit Act 1985 from proper accounts and records to present fairly the financial transactions for the period ending 30 June 1999 and the financial position as at 30 June 1999.

At the date of signing we are not aware of any circumstances which would render the particulars included in the financial statements misleading or inaccurate.

Australian Accounting Standard AAS 35 "Accounting for Self-Generating and Regenerating Assets" has not been applied by the Treasurer's Instructions for the financial year to 30 June 1999, however the Accountable Officer has elected to apply that Australian Accounting Standard to the accompanying financial statements.



ACCOUNTABLE OFFICER
13 August 1999



PRINCIPAL ACCOUNTING OFFICER
13 August 1999

**DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
OPERATING STATEMENT
FOR THE YEAR ENDED 30 JUNE 1999**

	Note	1998-99 (\$'000)	1997-98 (\$'000)
COST OF SERVICES			
OPERATING EXPENSES			
Salaries and wages	4.	58,073	59,384
Superannuation		4,475	5,568
Interest	5.	8,791	9,679
Harvesting costs		56,022	61,412
Depreciation	6.	10,186	7,709
Administration	7.	6,727	6,208
Accommodation		3,046	2,900
Maintenance costs		2,746	2,319
Operating lease costs		9,841	8,750
Materials		16,835	22,259
Services and contracts		23,518	23,786
Grants, Subsidies & Transfer payments		209	0
Other		6	85
Total Cost of Services		<u>200,475</u>	<u>210,059</u>
REVENUES FROM SERVICES			
OPERATING REVENUE			
Royalties and timber sales	8.	111,750	119,481
National parks and recreation		5,735	4,322
Recoupable works	9.	24,333	22,637
Grants - Commonwealth		7,796	11,421
- State	10.	2,681	1,949
Interest on investments		782	1,182
Other revenue	11.	6,962	7,682
Net profit on sale of assets	12.	1,281	38
Total Operating Revenue		<u>161,320</u>	<u>168,712</u>
Net Cost of Services Before Abnormals	24.	<u>(39,155)</u>	<u>(41,347)</u>
ABNORMALS			
Forest Assets Valuation Change	15.	(45,962)	0
Net Cost of Services after Abnormals		<u>(85,117)</u>	<u>(41,347)</u>
REVENUES FROM GOVERNMENT			
Appropriations	13.	49,950	43,565
Non Retainable Revenue paid to Treasury		(66)	(93)
Resources received free of charge	14.	504	696
Liabilities assumed by Treasurer		(517)	1,116
Total Revenues from Government		<u>49,871</u>	<u>45,284</u>
Change in Net Assets as a result of operations and abnormals		(35,246)	3,937
Increase in Equity Arising from Restructuring	15.	38,686	0
Change in Net Assets as a result of operations, abnormal items and Restructuring		<u>3,440</u>	<u>3,937</u>

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
STATEMENT OF FINANCIAL POSITION
AS AT 30 JUNE 1999

	Note	1998-99 (\$'000)	1997-98 (\$'000)
CURRENT ASSETS			
Cash and amounts in suspense	16.	15,922	11,746
Receivables	17.	19,265	20,304
Inventories	18.	13,050	5,975
Prepayments	19.	358	323
		<u>48,595</u>	<u>38,348</u>
NON-CURRENT ASSETS			
Land	20.	1,929,920	2,233,168
Timber and Infrastructure		412,165	456,600
Buildings, Plant & Equipment		49,739	38,556
Recreation and Tourism Facilities		50,057	54,266
Works in Progress		6,009	447
		<u>2,447,890</u>	<u>2,783,037</u>
Total Assets		<u><u>2,496,485</u></u>	<u><u>2,821,385</u></u>
CURRENT LIABILITIES			
Accounts payable		8,728	7,125
Accrued salaries/wages		1,196	866
Accrued superannuation		1,140	788
Accrued logging costs		1,794	2,033
Borrowings	21.	4,963	4,200
Accrued loan interest		1,791	1,921
Employee entitlements	22.	9,651	11,208
Unearned revenue		955	105
		<u>30,218</u>	<u>28,246</u>
NON-CURRENT LIABILITIES			
Borrowings	21.	83,358	84,121
Employee entitlements	22.	1,926	2,107
		<u>85,284</u>	<u>86,228</u>
Total Liabilities		<u>115,502</u>	<u>114,474</u>
EQUITY			
Reserves	23.	1,906,550	2,248,217
Accumulated Surplus (Deficit)		474,433	458,694
		<u>2,380,983</u>	<u>2,706,911</u>
TOTAL LIABILITIES AND EQUITY		<u><u>2,496,485</u></u>	<u><u>2,821,385</u></u>

**DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED 30 JUNE 1999**

	Note	1998-99 (\$'000)	1997-98 (\$'000)
CASH FLOWS FROM GOVERNMENT			
Receipts from recurrent appropriations		38,795	32,325
Receipts from capital appropriations		11,155	11,240
Receipts credited to Consolidated Fund		(66)	(93)
NET CASH PROVIDED BY GOVERNMENT		<u>49,884</u>	<u>43,472</u>
UTILISED AS FOLLOWS:			
CASH FLOWS FROM OPERATING ACTIVITIES			
Payments			
Employee entitlements		(59,692)	(57,611)
Superannuation		(4,640)	(4,701)
Interest		(8,921)	(9,907)
Harvesting costs		(56,492)	(60,276)
Administration		(5,967)	(5,801)
Accommodation		(2,837)	(2,880)
Other		(56,368)	(55,058)
Total Payments		<u>(194,917)</u>	<u>(196,234)</u>
Receipts			
Royalties		55,352	56,534
Harvesting Cost Recovery		57,853	60,655
Recoupable projects		22,929	22,042
Grant receipts - Commonwealth		8,054	11,171
- State		2,287	2,007
Interest on Investments		782	1,182
Other revenues		12,718	12,131
Total Receipts		<u>159,975</u>	<u>165,722</u>
NET CASH USED IN OPERATING ACTIVITIES	24.	<u>(34,942)</u>	<u>(30,512)</u>
CASH FLOWS FROM INVESTING ACTIVITIES			
Payments for the creation of Forestry assets		(9,299)	(2,236)
Payments for the purchase of non-current assets		(9,006)	(6,113)
Less Proceeds from the sale of non-current assets		7,539	2,331
NET CASH USED IN INVESTING ACTIVITIES		<u>(10,766)</u>	<u>(6,018)</u>
CASH FLOWS FROM FINANCING ACTIVITIES			
Borrowing proceeds		4,963	0
Less Borrowing repayments		(4,963)	(6,175)
NET CASH USED IN FINANCING ACTIVITIES		<u>0</u>	<u>(6,175)</u>
Net increase in cash held		4,176	767
Cash at the beginning of the reporting period		11,746	10,979
Cash at the end of the reporting period	16.	<u>15,922</u>	<u>11,746</u>

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
SUMMARY OF CONSOLIDATED FUND APPROPRIATIONS AND REVENUE ESTIMATES (NOTE 32)
FOR THE YEAR ENDED 30 JUNE 1999

	Estimate \$'000	1998-99 Actual \$'000	Variation \$'000	1997-98 Actual \$'000
RECURRENT				
Amount required to fund outputs for the year	155,014	152,858	(2,156)	151,887
Less Retained Revenue - Section 23A of the Financial Administration and Audit Act	120,913	114,414	6,499	119,718
Item 60 Amount provided to fund outputs for the year	34,101	38,444	4,343	32,169
Amount Authorised by Other Statutes				
- Salaries and Allowances Act 1975	156	160	4	156
- Financial Administration and Audit Act 1985 Section 25	0	191	191	0
Transfer from Recreation Camps and Reserves Board				
Total Recurrent Services	34,257	38,795	4,538	32,325
CAPITAL				
Amount required for Capital Services for the year	17,263	15,636	(1,627)	11,240
Less Retained Revenue - Section 23A of the Financial Administration and Audit Act	6,108	4,481	1,627	0
Item 149 Amount provided for Capital Services for the year	11,155	11,155	0	11,240
Total Capital Services	11,155	11,155	0	11,240
GRAND TOTAL	45,412	49,950	4,538	43,565
DETAILS OF EXPENDITURE				
RECURRENT				
Outputs				
Output 1 : Nature Conservation	37,536	38,885	1,349	32,243
Output 2 : Native Forest Management	71,008	70,717	(291)	70,679
Output 3 : Plantation Management	53,770	53,604	(166)	52,206
Output 4 : Tourism and Recreation Management	25,760	28,830	3,070	23,836
Output 5 : Astronomical Services	807	863	56	748
TOTAL	188,881	192,899	4,018	179,712
Less Retained Revenue:				
As per Section 23A of the FAAA Net Appropriation Determination	115,033	113,586	(1,447)	117,626
As per the CALM Act	44,072	52,531	8,459	35,301
Changes in Operating Account Balances	0	1,839	1,839	(1,153)
	29,776	28,621	(1,155)	25,632
Other Funding Sources	2,770	5,145	2,375	2,516
Capital Repayments	1,620	4,963	3,343	4,084
Add: Cash Operating Revenue Taken to Consolidated Fund	91	66	(25)	93
Consolidated Fund Recurrent Appropriations	34,257	38,795	4,538	32,325
CAPITAL				
Capital Expenditure	20,665	25,073	4,408	13,938
Less Retained Revenue:				
As per Section 23A of the FAAA Net Appropriation Determination	6,108	4,481	(1,627)	0
As per the CALM Act	3,402	12,010	8,608	2,516
Changes in Operating Account Balances	0	2,573	2,573	(182)
Consolidated Fund Capital Appropriations	11,155	11,155	0	11,240
GRAND TOTAL OF APPROPRIATIONS	45,412	49,950	4,538	43,565
REVENUE				
Territorial	20	0	(20)	25
Departmental	71	66	(5)	68
	91	66	(25)	93

Comparative estimate figures for recurrent services are not available due to the change in 1997-98 reporting from a program basis to an output basis in 1998-99. The estimates for recurrent services by program for 1997-98 were as per table below:

	1997-98 Estimates \$'000
EXPENDITURE	
RECURRENT	
Astronomical Services Program	749
Nature Conservation Program	26,657
Forest Resources Management Program	122,536
Management for Tourism and Recreation Program	22,983
Total Recurrent Expenditure	172,925

NOTES TO THE FINANCIAL STATEMENTS

1. OBJECTIVES AND FUNDING

a) Departmental Mission and Funding

The mission of the Department of Conservation and Land Management is to conserve and manage Western Australia's wildlife and the lands, waters and resources entrusted to the Department for the benefit of present and future generations.

In 1998–99 the Department was predominantly funded by Parliamentary appropriations and retained revenues from timber sales and other activities. The Department provided the outputs as disclosed at Note 3. Prevailing market forces and Government policy determine fees charged. The financial statements encompass all funds through which the Department controls resources to carry on its functions.

In the process of reporting on the Department as a single entity, all intra-entity transactions and balances have been eliminated.

b) Events Occurring after Reporting Date

In July 1999 policy changes in native forest management were announced by the Western Australian Government. These policy changes occurred after the reporting date of 30 June 1999. As required by Australian Accounting Standard AAS 8 "Events Occurring After Reporting Date" the financial effect has not been recognised in these statements. At the date of signing the statements it was not possible to reliably estimate the financial effect of these events on the Department as details of future silvicultural treatments, harvesting schedules and administrative structures were still being finalised.

2. SIGNIFICANT ACCOUNTING POLICIES

a) General

The financial statements constitute a general purpose financial report which has been prepared in accordance with Australian Accounting Standards and Urgent Issues Group (UIG) Consensus Views as applied by the Treasurer's Instructions to vary application, disclosure, format and wording. The Financial Administration and Audit Act and the Treasurer's Instructions are legislative provisions governing the preparation of financial statements and take precedence over Australian Accounting Standards and UIG Consensus Views. The modifications are intended to fulfil the requirements of general application to the public sector together with the need for greater disclosure and also to satisfy accountability requirements.

If any such modification has a material or significant financial effect on the reported results, details of that modification and where practicable, the resulting financial effects are disclosed in the notes to these financial statements.

b) Basis of Accounting

The financial statements have been prepared in accordance with Treasurer's Instruction 1101A and are based on the provisions of Australian Accounting Standard AAS29 "Financial Reporting by Government Departments" as if the relevant aspects were applicable to the department as an accounting standard.

The statements have been prepared on an accrual basis using historic cost accounting, with the exception of certain non-current assets included at valuation such as forestry assets. Additions to non-current physical assets since valuation are stated at cost.

Forestry assets have been valued in accordance with AAS35 "Self-Generating and Regenerating Assets" (SGARAs), issued in August 1998. In 1997–98 the Department had applied Exposure Draft ED83 which preceded AAS35.

Administered assets, liabilities, expenses and revenues are not integral to the Department in carrying out its functions and are disclosed in schedules to the financial statements (Note 33), forming part of the general purpose financial report of the Department. The administered items are disclosed on the same basis as is described above for the financial statements of the Department. The administered assets, liabilities, expenses and revenues are those which the Government requires the Department to administer on its behalf. The assets do not render any service potential or future economic benefits to the Department, the liabilities do not require the future sacrifice of service potential or future economic benefits of the Department, and the expenses and revenues are not attributable to the Department.

As the administered assets, liabilities, expenses and revenues are not recognised in the principal financial statements of the Department, the disclosure requirements of Australian Accounting Standard AAS 33, Presentation and Disclosure of Financial Instruments, are not applied to administered transactions.

c) Appropriations

Appropriations in the nature of revenue, whether recurrent or capital are recognised as revenues in the period in which the Department gains control of the appropriated funds. The Department gains control of appropriated funds at the same time those funds are deposited into the Department's bank account.

In 1998–99 the Department operated under a Net Appropriation Determination. This agreement pursuant to Section 23A of the Financial Administration and Audit Act provided for the retention of the following moneys received by the Department:

- Proceeds from contract of sale of forest products - Sections 88(1)(b) and 92(2) Conservation and Land Management Act.

- Proceeds from sale of real property.
- Proceeds from the disposal of equipment and non-real property.
- Certain minor fees and charges.

The moneys received and retained were applied to the Department's Outputs as specified in the budget statements for the financial year:

- i) in respect to the revenue from the sale of land and assets, to Salinity Eutrophication Amelioration Commercial Afforestation and/or reduce loan liabilities; and
 - ii) in respect of other revenue sources, to be applied in the first instance to the purposes and functions authorised by the Conservation and Land Management Act and to apply surpluses over and above this requirement to the retirement of debt and/or funding of capital works.
- d) Operating Accounts

Amounts appropriated are deposited into the account and any revenues which are the subject of net appropriation determinations are also deposited into the account. Revenues not subject to net appropriation determinations are credited to the Consolidated Fund. All payments of the Department are made from the operating account.

- e) Depreciation of Non-Current Assets

Depreciation has been provided for on a straight-line basis, using rates which are reviewed annually. 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
• Aircraft	5 - 6 years
• Boats	5 years
• Plant and machinery	4 - 10 years
• Heavy fleet vehicles	5 years
• Recreation/Tourism assets	10 - 20 years

- f) Valuation of Assets

Timber and Forestry Infrastructure

In accordance with AAS35 a Net Present Value method has generally been used to estimate the commercial value of the cash flows expected to be generated by the sustainable yield, standing timber and supporting infrastructure in native forests, plantations and sandalwood on Crown land. Reductions in sustainable yield in the Regional Forest Agreement announced in May 1999 are reflected in the valuation. Due to the young age of the plantings, the Department's rights in *Pinus pinaster* (Maritime Pine) sharefarming contracts have been initially valued on an historic cost basis to reflect most accurately their current market value.

Forestry infrastructure has been valued by officers using a depreciated replacement cost basis. The written down value of forestry infrastructure has been deducted from the Net Present Value of timber to allow separate disclosure of SGARA and non-SGARA asset values as required by AAS35. Non-commercial values inherent in forests are not accounted for in timber valuations pursuant to AAS35.

Land

Crown land in the conservation estate and vested State Forest is valued in the Government Property Register by the Valuer General on either a market value or current use basis. The Valuer General revalued this Crown land during 1998/99 and the revised values have been included in the Statement of Financial Position.

Crown land is reserved for or held by the Department for the conservation and land management purposes prescribed by the Conservation and Land Management Act 1984. Section 17(7) of the Act provides that should the land no longer be reserved or held for these purposes the land shall become Crown land within the meaning of the Land Administration Act 1997 and thus would no longer be vested in the Department. Therefore land of this nature cannot be liquidated by the Department to meet liabilities or fund activities.

The commercial values of timber and of recreation and tourism facilities standing on the land are reported separately from the Valuer General's land valuation.

- g) Recognition of Revenue

The Department's general policy is to recognise revenue when an invoice is issued.

In line with this policy, native forest and softwood timber sales are recorded in the General Ledger when timber is delivered to sawmills. A revenue accrual is made for services supplied to certain sharefarming investors who are invoiced on a three monthly basis, and for seedlings delivered but not invoiced at the end of the financial year.

Other revenues such as proceeds from the sale of motor vehicles, land sales and miscellaneous revenue are recognised at the time of receipt.

- h) Leases

The Department has entered into operating lease agreements for buildings, office equipment and motor vehicles where the lessors effectively retain all of the risks and benefits incidental to ownership of the items held under the operating leases. Equal instalments of the lease payments are charged to the operating statement over the lease term as this is representative of the pattern of benefits to be derived from the leased property.

The Department had no finance lease commitments during 1998-99.

i) Inventories

Inventories have been valued at the lower of cost and net realisable value apart from timber cut but not yet removed from Crown land which is valued at net market value in accordance with AAS35. Publications are valued at the wholesale price. Nursery and timber technology stock is valued at cost including overheads. Processed sandalwood stock is valued at cost including overheads directly attributable to the sandalwood management activity.

j) Employee Entitlements

Annual and long service leave

Employee entitlements are calculated at current remuneration rates. A liability for long service leave is recognised after an officer has completed four years service of a seven year long service leave term and six years service of a ten year long service leave term.

As provided for in AAS30 "Accounting for Employee Entitlements", the liability for long service leave has not been discounted as an evaluation of the application of discount factors and ancillary changes to the non current long service leave liability indicated an insignificant impact on the financial results.

Superannuation

Staff contribute to the Superannuation and Family Benefits Act Scheme (a pension scheme closed to new entrants) or the Gold State Superannuation Scheme (a lump sum benefit scheme also closed to new entrants) which are both defined benefit schemes. All staff who do not contribute to either of these schemes become non contributory members of the West State Superannuation Scheme, an accumulation fund complying with the Commonwealth Government's Superannuation Guarantee (Administration) Act 1992. The Department is responsible for employer contributions to the Gold State and West State Superannuation Schemes.

Employer contributions have been paid to the Gold State Superannuation Scheme since the inception of the Scheme in 1987.

The financial statements include the Department's contributions adjusted for the change in the unfunded liability assumed by the Treasurer for pre 1987 service for current employees in the Gold State Superannuation Scheme.

The total unfunded liability assumed by the Treasurer for current employees in the Gold State Superannuation Scheme for pre 1987 service is \$16.02M. (1997-98 \$16.5M)

The total unfunded liability assumed by the Treasurer in respect of Superannuation and Family Benefits Act pensions that will be payable to current employees when they retire is \$2.39M. (1997-98 \$2.28M).

The superannuation expense does not include payment of pensions to former employees who have retired as this

does not constitute part of the cost of services provided by the Department in the current year.

k) Accounts Receivable, Accounts Payable, Accrued Salaries, Accrued Logging Costs, and Accrued Superannuation.

Accounts Receivable are carried at the amounts due less any provision for doubtful debts. Provision for doubtful debts is recognised to the extent that recovery of outstanding debts is considered less than likely. Settlement terms are normally 30 days with 15% interest (or rates set in individual contracts) charged on overdue debts.

Accounts Payable (including accrued logging costs) in commercial operations are normally settled on 30 day terms reflecting general contract requirements in the timber industry. 30 day terms are also applied to general creditor payments or shorter terms may be applied where discounts are made available. Obligations to creditors, including accruals not yet billed, are recognised as amounts to be paid in the future for goods and services received, whether or not an invoice has been received prior to balance date.

Accrued salaries in suspense consists of amounts paid annually into a suspense account at Treasury over a period of 10 financial years to meet the additional cash outflow in each eleventh year when 27 pay days occur in that year instead of the normal 26. No interest is received on this account.

Accrued salaries/wages represents the amount due to staff but unpaid at the end of financial year, as the end of the last pay period for that financial year does not coincide with the end of the financial year.

Accrued Logging Costs represents the amount owing to harvesting and delivery contractors for timber delivered to sawmills but not yet recorded in the Department's Accounts Payable system.

Accrued superannuation represents the Department's estimated liability at the end of year for employer superannuation contributions to the Government Employees Superannuation Board. The Department received quarterly invoices in arrears.

l) Net Fair Values of Financial Assets and Liabilities

Net fair values of financial instruments are determined on the following bases:

Monetary financial assets and liabilities are not traded in an organised financial market and are reported on a cost basis in the financial statements. The carrying amounts of debtors, accounts payable, and accruals approximate net market value.

m) Comparative Figures

Comparative figures have been adjusted to conform with changes in the presentation of the financial statements.

3. OUTCOMES AND OUTPUTS

The Budget for 1998–99 was framed in terms of outputs, consequently financial reporting for the year is also analysed in terms of outputs.

Information about the Department's outputs and the expenses and revenues which are reliably attributable to those outputs is set out in the Output Schedule of Expenses and Revenues. Information about assets and liabilities administered by the Department are given in the schedule of Administered Assets and Liabilities (Note 33).

The Government outcomes and Departmental outputs during the reporting period were:

Outcome: Conservation of indigenous plants, animals and ecological processes in natural habitats.

Output 1: Nature Conservation

Outcome: Long term maintenance of the forest ecosystem and provision of sustainable wood production.

Output 2: Native Forest Management

Output 3: Plantation Management

Outcome: Community enjoyment of wildlife, lands and waters without compromising conservation and other management objectives.

Output 4: Tourism and Recreation Services

Outcome: Astronomical information and services for the benefit of the Community.

Output 5: Astronomical Services

Information about the expenses and revenues are set out in the Output Schedule.

	1998–99 (\$'000)	1997–98 (\$'000)
4. SALARIES AND WAGES		
Salaries and Wages	59,811	57,657
Change in Annual and Long Service leave entitlements	(1,738)	1,727
	<u>58,073</u>	<u>59,384</u>
5. INTEREST		
WA Treasury Corporation	8,765	9,620
Commonwealth Dept. of Finance	26	59
	<u>8,791</u>	<u>9,679</u>
6. DEPRECIATION		
Vehicles	2,138	1,873
Buildings, Plant & Equipment	4,958	2,676
Recreation & Tourism Facilities	3,090	3,160
	<u>10,186</u>	<u>7,709</u>
7. ADMINISTRATION		
Administration expenses for the reporting period include:		
Resources received free of charge	504	696
Bad debts	42	28
Telephones, postage, communications	2,103	2,052
Travel expenses	2,128	1,731
Workers Compensation Insurance	926	872
Other	1,024	829
	<u>6,727</u>	<u>6,208</u>
8. ROYALTIES AND TIMBER SALES		
Hardwood royalties	33,861	32,399
Softwood stumpages	14,305	17,171
Sandalwood sales	6,629	8,352
Hardwood harvesting cost recovery	41,672	42,335
Softwood harvesting cost recovery	15,283	19,224
	<u>111,750</u>	<u>119,481</u>
9. RECOUPABLE WORKS		
Sharefarming income	15,422	14,183
Other recoups	8,911	8,454
	<u>24,333</u>	<u>22,637</u>
10. GRANTS - STATE		
Commissioner of Main Roads	1,175	947
Other	1,506	1,002
	<u>2,681</u>	<u>1,949</u>
11. OTHER REVENUE		
Mining compensation	3,031	3,593
Sale of publications	700	694
Proceeds from nurseries	2,279	2,335
Royalties and fees	68	93
Other revenues	884	967
	<u>6,962</u>	<u>7,682</u>

	1998-99 (\$'000)	1997-98 (\$'000)		1998-99 (\$'000)	1997-98 (\$'000)
12. NET (LOSS) / PROFIT ON SALE OF ASSETS			16. CASH AND AMOUNTS IN SUSPENSE		
Land	941	(42)	Cash on hand (CALM Fund)	14,679	10,867
Motor Vehicles & Vessels	507	124	Petty Cash	40	40
Plant & Equipment	(56)	(44)	Lane Poole Memorial Trust	13	13
Sharefarming Contracts	(111)	0	Cash in suspense	141	20
	<u>1,281</u>	<u>38</u>	Accrued Salaries Suspense Account	1,049	806
				<u>15,922</u>	<u>11,746</u>
13. APPROPRIATIONS			17. RECEIVABLES		
Consolidated Fund			Receivables	19,465	20,504
Recurrent	38,635	32,169	Less provision for doubtful debts	(200)	(200)
Capital Works	11,155	11,240		<u>19,265</u>	<u>20,304</u>
Salaries & Allowances Act 1975	160	156			
	<u>49,950</u>	<u>43,565</u>			
14. RESOURCES RECEIVED FREE OF CHARGE					
Resources received free of charge have been determined on the basis of the following estimates provided by agencies:					
Office of the Auditor General	140	160	18. INVENTORIES		
Treasury Department	19	17	Publications & Souvenirs	2,463	1,154
Department of Land Administration	279	286	Nursery stock	3,417	2,287
State Repository	0	1	Sandalwood	3,325	2,235
Contract & Management Services	66	232	Timber on Forest Landings	3,603	0
	<u>504</u>	<u>696</u>	Timber technology stocks	242	299
				<u>13,050</u>	<u>5,975</u>
15. CHANGE IN NET ASSETS AS A RESULT OF OPERATIONS, ABNORMAL ITEMS AND RESTRUCTURING					
a) AAS 35 requires the Change in Forest Asset Values to be taken to the Operating Statement. The forest asset decrement of -\$M45.962 between 30 June 1998 and 30 June 1999 is comprised of a native forest asset decrement of -\$M30.443, a standing sandalwood asset decrement of -\$M19.045, and an increment in the value of plantations of \$M3.526.			Timber on Forest Landings was taken up for the first time on 30 June 1999 as required by AAS35.		
b) The increase in equity arising from restructuring of \$M38.686 reflects the required treatment of land transfers between government agencies under AAS29 "Financial Reporting by Government Departments". During 1998/99 control of Woodman Point was transferred to the Department from the Recreation Camps and Reserves Board with revenue and corresponding assets of \$M43.029 being recognised, and an expense and corresponding decrease in land value of \$M4.343 was recognised to reflect the transfer of Crown land from the Department to the Department of Land Administration.			19. PREPAYMENTS		
			Motor vehicle licences & insurance	256	249
			Accommodation	23	5
			Administration	30	3
			Asset Purchases	11	14
			Other	38	52
				<u>358</u>	<u>323</u>
			20. NON CURRENT ASSETS		
			Land at valuation 1/7/98	1,883,294	2,233,168
			Land at valuation 1/7/97	43,000	0
			Land at cost	3,626	0
			Total Land a)	<u>1,929,920</u>	<u>2,233,168</u>
			Timber and Infrastructure at valuation 30 June 1999 b.)		
			Native Forest Standing Timber	91,461	190,391
			Native Forest Infrastructure	68,488	0
			Standing Sandalwood	49,959	69,004
			Plantations Standing Timber	189,463	193,426
			Plantations Infrastructure	5,143	0
			Dryandra Mallet	100	0
				<u>404,614</u>	<u>452,821</u>
			Timber and Infrastructure at cost b)		
			Maritime Pine	7,551	3,779
				<u>7,551</u>	<u>3,779</u>
			Total Timber and Infrastructure	<u>412,165</u>	<u>456,600</u>

	1998-99 (\$'000)	1997-98 (\$'000)
Buildings at valuation 1996-97, 1997-98 c)	30,603	19,901
less : Accumulated depreciation	<u>(2,727)</u>	<u>(1,062)</u>
	<u>27,876</u>	<u>18,839</u>
Buildings at cost	4,468	3,039
less : Accumulated depreciation	<u>(395)</u>	<u>(211)</u>
	<u>4,073</u>	<u>2,828</u>
Plant & Equipment at valuation 1996-97	6,245	7,107
less : Accumulated depreciation	<u>(4,406)</u>	<u>(4,906)</u>
	<u>1,839</u>	<u>2,201</u>
Plant and Equipment at cost	18,233	13,517
less : Accumulated depreciation	<u>(7,370)</u>	<u>(4,374)</u>
	<u>10,863</u>	<u>9,143</u>
Vehicles at cost	12,104	10,859
less : Accumulated depreciation	<u>(7,016)</u>	<u>(5,314)</u>
	<u>5,088</u>	<u>5,545</u>
Total Buildings, Plant and Equipment	<u>49,739</u>	<u>38,556</u>
Recreation & Tourism Facilities at valuation	55,342	57,426
less : Accumulated depreciation	<u>(6,226)</u>	<u>(3,160)</u>
	<u>49,116</u>	<u>54,266</u>
Recreation & Tourism Facilities at cost	965	0
less : Accumulated depreciation	<u>(24)</u>	<u>0</u>
	<u>941</u>	<u>0</u>
Total Recreation & Tourism Facilities	50,057	54,266
Work In Progress d)	6,009	447
Grand Total of Non-Current Assets	<u>2,447,890</u>	<u>2,783,037</u>

a) Land

The Valuer General's Office provided a revised land valuation of \$M1,891.775 of all land under the Department's control as at 1 July 1998 and this valuation, plus the value of land acquired of \$M46.626 less the value of land disposed of since then (\$M8.481) has been used for 30 June 1999.

Refer to note 2 (f) for accounting policies on Land valuation

b) Timber and Infrastructure

For 1997-98 the value of the standing timber and infrastructure was combined.

These amounts have been shown separately for the first time this year. Refer to the note 2 (f) for the basis for valuation.

Forestry infrastructure includes roads and bridges.

	1998-99 (\$'000)	1997-98 (\$'000)
c) Buildings		
Officers valued 886 minor buildings at depreciated replacement cost for takeup purposes.		
d) Works in Progress		
The major project in progress is the expansion of the Plant Propagation Centre at Manjimup.		
As at 30 June 1999 \$M5.373 had been expended. The remainder consists of various improvements to recreation and tourism sites.		
21. BORROWINGS		
Current		
Commonwealth Department of Finance	0	115
WA Treasury Corporation	4,963	4,085
	<u>4,963</u>	<u>4,200</u>
Non-Current		
Commonwealth Department of Finance	0	763
WA Treasury Corporation	83,358	83,358
	<u>83,358</u>	<u>84,121</u>

The Department's borrowings are governed by a lending facility dated 1 October 1995 with the Western Australian Treasury Corporation. The facility limit is \$150,000,000. Debt is structured to a target of 30% short term lines (6 month maturity) and 70% long term lines (10 year maturity) with interest fixed on each line at the date of each advance.

22. EMPLOYEE ENTITLEMENTS

Current		
Provision for annual leave	4,012	5,833
Provision for long service leave	5,639	5,375
	<u>9,651</u>	<u>11,208</u>
Non current		
Provision for long service leave	1,926	2,107
	<u>1,926</u>	<u>2,107</u>

23. EQUITY

Equity represents the residual interest in the net assets of the Department. The Government holds the equity interest in the Department on behalf of the community.

Accumulated Surplus/(Deficit)

Balance at the beginning of the year	458,694	(59,269)
Change in net assets resulting from operations, abnormal items and restructuring	3,440	3,937

	1998-99 (\$'000)	1997-98 (\$'000)
Takeup of minor buildings 20c)	10,680	0
Takeup of Forestry assets	100	456,600
Takeup of Recreation & Tourism assets	(2,084)	57,426
Take up of Timber on Forest Landings	3,603	0
Balance at the end of the year	<u>474,433</u>	<u>458,694</u>
Reserves		
Asset Revaluation Reserve		
Balance at beginning of year	2,248,217	1,327,916
Revaluation of land during year	(341,667)	920,301
Balance at end of year	<u>1,906,550</u>	<u>2,248,217</u>

The Asset Revaluation Reserve represents that portion of equity resulting from the revaluation of non current assets.

24. RECONCILIATION OF NET CASH USED IN OPERATING ACTIVITIES TO NET COST OF SERVICES

a) For the purposes of the statement of cash flows, cash includes cash at bank and cash equivalents as shown in note 16.		
b) Net cash used in operating activities (Statement of Cash Flows)	(34,942)	(30,512)
Depreciation	(10,186)	(7,709)
Superannuation liabilities assumed by the Treasurer	517	(1,116)
Decrease/(Increase) in employee entitlements	1,738	(1,727)
(Increase)/Decrease in accrued superannuation	(352)	249
Decrease in accrued loan interest rates	130	228
Increase in accrued salaries & wages (330)		(265)
Increase in accounts payable	(2,202)	(4,312)
Decrease in accrued logging costs	239	516
Increase in prepayments	35	104
Net profit on sale of assets	1,281	38
Increase in Inventories	7,075	386
(Decrease)/Increase in receivables	(1,039)	3,037
(Increase)/Decrease in unearned revenue	(850)	(206)
Resources received free of charge	(504)	(696)
Other	235	226
Net Cost of Services (Operating Statement)	<u>(39,155)</u>	<u>(41,347)</u>

25. COMMITMENTS FOR CAPITAL EXPENDITURE

At the reporting date, the Department has committed \$M4.277 for capital expenditure in in 1999-2000 at the Manjimup Nursery. A number of contracts have been let for this purpose and commitments have been made under these contracts.

26. CONTINGENT OBLIGATIONS

Various claims for damages have been lodged against the Department. The Department has denied liability and the Accountable Officer is of the opinion that no material loss will be incurred.

27. RESOURCES PROVIDED FREE OF CHARGE

During the year no material services were provided free of charge.

28. REMUNERATION AND RETIREMENT BENEFITS OF SENIOR OFFICERS

Remuneration of Senior Officers

The number of Senior Officers whose total of fees, salaries and other benefits received or due and receivable for the financial year falls within the following bands:

\$	1998-99	1997-98
70,000 - 80,000	0	1
80,000 - 90,000	0	3
90,000 - 100,000	3	3
100,000 - 110,000	3	2
110,000 - 120,000	1	0
120,000 - 130,000	1	0
170,000 - 180,000	1	0
240,000 - 250,000	0	1

	1998-99	1997-98
\$	\$	\$

The total remuneration of senior officers is :

1,010,393 1,111,160

Retirement Benefits

In respect of Senior Officers the following amounts were paid for the financial year.

Contributions to Government Employees

Superannuation Act scheme 86,492 100,948

At 30 June 1999 eight employees of the Department were members of the Superannuation and Family Benefits Act Scheme.

No Senior Officers were members of the Superannuation and Family Benefits Act scheme.

29. FINANCIAL INSTRUMENTS

Interest Rate Risk Exposure

The Department's exposure to interest rate risk, repricing maturities and the effective interest rates on financial instruments as at 30 June 1999 was:

Assets	Weighted average effective interest rate %	Floating interest rate \$'000	Fixed interest rate maturities			Non interest bearing \$'000	Total 30-June-99 \$'000
			1 year or less	1 to 5 years	Over 5 years		
Cash resources	5.03%	14,873					14,873
Accrued salaries in suspense (held by Treasury)						1,049	1,049
Accounts receivable						19,265	19,265
Total financial assets		14,873	-	-	-	20,314	35,187
Liabilities	Weighted average effective interest rate %	Floating interest rate \$'000	Fixed interest rate maturities			Non interest bearing \$'000	Total 30-June-99 \$'000
			1 year or less	1 to 5 years	Over 5 years		
Accounts payable						8,728	8,728
Accrued salaries & wages						1,196	1,196
Accrued superannuation						1,140	1,140
Accrued logging costs						1,794	1,794
Loan liabilities	10.28%		4,963	14,400	68,958		88,321
Employee entitlements						11,577	11,577
Total financial liabilities			4,963	14,400	68,958	24,435	112,756
Net financial liabilities		14,873	(4,963)	(14,400)	(68,958)	(4,121)	(77, 569)

Credit Risk Exposure

Accounts receivable largely consists of timber debtors, for which deposits and securities are required to be lodged in favour of the Department under timber Contracts of Sale. Section 117 of the Conservation and Land Management Act 1984 provides that forest produce is the property of the Crown until royalty is paid and in default of payment may be seized and disposed of.

Net Fair Value of Financial Instruments

The Department's borrowings of \$M88.321 have been assessed by the WA Treasury Corporation to have a net fair value of \$M98.302 as at 30 June 1999. The net fair value of a financial liability is the amount at which the liability could be settled in a current transaction after allowing for the premium required if debt is settled prior to the due date.

For comparative purposes, details of the Department's financial assets and liabilities as at 30 June 1998 were:

Assets	Weighted average effective interest rate %	Floating interest rate \$'000	Fixed interest rate maturities			Non interest bearing \$'000	Total 30-June-98 \$'000
			1 year or less	1 to 5 years	Over 5 years		
Cash resources	5.41%	10,940					10,940
Accrued salaries in suspense (held by Treasury)						806	806
Accounts receivable						20,304	20,304
Total financial assets		10,940	-	-	-	21,110	32,050
Liabilities	Weighted average effective interest rate %	Floating interest rate \$'000	Fixed interest rate maturities			Non interest bearing \$'000	Total 30-June-98 \$'000
			1 year or less	1 to 5 years	Over 5 years		
Accounts payable						7,125	7,125
Accrued salaries & wages						866	866
Accrued superannuation						788	788
Accrued logging costs						2,033	2,033
Loan liabilities	10.67%		4,200	8,400	75,721		88,321
Employee entitlements						13,315	13,315
Total financial liabilities			4,200	8,400	75,721	24,127	112,448
Net financial liabilities		10,940	(4,200)	(8,400)	(75,721)	(3,017)	(80,398)

	1998-99	1997-98
	\$	\$

SUPPLEMENTARY FINANCIAL INFORMATION**30. LOSSES OF PUBLIC MONEY AND PUBLIC OR OTHER PROPERTY**

Irrecoverable amounts	41,551	28,245
Other	18,358	7,694
General (includes thefts reported to Police, lost property and stock taking deficiencies).	798	1,661
	<u>60,707</u>	<u>37,600</u>

Public and other property, revenue and other debts due to the state written off in accordance with Section 45 of the Financial Administration Act 1985

Approved by the Executive Director	24,538	15,112
Approved by the Hon. Minister	36,169	22,488
	<u>60,707</u>	<u>37,600</u>

	1998-99	1997-98
	(\$'000)	(\$'000)

31. OPERATING LEASE COMMITMENTS

At the reporting date, the Department had the following obligations under non-cancellable operating leases (these obligations are not recognised as liabilities):

Not later than one year	2,993	2,181
Later than one year and not later than two years	3,224	2,178
Later than two years and not later than five years	9,529	6,461
Later than five years	225	10,024
	<u>15,971</u>	<u>20,844</u>

32. EXPLANATORY STATEMENT

The Summary of Consolidated Fund Appropriations and Revenue Estimates discloses appropriations and other statutes expenditure estimates, the actual expenditure made and revenue estimates and payments into Consolidated Fund, all on a cash basis.

The following explanations are provided in accordance with Treasurer's Instruction 945:

As mentioned in Note 2 (c), the Department operates under a Net Appropriation Determination whereby moneys received under the agreement are retained as a source of funds for its operations.

Commonwealth Recoups are grants provided by the Commonwealth Government mainly for wildlife and other research projects. Opportunities for these grants arise during the year and amounts involved are not easily predicted. They do not bear any comparison in dollar terms to previous years.

Under the Net Appropriation Determination, CALM's expenditure outputs are reliant on revenue collected. Consequently any variation to revenue collected is reflected in the expenditure outputs of the Department.

	1998-99	1997-98
	Estimates	Actual
	(\$'000)	(\$'000)

SIGNIFICANT VARIATIONS TO BUDGET ESTIMATES

Significant variations are considered to be those greater than 10% of budget or above \$2M.

Details of Revenue**Recurrent Revenue**

Item 60 amount provided to fund outputs for the year.	34,101	38,444
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This relates to the reappropriation of Crown land sales proceeds (\$4.343M) for the sale of land located at CALM's State Operational Headquarters at Como required for the Technology Park expansion.

Less retained revenue – As per the CALM Act.	44,072	52,531
--	--------	--------

This item refers predominantly to Commonwealth grants, recoup of services provided by CALM to private industry and collections from recreation facilities.

The forecast amount is difficult to predict from year to year and will depend on what opportunities arise during the year.

Other Funding Sources	2,770	5,145
-----------------------	-------	-------

The increase relates principally to the inclusion of \$2.056M Commonwealth specific purpose grants for the purchase of land for nature conservation.

Capital Revenue

Less retained revenue – Section 23A of the Financial Administration and Audit Act.	6,108	4,481
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The need for Section 23A revenues to fund Capital Services was reduced by an increase in other retained revenues under the CALM Act.

Less retained revenue – As per the CALM Act.	3,402	12,010
--	-------	--------

The increase mainly concerns the transfer from recurrent services of \$2.056M Commonwealth specific purpose grants required for the purchase of land and capital borrowings of \$4.963M.

Details of Expenditure**Recurrent Expenditure**

Output 4: Tourism and Recreation Management.	25,760	28,830
--	--------	--------

Opportunity for increased expenditure on tourism and recreation was assisted by increased recreation income of \$1.735 M above 1998-99 budget estimate.

Capital Expenditure

Capital Expenditure	20,665	25,073
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Increased expenditure above budget relates principally to land purchase for nature conservation (increase \$3.572M).

	1998-99 Actual (\$'000)	1997-98 Actual (\$'000)
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SIGNIFICANT VARIATIONS TO 1997-98 OUT-TURNS

Significant variations are considered to be those greater than 10% of out-turns or above \$2M.

Details of Revenue

Recurrent Revenue

Item 60 amount provided to fund outputs for the year.	38,444	32,169
This increase in 1998-99 was attributable to several factors including:		
a) increased funding for the Salinity Action Plan (+ \$2.215M)		
b) Crown land sale proceeds (+ \$3.524M)		
c) payroll increases (+\$1.414M)		
d) adjustment for supplementary funds granted in 1997-98 for wildfires (- \$2M)		
e) funding for Regional Parks (+ \$0.8M).		

Less retained revenue –		
As per the CALM Act.	52,531	35,301

The reported retained revenue for 1997-98 excluded details for the Specific Purpose Grants Trust Account (\$15.621M) and the Nature Conservation and National Parks Trust Account (\$0.131M) in the table “Summary of Consolidated Fund Appropriations and Revenue Estimates”.

The 1998-99 annual report information on the Trust Accounts is now included in this table. Comparison of 1997-98 and 1998-99 actuals cannot be made.

Capital Revenue

Amount required for Capital Services for the year.	15,636	11,240
--	--------	--------

Less retained revenue - Section 23A of the Financial Administration and Audit Act.	4,481	0
--	-------	---

The “Amount required for Capital Services for the year” is derived from the combination of section 23A retained revenue and “Item 149 amount provided for capital services for the year”. Section 23A retained revenues were \$4.481M over 1997-98 and consequently this has increased the amount required for Capital Services for the year from \$11.24M in 1997-98 to \$15.636M in 1998-99.

The increase in Section 23A retained revenues required for Capital Services is attributable to the need to fund the Maritime Pine Nursery construction project (additional \$3.543M) and land purchases for nature conservation (additional \$1.530M).

Less retained revenue –		
As per the CALM Act.	12,010	2,516

Increased revenue sources for capital services were mainly attributable to Commonwealth grants for land purchase \$2.056M, capital borrowings \$4.963M and Main Roads Department tourist road grants \$0.819M.

	1998-99 Actual (\$'000)	1997-98 Actual (\$'000)
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Details of Expenditure

Recurrent Expenditure

Recurrent Outputs—TOTAL	192,899	179,712
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The reported expenditure by outputs for 1997-98 excluded details for the Specific Purpose Grants Trust Account and the Nature Conservation and National Parks Trust Account in the table “Summary of Consolidated Fund Appropriations and Revenue Estimates”.

The 1998-99 annual report information on the Trust Accounts is now included in this table.

Comparison of 1997-98 and 1998-99 actual expenditures by output cannot be made.

Capital Expenditure

Capital Expenditure	25,073	13,938
Increased expenditures on major capital projects include; Maritime Pine Nursery construction \$3.543M, land purchases \$3.586M, improvement to tourism facilities \$0.869M plant and equipment \$0.821M and hardwood forest regeneration \$0.677M.		

33. ADMINISTERED ASSETS AND LIABILITIES

Cash deposits lodged with the Department by contractors pending satisfactory performance of the contract.	1,411	1,533
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Auditor General

To the Parliament of Western Australia

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT FINANCIAL STATEMENTS FOR THE YEAR ENDED JUNE 30, 1999

Scope

I have audited the accounts and financial statements of the Department of Conservation and Land Management for the year ended June 30, 1999 under the provisions of the Financial Administration and Audit Act 1985.

The Executive Director is responsible for keeping proper accounts and maintaining adequate systems of internal control, preparing and presenting the financial statements, and complying with the Act and other relevant written law. The primary responsibility for the detection, investigation and prevention of irregularities rests with the Executive Director.

My audit was performed in accordance with section 79 of the Act to form an opinion based on a reasonable level of assurance. The audit procedures included examining, on a test basis, the controls exercised by the Department to ensure financial regularity in accordance with legislative provisions, evidence to provide reasonable assurance that the amounts and other disclosures in the financial statements are free of material misstatement and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial statements are presented fairly in accordance with Accounting Standards, other mandatory professional reporting requirements and the Treasurer's Instructions.

The audit opinion expressed below has been formed on the above basis.

Audit Opinion

In my opinion,

- (i) the controls exercised by the Department of Conservation and Land Management provide reasonable assurance that the receipt, expenditure and investment of moneys and the acquisition and disposal of property and the incurring of liabilities have been in accordance with legislative provisions; and
- (ii) the Operating Statement, Statement of Financial Position, Statement of Cash Flows, Output Schedule of Expenses and Revenues, Summary of Consolidated Fund Appropriations and Revenue Estimates and the Notes to and forming part of the financial statements are based on proper accounts and present fairly in accordance with applicable Accounting Standards, other mandatory professional reporting requirements and the Treasurer's Instructions, the transactions for the year ended June 30, 1999 and the financial position at that date.

D D R PEARSON
AUDITOR GENERAL
September 29, 1999

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APPENDIX 1 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

**APPENDIX 2
AREAS OF EVEN-AGED KARRI REGENERATION**

Year of Regeneration Area (ha)	Multiple Use Forest		Conservation Forest		Totals	
	Annual Total (ha)	Cumulative Area (ha)	Annual Total (ha)	Cumulative Area (ha)	Annual Total (ha)	Cumulative (ha)
Before 1900	60	60	1,200	1,200	1,260	1,260
1900-09	-	60	-	1,200	-	1,260
1910-19	140	200	30	1,230	170	1,430
1920-29	170	370	50	1,280	220	1,650
1930-39	5,800	6,170	460	1,740	6,260	7,910
1940-49	710	6,880	460	2,200	1,170	9,080
1950-59	560	7,440	160	2,360	720	9,800
1960-65	230	7,670	-	2,360	230	10,030
1966	160	7,830	-	2,360	160	10,190
1967	210	8,040	80	2,440	290	10,480
1968	690	8,730	130	2,570	820	11,300
1969	1,290	10,020	310	2,880	1,600	12,900
1970	80	10,100	-	2,880	80	12,980
1971	80	10,180	10	2,890	90	13,070
1972	1,110	11,290	1,380	4,270	2,490	15,560
1973	190	11,480	-	4,270	190	15,750
1974	140	11,620	30	4,300	170	15,920
1975	630	12,250	430	4,730	1,060	16,980
1976	1,770	14,020	50	4,780	1,820	18,800
1977	1,630	15,650	220	5,000	1,850	20,650
1978	1,630	17,280	310	5,310	1,940	22,590
1979	1,920	19,200	310	5,620	2,230	24,820
1980	2,090	21,290	120	5,740	2,210	27,030
1981	2,950	24,240	300	6,040	3,250	30,280
1982	2,310	26,550	150	6,190	2,460	32,740
1983	1,930	28,480	370	6,560	2,300	35,040
1984	1,750	30,230	470	7,030	2,220	37,260
1985	2,400	32,630	-	7,030	2,400	39,660
1986	1,910	34,540	-	7,030	1,910	41,570
1987	1,110	35,650	-	7,030	1,110	42,680
1988	1,460	37,110	-	7,030	1,460	44,140
1989	1,110	38,220	-	7,030	1,110	45,250
1990	1,300	39,520	-	7,030	1,300	46,550
1991	1,270	40,790	-	7,030	1,270	47,820
1992	1,400	42,190	-	7,030	1,400	49,220
1993	1,930	44,120	-	7,030	1,930	51,150
1994	2,300	46,420	-	7,030	2,300	53,450
1995	1,530	47,950	-	7,030	1,530	54,980
1996	1,560	49,510	-	7,030	1,560	56,540
1997	1,570	51,080	-	7,030	1,570	58,110
1998	1,470	52,550	-	7,030	1,470	59,580
Totals	52,550	52,550	7,030	7,030	59,580	59,580

Note: Conservation Forest is as defined in the Forest Management Plan 1994-2003.

**APPENDIX 3
AREA OF STATE-OWNED CONIFEROUS PLANTATIONS AS AT 31-12-98**

Planting Year	Pinus Radiata				Pinaster & Other Species				All Species			
	First Rotation (ha)	Replanted Areas (ha)	Cumulative Total (ha)		First Rotation (ha)	Replanted Areas (ha)	Cumulative Total (ha)		Year Total (ha)	Cumulative Total (ha)		
< 1959	343	(79)	18 (0)	361 (79)	3413 (58)	45 (0)	3,458 (58)	3819 (137)	3,819 (137)			
1959	29	(2)	0 (0)	390 (81)	245 (0)	0 (0)	3,703 (58)	274 (2)	4,093 (139)			
1960	83	(28)	3 (0)	476 (109)	306 (0)	0 (0)	4,009 (58)	392 (28)	4,485 (167)			
1961	43	(0)	0 (0)	519 (109)	434 (0)	3 (0)	4,446 (58)	480 (0)	4,965 (167)			
1962	89	(5)	0 (0)	608 (114)	412 (0)	0 (0)	4,858 (58)	501 (5)	5,466 (172)			
1963	115	(0)	0 (0)	723 (114)	301 (0)	0 (0)	5,159 (58)	416 (0)	5,882 (172)			
1964	219	(0)	0 (0)	942 (114)	553 (3)	24 (24)	5,736 (85)	796 (27)	6,678 (199)			
1965	114	(0)	13 (0)	1,069 (114)	441 (0)	3 (0)	6,180 (85)	571 (0)	7,249 (199)			
1966	247	(0)	6 (0)	1,322 (114)	701 (0)	2 (0)	6,883 (85)	956 (0)	8,205 (199)			
1967	374	(0)	0 (0)	1,696 (114)	917 (0)	0 (0)	7,800 (85)	1,291 (0)	9,496 (199)			
1968	340	(0)	16 (0)	2,052 (114)	1,271 (0)	3 (0)	9,074 (85)	1,630 (0)	11,126 (199)			
1969	915	(4)	0 (0)	2,967 (118)	1,468 (0)	9 (0)	10,551 (85)	2,392 (4)	13,518 (203)			
1970	1,010	(157)	0 (0)	3,977 (275)	1,192 (1)	19 (0)	11,762 (86)	2,221 (158)	15,739 (361)			
1971	913	(58)	0 (0)	4,890 (333)	827 (1)	0 (0)	12,589 (87)	1,740 (59)	17,479 (420)			
1972	1,005	(29)	4 (0)	5,899 (362)	668 (0)	0 (0)	13,257 (87)	1,677 (29)	19,156 (449)			
1973	1,174	(102)	51 (0)	7,124 (464)	542 (0)	3 (0)	13,802 (87)	1,770 (102)	20,926 (551)			
1974	1,369	(165)	2 (0)	8,495 (629)	321 (0)	0 (0)	14,123 (87)	1,692 (165)	22,618 (716)			
1975	1,290	(159)	0 (0)	9,785 (788)	1,210 (0)	0 (0)	15,333 (87)	2,500 (159)	25,118 (875)			
1976	1,485	(101)	5 (0)	11,275 (889)	1,122 (0)	1 (0)	16,456 (87)	2,613 (101)	27,731 (976)			
1977	1,307	(9)	33 (0)	12,615 (898)	864 (0)	0 (0)	17,320 (87)	2,204 (9)	29,935 (985)			
1978	2,006	(10)	17 (0)	14,638 (908)	495 (0)	0 (0)	17,815 (87)	2,518 (10)	32,453 (995)			
1979	1,382	(4)	407 (0)	16,427 (912)	515 (0)	0 (0)	18,330 (87)	2,304 (4)	34,757 (999)			
1980	1,505	(0)	0 (0)	17,932 (912)	899 (0)	0 (0)	19,229 (87)	2,404 (0)	37,161 (999)			
1981	1,353	(0)	114 (0)	19,399 (912)	878 (0)	5 (0)	20,112 (87)	2,350 (0)	39,511 (999)			
1982	1,199	(0)	279 (0)	20,877 (912)	463 (0)	5 (0)	20,580 (87)	1,946 (0)	41,457 (999)			
1983	1,307	(0)	37 (0)	22,221 (912)	662 (0)	0 (0)	21,242 (87)	2,006 (0)	43,463 (999)			
1984	1,823	(0)	3 (0)	24,047 (912)	506 (0)	9 (0)	21,757 (87)	2,341 (0)	45,804 (999)			
1985	1,637	(48)	126 (0)	25,810 (960)	478 (0)	2 (0)	22,237 (87)	2,243 (48)	48,047 (1,047)			
1986	1,049	(164)	0 (0)	26,859 (1,124)	481 (0)	0 (0)	22,718 (87)	1,530 (164)	49,577 (1,211)			
1987	1,397	(702)	159 (0)	28,415 (1,826)	663 (0)	39 (39)	23,420 (126)	2,258 (741)	51,835 (1,952)			
1988	1,655	(1,234)	134 (1)	30,204 (3,061)	194 (0)	1 (0)	23,615 (126)	1,984 (1,235)	53,819 (3,187)			
1989	974	(420)	461 (32)	31,639 (3,513)	22 (0)	20 (0)	23,657 (126)	1,477 (452)	55,296 (3,639)			
1990	888	(746)	356 (0)	32,883 (4,259)	0 (0)	6 (0)	23,663 (126)	1,250 (746)	56,546 (4,385)			
1991	1,278	(1,197)	517 (0)	34,678 (5,456)	4 (0)	19 (0)	23,686 (126)	1,818 (1,197)	58,364 (5,582)			
1992	1,784	(1,777)	494 (0)	36,956 (7,233)	118 (118)	345 (0)	24,149 (244)	2,741 (1,895)	61,105 (7,477)			
1993	767	(682)	995 (0)	38,718 (7,915)	0 (0)	264 (0)	24,413 (244)	2,026 (682)	63,131 (8,159)			
1994	544	(401)	419 (0)	39,681 (8,316)	0 (0)	182 (0)	24,595 (244)	1,145 (401)	64,276 (8,560)			
1995	101	(97)	1,110 (1)	40,892 (8,414)	266 (266)	149 (0)	25,010 (510)	1,626 (364)	65,902 (8,924)			
1996	16	(9)	1,220 (0)	42,128 (8,423)	609 (609)	30 (0)	25,649 (1,119)	1,875 (618)	67,777 (9,542)			
1997	3	(0)	1,152 (0)	43,283 (8,423)	1,137 (1,137)	177 (0)	26,963 (2,256)	2,469 (1,137)	70,246 (10,679)			
1998	81	(75)	55 (0)	43,419 (8,498)	1,914 (1,906)	0 (0)	28,877 (4,162)	2,050 (1,981)	72,296 (12,660)			
Totals	35,213	(8,464)	8,206 (34)	43,419 (8,498)	27,512 (4,099)	1,365 (63)	28,877 (4,162)	72,296 (12,660)	72,296 (12,660)			

Notes: Areas for years prior to 1998 have been adjusted to account for areas harvested, replantings, renegotiations of plantation boundaries and land sales. Areas shown in brackets have been established under sharefarm agreements. These areas are included in the totals.

**APPENDIX 4
AREA OF STATE-MANAGED BROADLEAVED PLANTATIONS
AS AT 31-12-98**

PLANTING YEAR	CALM-OWNED		CALM-MANAGED		ALL SPECIES			
	<i>E. globulus</i> (ha)	Other Eucs. (ha)	Owned by other Govt.	Privately owned	Year Total		Cumulative Total	
			<i>E. globulus</i> (ha)	<i>E. globulus</i> (ha)	<i>E. globulus</i> (ha)	Other Eucs. (ha)	<i>E. globulus</i> (ha)	Other (ha)
<1987	19 (0)	6,643 (3)	548	0	567	6,643	567	6,643
1987	0 (0)	24 (0)	43	0	43	24	610	6,667
1988	1,469 (1,466)	12 (0)	7	0	1,476	12	2,086	6,679
1989	2,840 (2,823)	2 (0)	24	20	2,884	2	4,970	6,681
1990	295 (241)	25 (0)	58	152	505	25	5,475	6,706
1991	405 (399)	40 (0)	79	288	772	40	6,247	6,746
1992	466 (452)	1 (1)	68	603	1,137	1	7,384	6,747
1993	294 (279)	15 (0)	36	1,358	1,688	15	9,072	6,762
1994	49 (49)	2 (0)	22	1,915	1,986	2	11,058	6,764
1995	6 (3)	0 (0)	3	3,581	3,590	0	14,648	6,764
1996	96 (96)	0 (0)	0	6,318	6,414	0	21,062	6,764
1997	78 (61)	0 (0)	0	6,517	6,595	0	27,657	6,764
1998	83 (83)	0 (0)	0	5,352	5,435	0	33,092	6,764
Total	6,100 (5,952)	6,764 (4)	888	26,104	33,092	6,764	33,092	6,764

Notes: Areas for years prior to 1998 have been adjusted to account for areas harvested, replantings, renegotiations of plantation boundaries and land sales. Areas shown in brackets have been established under sharefarm agreements. These areas are included in the total.

**APPENDIX 5
TRENDS IN PRODUCTION OF LOGS BY CALM**

Year Ended 30 June	HARDWOOD			SOFTWOOD			TOTAL		
	Crown Land (m ³)	Private Property (m ³)	Total (m ³)	Crown Land (m ³)	Private Property (m ³)	Total (m ³)	Crown Land (m ³)	Private Property (m ³)	Total (m ³)
1998	1,365,792	3,370	1,369,162	618,162	51,722	669,884	1,983,954	55,092	2,039,046
1999	1,258,683	136	1,258,819	560,816	29,064	589,880	1,819,499	29,200	1,848,699

*Includes logs from Crown land sold under Forest Produce Licences.

**APPENDIX 6
TRENDS IN PRODUCTION OF HARDWOOD CHIPLOG BY CALM FROM NATIVE FOREST AND PLANTATIONS**

Year Ended 30 June	CROWN LAND				PRIVATE PROPERTY				TOTAL Produced by CALM (m ³)
	Bolewood + Branchwood				Bolewood + Branchwood				
	Marri	Karri	Other*	Total Crown land	Marri	Karri	Other P. Property	Total P. Property	
	(m ³)	(m ³)	(m ³)	(m ³)	(m ³)	(m ³)	(m ³)	(m ³)	(m ³)
1998	413,327	187,799	10,803	611,929	-	-	3,252	3,252	615,181
1999	317,596	197,005	14,526	529,127	-	-	-	-	529,127

* includes chipwood from inforest chipping.

APPENDIX 7
LOG PRODUCTION BY CALM FROM CROWN LAND & PRIVATE PROPERTY 1998-99

TYPE	Crown Land		Private Property		Total	
	(m ³)	(tonnes)	(m ³)	(tonnes)	(m ³)	(tonnes)
SAWLOG TIMBER*						
Jarrah	349,968	459,124	136	179	350,104	459,303
Karri	226,098	279,581	-	-	226,098	279,581
Marri	10,268	12,741	-	-	10,268	12,741
Blackbutt	1,065	1,392	-	-	1,065	1,392
Wandoo	467	615	-	-	467	615
Sheoak	1,550	1,550	-	-	1,550	1,550
Other	158	197	-	-	158	197
Total Native Hardwood	589,574	755,200	136	179	589,710	755,379
Globulus	133	159	-	-	133	159
Yellow Stringybark	95	113	-	-	95	113
Mallet	249	296	-	-	249	296
Total Plantation Hardwood	477	568	-	-	477	568
Pine Sawlogs and Veneer Logs	266,516	266,516	10,574	10,574	277,090	277,090
TOTAL SAWLOGS	856,567	1,022,284	10,710	10,753	867,277	1,033,037
OTHER LOG MATERIAL						
Native Hardwood						
Chiplogs	514,628	628,250	-	-	514,628	628,250
Industrial wood	1,962	2,421	-	-	1,962	2,421
Firewood/charcoal logs	116,181	124,518	-	-	116,181	124,518
other**	20,253	24,376	-	-	20,253	24,376
SubTotal Native Forest/Other	653,024	779,565	-	-	653,024	779,565
Plantation Hardwood						
Chiplogs	14,499	15,091	-	-	14,499	15,091
Industrial wood	-	-	-	-	-	-
other**	1,109	1,148	-	-	1,109	1,148
SubTotal Hardwood Pltn/Other	15,608	16,239	-	-	15,608	16,239
Softwood						
Industrial wood***	275,996	285,566	13,887	13,887	289,883	299,453
Pine rounds	18,304	18,304	4,603	4,603	22,907	22,907
SubTotal Softwood/Other	294,300	303,870	18,490	18,490	312,790	322,360
Total Other Material	962,932	1,099,674	18,490	18,490	981,422	1,118,164
TOTAL LOG TIMBER	1,819,499	2,121,958	29,200	29,243	1,848,699	2,151,201

* Sawlog timber from all sources, including veneer, but not including chiplogs, particleboard, industrial wood, firewood, fencing material, poles, piles and minor forest products.

** Includes poles, bridge timbers, burls, chopping logs, mining timber, pegging logs and fencing material.

*** Includes pine woodchips.

Includes logs from Crown land sold under Forest Produce Licences.

**APPENDIX 8
PRODUCTION OF SAWN TIMBER 1997-98**

Hardwood m ³	Softwood m ³	Total m ³
238,820	161,860	400,680

Final figures for 1998-99 not yet available. These will be published in the next annual report.

Note: Total sawn production figures supplied by sawmills include some private property timber not separately identified.

**APPENDIX 9
OFFENCES UNDER THE CALM ACT AND FOREST MANAGEMENT REGULATIONS 1998-99**

Charges	Prosecution Recommended	Letter of Warning	Prosecutions Pending
CONSERVATION AND LAND MANAGEMENT ACT			
Unlawful taking of forest produce	5	12	2
Unlawful lighting of fire		1	
Removal of forest produce without payment of royalty	1		
Failure to provide name and address	1		
FOREST MANAGEMENT REGULATIONS			
Offences relating to log delivery notes	5	1	3
Offences relating to control and eradication of forest diseases	5	10	
Offences relating to illegal plant material	1		
Totals	18	24	5

Note: Offences related to Temporary Control Areas not included.

**APPENDIX 10
AREA OF PRESCRIBED BURNS FOR ALL CALM REGIONS 1996-97 TO 1998-99**

	1996-97	1997-98	1998-99
Indigenous Vegetation - Hand Burning (ha)			
State forest			
• handburns	11,468	10,488	10,883
• clearing burns	-	-	-
National parks	31,866	31,683	3,530 ¹
Nature reserves	12,735	7,410	5,279 ¹
Other Crown land and private property	4,040	133	1,000
Total	60,109	49,714	20,692
Indigenous Vegetation - Aerial Burning (ha)			
State forest	112,695	86,637	51,893
National parks	110,434	16,355	1,776
Nature reserves	16,955	2,700	3,244
Other Crown land and private property	97,750	4,671	91,979 ²
Total	337,834	110,363	148,892
Indigenous Vegetation - Silviculture Burning (ha)			
• Jarrah	43,752	39,842	13,816
• Karri	1,845	926	2,135
• Wandoo	-	-	110
Total	45,597	40,768	16,061
Softwood Plantation - Burning (ha)			
State forest			
• fuel reduction	4,712	4,384	6,896
• second rotation clearing burns	949	268	370
Total	5,661	4,652	7,266
Grand Total	449,201	205,497	192,910

For data specific to Southwest Forest regions see Appendix 13 and 14.

¹ *Does not include buffer strips hand burnt within the Kimberley region.*

² *This consists of aerially ignited buffers and blocks burnt within the Kimberley (87,094 ha) and Swan (4,885 ha) regions.*

**APPENDIX 11
WILDFIRES IN ALL CALM REGIONS 1996-97 TO 1998-99
NUMBER AND AREA BY LAND CATEGORY
NUMBER AND PER CENT BY CAUSE**

	Number			Area Burnt (ha)		
	1996-97	1997-98	1998-99	1996-97	1997-98	1998-99
State forest						
• native hardwood	76	115	93	5,675	18,816	2,446
• softwood plantation	39	74	108	70	797	32
National parks	50	74	31	110,241	576,966	251,821 ¹
Nature reserves	16	37	29	26,774	64,311	62,498
Other CALM reserves	**	6	12	**	7,036	916
Other Crown lands	51	62	89	8,183	543,790	1,089,750 ¹
Private property	61	102	76	17,250	285,059	27,811
Total	293	470	438	168,192	1,496,775	1,435,274

CAUSES

	Number			Per cent		
	1996-97	1997-98	1998-99	1996-97	1997-98	1998-99
Deliberately/illegally lit	85	174	215	29	37	49
Escapes—CALM burns	12	25	3	4	5	1
Escapes—other burning	20	44	36	7	9	8
Accidental—timber industry	1	2	2	0	0	0
Accidental—other industries	23	33	17	8	7	4
Accidental—recreationists	27	22	20	9	5	5
Lightning	38	52	54	13	11	12
Unknown	67	102	75	23	22	17
Other causes	20	16	16	7	3	4
Total	293	470	438	100	100	100

¹ Most area burnt by wildfires occurred within the Kimberley and Pilbara regions (see Appendix 12).

** Not available previously.

**APPENDIX 12
AREA AND NUMBER OF WILDFIRES FOR ALL CALM REGIONS 1998-99**

Region		State forest native hardwood	State forest softwood plantation	National parks	Nature reserves	Crown lands and private property	Total
Swan	Area (ha)	922	24	345	86	2,323	3,701
	Number	58	98	10	20	105	291
Central Forest	Area (ha)	280	8	2,779	10	936	4,012
	Number	27	10	7	1	23	68
Southern Forest	Area (ha)	1,223	-	177	-	34	1,435
	Number	8	-	2	-	16	26
Sub Total	Area (ha)	2,426	32	3,301	96	3,293	9,148
	Number	93	108	19	21	144	385
Kimberley	Area (ha)	-	-	176,500	60,600	1,060,500	1,297,600
	Number	-	-	3	1	2	6
Pilbara	Area (ha)	-	-	65,530	-	27,115	92,645
	Number	-	-	3	-	4	7
Midwest	Area (ha)	-	-	130	1,200	14	1,344
	Number	-	-	2	-	5	7
Goldfields	Area (ha)	-	-	4,355	-	2,345	6,700
	Number	-	-	1	-	-	1
Wheatbelt	Area (ha)	20	-	-	466	4,275	4,761
	Number	-	-	-	4	7	11
South Coast	Area (ha)	-	-	2,005	136	20,936	23,076
	Number	-	-	3	3	15	21
Sub Total	Area (ha)	20	-	248,520	62,402	1,115,184	1,426,126
	Number	-	-	12	8	33	53
Grand Total	Area (ha)	2,446	32	251,821	62,498	1,118,477	1,435,274
	Number	93	108	31	29	177	438

**APPENDIX 13
AREAS PRESCRIBED BURNT WITHIN SOUTHWEST FOREST REGIONS FOR 1998-99**

Dominant purpose	Forest Region	Area (hectares)				Years since last burnt*
		Winter	Spring	Summer	Autumn	
Fuel reduction**	Swan	3,634	24,935	-	3,444	4 - 19
	Central Forest	371	18,717	250	2,310	6 - 14
	Southern Forest	-	12,931	1,300	233	8 - 12
		4,005	56,583	1,550	5,987	
Silviculture ***	Swan	-	1,350	-	3,105	7 - 14
	Central Forest	-	6,560	-	575	4 - 11
	Southern Forest	-	2,901	796	774	4 - 18
		-	10,811	796	4,454	
Nature **** Conservation	Swan	-	893	-	1,750	9 - 17
	Central Forest	-	1,113	-	497	16
	Southern Forest	-	-	-	-	N/A
		-	2,006	-	2,247	
Tourism and Recreation	Swan	-	688	-	15	4 - 17
	Central Forest	52	7,088	130	175	8
	Southern Forest	-	605	845	80	10 - 13
		52	8,381	975	270	
Grand Total (ha)		4,057	77,781	3,321	12,958	

Notes * Does not include softwood plantation burns.

** Fuel reduction burning also protects nature conservation values.

*** Years since last burnt applies to jarrah silviculture only.

**** Nature conservation burning also provides community protection benefits.

Data supplied pursuant to the Minister's Statement (24.12.92) under the Environmental Protection Act (1986) that the proposed amendments to the 1987 Forest Regional Management Plan and Timber Strategy may proceed.

**APPENDIX 14
NUMBER OF PRESCRIBED BURNS CONDUCTED IN NATIVE FORESTS WITHIN
SOUTHWEST FOREST REGIONS IN EACH SEASON FOR VARIOUS PURPOSES IN 1998-99**

Dominant purpose	Region	Winter		Spring		Summer		Autumn		No. of escapes
		Aero	Hand	Aero	Hand	Aero	Hand	Aero	Hand	
Fuel reduction	Swan	11	34*	10	33	-	-	1	8	3
	Central Forest	-	4	7	1	-	1	1	1	-
	Southern Forest	-	-	7	1	1	-	-	2	-
		11	38	24	35	1	1	2	11	3
Silviculture	Swan	-	-	1	-	-	-	3	1	-
	Central Forest	-	-	4	-	-	-	1	1	-
	Southern Forest	-	-	2	15	-	21**	-	20	-
		-	-	7	16	-	21	4	22	-
Nature Conservation	Swan	-	-	1	3	-	-	1	-	-
	Central Forest	-	-	1	1	-	-	1	-	-
	Southern Forest	-	-	-	-	-	-	-	-	-
		-	-	2	4	-	-	2	-	-
Tourism and Recreation	Swan	-	-	-	6	-	-	-	2	-
	Central Forest	-	3	2	1	-	1	1	-	-
	Southern Forest	-	-	1	1	1	-	-	1	-
		-	3	3	8	1	1	1	3	-
Total		11	41	36	62	2	23	9	36	3
Aero Burns (% by season)		19		62		3		16		
Hand Burns (% by season)			25		38		14		22	

* Predominantly pine plantation burns during winter months.

** Predominantly karri regeneration burns during summer months.

Data supplied pursuant to the Minister's Statement (24.12.92) under the Environmental Protection Act (1986) that the proposed amendments to the 1987 Forest Regional Management Plan and Timber Strategy may proceed.

**APPENDIX 15
WILDLIFE LICENCES ISSUED IN 1998-99**

Fauna Licences	Licences Issued	Fauna Licences (Cont.)	Licences Issued
SCIENTIFIC		GROCODILES	
Scientific Collection (Reg 17)	329	Crocodile Farming (Reg 14)	2
Bird/Bat Banding (Reg 23)	141	Skin Dealing (Reg 10)	1
		Processing (Reg 7)	2
EDUCATION & PUBLIC		KANGAROO	
(to take) (Reg 15)	277	Take Kangaroos for sale (Reg 6)	236
EDUCATION & PUBLIC		Deal in carcasses (Reg 8)	31
(to hold) (Reg 16)	132	Skin Dealing (Reg 10)	16
		Processing (Reg 7)	24
AVIAN FAUNA		EXPORTS INTERSTATE	
Keep & breed in captivity (Reg 12)	3,724	Skins of fauna (or other dead fauna)	61
Deal (Reg 13)	62	Fauna (live)	215
Breed for Commercial Purposes (Reg 14)	2		276
Trap (Reg 11)	4	EXPORT OVERSEAS	
		Skins of fauna (or other dead fauna) from WA	96
SPECIES TRAPPED COMMERCIALY	Number	Emu eggs or products (personal items) from WA	11
Twenty-eight Parrot	232	Fauna (avian) from WA (live)	1
Red-capped Parrot	14		108
Western Rosella	108	IMPORTS INTERSTATE	
Galah	45	Skins of fauna (or other dead fauna) into WA	6
FAUNA		Australian fauna (live)	432
Keep in Captivity (Reg 12A)	123	Live exotic birds and other animals	213
			651
EMUS		Flora Licences	
Emu Farming (Reg 14)	30	Commercial Purposes	566
Dealing (Reg 8)	4	Commercial Producers	452
Dealing (Emu eggshells Reg 13)	10	Scientific/Prescribed Purposes	962
Processing (Reg 7)	5	Permits To Take Declared Rare Flora	86
			2,066

APPENDIX 16
SUMMARY OF DAMAGE LICENCES ISSUED IN 1998-99

	No. of Licences Issued	Total No. of Each Species Authorised to be Taken		No. of Licences Issued	Total No. of Each Species Authorised to be Taken
WATERFOWL			OTHER AVIAN FAUNA		
Wood Duck	24	396 + scare only	Australian Raven	18	363 + scare
Mountain Duck	3	20	Corella LB	13	1,060 + scare
Little Black Cormorant	1	6	Wedged-tailed Eagle	4	scare only
Little Pied Cormorant	4	17	Galah	16	1,155 + scare
Sacred Ibis	1	scare only	Kookaburra	5	4 + trap/relocate
Eurasian Coot	1	trap/relocate	Little Corella	17	1,397 + scare
Maned Geese	3	150 + scare only	Silvereye	1	20
EMUS	43	1,363	Silver Gull	10	1,290 + scare
DANGEROUS FAUNA			Twenty Eight Parrot	27	1,545
Magpie	84	94	White-tailed Black Cockatoo	11	25 + scare only
Salt Water Crocodile	5	2 + trap/relocate	Magpie	1	trap/relocate
Australian Raven	2	2	Magpie Lark	1	trap/relocate
Kookaburra	4	11	Eastern LB Corella	1	14
Magpie Lark	1	trap/relocate	Crested Pigeon	1	20
Pink & Grey Galah	1	trap/relocate	Red-capped Parrot	2	150
Red Wattle Bird	1	1	Welcome Swallow	1	trap/relocate
Western Grey Kangaroo	4	14	Goshawks, Sparrowhawks	1	scare only
MAMMALS					
Grey Kangaroo	609	53,713			
Red Kangaroo	17	1,770			
Euro	13	830			
Agile Wallaby	1	10			
Little Red Flying Fox	1	10			

APPENDIX 17
OFFENCES UNDER THE WILDLIFE CONSERVATION ACT AND REGULATIONS
1998-99

Charges	Recomm'd Charges	Convic- tions	Fines \$	Costs \$	Dismissed	Letter of Warning	No. Further Action	Pending
WILDLIFE CONSERVATION ACT								
Use of illegal devices in taking fauna.	2	0	0	0	0	0	1	1
Illegal taking or possession of protected fauna.	132	43	11,600.00	1,879.00	0	6	9	74
Illegal importation, selling or taking for sale of fauna.	7	1	75.00	255.00	0	4	1	1
Offences relating to the taking or possession of rare or threatened fauna.	28	3	2,700.00	625.00	0	4	1	20
Illegal taking of protected flora.	183	2	1,200.00	432.50	0	6	0	175
Offences relating to the sale of protected flora.	21	0	0	0	0	3	0	18
Taking declared rare flora without the Minister's consent.	9	0	0	0	0	0	3	6
Offences against wildlife officers.	3	0	0	0	0	1	0	2
Failing to comply with licence conditions.	84	0	0	0	0	74	3	7
WILDLIFE CONSERVATION REGULATIONS								
Offences relating to the acquisition, possession, control and disposal of fauna.	85	2	2,000.00	315.00	0	27	6	50
Offences relating to activities on Nature Reserves.	21	0	0	0	0	10	0	11
Totals	575	51	\$17,575.00	\$3,506.50	0	135	24	365

APPENDIX 18
PUBLICATIONS PRODUCED IN 1998–99

GENERAL

Annual Report of the Department of Conservation and Land Management 1997–98
 Be a CALM Bush Ranger (leaflet)
 CALM Book News (leaflet, 4 issues)
 CALM Briefing Paper 1/95
 CALM Briefing Paper 2/94
 CALM Bush Ranger (certificate)
 CALM Bush Ranger Manual — Vol 1
 CALM Bush Ranger Manual — Vol 2
 CALM Corporate Plan 1998–2000
 CALM Internal Telephone Directory 1999
 CALM News (newspaper, 6 issues)
 CALM Personnel Pass 1999
 CALM Training and Development Manual 1999
 CALMScience Strategic Plan 1999–2004
 CALMScience Supplement 5
 CALMScience Vol 3 No 1 (journal)
 Conservation and Land Management: Working with Communities throughout WA (magpaper)
 Emergency Catering Handbook
 Esperance Lakes Nature Reserve Management Plan 1999–2009
 For Long and Meritorious Service (certificate)
 Gnaragara National Park Concept Plan
 Integrated Approach to Conservation, Public Land and Wildlife Management and Commercial Forestry (report)
 Karijini National Park Management Plan 1999–2009
 LANDSCOPE Calendar 2000
 LANDSCOPE Conservation BankWest Visa Card (leaflet)
 LANDSCOPE Expedition Procedures Manual
 LANDSCOPE Expeditions: Leader's Procedures and Operations Manual
 LANDSCOPE Expeditions Program 1999
 LANDSCOPE Gift Card
 LANDSCOPE Magazine (4 issues)
 Leschenault Management Plan 1998–2008
 Leschenault Management Plan: Analysis of Public Submissions
 Marine Parks and Reserves Scientific Advisory Committee Annual Report 1997–98
 Marine Parks and Reserves Scientific Advisory Committee Annual Report 1997–98
 Marine Reserves in Western Australia (leaflet)
 Marine Reserves Management Concepts (flyer)
 Nambung Management Plan Analysis of Public Submissions
 Nambung National Park Management Plan
 National Parks and Nature Conservation Authority Annual Report 1997–98
 Operation Foxglove (certificate)
 Rowles Lagoon Nature Reserve Draft Management Plan
 Safety in Bushfire Control
 Solar Eclipse Expedition (leaflet)
 Solar Eclipse Eye Safety (leaflet)
 Stars and Telescopes (leaflet)
 Swan Estuary Nature Reserves Analysis of Public Submissions
 Swan Estuary Nature Reserves Management Plan
 Take Your Partners – LANDSCOPE extract (brochure)
 WA Naturally (leaflet)

NATURE CONSERVATION

Aviary Birds: Information Sheet 1/97
 Believing the Balga: LANDSCOPE extract (brochure)

Best Recipes for Interpreting our Heritage (manual)
 Black Swan (leaflet)
 Bouncing Back: LANDSCOPE extract (brochure)
 Catchment Carers Trail '99 (leaflet)
 Common Plants of the Kimberley: Bush Book
 Crocodiles in Western Australia (leaflet)
 Dongolocking Pilot Planning Project (report)
 Environmental Weed Strategy (report)
 Environmental Weed Strategy for Western Australia (report)
 Environmentally Significant Site (poster)
 Esperance Lakes Nature Reserve (leaflet)
 Festival of Animals (flyer)
 Flatback Turtles (leaflet)
 From Blue Sky to Blue Chip: LANDSCOPE extract (brochure)
 Halt the salt: LANDSCOPE extract (brochure)
 Have You Seen This Flower? (flyer)
 How to Conduct a Community Fauna Survey
 Land for Wildlife (leaflet)
 Lower Ord Ramsar Site Draft Report
 Mallee Fowl (leaflet)
 Marine Turtles (flyer)
 No Take areas in Marine Park Management (booklet)
 Nuysia Vol 12 No 2 (journal)
 Operation Western Shield Newsletter (2 issues)
 Pacific Black Duck (leaflet)
 Partnerships in Nature Conservation
 Perup Forest and Lake Muir Nature Reserve Draft Plan
 Rare Birds of Western Australia: Bush Book
 Rare Flora Notification: Information Sheet
 Recovering Lake Toolibin: LANDSCOPE extract (brochure)
 Report to Greenhouse Council
 Salinity: A Situation Statement for Western Australia
 Salinity Action Plan
 Salinity Action Plan: Analysis of Public Submissions
 State Salinity Newsletter (2 issues)
 Stop If You See These Signs (stickers)
 Threatened Flora (various identification leaflets)
 Threatened Plant Communities of the Swan Coastal Plain
 Watching Whales (leaflet)
 Western Australia's Threatened Flora (book)
 Western Australian Roadside (handbook)
 Western Everlasting: Florabase (flyer)
 Western Long-necked Tortoise (leaflet)
 Western Shield: LANDSCOPE extract (brochure)
 Western Shield Newsletter
 Western Shield Poster
 Western Wildlife Newsletter (4 issues)
 Western Wildlife Vol 2 No 2
 What to Do with Granite Outcrops (flyer)
 Wildlife Awareness Colour-in Sheet
 Wildlife Notes No 3

TOURISM AND RECREATION

A Guide to Kimberley Parks (booklet)
 A Guide to the Bibbulmun Track Southern Half (book)
 A Guide to the Coral Coast Parks (magpaper)
 Aboriginal Culture Excursions (flyer)
 Avon Descent (flyer)
 Be a Trail Blazer (leaflet)
 CALM, A Natural Part of the Tourism Industry (leaflet)
 Caravan and Camping Show (flyer)
 Coastal Plain Walk Trail (leaflet)

Coral Bay Visitor and Boating Guide (leaflet)
 Dryandra Woodland (postcards)
 Dryandra Woodland (poster)
 Dryandra Woodland Ecology (leaflet)
 Dryandra Woodland Ecology Course (flyer)
 Dryandra Woodland Ecology Course (poster)
 Eagles View Walk Trail (leaflet)
 Exploring the Hills Forest 1999 (leaflet)
 Exploring Wheatbelt Woodland
 Exploring Woodlands with Noongars (leaflet)
 Forest Walk 98 (flyer)
 Francois Peron National Park (leaflet)
 Go Bush (leaflet)
 Go Bush Autumn 99 (leaflet)
 Go Bush Spring 98 (leaflet)
 John Forrest National Park (leaflet)
 Kalbarri National Park (leaflet)
 Kennedy Range National Park (leaflet)
 Leeuwin-Naturaliste National Park Pass
 Marine Tour Operators Handbook
 Millstream-Chichester National Park (leaflet)
 Mirima National Park Fact Sheet
 Mitchell Plateau (leaflet)
 Monkey Mia Day Passes
 Monkey Mia Newsletter
 Monkey Mia Reserve (leaflet)
 Nambung National Park (leaflet)
 National Park Pass (flyer)
 National Park Visitor Guide (leaflet)
 National Park Windscreen Passes
 Parks of the Coral Coast (leaflet)
 Recreation Guide to the Kimberley Parks and Reserves (leaflet)
 Saving the Giants: *LANDSCOPE* extract (brochure)
 Sensational Summer Nights (leaflet)
 Shannon National Park (leaflet)
 Sharing the Dreaming (flyer)
 Shark Bay (magpaper)
 Shark Bay Marine Environment (leaflet)
 Shark Bay Marine Environment Visitors' Guide (leaflet)
 The Sights and Sounds of the Night (leaflet)
 Tour Operators Handbook
 Touring Western Australia (leaflet 6 issues)
 Tread Lightly (leaflet)
 Valley of the Giants (leaflet)
 Walyunga National Park (leaflet)
 Wickiepin Wildflower Tour (leaflet)
 Win a Night Out with the Woylies
 Yanchep National Park Visitor Guide (leaflet)
 Yanchep Sun and Stars Festival (flyer)
 Yanchep Sun and Stars Festival (poster)

FOREST RESOURCES MANAGEMENT

A Woodworker's Dream (leaflet)
 Albany Plantation Forest Company: CALM Sharefarms (leaflet)
 Arbor Day Certificate
 Arbor Day Poster 1999
 Branch Out with CALM (leaflet)
 Code of Practice for Timber Harvesting (report)
 Dwellingup School of Wood: *LANDSCOPE* extract (brochure)
 Farming Carbon: *LANDSCOPE* extract (brochure)
 Forest Heritage Centre: Active in the Forest (leaflet)
 Forest Heritage Centre: Creative Workshops (leaflet)
 Forest Heritage Centre Postcards
 Growing WA Sandalwood from Seeds
 In Search of the Perfect Pine: *LANDSCOPE* extract (brochure)

Management Guidelines for Timber Harvesting (manual)
 Profit from a tree crop (leaflet)
 Sandalwood Information Sheet No1
 Sandalwood: *LANDSCOPE* extract (brochure)
 Seasoned with Fire: *LANDSCOPE* extract (brochure)
 Seed Price List 1998–1999
 The Balga Grass Tree (poster)
 The Potential for Tree Crops and Vegetation Rehabilitation to Sequester Carbon in Western Australia (report)
 Timber Harvesting in Western Australia (report)
 Tree Crops for Farms: *LANDSCOPE* extract (brochure)

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