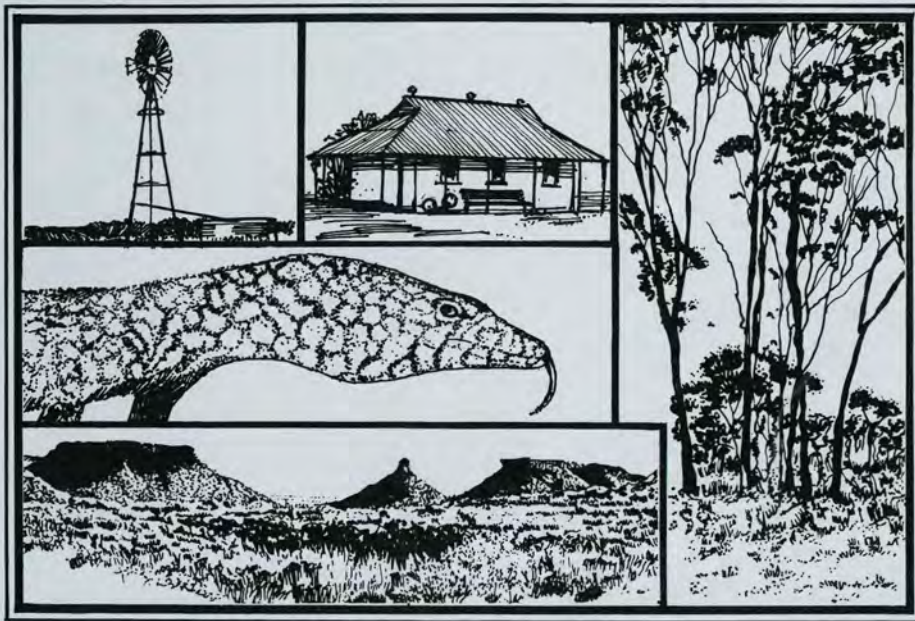


Goldfields Region

July 1992



Department of Conservation
and Land Management



National Parks and Nature
Conservation Authority

GOLDFIELDS REGION

DRAFT REGIONAL MANAGEMENT PLAN

July 1992

Planning Team

Andrew Chapman - Co-ordinator
Ian Kealley - Regional Manager, Goldfields Region
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Department of Conservation and Land Management
for
The National Parks and Nature Conservation Authority
and
The Lands and Forest Commission
Perth, Western Australia

WHAT DO YOU THINK ?

We want to know what you think of the proposals in this Draft Management Plan. Have you thought about writing a submission ?

WHY WRITE A SUBMISSION ?

It is an opportunity to provide information, express your opinion, suggest alternatives and have a say on how we are proposing to manage CALM land in the Goldfields Region over the next 10 years.

If you prefer not to write your own submission you could make a joint submission with others.

WHAT MAKES AN EFFECTIVE SUBMISSION ?

To ensure your submission is as effective as possible:

- make it concise and clear.
- list your points according to the subject sections (and page numbers) in the Plan.
- describe briefly each subject or issue you wish to discuss.
- say whether you agree or disagree with any or all of the objectives or recommendations within each subject or just those of specific interest to you; clearly state your reasons (particularly if you disagree) and give sources of information where possible.
- suggest alternatives to deal with any issue with which you may disagree.

It is important to indicate those strategies and recommendations you agree with as well as those with which you disagree.

Each submission is important in its own right but those that give reasons for concerns, give support where appropriate and offer information and constructive suggestions are most useful.

WHAT HAPPENS TO YOUR SUBMISSION ?

All submissions will be summarised according to the topics discussed. The Draft Management Plan will then be reviewed in the light of submissions, according to established criteria (see over). A summary of the submissions will be published, including an indication of how the plan was or was not amended in response to the submissions, along with the Final Management Plan. If a submission is marked 'CONFIDENTIAL' the author will remain anonymous in the summary of submissions.

WHAT CRITERIA WILL BE USED IN ASSESSING YOUR SUBMISSION ?

1. The Draft Management Plan *will* be amended if a submission:
 - (a) provides additional resource information of direct relevance to management;
 - (b) provides additional information on affected user groups of direct relevance to management;
 - (c) indicates a change in (or clarifies) Government legislation, management commitment or management policy;
 - (d) proposes strategies that would better achieve management goals and objectives; or
 - (e) indicates omissions, inaccuracies or a lack of clarity.

2. The Draft Management Plan *will not* be amended if a submission:
 - (a) clearly supports the draft proposals;
 - (b) offers a neutral statement or no change is sought;
 - (c) addresses issues beyond the scope of the plan;
 - (d) makes points which are already in the plan or were considered during plan preparation;
 - (e) indicates strongly opposing views with the existing recommendations providing a preferred management option; or
 - (f) contributes options which are not feasible (generally due to conflict with existing legislation, or Government or departmental policy).

DEADLINE

Submissions are welcome for four months closing on 31 October 1992.

WHERE DO YOU SEND YOUR SUBMISSION ?

Written submissions should be sent to:

Regional Manager
Department of Conservation and Land Management
P.O. Box 366
KALGOORLIE W.A. 6430

Attn: Plan Coordinator
Goldfields Regional Management Plan

ACKNOWLEDGEMENTS

Input and advice on this plan was provided by:

- CALM's Goldfields Regional Staff
- Various branches within CALM
- CALM Research Division
- The CALM Corporate Executive
- The National Parks and Nature Conservation Authority
- The Lands and Forest Commission.

Following liaison and discussions, advice was received from the six local government bodies in the region:

- Shire of Laverton
- Shire of Leonora
- Shire of Wiluna
- Shire of Menzies
- Shire of Coolgardie
- City of Kalgoorlie-Boulder.

Rob Walster, Goldfields Esperance Development Authority gave permission to quote from a departmental report. Neville Tonkin, Agriculture Protection Board, Kalgoorlie advised on declared weeds in the Goldfields. CALM's Land Information Branch provided the map products and checked area statements for this plan. Allan Padgett, Planning Branch, edited an earlier draft. Lee-Anne Martin and Debbie Bowra typed the manuscripts.

NOMENCLATURE

Inclusion of a name in this publication does not imply its approval by the relevant nomenclature authority.

OBJECTIVES

The objectives of the Goldfield Regional Management Plan are:

- i. To describe issues of conservation and land management on the Goldfields and indicate strategies for their management.
- ii. To describe the conservation reserve system in the Goldfields and make recommendations for its improvement.
- iii. To describe the role and function of CALM in the Goldfields.
- iv. To provide a means for public and other participation in items i) and ii) above.

Regional objectives are identical to CALM's overall objectives, with the emphasis being on the Region carrying out Departmental operational functions.

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**PART A. THE DEPARTMENT OF CONSERVATION
AND LAND MANAGEMENT**

Part A. The Department of Conservation and Land Management

1. THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

The Department of Conservation and Land Management was established in 1985 as a result of the amalgamation of the Forests Department, the National Parks Authority and the wildlife section of the Department of Fisheries and Wildlife. The Conservation and Land Management Act 1984 (CALM Act) was proclaimed on 22 March 1985. This Act also established two controlling bodies, the National Parks and Nature Conservation Authority (NPNCA) in which national parks, nature reserves, conservation parks, marine parks, and marine nature reserves are vested, and the Lands and Forest Commission (LFC) in which State Forests and timber reserves are vested. The membership of the controlling bodies represents community interests associated with the lands vested in them.

The organisational structure of CALM is indicated in Figure 1. Critical to CALM's regional operational role is the existence of ten decentralized regions (Map 1).

The statement of mission adopted in CALM's Strategic Plan is:

TO CONSERVE WESTERN AUSTRALIA'S WILDLIFE AND MANAGE LANDS AND WATERS ENTRUSTED TO THE DEPARTMENT FOR THE BENEFIT OF PRESENT AND FUTURE GENERATIONS.

To achieve this, five primary objectives have been established:

Management

To protect, restore and enhance the value of resources entrusted to the Department so as to meet, as far as possible, the diverse expectations of the community.

Conservation

To conserve the indigenous plant and animal species and environmental processes in natural habitats throughout the State.

Production

To provide and regulate the supply of those renewable resources that Government decides should be used, on a sustained yield basis for the satisfaction of long term social and economic needs, and in a manner that minimises impact on other values.

Recreation







To facilitate the public enjoyment of the natural attributes of public lands and reserved waters in a manner that does not compromise conservation and other management objectives.

Knowledge

To seek a better understanding of the natural environment and to promote awareness and appreciation of its values.

CALM ESTATE

KEY

- State Forest 
- National Park 
- Nature Reserve over 2000 ha. 
- Nature Reserve under 2000 ha. 
- Marine Park 
- Other C.A.L.M. Land. 

SCALE
0 100 200km.

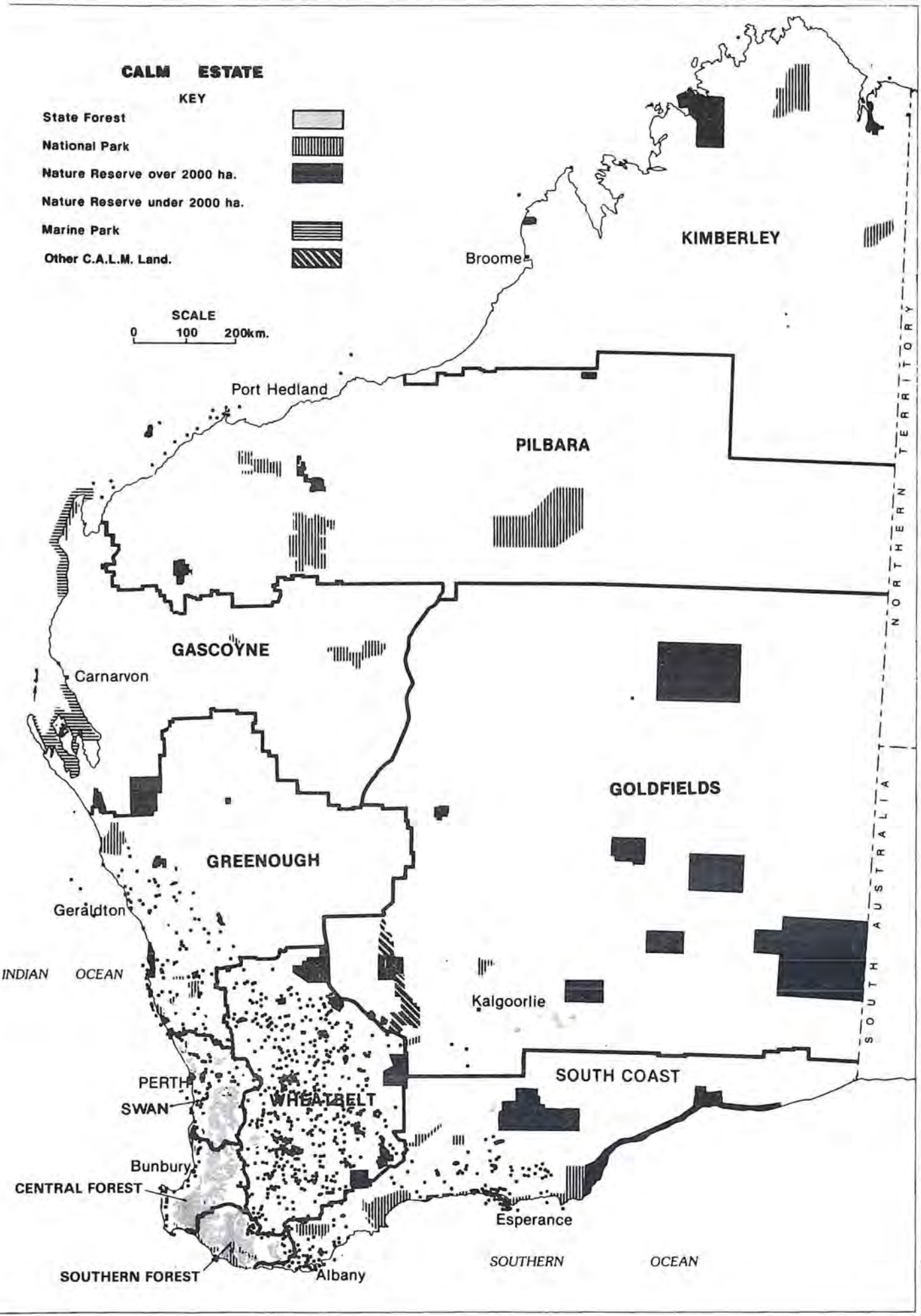
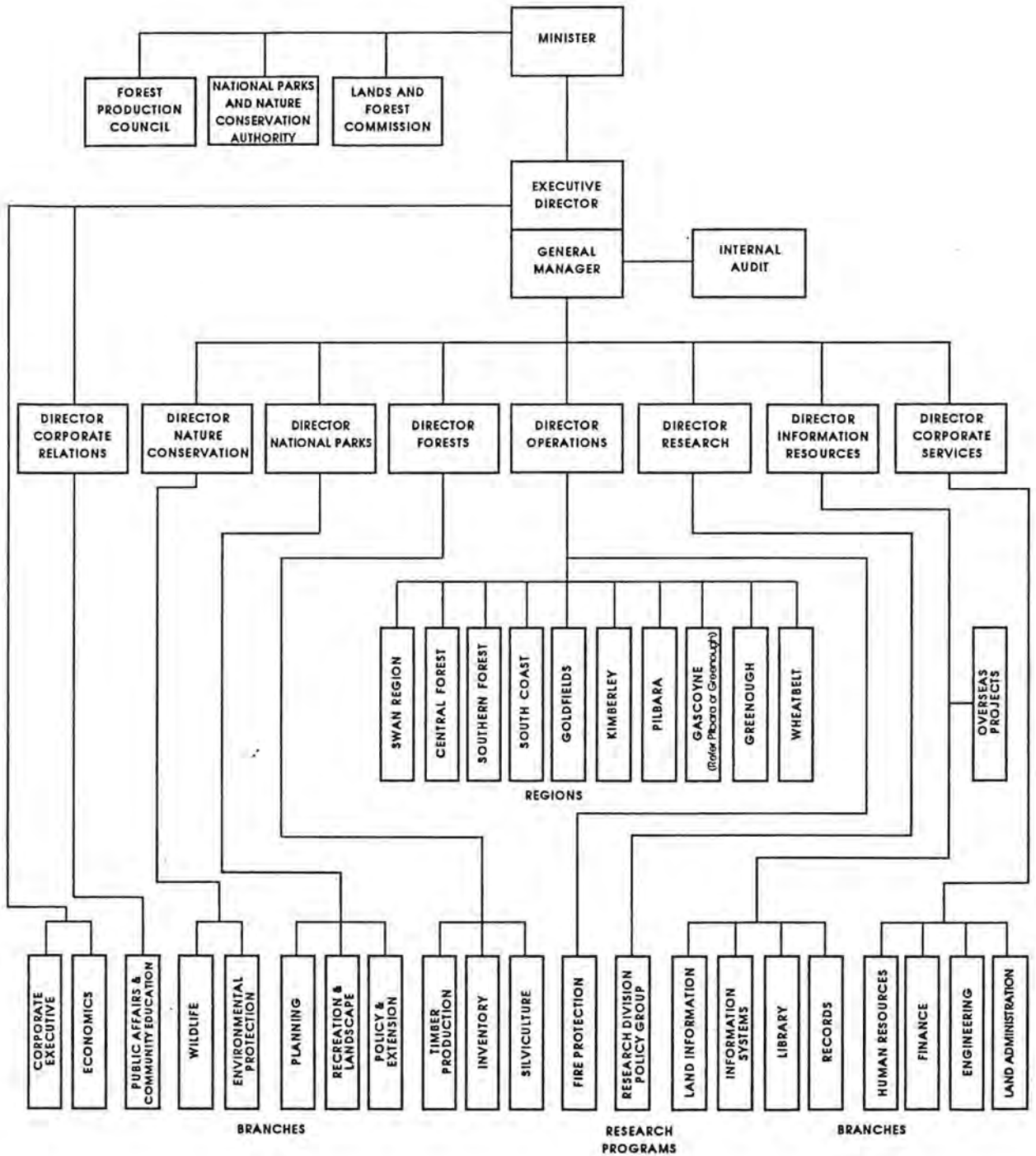


FIGURE 1.

Department of Conservation and Land Management Organisational Structure



Part A. The Department of Conservation and Land Management

In formulating policies and management plans for conservation and recreation management, CALM is guided by the principles set down in a number of key documents. These are:

- The State Conservation Strategy, which sets out conservation objectives and strategies for W.A.
- The CALM Act and the Wildlife Conservation Act, which provide the legal framework for management of parks, reserves, forests and wildlife in W.A.
- The Departmental Strategic Plan, which guides the Department in establishing overall objectives and allocating priorities to works programs.
- The strategies for Conservation and Recreation on CALM lands in Western Australia.
- The strategy for Timber Production in Western Australia, which elaborates on the principles in the State Conservation Strategy and applies them to forest management for timber production in W.A.
- The Resolution of Conflict - A Clear Policy for National Parks - a State government policy document which addresses the question of mining on conservation lands.

DEFINITIONS

The definitions of conservation, development and environment adopted by CALM are those set down in the State Conservation Strategy for Western Australia (Dept. of Conservation and Environment, 1987) and the Western Australian Environmental Protection Act 1986 (EPA Act)

Conservation

The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. Thus conservation is positive, embracing preservation, maintenance, sustainable utilisation, restoration, and enhancement of the natural environment. Living resource conservation is specifically concerned with plants, animals and microorganisms, and with those non-living elements of the environment on which they depend. Living resources have two important properties that distinguishes them from non-living resources: they are renewable if conserved; and they are destructible if not.

Development

The modification of the biosphere and the application of human, financial, living and non-living resources to satisfy human needs and improve the quality of human life. For development to be sustainable it must take account of social and ecological factors, as well as economic ones; of the living and non-living resource base; and of the long term as well as the short term advantages and disadvantages of alternate actions.

Environment

Living things their physical, biological and social surroundings, and interactions between all of these.

For the purposes of this definition of environment, the social surroundings of man are his aesthetic, cultural, economic and social surroundings to the extent that those surroundings directly affect or are affected by his physical or biological surroundings.

2. MANAGEMENT

CALM has two major management tasks:

- management of lands vested in the controlling bodies; and
- management of wildlife throughout W.A. irrespective of land tenure, vesting and ownership.

2.1 MANAGEMENT OF LANDS VESTED IN THE CONTROLLING BODIES

The Conservation and Land Management Act 1984 as amended provides the legislation, statutes and regulations for CALM's management of the following categories of land:

Nature Reserve

Marine Nature Reserve

National Park

Conservation Park

Marine Park

State Forest

Timber Reserve

Miscellaneous (5g) Reserve

These categories are defined in terms of vesting, tenure and purpose as follows:

2.1.1 Nature Reserve/Marine Nature Reserve

Vesting: National Parks and Nature Conservation Authority

Tenure: A, B or C Class

Purpose: Wildlife and landscape conservation, scientific study and preservation of features of archaeological, historic or scientific interest.

Comment: Nature reserves may be terrestrial or marine. These are areas in which nature conservation values may not be commercially exploited and where forms of recreation which damage natural ecosystems are not permitted.

2.1.2 National Park

Vesting: National Parks and Nature Conservation Authority

Tenure: Usually A Class, some National Parks are "C" Class.

Purpose: Wildlife and landscape conservation, scientific study and preservation of features of archaeological, historic or scientific interest, together with recreational enjoyment by the public.

Comment: Commercial exploitation of wildlife is not permitted. Only those recreational pursuits which do not adversely affect ecosystems and their landscapes are permitted. The classification of national park applies to areas which have national or international significance for scenic, cultural or biological values.

2.1.3 Conservation Park

Vesting: National Parks and Nature Conservation Authority

Tenure: A Class

Purpose: Identical to national park.

Comment: Conservation parks differ from national parks only in their significance, size or condition. They are managed as if they were national parks. The differences are that these areas may not necessarily have major national or international significance, may be relatively small in size or their landscape or biota has been affected by past land use. Conservation parks in forest areas will not be zoned to include areas where commercial timber production may occur.

2.1.4 Marine Park

Vesting: National Parks and Nature Conservation Authority

Tenure: A Class

Purpose: Marine conservation and recreation, with areas zoned for commercial fishing on an ecologically sustainable basis.

Comment: This classification is generally in accord with the internationally accepted concept of a managed resource area. It allows for management for conservation and recreation, plus controlled commercial use where appropriate.

2.1.5 State Forest

Vesting: Lands and Forest Commission

Tenure: Identical to A Class, in that the agreement of both Houses of Parliament is required before tenure can be changed.

Purpose: Multiple use.

Comment: The major uses of State forest are for recreation, sustainable timber and water production and for wildlife and landscape conservation. State forests will also provide for public utilities and mineral production, where these activities are imposed.

2.1.6 Timber Reserve

Vesting: Lands and Forest Commission

Tenure: At discretion of Minister only, ie. agreement of Parliament not required.

Purpose: Timber production.

Comment: Timber reserve is a transitional classification. As timber reserves are evaluated, they will be reclassified as State forest, nature reserve, national park or conservation park as appropriate.

2.1.7 Miscellaneous Reserve

Vesting: Lands and Forest Commission or National Parks and Nature Conservation Authority (areas managed under Section 5g of the CALM Act) or Executive Director.

Tenure: At discretion of Minister only, ie. agreement of Parliament not required.

Purpose: These reserves have a wide variety of purposes, but normally are related to recreation, wildlife conservation and historical features. As with timber reserves, this classification is often transitional, and on further evaluation the classification can be changed to a more appropriate one.

CRITERIA FOR ALLOCATION OF LAND TO CALM CATEGORIES

The following criteria apply to categories of CALM land:

Nature Reserve/Marine Nature Reserve

Areas to be managed for nature conservation and scientific study.

Have important nature conservation value, either as part of a conservation reserve system, as a remnant of native vegetation or because of the occurrence of particular species.

National Park

Areas to be managed for nature conservation, scientific study and public enjoyment.

Have important conservation, cultural and scenic values.

Nationally or internationally significant, in terms of landscape and/or biota.

Size must be sufficiently great to accommodate recreation or historical uses without significantly detracting from conservation values.

Conservation Park

Purpose identical to national park.

Areas generally are not nationally or internationally unique, in terms of landscape and/or biota.

These are generally smaller areas or where nature conservation values have been affected by past land use.

Marine Park

Marine areas managed for nature conservation, scientific study, public enjoyment and commercial fishing on an ecologically sustainable basis.

Where zoning includes commercial fishing, a marine park must be large enough to allow this fishing without detracting from the overall nature conservation and recreational values.

2.2 MANAGEMENT OF LANDS NOT VESTED IN THE CONTROLLING BODIES

CALM is responsible for the conservation and protection of indigenous flora and fauna on all land and waters within the State boundaries, under Section 6 of the Wildlife Conservation Act 1976.

Included as wildlife are both flora and fauna defined separately under S.6 as:

"fauna" means -

- (a) any animal indigenous to any State or Territory of the Commonwealth or the territorial waters of the Commonwealth;
- (b) any animal that periodically migrates to and lives in any State or Territory of the Commonwealth or the territorial waters of the Commonwealth; and

Part A. The Department of Conservation and Land Management

- (c) any animal declared as fauna pursuant to subsection (2) of this section, and includes in relation to any such animal
- (d) any class of individual member thereof;
- (e) the eggs, larvae or semen;
- (f) the carcass, skin, plumage or fur thereof, but does not include any prescribed animal or prescribed class of animal;

Although invertebrates and some fish are included as fauna under the Act, all invertebrates except Jewel beetles (family Buprestidae) and ants of the genus *Nothomyrmecia* have been declared not protected by Ministerial notice.

"**flora**" means any plant (including any wildflower, palm, shrub, tree, fern, creeper or vine) which is -

- (a) native to the State; or
- (b) declared to be flora pursuant to subsection (4) of this section, and includes any part of flora and all seeds and spores thereof;

Vacant Crown Land and unvested reserves are normally controlled by the Department of Land Administration. However, forest produce on vacant Crown land and pastoral leases is controlled by CALM under Section 88 of the CALM Act. Forest produce includes trees, timber, firewood, honey, seed, rocks, stone and soil, but excludes minerals under the Mining Act 1978. The Bush Fires Board is responsible for fire prevention measures on vacant Crown land and unvested reserves under Section 10 of the Bush Fires Act.

Under section 45 of the Bush Fires Act, CALM may take responsibility for the suppression of bush fires threatening State forest. Under an agreement with the Department of Land Administration, the Agriculture Protection Board has responsibility for the control of vermin and declared plants on vacant Crown land and unvested reserves. The Sandalwood Act 1929 (as amended) provides for the harvesting of sandalwood on Crown lands, private property and certain types of reserves.

CALM has the responsibility of administering regulations made under the Wildlife Conservation Act for the protection, management and control of nature reserves. Under section 130 of the CALM Act those provisions also apply to those reserves created under the Land Act for the conservation of flora and/or fauna, but which are not vested in the National Parks and Nature Conservation Authority.

3. THE PLANNING PROCESS

The CALM Act commits CALM to the preparation of management plans for all lands under its control. Relevant sections are s.53-61, including that:

- a management plan shall be operative for a period not exceeding 10 years; and
- written submissions may be made by any person within a period of not less than two months after the day the draft plan notice is published in the Gazette.

Due to the remote nature of some Goldfields communities this draft management plan will be open for public submissions for four months.

Consultation conducted prior to the production of this draft included briefing sessions with all the Shires in the Goldfields Region. Additionally, 18 organisations including Aboriginal groups, Land Conservation District Committees, Government Departments and the Amalgamated Prospectors and Lease Holders Association were asked for expressions of interest; of these only two replied. A leaflet advising the general public was circulated through Shire offices.

There is a hierarchy of types of plans to cater for the need for broad policy statements over the whole State, more detailed plans for regions, and still more detailed plans for specific areas. The hierarchy of plans is:

- CALM Strategic Plan
- Regional management plan
- Area management plan

The CALM strategic plan contains broad policy statements for all major aspects of land and water vested in the NPNCA or the LFC in Western Australia.

A regional management plan will be prepared for each CALM administrative region. The plan will cover all categories of land and water vested or proposed to be vested in the NPNCA or the LFC.

An area management plan will apply to a specific area such as national park, conservation park, marine park, nature reserve, marine nature reserve, State forest, or other reserve. These are the most detailed management plans of all. Area management plans will be prepared only where there are requirements above and beyond those that can be considered by a Regional management plan.

In the absence of an area management plan certain necessary operations may be undertaken on national parks and nature reserves under section 33(4) of the CALM Act. They are defined as "those operations that are necessary for the preservation or protection of persons, property, land, flora or fauna, or for the preparation of a management plan".

By this definition necessary operations are restricted in scope and it is important that they do not pre-empt the options for a future management plan.

Necessary operations are usually proposed as part of the interim guidelines prepared by district and specialist staff, to guide the management of an area until a management plan is prepared. Occasionally, necessary operations are proposed as a reaction to crisis, or to deal with a particular problem; for instance feral animal control, or upgrading a recreation site that may be suitable now but with increased use would deteriorate.

Necessary operations must be approved in a consistent manner and must be environmentally acceptable. It must also be clear what constitutes a necessary operation. As a general principle, CALM attempts to provide for as many land uses as possible, so long as they are consistent with the primary purpose of the land. Many areas of land can be used simultaneously for many different purposes, without conflict or land degradation. Where this cannot be done, systematic land use planning is necessary. This involves:

- identification of demands and conflicts;
- decisions on priority use;
- allocation of priority uses to areas;
- the preparation of a map showing proposed land uses and priorities.

A land use plan and map has two important functions. First, it provides the public with information about, and the opportunity to comment on and seek changes to, land use decisions. Second, it provides a basis for day-to-day management by CALM staff.

**PART B. THE GOLDFIELDS REGION -
RESOURCES AND ADMINISTRATION**

4. PHYSICAL AND BIOLOGICAL RESOURCES

The extent of the Goldfields Region of CALM is indicated in Map 1. The total area is 77.4 million hectares. Geographically the region extends from the eastern edge of the cereal producing area, the Wheatbelt, through the eucalypt woodlands of the South West Interzone to the central desert areas, and including large portions of the Nullarbor Plain and mulga woodlands. There is a climatic gradient from a winter rainfall regime of approximately 300 mm per annum in the south west to an unseasonal regime of approximately 150 mm in the northern Nullarbor area. The contribution to rainfall of cyclonic influences, particularly rain-bearing depressions increases to the north of the region. Predicted increases to rainfall of 10-20% associated with a southward movement of mid latitude cyclonic belts due to the greenhouse effect (Chittleborough 1985), are relevant to land use planning in the region.

Geographically the western half of the region comprises Pre-cambrian granites, gneisses and greenstones or erosional remnants, eg. breakaways and sandplains of these components. Minor topographic relief is offered by low hills and ranges of Banded Ironstone and Greenstone in the Yilgarn.

The Nullarbor is the largest karst area in the world. It comprises Tertiary limestones and other marine sediments. Deserts of W.A. have been described and delineated by Beard (1969); in the Goldfields Region deserts include red sandplains and dunes from the weathering of lateritic duricrust and low hills and ranges of either Proterozoic laterites or sandstones. Major ancient drainage lines and lakebeds of Tertiary age intersperse other landforms throughout the Goldfields.

Soils reflect geology with red-brown earthy loams in the south west, shallow calcareous loams on the Nullarbor, red siliceous sands in the desert and brown sandy clay loams over much of the Mulga woodlands. A useful summary of the physical environment of the Goldfields and a bibliography is in Department of Planning and Urban Development, (1989).

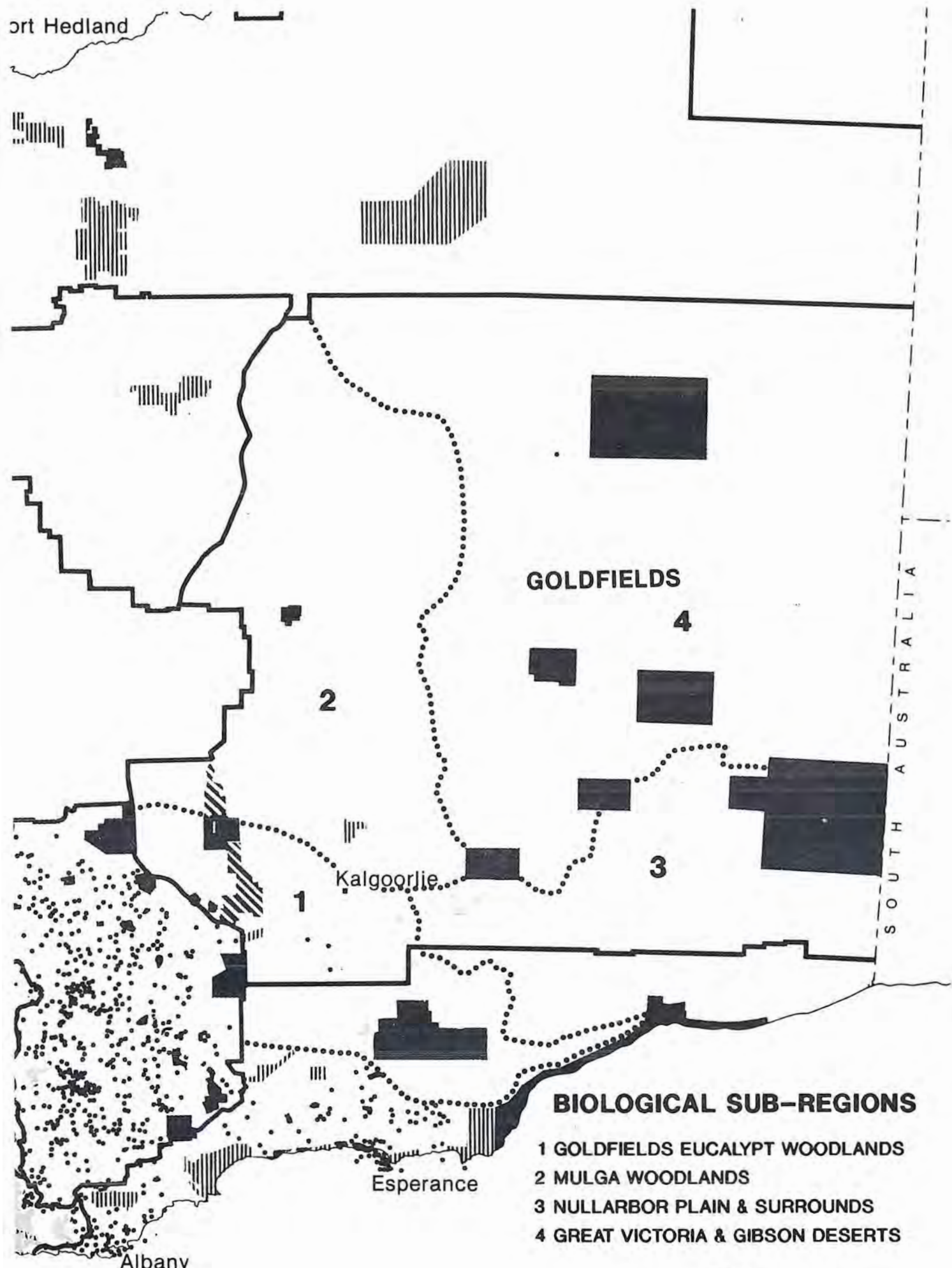
Flora and fauna are determined by climatic and geological gradients within the region as well as, more recent land use practices. For the purposes of this brief overview five biological sub-regions are recognized. Four of these are indicated in Map 2.

4.1 EUCALYPT WOODLANDS

These occupy an area known biologically as the south-west interzone - or the Coolgardie Botanical District; between the south-west land division and the deserts of the interior. The woodlands have some elements of the flora of both these regions as well as some of their own. They are located in the south-west of the region.

The vegetation is predominantly eucalypt woodland (Beard 1981) becoming open and with a saltbush-bluebush understorey on the more calcareous soils. Patches of shrub steppe adjoin the Great Victoria Desert and scrub-heath and *Allocasuarina* thickets occur on sandplains. *Casuarina cristata* woodlands occur on some soil types.

Port Hedland



GOLDFIELDS

2

4

1

Kalgoorlie

3

Esperance

Albany

SOUTH AUSTRALIA

BIOLOGICAL SUB-REGIONS

- 1 GOLDFIELDS EUCALYPT WOODLANDS
- 2 MULGA WOODLANDS
- 3 NULLARBOR PLAIN & SURROUNDS
- 4 GREAT VICTORIA & GIBSON DESERTS

SCALE

0 100 200Km.

The eucalypts of the Goldfields attract considerable attention because nowhere else in the world do so many tall trees grow in such an arid environment. This fact is of considerable interest to foresters from China, Africa, Israel and Mediterranean countries where Goldfields eucalypts are used for arid zone re-forestation and rehabilitation. It comes as a surprise to many people that the trees they are most familiar with as street or ornamental trees, only occur naturally in relatively localized and restricted areas. Of 47 eucalypt species in Goldfields woodlands, 24 are present as trees the remainder occurring as mallees.

These woodlands are not continuously distributed. Other landforms of biological and conservation importance are granite outcrops, small patches of sandplain, and saltlakes and drainage lines. These are specialized habitats for flora and fauna which harbour different species than the woodlands. Sandplains in particular have more small mammals than other habitats in the Goldfields.

Granite outcrops are often host to rare or poorly known plants such as Goldfields Bottlebrush (*Melaleuca coccinea*), and the eucalypts, Bookleaf Mallee (*Eucalyptus kruseana*), Round-leaved Mallee (*E. orbifolia*) and Websters Mallee (*E. websteriana*).

The stony hills of the Goldfields also contribute some interesting flora such as the Yilgarn Dryandra (*Dryandra arborea*) which is the largest and most eastern occurring Dryandra. Many other geographically restricted and rare plants also occur on the stony hills around Mt. Jackson, Mt. Manning and the Koolyanobbing Range.

4.2 MULGA WOODLANDS

As a generalisation, the areas to the north and east of Kalgoorlie-Boulder essentially form the Mulga region of Western Australia (Beard 1976), though there are small patches of Mulga in other parts of the Goldfields, in the deserts, and around the Nullarbor. Mulga is a typically Australian word with different connotations to different people; biologically it refers to the small wattle tree or shrub *Acacia aneura*. This species grows on red-brown sandy loams throughout much of the southern interior of Western Australia. Both leaf shape and size vary according to the environment. Over much of the plains it forms a low woodland, but on shallow soils and hills it is a shrubland. Recent studies indicate that Mulga is very sensitive to fire (Fox 1986).

Sandalwood (*Santalum spicatum*) is a valuable small tree which is widespread in this region. It forms the basis of a small, thriving industry based on the export of the wood for incense manufacture in southern east Asia.

4.3 NULLARBOR PLAIN

Vegetation of the Nullarbor (which means “no-trees”) consists of shrubs dominated by either Pearl Bluebush (*Maireana sedifolia*) or Saltbush (*Atriplex* species). Claypans support a grassland of *Stipa* spp. and *Danthonia caespitosa*. Slight depressions in the plain with deeper soil and more moisture are known as dongas. These have taller plants including Weeping Pittosporum (*Pittosporum phylliraeoides*), Kurara (*Acacia tetragonophylla*) and *Grevillea nematophylla*.

Ephemeral species occur in great abundance following rain. Sturt Pea (*Clianthus formosus*) and White Everlastings (*Helipterum floribundum*) add a dash of colour.

On the north and west peripheries of the open plain, the vegetation consists of low woodlands of Myall (*Acacia papyrocarpa*), Mulga (*Acacia aneura*) and Beelar (*Casuarina cristata*). The predominant low shrubs are Pearl Bluebush (*Maireana sedifolia*) and Saltbush (*Atriplex vesicaria*). Low grasslands (*Danthonia caespitosa* and *Stipa* spp.) occur on drainage floors, claypans and dongas.

To the south of the open plain, low limestone ridges carry low woodlands. The local distribution of salt in some intervening claypans is responsible for the presence of Samphire (*Halosarcia* spp.) while Pearl Bluebush (*Maireana sedifolia*) and Saltbush (*Atriplex vesicaria*) occur on the lower slopes of the ridges and less saline claypans.

A narrow coastal plain (the Roe Plain) links through to South Australia. Its vegetation consists of a mosaic of mallee dominated by *Eucalyptus gracilis*, *E. socialis* and *Melaleuca* spp., including *M. pauperiflora*, and lightly wooded shrub steppe dominated by Myall (*Acacia papyrocarpa*) (Beard 1975). The distribution of many south western species ends on this plain. The shrub steppe on the mud flats near the coast is dominated by Samphire (*Halosarcia* spp.), and Heath occurs on cliff tops and slopes. Vegetation surrounding the Plain provides an important corridor for fauna, particularly birds, between south-west Western Australia and South Australia.

4.4 GREAT VICTORIA AND GIBSON DESERTS

To the north of the Nullarbor Plain the vegetation grades into the sand dunes and spinifex of the Great Victoria Desert.

Vegetation is typified by very open woodland of Marble Gum (*Eucalyptus gongylocarpa*) over Spinifex (*Triodia basedowi*). This combination occurs on open plains and sand ridges in the desert.

Other vegetation types are Mallee (*Eucalyptus youngiana*, *E. concinna*, *E. leptopoda* and *E. rigidula*), *E. kingsmillii*, *E. oleosa*, and Mulga, the latter occurring principally on breakaway ridges.

Saltlakes including Forrest Lakes, Carlisle Lakes and Jubilee Lakes are surrounded by a low woodland of Beelar (*Casuarina cristata*). Understorey near Lakes Throssell and Rason includes *Ptilotus obovatus*, *Atriplex hymenotheca*, *Maireana carnososa*, *Frankenia* sp. and *Zygophyllum* sp. Samphires (*Halosarcia* species) and Saltbush surround and cover the lake beds.

The desert Grass Tree *Xanthorrhoea thorntonii* occurs in the south-west of the desert.

Plains of deep red sands which occur north and east of the Interzone between the arid zone and the South-west Botanical Province (Beard 1981) support richly varied assemblages of trees, shrubs and hummock grasses. The hummock grasses are collectively known as spinifex and feature the genera *Triodia* and *Plectrachne*.

Geomorphically, the spinifex plains occur on sand sheets found on elevated plains. Many of these plains overlie remnant sections of the Plateau of Tertiary laterite, while other sand plains overlie granite slopes and plains or salt lake fringes. All evidently originate from Pleistocene aeolian periods and many exhibit desert dunefield development, which becomes more marked to the north and east. The distinctive red siliceous sands are very low in plant nutrients.

Unlike the mulga woodlands, with which they occur regionally (and intergrade locally), the spinifex plains are inherently adapted to fire. Fire patterns dominate the appearance of these landscapes at all scales, from the ground to satellite images of the region. The structure and composition of spinifex associations is very variable as a result of fire-related plant succession and many local variations in soils and species distributions.

4.5 LAKE FRONTAGE-CHENOPOD SHRUBLAND

Low-lying areas receiving run-off from breakaways, ranges and wash plains enjoy better moisture and nutrient status than elsewhere. Halophytic shrubs dominate the vast majority of such areas, which exhibit characteristic zonation of the plant communities according to local effects of topography, drainage and soil type. Within the confines of the salt lake beds, soils are replaced by saline muds or other sediments such as kopi, which is an un-refined form of gypsum.

4.6 STATE OF BIOLOGICAL KNOWLEDGE OF THE GOLDFIELDS REGION

The Goldfields Region of CALM has the distinction of being the most intensively and systematically biologically surveyed region of W.A. In 1975 following well above average rainfall years in 1973/74 a series of desert biological surveys commenced which ran until 1980 and examined some 10 remote desert localities, see Burbidge et al (1976), McKenzie and Burbidge (1979) and Burbidge and McKenzie (1983). Prior to these surveys Queen Victoria Spring Nature Reserve and Great Victoria Desert Nature Reserve were the only two desert reserves in W.A. The System 11 biological surveys undertaken between 1978 and 1982, see McKenzie (1983) and Biological Surveys Committee (1984), examined some 160 sites for fauna and approximately 1 500 flora sites were described, and each site was sampled three times. This was a landmark in biological survey theory and practice, and it involved some 3 700 person days. It also revealed 3 species of mammal and two species of reptile new to science.

In 1983 and '84 further surveys of the Nullarbor Plain were conducted by the then Department of Fisheries and Wildlife and South Australian National Parks and Wildlife Service. These were funded by Australian National Parks and Wildlife Service (see McKenzie and Robinson 1987). This survey examined 82 separate sites, each twice, in an area of 32 million ha between Balladonia and Colona and the coast and the Great Victoria Desert. This survey was notable as new techniques of analysis of biological data and physical gradients were developed as a result.

Vegetation has been mapped at 1:1 000 000 over the Region by Beard (1974, 1975, 1976) and the accompanying memoirs provide much information relevant to land management.

Part B. The Goldfields Region - Resources and Administration

Further biological data on the Goldfields Region have been obtained from mining company environmental assessments, the Agriculture Protection Board, the Rangeland Management Branch of the Department of Agriculture, the Mulga Research Centre within Curtin University, and from within CALM. These are dealt with further in Section 18.0 Research.

5. HISTORY OF LAND USE IN THE GOLDFIELDS

It is important to realise that conservation as a land use is a relatively new concept and that past land use practices influence both the biota of the Goldfields and the practice of conservation and land management.

Archaeological studies in the Goldfields indicate that Aboriginal people have been in this region for at least 20 000 of the 40 000 or more years they have occupied Australia.

Aboriginal practices including hunting and burning had already modified the flora and fauna of Australia by the time of European settlement, (see Merrilees 1968). The cessation of traditional Aboriginal burning in the spinifex deserts as recently as 1960's may have been a factor in the local extinction of mammal species (see Burbidge and McKenzie 1989). Addressing this situation is now a major research project for CALM.

In parts of the Great Victoria and Gibson Deserts Aboriginal people still maintain strong cultural links with their lands. There is also an emerging trend for urban Aboriginal people to re-identify with their culture and lands.

The discoveries of gold in the 1880's in the Yilgarn, 1892 in Coolgardie and Wiluna, 1893 in Kalgoorlie and 1896 in Laverton prompted the European settlement of the Goldfields.

These discoveries led to establishment of towns, railways and telegraph communications and stimulated pastoral settlement. The goldmining industry declined temporarily after 1908, yet remained buoyant throughout the depression of 1930-33, with rising gold prices. From the mid 1960's to the early 1980's the gold industry declined again but this was offset in this region to some extent by the "Nickel Boom" of 1966-70. Gold output reached a record 1 623 000 fine ounces in 1987 (Department of Planning and Urban Development 1989).

Pastoral development followed prospectors into the Goldfields. In the Laverton/Leonora district Nambi pastoral station was established in 1899 and Banjiwarn in 1903. Laverton Downs was taken up in 1918, Erlistoun and Bandy in 1921. Further north Yelma was established in 1901, Eraheedy 1903, Windidda 1916, Carnegie 1921, and Glenayle 1938 (Beard 1974). Thus, unlike the Murchison where pastoral use began in the 1870's and most land was taken up by 1910, the Goldfields has a relatively short history of pastoral use. Except for Noondoonia 1880, Balladonia and Nanambinia in 1883, the industry on the Nullarbor is even more recent; most development did not occur until the 1960's. The numbers of sheep in pastoral areas of W.A. peaked at 5.5 million in 1934, declining to 3.0 million in 1941 and have maintained that approximate figure until the present (Beard 1976). In the last decade sheep numbers have declined further, but there has been a small increase in the cattle numbers.

At present there are 79 pastoral leases in CALM's Goldfields Region occupying 18.8 million ha or 24.3% of the region (Table 1). The opportunity for expansion of the pastoral industry in the Goldfields is extremely limited as all land east of 122° and south of 26° has been withdrawn from further releasing (Government Gazette of W.A. 13 April 1973). The recently convened working group for the release of Crown land for pastoral

purposes is in complete agreement that there should be no further release of vacant Crown land for entirely new pastoral leases.

A unique feature of land-use on the Goldfields has been the extensive utilization of native eucalypt and mulga timber for both mining timber and fuel. Between 1890 and 1960 an estimated 30 million tonnes of timber were removed from 4 million hectares of eucalypt and mulga woodland (Williamson 1983).

**TABLE 1. MAJOR LAND TENURE CATEGORIES IN CALM
GOLDFIELDS REGION**

	million hectares	percent
Pastoral lease	18.8	24.3
Conservation Reserve	6.9	8.9
Aboriginal Reserve	8.0	10.3
Vacant Crown land	41.3	54.6
Other (townsite, other reserve etc)	<u>1.5</u>	<u>1.9</u>
	<u>77.4</u>	<u>100.0</u>

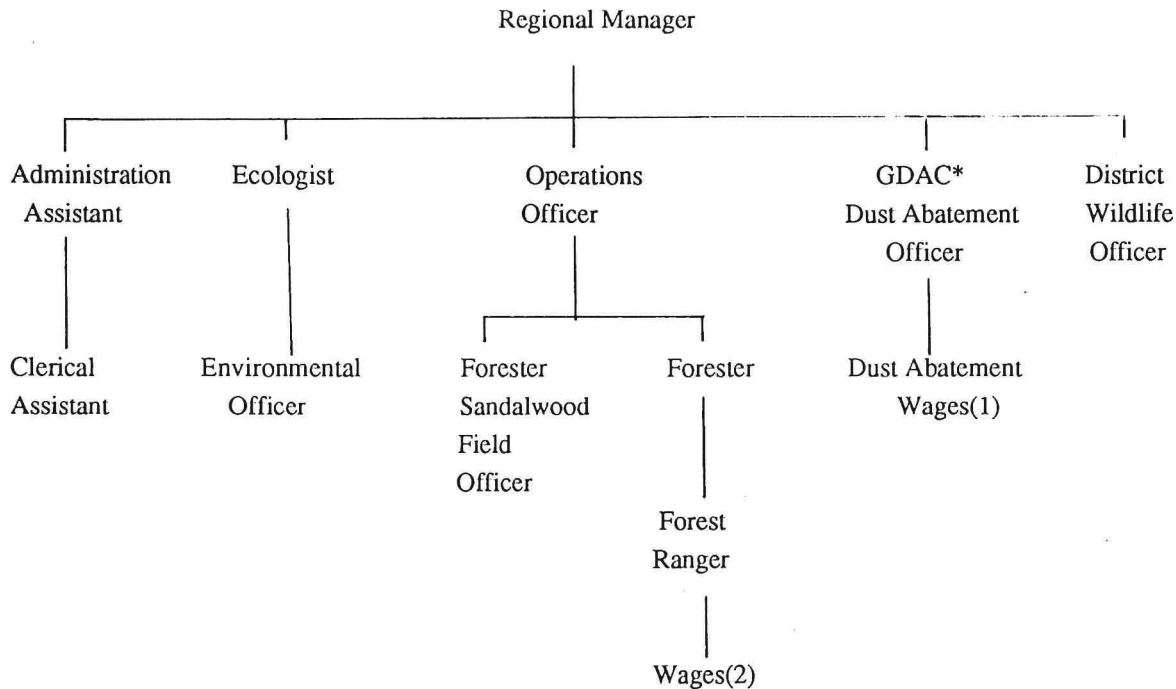
6. LOCAL GOVERNMENT AND POPULATION

The Goldfields Region of CALM includes the Shires of Wiluna, Leonora, Laverton, Menzies and Coolgardie, the City of Kalgoorlie-Boulder and part of the Shire of Yilgarn. In the 1986 census the residential population was 37 625 with 64% residing within the City of Kalgoorlie-Boulder. It has been estimated the population will rise to 42 300 by 1991 (Department of Planning and Urban Development 1989). Characteristic of the Goldfields population is the relatively high proportion of Aborigines, males and people in the working age group of 15-59 years. The Goldfields region represents 30% of the area of Western Australia, but holds only three percent of the State's population.

7. REGIONAL ORGANIZATION

7.1 PERSONNEL

The existing staffing structure is indicated below:-



* Goldfields Dust Abatement Committee

7.2 INFRASTRUCTURE

The present Regional infrastructure includes a regional office in Hannan Street, Kalgoorlie, and a workshop, depot and laboratory at 89 Ward Street, Kalgoorlie.

The Region has no district organization but there are un-manned outstations at Wanjarri Nature Reserve, Jaurdi and Mt Elvire Pastoral Leases which can be used as bases for regional operations.

7.3 MANAGEMENT CAPABILITY ZONES

Map 3 indicates Goldfields Region management capability zones. In Zone A (within a 50 km radius of Kalgoorlie) CALM's ability to respond to any situation, eg. fire, salt water spill, illegal activities, is excellent in that the response can be within 1-2 hours. In Zone B, between 50 and 150 km radius of Kalgoorlie the response time is increased to 4-6 hours. In Zone C management capability is severely constrained by remoteness, lack

of access, and very sparse population. Management operations here can only be achieved with prior planning and preparation, or by utilizing local government or private resources, and response time for any contingency is increased to 1-3 days. In some situations CALM resources from Merredin or Esperance district offices would be available in shorter time than from Kalgoorlie. Management capability with respect to fire is addressed in Section 14.1.

7.4 REGIONAL OFFICE SERVICES

In addition to regional administration, management and operations, the following services are available at the Kalgoorlie Regional Office:

- a) Licensing
 - Forest Produce and Sandalwood Licences issued locally
 - Damage Licences issued only by District Wildlife Officer
 - Kangaroo Tags issued locally
 - Avicultural Licences receipted locally and processed in Perth
 - Licences for commercial purposes, scientific or other prescribed purposes, commercial producers and nurseryman's licence receipted locally and processed in Perth.
 - Receiving point for logging contract returns.
- b) Publications
 - Sale of selected CALM publications and posters.
- c) Information Services
 - Information and pamphlets are available on CALM activities, national parks and reserves throughout W.A., local tree planting, native flora and fauna.
- d) Tree Orders for Narrogin Nursery
 - Tree (seedling) orders are taken throughout the year and trees are delivered in June of each year.

**GOLDFIELDS REGION
DRAFT
MANAGEMENT PLAN**

LEGEND

LAND MANAGED BY C.A.L.M.
AS AT 1st APRIL 1992



PROPOSED C.A.L.M. ESTATE



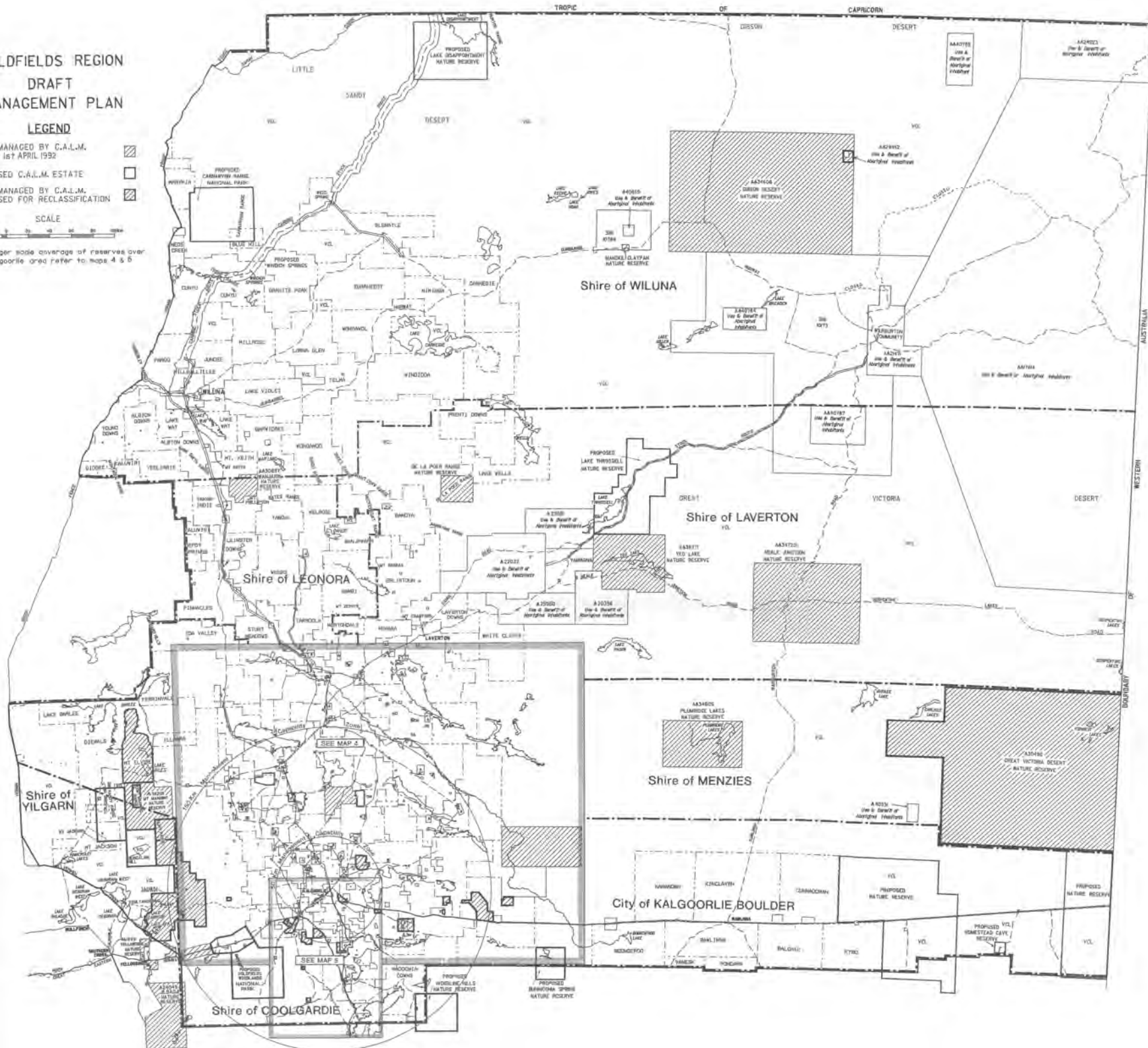
LAND MANAGED BY C.A.L.M.
PROPOSED FOR RECLASSIFICATION



SCALE



For larger scale coverage of reserves over
the Kalgoorlie area refer to maps 4 & 5



PART C. PUBLIC LANDS MANAGED BY CALM

8. MANAGEMENT OF CONSERVATION RESERVES

Policy Statement No. 31 Management of Reserves for the Conservation of Nature establishes CALM's objectives, policies and strategies for management of conservation reserves. It includes the following objective:

To select and manage conservation reserves, and take other steps necessary, to ensure the long-term maintenance of species and genetic diversity and the persistence of those habitats, indigenous species and ecological processes that comprise Western Australian ecosystems.

GENERAL POLICIES

The Department will:

1. Seek to establish and manage a Statewide reserve system that:
 - (a) is broadly representative of the State's natural habitats and contains viable populations of all species of animals and plants representative of the indigenous Western Australian flora and fauna;
 - (b) forms a network of natural lands and waters which are sufficiently large and appropriately located and spaced to provide refuge for migratory and nomadic species as well as habitat for sedentary species;
 - (c) protects areas of special nature conservation value.
2. Manage these reserves to maintain the existing suite of native species, where appropriate to re-establish species which have been lost from the area, and in special cases, provide appropriate habitat for particular species or communities.
3. Determine and maintain those ecological processes that are essential for the persistence of natural communities and ecosystems, promote opportunities for enhancing current biotic diversity where appropriate and eliminate or reduce those processes such as loss of habitat and predation that result in a reduction of biotic diversity.
4. Maintain the most favourable possible habitat and ecological conditions for species of indigenous plants and animals in danger of extinction.
5. Protect conservation reserves against natural or man-induced changes detrimental to the maintenance of conservation values in the long-term, whether such changes arise from events or activities inside or outside the reserves.
6. Rehabilitate conservation reserves which have suffered detrimental changes in the past, as laid down in Policy Statement No. 10, Rehabilitation of Disturbed Land.
7. Undertake ecological research to develop a knowledge base and management techniques and guidelines appropriate to reserve management objectives.

8. Monitor change in reserve environments and selected species populations and translate and incorporate results into management objectives, as laid down in Policy 28.
9. Encourage the use of nature reserves and national parks for non-destructive and management-oriented research, and appreciation of nature.
10. Encourage the adoption by the public of a "conservation ethic", which recognises the rights of future generations and the responsibilities of the present one to manage natural resources such that the opportunities, the environmental quality and natural values we enjoy remain for future generations as well.

MULTIPLE USE PLANNING

Demands

The community requires that seven principal values are provided from the lands entrusted to CALM. These are:

- wildlife (flora and fauna) conservation;
- landscape (scenic beauty and amenity);
- water;
- timber;
- recreation;
- minor resources (eg. honey, gravel, wildflowers);
- historical or cultural factors.

In addition, a number of "imposed" activities must be provided for, eg. community services and public utilities (roads, power lines), and mineral exploitation, where mining on CALM land has been approved under the Mining Act or Special Agreements Acts.

Finally, lands managed by CALM are an important "resource" for research, scientific study and education, and provision must be made to ensure that these activities can proceed.

Priorities for Land Use

All lands entrusted to CALM are managed for many uses. In many cases, different uses are compatible and it is a simple matter to ensure that they can take place on the same area at the same time.

For example, a nature reserve can provide harmoniously and simultaneously for wildlife habitat and some forms of minimal impact recreation. State forests can provide simultaneously for ecologically sustainable yields of timber, fresh water, recreation, and most forms of wildlife habitat.

Multiple use planning becomes complex when demands on the same area of land conflict and cannot be practised simultaneously. Every area within a land use plan proposed by CALM is therefore allocated a priority use. This is the value which is most favoured by:

- the specific attributes of the ecosystem;
- the location, or accessibility of the area;
- potential for appropriate public use;
- the purpose for which the area is vested.

An area will often be suited to a number of uses. Uses which can be carried out in addition to, and without conflicting with, the priority use are called **compatible uses**. Compatible uses can occur in the same area at the same time. Uses that can be compatible with the priority use if practised under certain constraints (ie. at certain periods or at very regulated levels) are referred to as **conditional uses**. Uses which will conflict with the priority use are referred to as **incompatible uses**. These can not be permitted in the same area at the same time.

CALM follows two basic rules in the allocation of uses:

- Any use allocated must be in accord with the tenure and purpose of the area
- No use may be permitted which is detrimental to the priority use.

Land Use Priorities and Compatibility

Six land use priorities are recognised in the preparation of land use plans for CALM managed lands:

- nature conservation
- recreation
- environmental management (of water catchments or other environmental values)
- production (zoned for water, timber or other products)
- mineral resource development (where this is required under Government policy)
- public utilities.

9. EXISTING PUBLIC LANDS MANAGED BY CALM

Existing public lands managed by CALM in the Goldfields Region are listed in Appendix I with their area, Shire and vesting body. A summary description of the different reserve categories is as follows:

9.1 NATIONAL PARKS

Both Boorabbin and Goongarrie National Parks are at present completely undeveloped without facilities or Ranger Staff. Boorabbin National Park flora and fauna is well known; it has high conservation values including three species of semi-arid-zone Banksia (*B. audax*, *B. elderiana* and *B. lullfitzii*) and nine species of agamid reptiles, which is the greatest species richness for agamids in the Eastern Goldfields. On its present boundaries Boorabbin does not fit the usual image of a National Park; it is proposed as a component in a larger national park proposal (Section 11.10). Goongarrie National Park's flora and fauna is very poorly known, however it does have considerable potential to be developed as a functional national park (Section 10.4).

9.2 STATE FORESTS AND TIMBER RESERVES

Timber Reserves on the Goldfields have an interesting history in that all were once part of a total of 243 000 ha of State forest established around Goldfields mining centres and towns to protect eucalypt and mulga woodland. These were all relinquished in the 1960s because the then Forests Department was unable to take responsibility for fire control on them.

The four existing timber reserves were resurrected in 1975. Karamindie State forest was gazetted on 8 May 1925, and is one of the State's earliest State forests. Together, these reserves conserve some of the best examples of cut and un-cut, arid-zone eucalypt woodland in the world. Approximately 30 species of eucalypt, 14 growing as trees are present on the reserves, and with few exceptions eg. *Eucalyptus salmonophloia*, Salmon Gum, these species are restricted to the Goldfields.

9.3 SANDALWOOD RESERVES

Goldfields sandalwood reserves are a conservation resource of considerable importance. They are amongst the State's earliest reserves, some being gazetted as early as 1923; their importance attaches to sandalwood growth rate, germination and phenology data dating back to the 1920s. There are few opportunities for research in WA which have a comparable time dimension. These data have recently been collated and summarized (see Loneragan 1990). All sandalwood reserves are either fenced on the boundary or have fenced exclusion plots to control grazing and determine its effect on regeneration. Under the CALM Act (Forest Regulations) no green Sandalwood harvesting is permitted on these reserves.

Seven of the eight sandalwood reserves were vested in the Lands and Forests Commission in March 1992. One remains an unvested Land Act reserve managed by CALM, due to its purpose, by arrangement with the Department of Land Administration.

9.4 NATURE RESERVES

The nature reserves of the Goldfields include an adequate system of reserves in the Great Victoria Desert and one large reserve in the Gibson Desert. It is noteworthy that the selection of these reserves in the 1970s was the first time in WA that reserves had been selected on the basis of biological knowledge and scientific reserve selection criteria; particularly size and landform diversity. Elsewhere in the Goldfields nature reserves are either very small or do not represent the landform and vegetation diversity of the region (See Map 2). Wanjarri Nature Reserve is notable as the only reserve in the northern Goldfields, as well as having the richest vertebrate fauna for an arid zone nature reserve in WA. Smaller nature reserves close to Kalgoorlie/Coolgardie are often associated with granite outcrops; some are extensively used for recreation as they have been modified by dam construction for Goldfields woodline use. An important exception is Victoria Rock Nature Reserve which is a largely pristine granite outcrop.

9.4 PASTORAL LEASES

The Goldfields conservation estate includes two pastoral leases, Jaurdi and Mt. Elvire. These were purchased under the Sandalwood Conservation and Regeneration Project (SCARP) in 1989 and 1990 respectively. They are very important for sandalwood and arid-zone woodlands conservation. The fauna of Mt. Elvire is reasonably well known as it was studied in 1980-81 as part of the System Eleven biological studies.

There are some data on flora and fauna (particularly birds) for Jaurdi pastoral lease but there have been no detailed surveys.

9.5 ARBORETA

The Goldfields Region includes two arboreta:
Kalgoorlie Arboretum, Reserve No. 23840, 24 hectares and
Coolgardie Arboretum, Reserve No. 31983, 29 hectares.

Both arboreta have extensive plantings of Goldfields trees, particularly eucalypts. Kalgoorlie Arboretum is a high profile area for CALM and is used extensively for recreation. It has developments including picnic tables, walk trails and information. The arboreta have considerable potential for environmental education. They will be managed by CALM in conjunction with the community and local government, in accordance with CALM policy.

9.6 NATIONAL ESTATE

In recognition of their outstanding conservation values, the following areas in the Goldfields Region are listed on the Register of the National Estate:

Boorabbin National Park
Goongarrie National Park
Queen Victoria Spring Nature Reserve
Mt Manning Range Nature Reserve
Wanjarri Nature Reserve
Mangkili Claypan Nature Reserve
Gibson Desert Nature Reserve
Carnarvon Range Proposed Reserve
Lake Disappointment Proposed Reserve
Windich Spring Proposed Conservation Park.

Funding for certain aspects of management of listed areas eg. biological or heritage value surveys may be available upon application to the Australian Heritage Commission for the National Estate Grants Program.

10. PROPOSED CHANGES OF TENURE, PURPOSE, VESTING OR BOUNDARIES OF PUBLIC LANDS MANAGED BY CALM

(NOTE: Some of these proposals are proceeding irrespective of the Regional Plan. This applies to conversion of Sandalwood Reserves to State forests and future tenure and vesting of Jaurdi pastoral lease. They are included in this draft to present the entire picture of proposed changes of vesting and tenure.

The requirement to change tenure, purpose vesting or boundaries of reserves arises for several reasons which may be interrelated. For example, traditional uses, particularly heavy recreational use, may in some cases be incompatible with nature reserve management and purpose. Thus a change in purpose and or vesting may be appropriate. The management of recreation in natural environments requires a "manageable boundary" which accommodates the extent of the feature, eg. a granite rock. The boundary must protect the attraction and its conservation values, and at the same time allow the impact of recreation, eg. soil compaction and access, not to be too severe over a small area. Thus a boundary change may be appropriate.

In the case of unvested reserves, the managing authority has a case for tenure and vesting to be in the appropriate authority to justify continuing allocation of resources.

10.1 SANDALWOOD RESERVES TO BECOME STATE FORESTS

Recommendation 1.

That the following reserves vested in the Lands and Forests Commission for the purpose of "timber-sandalwood" and "timber" become State forests vested in the Lands and Forest Commission under S.8 of the CALM Act:

Emu Rock (No. 19645) City of Kalgoorlie-Boulder
Wallaby Rock (No. 19764) City of Kalgoorlie-Boulder
Coonana (No. 19640) City of Kalgoorlie-Boulder
Yallari (No. 19212) Shire of Coolgardie
Scahill (No. 19621) Shire of Coolgardie
Calooli (No. 19211) Shire of Coolgardie, is recommended for incorporation into Kangaroo Hills State Forest (see below)
Lakeside (No. 19214) City of Kalgoorlie-Boulder.

Recommendation 2.

That the following unvested Land Act reserve, for the purpose of "timber - sandalwood", become State forest vested in the Lands and Forests commission under S.8 of the CALM Act:

Bullock Holes (No. 19825) City of Kalgoorlie - Boulder.

The annual special grazing lease 332/1749 (Black Flag Station) on part of Bullock Holes reserve should be cancelled subject to negotiation with the pastoralist and the Pastoral Board.

See Appendix 1 for further details of these reserves.

Justification and Implications

These reserves, which were gazetted between 1923-1928, are amongst the State's oldest conservation reserves. They have considerable importance to sandalwood research as they have research plots which are fenced and ungrazed and growth rate data going back to these years. In pastoral areas these plots and reserves have considerable value in evaluating the effects of grazing.

In the case of the unvested reserve CALM requires security of tenure as the Department allocates resources to its management. Conversion to State forest affords them greater protection without restricting some other uses under S.9 of the CALM Act. For implications see Section 2.1.5.

10.2 EXISTING TIMBER RESERVES TO BECOME STATE FOREST

Recommendations

That the following existing Timber Reserves become State forests vested in the Lands and Forests Commission:

Majestic (No. 195/25) City of Kalgoorlie-Boulder
Randell (No. 194/25) City of Kalgoorlie-Boulder
Kambalda (No. 199/25) Shire of Coolgardie
Kangaroo Hills (No. 198/25) Shire of Coolgardie

Grazing lease number 3114/1192 (Mt. Monger Station) on Majestic and 3114/617 (Cowna Downs) and 332/1803 and 3114/1192 (Mt. Monger) on Randell as well as 3114/468, 3114/754 (Calooli and Bullabulling Stations) on Kangaroo Hills should be relinquished after negotiation with the pastoralist, the Pastoral Board and Department of Land Administration.

An additional encumbrance on Randell Timber reserve is the presence of four unvested Land Act reserves:-

Reserve No.	Area	Class	Purpose	Vesting
9695	5149.62 ha	C	Common	Not vested
12923	515.97 ha	C	Water	Not vested
9885	4.04 ha	C	Recreation	Not vested
11662	2.02 ha	C	Water	Not vested

Reserves 12923, 9885 and 11662 were specifically excluded from Randell Timber Reserve when it was gazetted (Government Gazette 31 December 1975). Reserve 9695 was not excluded by the gazettal notice. To rationalise management of Randell Timber Reserve all four reserves should be cancelled. Fencing of both Majestic and Randell Timber Reserves will be required once negotiations are complete and grazing leases have been relinquished. This could be achieved with Sandalwood Conservation and Regeneration Project funding in co-operation with the adjacent pastoral lease.

Justification and Implications

These reserves include some of the best examples of cut and un-cut, arid zone eucalypt woodlands in the world (See section 2.1.1). Continued grazing is incompatible with this status. Conversion to State forest affords them greater protection without restricting some other uses under S.9 of the CALM Act. For implications see Section 2.1.5.

10.3 NATURE RESERVES TO BECOME CONSERVATION PARKS

Recommendations

That the following existing nature reserves vested in the Hon. Minister for Water Supply become "A" Class Conservation Parks vested in the NPNCA:

Burra Rock Nature Reserve (No. 7038) Shire of Coolgardie
Cave Hill Nature Reserve (No. 17804) Shire of Coolgardie.

An increase in size from 202 ha to 1 600 ha is recommended for Cave Hill to accommodate recreation and conservation over the entire Cave Hill granite outcrop system. The extension is defined from 31°38.44'S to 31°40.61'S and from 121°13.00'E to 121°15.60'E. At present the southern portion of the rock is outside the reserve (Map 5).

Justification and Implications

Both these reserves are used extensively for recreation and CALM promotes this use by installation of facilities such as barbecues, toilets, and picnic tables. Cave Hill in particular has high conservation values; both reserves would be difficult to manage as 'A' Class nature reserves. For implications see Section 2.1.3.

10.4 EXTENSION OF GOONGARRIE NATIONAL PARK

Recommendation 1.

That Goongarrie National Park in the Menzies Shire be extended to include part of Menangina South Pastoral Lease number 398/567 incorporating Cockatoo Rocks and water reserve No. 8640 (Map 4). An area of 12 150 ha is involved.

Justifications and Implications

This portion of Menangina Station has been offered for incorporation into Goongarrie National Park by the pastoralist but approval is being withheld by the Mines Department. The land has some different vegetation characteristics, eg. *Xanthorrhoea thorntonii* as well as *Eucalyptus jutsonii* growing with spinifex and an unusual form of *Allocasuarina corniculata* from the existing national park. Biological work in 1992 will clarify CALM's case for this extension.

Recommendation 2.

That if and when the extension of Goongarrie National Park is achieved, Water Reserve No. 8640 be cancelled and the land be incorporated in the National Park.

Justifications and Implications

To rationalise management, all other enclave water reserves in Goongarrie National Park have been cancelled or are in the process of being cancelled.

Recommendation 3.

CALM Goldfields Region develop Goongarrie as a functional national park according to an area management plan.

Justifications and Implications

With increasing public interest in conservation of the arid zone there is a case for establishing recreational, educational and environmental interpretation facilities in a national park context in the Goldfields Region. This area lends itself admirably to the interpretation of several environmental themes, including:

- i) The mulga/eucalypt line. This is an exceptionally good theme involving the interaction of climate and soil to influence vegetation and land use. Goongarrie National Park is practically on the mulga/eucalypt line with both vegetation types present.
- ii) Arid zone ecology. This theme can be developed by reference to the observation that 75% of Australia receives less than 250mm rainfall per annum. Issues include fragile soils, effects of grazing and fire, and the difficulty of mulga regeneration.

The System 11 Biological Survey and mulga research work by the Mulga Research Centre on Menangina pastoral lease and Goongarrie National Park provide a wealth of local resource data to call upon.

10.5 MT MANNING RANGE NATURE RESERVE

Recommendation 1.

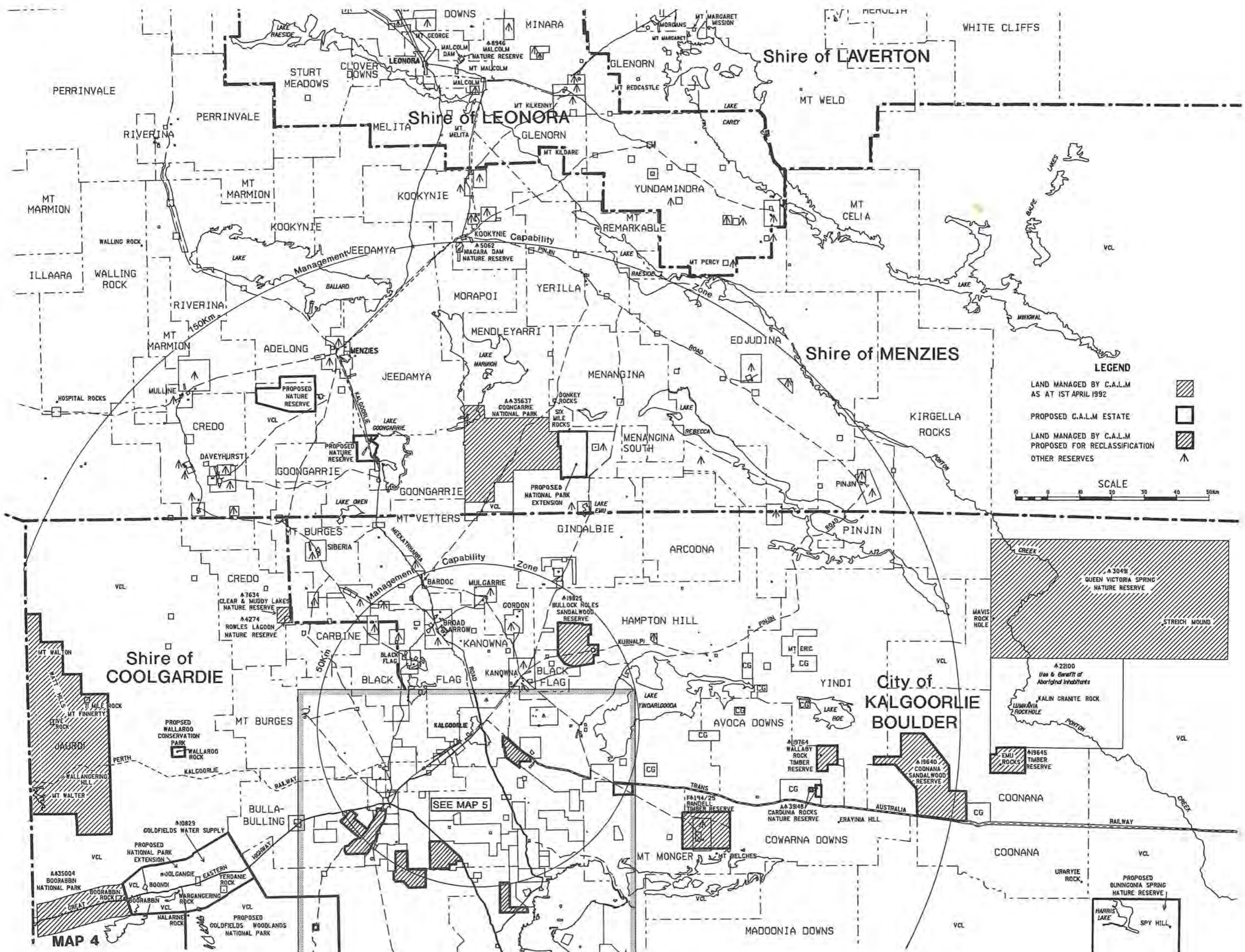
That Mt. Manning Range Nature Reserve in the Shire of Yilgarn retain its 'C' Class status, vesting and purpose and that the enclave formerly occupied by Temporary Reserve 1971, including the range itself, be incorporated into the reserve (Map 3).

Justification and Implications

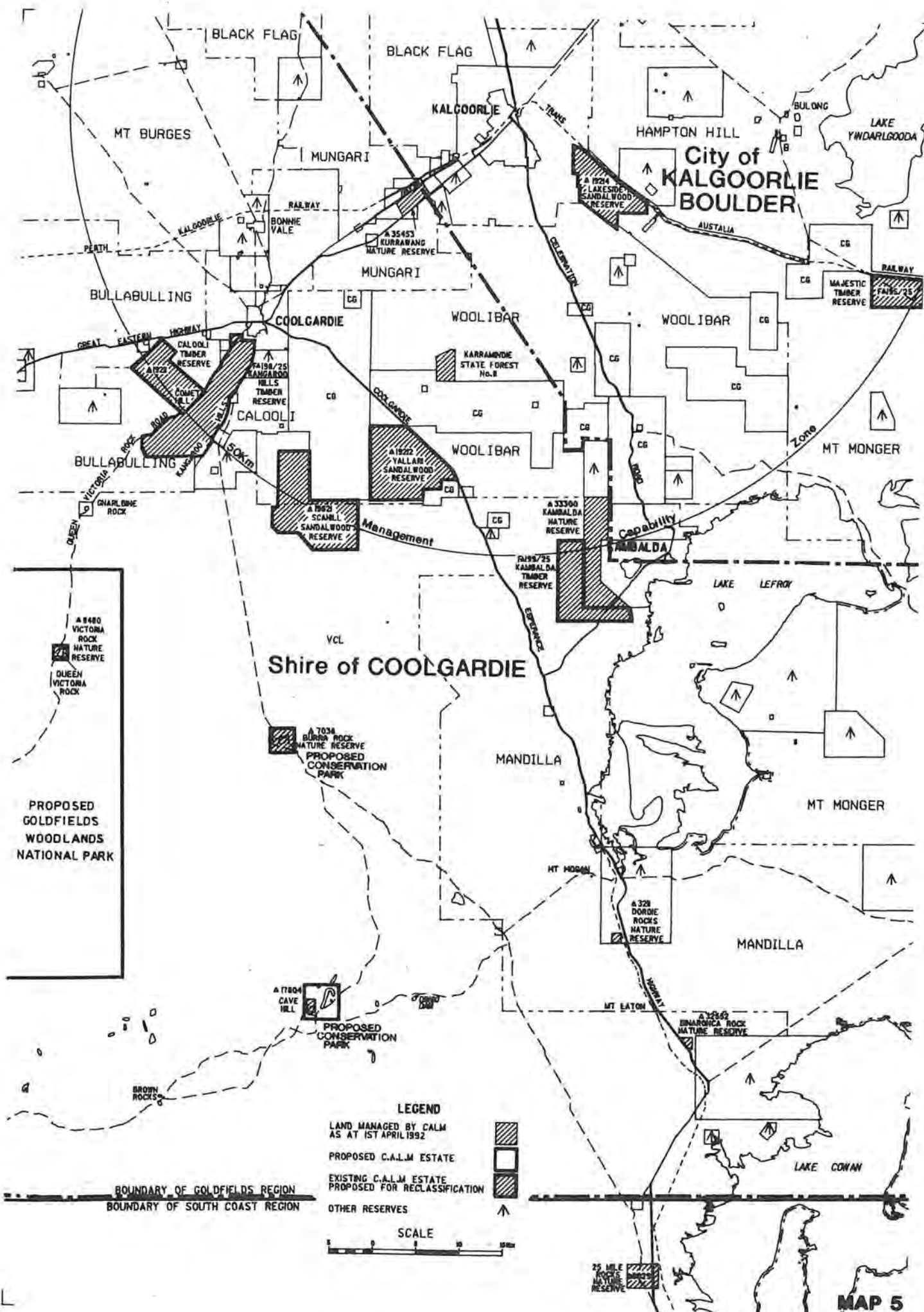
'A' Class status is not recommended because the proposed additions (see below) will have 'C' Class status according to Government policy and it is desirable to have consistent management across the entire reserve. The land formerly occupied by temporary reserve 1971 has reverted to vacant Crown land though it is now occupied by an exploration licence. It is appropriate that the vacant Crown land which incorporates the range itself become part of the reserve and mining is managed according to Government policy (see Section 14.5).

Recommendation 2.

That Mt Manning Range Nature Reserve be extended southward by adding 91 650 ha of vacant Crown land to include the Helena and Aurora Range. The proposed southern extension is defined by that area from approximately latitude 30°11.75'S to 30°30.00'S and longitude 119°30.06'E to 119°47.80'E. The southern extension should have 'C' Class status.



MAP 4



City of KALGOORLIE BOULDER

Shire of COOLGARDIE

LEGEND

LAND MANAGED BY CALM AS AT 1ST APRIL 1992

PROPOSED C.A.L.M ESTATE

EXISTING C.A.L.M ESTATE PROPOSED FOR RECLASSIFICATION

OTHER RESERVES

SCALE

0 5 10 20 km

PROPOSED GOLDFIELDS WOODLANDS NATIONAL PARK

Justifications and Implications

With the proposed southern extension, the opportunity also exists to conserve the reptile and small mammal fauna of the Bungalbin Hill area. This virtually undisturbed habitat contains a rich fauna including five dasyurid marsupial species, and 51 species of reptiles including 13 species of geckoes, the highest number recorded for any surveyed site in the Eastern Goldfields District (Henry-Hall 1990).

Keighery (1980) and Dell et al. (1985) have advocated a southern extension to conserve both the restricted banded ironstone flora, and the rich and diverse fauna. Conservation Through Reserves Committee (CTRC) recommendation 11.4 also involves an extension of Mt. Manning Range Nature Reserve.

Key Features:

- Restricted vegetation types and flora of the banded ironstone ranges.
- Declared Threatened Flora confined to the Helena and Aurora Range.
- Five Priority species from CALM's Reserve Flora List.
- The sandplain vegetation representing an important inland extent of south-western sandplain heaths.
- Ungrazed eucalypt woodlands surrounding the ranges.
- The diverse reptile and small mammal fauna of the Bungalbin Hill area containing extremely rich dasyurid marsupial and gecko assemblages.

Recommendation 3.

That Mt. Manning Range Nature Reserve be further extended west by 132 400 ha as recommended by Henry-Hall (1990) and CTRC recommendation 11.4.

The proposed western extension is defined as that area bounded on the west by 119°14'E to include Marda Dam, Windarling Peak, Pigeon Rock, and Deception Hill; north by 29°50'S to include Chatarie Well, the entire Die Hardy Range and Yokradine Hills system, Olby Rock and vacant Crown land; east by the western boundary of the Mt. Manning Range Nature Reserve; and south by 30°17'S to include Mt. Jackson, Boondine Hill, Muddarning Hill and Yenyanning Hills (Map 3).

The proposed western extension includes excisions of 37 450 ha from Mt. Jackson (3114/639) and 50 500 ha from Diemals (3114/1110) pastoral leases.

The proposed extension should incorporate an additional block of vacant Crown land (3 200 ha) adjacent to the north-west corner of the Mt. Manning Range Nature Reserve, and the Water Reserves Marda Dam (17009), Pigeon Rock (9644), Chatarie Well (13468), and Olby Rock (13467). The western extension is a CTRC recommendation, therefore would have 'C' class status.

Justification and Implications

Several important flora populations potentially threatened with extinction by degradation of their specific habitat would be protected with the proposed western extension (Henry-Hall 1990). These include Declared Threatened Flora entirely confined to the banded ironstone hills in the vicinity of Mt. Jackson, and restricted flora on the Die Hardy Ranges and Yokradine Hills. Nearby Pigeon Rock is the largest of a series of granite outcrops that support distinctive vegetation complexes including poorly known eucalypts and diverse orchids.

The restricted distributions of two rare eucalypts would also be incorporated by the proposed western extension. The *Eucalyptus formanii* vegetation type occurs only to the north and the south of the Die Hardy Range, and east towards the Mt. Manning Range and Mt. Elvire. Undulating plains in the greenstones of the Mt. Jackson area support interesting Eucalyptus woodland mosaics, including *E. corrugata*. The Declared Threatened Flora *Tetradlea harperi* and *Prostanthera magnifica* occur in the Mt. Jackson area. *Tetradlea harperi*, entirely confined to banded ironstone hills around Mt. Jackson, grows only within this restricted habitat over a small geographical range. The Priority One species *Leptospermum* sp. (J. Thompson s.n.) and *Lepidium merrallii* are rarely collected and poorly known and occur in the area.

10.6 NIAGARA AND MALCOLM DAMS

The recommendations involving reserve No. 5062 - Niagara Dam, Shire of Menzies vested in the NPNCA and reserve No. 8946 - Malcolm Dam, Shire of Leonora vested in the Minister for Water Supply, both relatively small reserves, include several options. CALM's preferred position is to relinquish part of Niagara Dam and all of Malcolm Dam reserves to their respective local authorities for recreation.

Recommendation 1.

That Niagra Dam Reserve No. 5062, Shire of Menzies vested in the NPNCA, be divided in half, the southern half including the dam itself and the recreation area be vested in the Shire for recreation, and the northern half which includes the only known population of *Eremophlia 'mirabilis'* be re-gazetted 'A' Class nature reserve vested in the NPNCA.

Recommendation 2.

That Malcolm Dam Reserve No 8946, Shire of Leonora be relinquished by the NPNCA and vested in the Shire for recreation.

However if continuing CALM management is required by either local authority then an appropriate tenure and vesting would be 'A' Class conservation park vested in the NPNCA. An agreement for joint management, eg. rubbish removal and sign-posting would be required with the local authority. For implications, see Section 2.1.3.

Justification and Implications

It is considered inappropriate for CALM to manage these two reserves for three reasons:

- a) Neither are natural areas; both are man-made dams.
- b) Both are heavily used for recreation and sometimes activities, eg. shooting, which are incompatible with nature reserve status.
- c) Both are too distant from Kalgoorlie to be effectively managed for recreation.

10.7 CARDUNIA ROCKS NATURE RESERVE

Recommendation

That Cardunia Rocks Nature Reserve No. A39148 in the City of Kalgoorlie-Boulder be increased in size from 38 ha to 823 ha to more adequately conserve rare eucalypt species (Map 4). The extension also to have 'A' Class status.

Justifications and Implications

Cardunia Rocks Nature Reserve comprises two separate blocks east and west of government dam at Cardunia Soak; they were gazetted in 1987 to conserve Bookleaf Mallee, *Eucalyptus kruseana*, a priority 4 species on the reserve list. The largest population of this species has now been located to the east of Cardunia Soak outside the boundary of the present reserve. The proposed extension is on Hampton Location 16 which is owned free-hold by Australian National Railways and leased to Avoca Downs pastoral lease.

10.8 JAURDI PASTORAL LEASE

Recommendation 1.

That Jaurdi pastoral lease No. 3114/1072 (321 000 ha) in the Shires of Yilgarn, Menzies and Coolgardie become State forest vested in the Lands and Forest Commission and the water reserves Nos 3112, 3114, 3115, 3116 and 3117 be cancelled and incorporated within the State forest.

Justifications and Implications

The lease was purchased by CALM in 1989 under Sandalwood Conservation and Regeneration Project funding. The lease has high conservation values for arid-zone woodland vegetation because it was never extensively stocked. State forest is an appropriate form of tenure to achieve the multiple objectives of sandalwood, arid-zone woodland and flora and fauna conservation without unduly restricting other land uses, particularly mining. See section 2.1.5 for implications.

Recommendation 2.

That the northern portion of Jaurdi pastoral lease including the Hunt Range in the Shire of Yilgarn be excised from the lease and incorporated into Reserve No. 36208 Mt. Manning Range Nature Reserve, see Map 3. The proposed excision is defined by from latitude 30°06.70' to 30°17.00' and from longitude 119°47.180' to 120°00', an area of 37 240 ha. 'C' Class status is recommended for the proposed addition.

Justifications and Implications

The greenstone landform which comprises the Hunt Range is not represented in any nature reserve in the Goldfields. See also recommendation 11.6. Other conservation values include the presence of *Dryandra arborea*, a rare and geographically restricted plant (see Keighery, 1980). *Eremophila caerulea merrallii* a Declared Threatened Species has recently been discovered in the Range. Hunt Range, Pittosporum Rock and Kurrajong Rock are vegetation monitoring sites for System Eleven biological surveys (see Dell et al. 1985). Mining would be subject to Government Policy procedures. See Section 14.5.

10.9 MT. ELVIRE PASTORAL LEASE

Recommendation

That Mt. Elvire pastoral lease No. 3114/699 (155 000 ha) in the Shire of Menzies become State forest vested in the Lands and Forest Commission and water reserve No. 13478 be cancelled and incorporated within the State forest.

Justification and Implications

The lease was purchased by CALM in 1990 under Sandalwood Conservation and Regeneration Project funding. The lease has outstanding conservation values for sandalwood, flora, fauna and landscape including the only extensive tract of chenopod lake frontage vegetation in the conservation estate on the Goldfields, an outlier population of Myall trees, *Acacia papyrocarpa*, and a geographically restricted eucalypt *Eucalyptus formanii*. The fauna is reasonably well known and includes 15 species of native mammal, 34 species of reptiles, 4 species of frogs and 106 species of birds which is exceptionally high for an arid zone area. State forest is an appropriate form of tenure to achieve the multiple objectives of conservation of sandalwood, and flora and fauna without unduly restricting other land uses, particularly mining.

10.10 MISCELLANEOUS RECOMMENDATIONS CALM REVIEW OF 'B' AND 'C' CLASS NATURE RESERVES

In 1988 CALM reviewed all 'B' and 'C' Class nature reserves with a view to either cancelling or upgrading them to 'A' Class. Of the Goldfields Regions' recommendations for upgrading only Victoria Rock Nature Reserve has been implemented (Government Gazette 4 August 1989).

Recommendation

That the following outstanding 'C' Class nature reserves be upgraded to 'A' Class nature reserves vested in the NPNCA:

Dordie Rock No 3211 Shire of Coolgardie
Kurrawang No 35453 Shire of Coolgardie
Clear and Muddy Lakes No 7634 Shire of Coolgardie
Kambalda West No 33300 Shire of Coolgardie
Binaronca Rock No. 32552 Shire of Coolgardie
Rowles Lagoon No 4274 City of Kalgoorlie - Boulder.

Justification and Implications

These relatively small reserves each have high conservation values based on the presence of wetlands, unmodified eucalypt woodland, rich vertebrate fauna or geomorphology. Mining would be subject to Government policy and the proposal to upgrade requires consent of the Ministerial Council.

10.11 VICTORIA ROCK NATURE RESERVE

Recommendation

That the Victoria Rock Nature Reserve No. 8480 in the Shire of Coolgardie be cancelled and incorporated into the proposed Goldfields Woodlands National Park. See recommendation 11.9 for justifications and implications.

10.12 GREAT VICTORIA DESERT NATURE RESERVE

Recommendation

That the Great Victoria Desert Nature Reserve have a change of purpose to 'A' Class national park vested in the NPNCA.

Justification and Implications

This recommendation is made to accommodate the living area and land access requirements of Paupiyala Tjurutja Aboriginal Corporation in an area over which they have strong traditional and cultural ties. National Park purpose would allow issue of a living area lease over the established outcamp (Tjuntjunjarra) in the reserve as well as the establishment of a Park Advisory Council to facilitate Aboriginal input into the management of the proposed park, similar to the situation already operative for Purnululu (Bungle Bungle) National Park. The proposed National Park will be zoned to accommodate the multiple objectives of Aboriginal land access, conservation, and traditional National Park values. Mining would be excluded from the National Park according to Government policy.

10.13 PROPOSED EXCISION, GIBSON DESERT NATURE RESERVE

Recommendation

The existing enclave reserve No. 29452 'for use and benefit of Aborigines' within Gibson Desert Nature Reserve No. A34606 be extended as indicated in Map 3. This will require the excision of some 6 804 ha from the Gibson Desert Nature Reserve.

Justification and Implications

The area known at Karilywara near the Clutterbuck Hills is contained within reserve No. 29452; it is an area of great importance to Ngaawyat-Jarra members. There is an existing outstation at Karilywara (also known as Partjarr) including a camp, bore and airstrip. These facilities were constructed in error outside reserve No. 29452 and actually within the Gibson Desert Nature Reserve. This recommendation is made to legitimise this unsatisfactory situation and give the outstation tenure required for Aboriginal and Torres Strait Islanders Commission funding.

11. PROPOSED ADDITIONS TO PUBLIC LANDS MANAGED BY CALM

The rationale for further nature conservation reserves being declared in CALM's Goldfields Region is that certain of the biological sub-regions identified in Section 2.1, particularly Goldfields eucalypt woodlands and mulga woodlands, are very poorly represented in the existing reserve system. This deficiency is apparent in Map 1 which indicates the distribution of conservation reserves in W.A., that is, the western half of the Goldfields is demonstrably deficient in reserves. As vacant Crown land is non-existent in this general area, the only option for CALM to rectify this deficiency is to purchase pastoral leases on the open market and change their tenure to a category appropriate to flora, fauna and landscape conservation. The State Conservation Strategy which has been endorsed by the Government supports the principle of protection and management of representative areas with those of highest conservation value being protected by 'A' Class nature reserve or national park status.

To be effective any conservation reserve must have the following characteristics:

- i) be large enough to support sufficient individuals of a species to maintain a sufficient gene pool to survive natural disturbances eg. fire and human agents of attrition
- ii) have a high area to perimeter ratio to reduce "edge" effects
- iii) be large enough to contain examples of all or most of the sub-regional landforms and vegetation types.

The proposed new reserves which follow are recommended by reference to these characteristics, made on the basis of identified need, and based on biological data (Section 4.0).

Recommendations from Conservation Through Reserves Committee (CTRC)

The following proposed reserves (11.1 - 11.5) were recommended by the CTRC in the "Greenbook" in 1974. The recommendations were endorsed by the EPA "Redbook" and approved by Cabinet on 9/2/1976. Sixteen recommendations were made over CALM's Goldfields Region; of these nine have been implemented. One, Baker Lake Nature Reserve, has been revoked due to the issue of an Aboriginal special purpose lease. The remainder, with the exception of Weld Spring, which is more appropriate as an historic site than a nature reserve, are addressed below.

11.1 CARNARVON RANGE

Recommendation

That the proposed Carnarvon Range Nature Reserve (CTRC 12.9, Shire of Wiluna) be gazetted 'A' Class National Park vested in the NPNCA.

Justifications and Implications

The Carnarvon Range is a spectacular sandstone landform, being the only arid zone mountain range proposed for conservation in the region; it is at the southern limit of several plant species with a more northern distribution. The Range has very high scenic values as well as numerous registered Aboriginal sites. Some biological work has been done (McKenzie and Burbidge 1979), but more is required.

Negotiation will be required with Ngangganawili Community (Inc.) of Wiluna who have a special purpose lease proposal, the former Blue Hills pastoral lease, adjacent to and overlapping the proposed reserve. The proposed boundaries are from the northeast boundary corner of Marymia pastoral lease (approximately 24° 52' S, 120° 18' E) east to 120° 52' E, south to 25° 19' 30" S, west to the boundary of 120° 28' e), north to the starting point. The area of the proposed reserve is 390 726 ha.

Mining will be excluded according to Government policy.

Note that this recommendation differs from CTRC 12.9 in that it includes the vacant crown land around the Miss Fairbairn Hills. It also involves a minor southward extension to include Ilyee pool which is incorrectly mapped as the H. Dowd waterhole. The proposed extension is to incorporate several semi-permanent waterholes which support populations of Dinnerplate Tortoises, which are not present in any existing desert nature reserve.

11.2 LAKE THROSSEL

Recommendation

That within the life of this plan, ie. ten years, CALM establish the nature conservation values and appropriate boundaries of the proposed Lake Throssel Nature Reserve (CTRC 12.15, Shire of Laverton), (Map 3). This assessment also to take into account whether the proposed reserve duplicates or complements the existing Yeo Lake Nature Reserve.

11.3 LAKE DISAPPOINTMENT

Recommendation

That the proposed Lake Disappointment Nature Reserve (CTRC 12.8, Shire of Wiluna), which is a rectangle bounded by 23°31'S to 24°00'S and 122°20'E to 123°00'E, be deferred and addressed in the Pilbara Regional Management Plan.

Justifications and Implications

The proposed reserve is subject to intense interest from Aboriginal people who identify with the Pilbara rather than the Goldfields. Additionally the proposed reserve is within the scope of the government's Social Impact Study; it would be inappropriate and confusing to Aboriginal people for the CALM's Goldfields Region to become involved in negotiations on tenure and land access for this proposed reserve.

11.4 WINDICH SPRING

Recommendation

That a small reserve of 150 ha centred on Windich Spring (CTRC 11.1, Shire of Wiluna) be gazetted 'A' Class Conservation Park, vested in the NPNCA.

Justifications and Implications

Windich Spring is an important historic site associated with the Canning Stock Route and the Heritage Trail, with high conservation values (eg. the Dinnerplate Tortoise) and recreational potential for Stock Route travellers. As a semi-permanent freshwater pool in a creek lined with River Gums, the Spring has great aesthetic and wildlife value. The proposed reserve will require fencing to exclude cattle from Cunyu Station and feral herbivores. An arrangement for maintenance of the fence and construction of a new bore will be required with the lessee of Cunyu Station. Note that this recommendation is smaller in area than the original CTCRC recommendation because of the requirement to fence the proposed reserve. The conservation and historical values identified in CTCRC 11.1 can still be protected by the smaller reserve.

11.5 RESERVE NO. 16153 IN THE COMET VALE AREA

Recommendation

That unvested 'C' Class reserve No. 16153, Comet Vale Common, Shire of Menzies become 'A' Class nature reserve vested in the NPNCA (Map 4). The area of the reserve is 5058 ha.

Justifications and Implications

Comet Vale common, originally proposed as a Timber Reserve in the early 1970's, incorporates areas of poorly represented greenstone. Results from the biological survey of the Eastern Goldfields, highlighting the high conservation values of the area, have resulted in recommendations for a proposed nature reserve. Notable fauna species include two species of native hopping mice, two species of dasyurid marsupial, two species of fairy-wren, an outlying population of an arid zone skink, and the Scarlet-chested Parrot. Important flora records include three mallees with restricted ranges centred on the Comet Vale area (Henry-Hall 1990).

During the survey, long-term biological monitoring sites were established in the Comet Vale area in 1979. The majority of these survey sites are located to the south-west of Salt Dam, on the southern portion of Jeedamya Pastoral Lease, outside the proposed nature reserve. These sites will become increasingly important in monitoring changes in the region's flora and fauna, particularly the changes in land under pastoral use.

Key Features

- The rich flora and fauna present on a series of sandplain dunes in the north-eastern corner of the proposed reserve.
- Three eucalypts with restricted distributions, including the rare *Eucalyptus jutsonii*, occurring on sandplain in the area.
- Long-term monitoring sites established within the proposed reserve and on the adjacent Jeedamya Pastoral Lease.

- The inclusion of the poorly reserved greenstone landform, present along the western margins of Lake Goongarrie.

Mining would occur only according to Government Policy. Enclave reserves No. 13763 - recreation, No. 13737 - rifle range, No. 11107 - cemetery and No. 13500 - explosives, could either be cancelled if they no longer fulfil their function, or remain unchanged if they do.

11.6 ADELONG DUNES

Recommendation

That a new "A" Class reserve in the Shire of Menzies be created for the purpose of Conservation of Flora and Fauna, vested in the NPNCA, and defined as the area bounded to the west by the eastern boundary of Riverina Pastoral Lease (3114/1017) along 120°46'E for 4.5km; north by 29°47'15"S for 7.5 km, then along 120°50'30"E for 3.5 km to 29°45'30"S for 11 km; east by the Adelong Pastoral Lease (3114/801) boundary along 120°57'30"E for 11 km; and south by 29°51'S for 8 km and for 10.8 km to join the western boundary. Area of proposed reserve is 15 956 ha (Map 4).

Justifications and Implications

The proposed nature reserve has been selected to incorporate a representative dunefield system. This extensive sandplain area, with associated dunes, contrasts with the small dunefields to the south-east, in the vicinity of Comet Vale. The proposed boundaries, reflecting the natural borders of the sandplain, include the full extent of the dune system, (Henry-Hall 1990).

A preliminary flora and vegetation survey confirmed the floristic importance of the sandplain dune systems in the Menzies area (G.J. Keighery, field notes: 1989). The biological survey of the Comet Vale area 25 km to the south-east highlighted the distinctive south-western floral elements present on isolated sand dunes (Dell et al, 1988). The extensive dunefield south west of Menzies, however, appears more diverse than the small dune system near Comet Vale (G. Keighery, pers. comm.).

The proposed nature reserve south west of Menzies contains both flora recorded at Comet Vale and several additional species. Representatives of the Comet Vale flora include *Calytrix watsonii*, *Eucalyptus ceratocorys* and *Triodia* sp. nov. (G.J. Keighery 9427). The presence of *Acacia* aff. *jutsonia* (G.J. Keighery 11219), *Banksia elderiana*, *Stylidium humphresii* and *Xanthorrhoea thorntonii* contributes to the diversity of the proposed reserve. In addition, new species collected are *Tricoryne* sp. nov. (G.J. Keighery 11230) and *Acacia* sp. nov. (G.J. Keighery 11217).

Many interesting south western species occur at the inland margins of their range within the proposed reserve. These include *Caustis ?dioica*, *Hybanthus floribundus* and *Lechenaultia brevifolia*. The record of *Chamelaucium ciliatum* is the only collection within the Austin Botanical District. *Eucalyptus ceratocorys* (formerly *E. angulosa* var. *ceratocorys*) was also recorded on sandplain dunes in the area (G. Keighery, pers. comm.).

A preliminary fauna survey in 1989 compiled a species list that consisted of four native mammals, 15 reptiles and 26 birds (N. McKenzie and A. Chapman, field notes: 1989). A variety of habitats including lakeside dune slopes, interdunes and dune crests were sampled. The small list of fauna recorded is consistent with the preliminary nature of the survey and short duration of sampling.

Key Features:

- Representative dunefield surrounded by sandplain
- Most extensive system of dunes in the area
- Reptile and small mammal fauna associated with the dunes.

Mining will be restricted according to Government Policy. A small portion of Adelong pastoral lease No. 3114/1017 is within the proposed reserve (Map 4). Negotiation with the pastoral lease holder will be required.

11.7 RESERVE NO. 27585 AT WALLAROO ROCK

Recommendation

That Government Requirements Reserve No. 27655 at Wallaroo Rock in the Shire of Coolgardie become "A" Class conservation park vested in the NPNCA.

Justifications and Implications

This recommendation is in part a response to a request from the Shire of Coolgardie for CALM to manage the area which has become excessively degraded by recreational use. The rock itself and the constructed dams offer considerable recreational opportunities which if managed will take some pressure from other recreation sites, eg. Cave Hill and Burra Rock. The reserve has important historical associations with woodline operations and is also a System Eleven biological survey vegetation monitoring point, (see Dell et al (1985).

Negotiations with both Westrail, DOLA and the Shire of Coolgardie will be required with respect to access to the reserve, assistance with management and change of tenure.

11.8 GOLDFIELDS WOODLANDS NATIONAL PARK

Recommendation

That a Goldfields Woodlands National Park vested in the NPNCA be gazetted in the Shire of Coolgardie as in Maps 3 and 4 with a total area of 282 772 ha, between Boorabbin, Woolgangie and Victoria Rock. Cancellation of the following small reserves and their incorporation into the proposed National Park is also recommended:

Reserve No. 2917 for Water at Boorabbin Rock

Reserve No. 6078 for Water at Boondi Rock

Reserve No. 2918 for Water at Woolgangie

Reserve No. 2178 for Public Utility at Yerdanie Rock

Reserve No. 8480 Victoria Rock Nature Reserve.

Justifications and Implications

This recommendation is a package of several components to establish a major regional national park of international significance because it would combine conservation of arid-zone eucalypt woodlands with other high conservation and historical values, with recreational and tourist opportunities. The components are:

- a) the existing Boorabbin National Park
- b) an extension eastward including Woolgangie Firewood Reserve No. 10829 and vacant Crown Land but excluding pumping station No. 8 (Reserve No. 8232) and service reserves for the Goldfields pipeline and Great Eastern Highway
- c) a southward extension including 223 590 ha of vacant Crown Land and the existing Victoria Rock Nature Reserve No. 8480 Map 3. The final boundary of this component could be amended to exclude greenstone areas which are prospective.

The proposed national park includes a diversity of landforms/vegetation types which were studied during System Eleven biological surveys including sandplains, chenopod lake frontage shrublands, eucalypt woodlands and granite complex. These studies recorded the richest assemblage of agamid reptiles for the Eastern Goldfields in Boorabbin National Park, as well as 14 species of native mammals in the southwards extension.

The proposed national park would be zoned according to CALM policy and an area management plan produced to accommodate conservation, appropriate recreation and tourist interests. As such it would be a major regional tourism resource within the Goldfields, Coolgardie Shire in particular. Recreational nodes and campsites could be developed and managed on existing sites such as Boondi Rock and dam, Woolgangie Dam and Yerdarnie Rock. A tourist route could be designed to include historical features, eg. woodlines and dams, eucalypt woodlands and granite outcrops. To succeed this proposal would require community support and a major allocation of resources.

Mining and other imposed activities would be excluded according to Government Policy. Procedures for gazettal of new national parks proceed through a Ministerial Council consisting of the Ministers for Environment, Mines and Resources Development and chaired by the Premier, and must be approved by Parliament.

11.9 HOMESTEAD CAVE

Recommendation

That a 10 x 10 km'A' class reserve vested in the NPNCA classified 5(g) under the CALM Act for protection of cave system be established in vacant Crown land over Homestead Cave in the City of Kalgoorlie-Boulder (Map 3).

Justifications and Implications

The Australian Speleological Federation believes that Homestead Cave has the potential to be the longest in the world; in order to afford some protection to the cave system it is necessary to establish a reserve over the cave. As a 5g reserve surface activities - except possibly water extraction - would not be restricted under the CALM Act.

11.10 WOODLINE HILLS

Recommendation (Joint with South Coast Regional Plan)

The proposed Woodline Hills Nature Reserve should be Class A, for the purpose of Conservation of Flora and Fauna and vested in the NPNCA. It is defined as the area bounded to the: west by 122°17'E for 36 km to include Reserve Nos. 17629 (Yardina soak) and 8847 (Moochabinia Spring); north by 31°37'S for 38 km; east by 122°42'E for 36 km; and south by 31°56'S for 38 km. The proposed reserve is in the City of Kalgoorlie-Boulder and the Shire of Dundas, with an area of 134 630 ha (Map 3).

Justifications and Implications

The woodline hills are a quartzite landform not represented in a nature reserve elsewhere in the Goldfields Region. The vegetation includes poorly known eucalypts *Eucalyptus websteriana* and *E. carnei* as well as a rare species *Brachycome billardierei*. The proposed reserve includes some of the Goldfields woodlines which are of historical and recreational interest. The northern and part of the western boundary adjoins Madoonia Downs pastoral lease therefore negotiations with the pastoralist on fencing and dog control will be required. Mining on the reserve will be according to Government Policy for "A" class nature reserves. It is proposed that the Goldfields Region would manage this reserve.

11.11 BUNINGONIA SPRING

Recommendation 1.

The proposed Buningonia Spring Nature Reserve should be an A Class reserve, vested in the NPNCA for the purpose of Conservation of Flora and Fauna, and is defined as the area bounded to the: west by 123°28'E for 30 km along the eastern boundary of Coonana Station (3114/566); north by 31°14'S for 27 km to include Harris Lake; east by 123°45'E for 30 km to include Spy Hill; and south by 31°30'S for 27 km to incorporate the long term flora and fauna monitoring quadrats established in the vicinity of Buningonia Spring. The proposed area of 79 170 ha incorporates 32 905 ha of land from Dundas Shire and 46 265 ha from The City of Kalgoorlie-Boulder. An excision of 15 678 ha from Fraser Range pastoral lease (3114/1137) is required, (see Maps 3 and 4).

Justifications and Implications

The proposed reserve has a biological data base and monitoring potential arising from the System 11 biological surveys in 1978 (Newbey et al 1984). It also includes some of the basic granitite landform which with the exception of Binaronca Rock Nature Reserve which is very small, is not represented in the existing reserve system. Newbey et al (1984) have also drawn attention to the biological importance of this proposed reserve as a partial refuge for nomadic south-west birds as it occurs on the edge of many of these birds' ranges. Negotiations with the lessee of Fraser Ranger pastoral lease, Department of Agriculture and Department of Land Administration will be required regarding the northern, un-used portion of this lease. Mining will be in accordance with Government Policy for "A" class reserves. The proposed reserve would be managed by the Goldfields Region of CALM.

11.12 NULLARBOR RESERVES

Recommendation (Joint with South Coast Regional Plan)

(These proposed reserves fall across the Goldfields/South Coast regional boundaries. They are also addressed in CALM's South Coast Regional Plan.)

That two large "A" class nature reserves vested in the NPNCA be established in vacant Crown land on the Nullarbor Plain. One is east of Kybo and north of Madura Stations (976 545 ha) and the other between Brambah pastoral lease and the State border (501 163 ha) Map 3. Both cross the boundary between the City of Kalgoorlie-Boulder and the Shire of Dundas.

Justifications and Implications

The Nullarbor karst landform is the largest of its kind in the world and has many unique features including caves and an unique cave-dwelling invertebrate fauna. In spite of this most of the Nullarbor, particularly the southern half, is not represented in any Western Australian conservation reserve. A recent computer analysis (McKenzie et al. 1989) using data from the 1984 biological survey (McKenzie and Robinson 1987), indicated that Nullarbor plants and animals could be assigned to 14 distinct groups. Of these, only 6 are represented in the existing reserve system; an additional 6 groups will be represented if the proposed reserves are established. The remaining two groups are present only on pastoral leases, but their fauna and flora are present elsewhere in the Goldfields.

The proposed reserves would exclude existing road, rail and Telecom reserves and Loongana townsite reserve. Existing accesses within the proposed reserves eg. Madura to Loongana will remain open but any further access would be subject to environmental impact assessment and CALM's concurrence.

Dingo control on the proposed reserves could be undertaken with CALM's approval if it can be substantiated that dingoes from within the reserves are causing problems to neighbours. In this case barrier control to the east of Kybo pastoral lease (priority 2 zone in A.P.B. Wild Dog Zone 9 species management plan) would be acceptable to CALM with CALM prescription 1080 baits and shooting but not strychnine baits or steel jaw traps.

Basic raw materials, eg. gravel or road base for road construction or maintenance within the reserves may be obtained by issue of a CALM lease, subject to rehabilitation prescriptions. The effective management of these two reserves will require the input of both the Goldfields and South Coast CALM regions as well as liaison with South Australian National Parks and Wildlife Service and pastoralists.

PROPOSED RESERVES AND EXTENSIONS

A. NATIONAL PARKS

Goldfields Woodland National Park (includes Boorabbin National Park extensions)	282 772 ha
Goongarrie National Park (extension)	12 150 ha
Carnarvon Range	<u>390 726 ha</u>
	685 648 ha

B. CONSERVATION PARKS

Cave Hill (extension)	1 398 ha
Wallaroo Rock	1 214 ha
Windich Spring	<u>150 ha</u>
	2 762 ha

C. NATURE RESERVES

Lake Throssell	409 000 ha
Lake Disappointment	612 000 ha
Nullarbor Reserve a) *	976 545 ha
Nullarbor Reserve b) *	501 163 ha
Adelong Dunes	15 956 ha
Comet Vale	5 058 ha
Cardunia Rocks (extension)	823 ha
Homestead Cave	10 000 ha
Mt. Manning Range (extension a)	132 400 ha
Mt. Manning Range (extension b)	91 650 ha
Woodline Hills *	134 630 ha
Buningonia Spring *	<u>79 170 ha</u>
	<u>2 968 415 ha</u>
	<u>3 656 825 ha</u>

* These reserves overlap into South Coast Region

Proposed reserves and extensions would increase the Goldfields Region conservation estate to 10 532 400 ha or 13.6% of the region.

12. SITES WITH HIGH CONSERVATION VALUES NOT INTENDED FOR RESERVATION

The rationale for this section is that on-going biological and inspection work does identify particular areas which although having high conservation values are usually relatively small and so it is not practical to formally acquire them as conservation reserves. These are often in pastoral leases and aboriginal land. The intention of this section is to identify these areas, put CALM's interest on public record and request that CALM have an advisory and monitoring role in any major change in land use proposed for these areas. Section 16A of the CALM Act provides a mechanism for CALM and pastoral lessees to enter into an agreement to manage for conservation purposes, specified portions of pastoral leases.

12.1 SITE EM22 JEEDAMYA STATION (SHIRE OF MENZIES)

This site is near the south west corner of pastoral lease 3114/828 at 29°56'S 121°08'E or 4 km north east of Comet Vale townsite. The vegetation comprises three species of mallee; *Eucalyptus concinna*, *E. leptopoda* and *E. transcontinentalis* on deep sands. With 19 lizards and 3 snakes recorded it is the richest reptile assemblage in the Eastern Goldfields (Dell and How 1988).

12.2 ERAYINIA HILL, COWARNA DOWNS STATION

Erayinia Hill is an extensive and prominent granite exposure on pastoral lease 3114/617 at 122°38', 31°01'. It has a diverse flora of ca 93 species Newbey et al (1984) including *Eucalyptus kruseana*, (P5) *E. brachyphylla* and *Melaleuca coccinea*, (P3).

12.3 GUM CREEK, RIVER RED GUM SITE, 15-20 KM WEST OF WILUNA ON MILLBILLILLIE STATION (SHIRE OF WILUNA)

This site includes the finest stand of River Red Gums, *Eucalyptus camaldulensis*, in the Goldfields. It is a major provenance area for this species which is, "perhaps the worlds most widely used tree species for plantings in arid and semi-arid lands" (Midgley et al 1989). These trees are a genetic resource of considerable importance because they are more salt tolerant than *E. camaldulensis* from elsewhere except De Grey River (W.A.) and Silverton (N.S.W.).

12.4 SERPENTINE LAKES PALAEOCHANNEL W.A. - S.A. BORDER (SHIRE OF LAVERTON)

The South Australian National Parks and Wildlife Service has expressed interest in the conservation of this palaeochannel in W.A. In S.A., where most of it occurs, it is conserved in an unnamed conservation park. The area is presently vacant Crown land but there are Aboriginal interests in the area.

12.5 RANGES OF WESTERN DESERT (SHIRES OF WILUNA AND LAVERTON)

The Western Desert Ranges are included in Aboriginal Reserve No. 17614. The Conservation Through Reserves Committee "green book" drew attention to their value for conservation, landscape and Aboriginal cultural material. A recommendation (number 12.19) that the EPA and AAPA liaise to achieve multiple use management was endorsed by Cabinet in 1976.

**PART D. ISSUES OF CONSERVATION AND
LAND MANAGEMENT ON THE GOLDFIELDS**

13. CONSERVATION

13.1 FLORA CONSERVATION

Of an estimated total of 12 500 vascular plant species occurring in WA, only 7 500 are described and scientifically named, of these approximately 2 600 occur in CALM's Goldfields Region. A brief description of the flora of the region is in section 4.0.

Two policy statements refer; No. 9 Conservation of Endangered Flora in the Wild and No. 27 Conservation of Native Vegetation in Rural Areas. The former refers to species of particular concern, to be declared under S.23F of the Wildlife Conservation Act 1950-1979.

As of 25 November 1991 there were 14 species of gazetted threatened flora in the Goldfields Region:

Eucalyptus articulata M.S.
Eucalyptus rameliana
Conospermum toddii
Daviesia purpurescens
Eremophila virens
Eremophila caerulea merrallii
Gastrolobium graniticum
Grevillea inconspicua
Myriophyllum petraem
Prostanthera magnifica
Sowerbaea multicaulis
Tetradlea aphylla
Tetradlea harperi
Tetradlea paynteri M.S.

This compares with 79 species in the South Coast Region and 85 in the Wheatbelt. In addition to the species above, an additional 87 Goldfields species are being considered for threatened status.

"Taking" Threatened Flora

In the Wildlife Conservation Act (subsection 6 [1]) the following definition is given:

to take in relation to any flora includes to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means.

Thus, taking declared threatened flora would include not only direct injury or destruction by human hand or machine but such activities as allowing stock to graze on the flora, introducing pathogens that attack it, altering water tables such that the flora is deprived of adequate soil moisture or is inundated, allowing air pollutants to harm foliage etc.

In the case of threatened plants which need fire for regeneration, burning at an appropriate time may not adversely affect the survival of the population. However, burning would injure existing plants and constitutes "taking" under the Act. Therefore,

Ministerial approval is required prior to conducting a prescribed burn which involves any species of endangered flora. A fine of up to \$10 000 may be imposed for a breach of the Act.

Flora

Under the Wildlife Conservation Act the Department administers control of the taking and sale of flora in accordance with three types of licence:

- commercial purposes licences, which allow the taking of protected flora from Crown land
- commercial production licences, which allow the sale of protected flora taken on private land
- scientific or prescribed purposes licences, issued to those people intending to take native plants, but not to sell them.

These licences allow the picking of all but declared threatened flora (for which a special Ministerial permit is required). No picking is allowed within 50 m of public roads. Commercial picking is allowed in State forest, but not in nature reserves, national parks or conservation parks.

Currently there is one seed merchant operating in the Goldfields Region, though itinerant collectors visit occasionally. Mining company rehabilitation often requires issue of scientific or prescribed purposes licences.

STRATEGIES

In addition to implementing departmental policies and guidelines for flora conservation, the Goldfields Region will:

- 1. Establish a map-based recording system for all threatened species in conjunction with the central computer data base.*
- 2. Make available a means of identification for all threatened and priority listed species to regional staff and others.*
- 3. Allocate funding for surveys of threatened and priority listed species.*

13.2 SANDALWOOD CONSERVATION AND MANAGEMENT

Sandalwood (*Santalum spicatum*) highly valued for the aromatic qualities of the oils contained in the heartwood occurs throughout the Goldfields Region and forms the basis of a substantial export industry.

The current sandalwood industry is stable, harvesting a maximum of 2 000 tonnes per annum, 1 800 tonnes from Crown land and 200 tonnes from private property. Harvest is mainly from vacant Crown land and pastoral leases in the Yilgarn, Goldfields and Paynes Find area with additional operations in the central desert areas and on the western edge of the Nullarbor plain.

The sandalwood harvesting industry throughout the state is managed by Goldfields Region staff through issue of licences under the CALM and Sandalwood Act. Licences are issued in accordance with the sandalwood management program which outlines resource information, research, and strategies for management and conservation of sandalwood.

As outlined in CALM's Wildlife Management Program No 8, The Management of Sandalwood (Kealley 1991), the objectives are:

To conserve sandalwood as a species in WA, and at the same time maintain the sandalwood industry by reducing harvest of the natural green wood resource and supplementing the natural resource by the increasing use of plantations.

SPECIFIC OBJECTIVES AND STRATEGIES

Conservation Reserves

The objective is to develop and manage an effective conservation reserve system to conserve and protect representative areas of sandalwood containing viable populations of plants throughout its range.

- 1. Investigate and review current conservation reserves with a view to establishing an effective reserve system, with secure tenure and purpose, free of encumbrances, to conserve representative stands of sandalwood throughout its range.*
- 2. Review conservation through reservation of sandalwood throughout its range using inventory and distribution data. Improve conservation status by acquiring areas for sandalwood reserves.*
- 3. Manage conservation reserves to ensure maximum protection of existing sandalwood by removing and controlling grazing by introduced herbivores and protection from wildfire.*
- 4. Use developed techniques for enrichment and re-establishment of sandalwood in reserves where it occurred naturally.*

Research

The objective is to carry out research and inventory to ensure the best silvicultural, protection, conservation and utilisation techniques are used in management and reservation.

- 5. Initiate a major study of alloenzyme variation in sandalwood to document the genetic resource and integrate sandalwood conservation with reservation strategies.*
- 6. Continue research on sandalwood management in accordance with defined priorities to achieve research objectives.*

7. *Review existing research projects, remeasure established trials and publish existing research data.*
8. *Contribute to ongoing research co-ordination by involvement with the Sandalwood Research Institute and maintaining an overview and input to research programs.*
9. *Conduct research into sandalwood regeneration and enrichment techniques, and silvicultural techniques for plantations of both *S. spicatum* and *S. album**

Harvesting

The objective is to adjust the level of harvest from natural stands to a level consistent with growth, with due regard to employment and economic stability and replace harvest of natural stands with increasing use of plantations, to meet demand and achieve conservation, land use and economic aims.

10. *Restructure licences and quotas, adjust the level of green wood harvesting to achieve management objectives without disadvantaging those engaged in the industry.*
11. *Ensure harvesting of dead wood receives priority over living trees.*
12. *Modify licence conditions to achieve objectives.*

Marketing

The objective is to ensure that sandalwood products are marketed to favour the highest value products with the maximum level of local processing.

13. *Investigate and review harvesting, transport, and processing methods to achieve the most economic methods.*
14. *Use returns from the sale of sandalwood for management, conservation and reservation.*

Plantations

15. *Investigate and establish trial commercial plantations of sandalwood (*Santalum spicatum* and *Santalum album*) where this is a practical, economic and an acceptable land use.*
16. *If it is shown that viable plantations of *Santalum album* are possible, promote the economic returns, feasibility and techniques to commence a program of plantation establishment with the long term objective of transferring the majority of green wood harvesting to that species.*
17. *Establish trial plots of WA sandalwood in the higher rainfall areas of its range and manage remnant stands throughout its former range.*

Management

The objective is to maintain sandalwood harvesting operations as planned with control by the present system of licences, quotas and conditions, to continue the emphasis on efficient utilisation of the resource, and to update protection and regeneration prescriptions in the light of research.

18. *Supply of sandalwood should not exceed 2 000 tonnes per annum: 1 800 tonnes maximum from Crown land, 200 tonnes maximum from private property.*
19. *Continue to provide advice to the Sandalwood Export Committee.*
20. *Ensure operating areas are allocated to defined boundaries and directed to those areas where land use and conservation objectives are achieved.*
21. *Use licence conditions to achieve management and conservation objectives and to minimise conflict with other land use objectives. Review conditions regularly.*
22. *Provide infrastructure for management of the sandalwood industry and new initiatives associated with the management program.*

Education

The objective is to educate and promote public awareness of sandalwood management, conservation and reservation.

23. *Develop and disseminate information on sandalwood.*
24. *Encourage landholders to regenerate and plant sandalwood and to manage remnant stands on private property.*
25. *Use promotion, education and publicity to increase community understanding of sandalwood management.*

Regeneration

The objective is to improve the establishment and survival of regeneration, throughout the range of sandalwood.

26. *In conjunction with the Agricultural Protection Board and other land users, develop and implement control measures for introduced herbivores throughout the range of sandalwood.*

13.3 FAUNA CONSERVATION

Declared Threatened and Specially Protected Fauna

Section 6 of the Wildlife Conservation Act affords protection to all native fauna on all land within State boundaries. CALM's Policy Statement No. 33, Conservation of Endangered and Specially Protected Fauna in the Wild, has strategies including research,

monitoring, habitat protection and management plans for those fauna which are declared threatened or which are specially protected. In the Goldfields Region the following species are subject to special management considerations; in particular data on numbers and distribution as well as habitat management and status within conservation reserves are required:

DECLARED THREATENED FAUNA

Mammals

Mulgara or Minyiminyi	<i>Dasyercus cristicauda</i>
Sandhill Dunnart	<i>Sminthopsis psammophila</i>
* Golden Bandicoot or Wintarru	<i>Isoodon auratus</i>
* Desert Bandicoot or Walilya	<i>Perameles eremiana</i>
* Pig-footed Bandicoot or Kantjilpa	<i>Chaeropus ecaudatus</i>
Dalgyte or Bilby or Ninu	<i>Macrotis lagotis</i>
* Lesser Bilby or Tjunpi	<i>Macrotis leucura</i>
* Brush-tailed Bettong or Woylie	<i>Bettongia penicillata</i>
* Burrowing Bettong or Boodie	<i>Bettongia lesueur</i>
* Spectacled Hare Wallaby or Wampana	<i>Lagorchestes conspicillatus</i>
* Rufous Hare Wallaby or Mala	<i>Lagorchestes hirsutus</i>
* Central Hare Wallaby or Kuluwarri	<i>Lagorchestes asomatus</i>
* Crescent Nailtail Wallaby or Tjawalpa	<i>Onychogalea lunata</i>
Black-footed Rock Wallaby or Warru	<i>Petrogale lateralis</i>
Plains Rat	<i>Pseudomys australis</i>
* Lesser Stick-nest Rat	<i>Leporillus apicalis</i>

* These species are presumed extinct in the Goldfields Region.

Birds

Freckled Duck	<i>Stictonetta naevosa</i>
Grey Falcon	<i>Falco hypoleucos</i>
Princess or Alexandra's Parrot	<i>Polytelis alexandrae</i>
Night Parrot	<i>Geopsittacus occidentalis</i>
Scarlet-chested Parrot	<i>Neophema splendida</i>
Crested Shrike-tit	<i>Falcunculus frontatus</i>
Nullarbor Quail-thrush	<i>Cinclosoma alisteri</i>
Thick-billed Grass-wren	<i>Amytornis textilis</i>
Grey Honeyeater	<i>Conopophila whitei</i>

SPECIALLY PROTECTED FAUNA

Birds

Peregrine Falcon	<i>Falco peregrinus</i>
Naretha Blue Bonnet	<i>Northiella haematogaster narethae</i>
Pink or Major Mitchell's Cockatoo	<i>Cacatua leadbeateri</i>

Reptiles

Woma, Ramsay's Python	<i>Aspidites ramsayi</i>
Carpet Python	<i>Morelia spilota imbricata</i>

Declared Native Fauna

The following native species occurring in the Goldfields are declared under the Agriculture and Related Resources Protection Act 1976 (ARRP Act): Red Kangaroo, Grey Kangaroo, Euro, Dingo, Wedge-tailed Eagle, Galah and Emu. Although S 39-41 of ARRP Act requires a government department to control declared plants and animals on or in relation to public land under its control, native fauna are not treated as declared within CALM lands unless a specific management program is approved. With the possible exception of the Dingo, control of declared native fauna on CALM lands in the Goldfields Region is not required.

Kangaroo Management

Red and Western Grey Kangaroos and the Euro are subject to CALM's Wildlife management programs, approved at State and Commonwealth Government levels, which describe management procedures. The aims of these programs are the same as those endorsed nationally by Commonwealth, State and Territory Ministers responsible for wildlife conservation, namely:

- to maintain populations of Kangaroos over their natural range in Western Australia;
- to contain the deleterious effects of kangaroos on other land management practices; and
- where possible, to manage kangaroo species as a renewable resource providing the conservation of the species is not compromised.

An annual quota (ie. upper limit to the commercial harvest) is set for each species, based on harvest and other data including the results of triennial aerial surveys of Red and Grey Kangaroo populations. Particular emphasis is given to directing the harvest in pastoral areas into special rangeland management areas, which are usually paddocks or groups of paddocks spelled from grazing by domestic stock for rehabilitation purposes, and a proportion of the quota may be held in reserve for this purpose.

Management of Emus and Wedge-tailed Eagles

Emus and Wedge-tailed Eagles, which formerly were subject to an open season can now only be controlled subject to a damage licence, issued by CALM Policy Statement No. 23 Conservation and Management of Emus details CALM's approach to all aspects of emu conservation and management, including control of emus causing damage and overseeing the farming of emus for their leather, meat and other products.

Dingo Management

Control of dingoes on CALM managed lands can only be approved under the following circumstances:

- it could reasonably be assumed that dingoes from within reserves were directly responsible for predation on stock
- no adequate buffer exists outside the reserve
- the effect of control measures on non-target species can be controlled(eg. metal traps are not to be used except in exceptional circumstances). Bait and 1080 dose must follow CALM specifications

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- control measures occur at specific known dingo locations within reserves or within a nominated buffer area within the reserve boundary
- control may also be necessary to meet conservation objectives (eg. predation on endangered species).

Two wild dog management plans have been prepared by the Agriculture Protection Board, a Statewide one and one for their Zone 9. (Their Zone 9 covers CALM's Goldfields Region and also includes the Shires of Sandstone and Dundas). CALM has had the opportunity to comment on both plans. CALM will prepare a policy statement on Dingo management within the life of this plan.

STRATEGIES

In addition to implementing departmental policies and guidelines the Goldfields Region will:

- 1. Contribute to the Agriculture Protection Board's Wild Dog Management Plans.*
- 2. Identify particular areas for research into presence and status of declared endangered animals.*
- 3. Initiate a local public awareness program in the media on declared endangered animals.*

13.4 CULTURAL AREAS

Protection of cultural sites is an intrinsic aspect of land management. In most instances the inclusion of these sites within a reserve might not have been the principal reason for reserve selection; however their protection is increasingly important. Cultural sites fall into two broad categories: European sites include historic sites - wells, soaks, dams, blazed trees, buildings and mining sites; Aboriginal sites include artefact scatters, burial, occupation, sacred and ceremonial sites as well as rock shelters with paintings or etchings.

Aboriginal Sites and objects in WA are protected under the Aboriginal Heritage Act 1972, which is administered by the trustees of the WA Museum. All sites and objects on land managed by CALM are subject to that legislation. Policy Statement No. 11 Protection of Aboriginal Sites specifically refers to protection of sites and objects on CALM managed lands.

STRATEGIES

In addition to implementing Departmental policies and guidelines the Region will:

- 1. Seek to identify and locate Aboriginal sites and objects on CALM-managed land, and report them to the Trustees of the W A Museum.*

2. *Take account of known Aboriginal sites and objects in management plans.*
3. *Take all steps to care for and protect known Aboriginal sites and objects against damage by human and natural causes.*
4. *Liaise with the W A Museum and appropriate Aboriginal community groups about access to and use of Aboriginal sites and objects.*
5. *Encourage and facilitate research on Aboriginal sites and objects, insofar as may be consistent with approved management and protection programs and the views of the appropriate Aboriginal community groups.*
6. *Encourage and facilitate use of Aboriginal sites and objects as a resource for developing public awareness and understanding of Aboriginal life, history and cultural traditions, but only insofar as this is consistent with approved management and protection programs and the views of the appropriate Aboriginal community groups, and conducted in a manner which is respectful of Aboriginal cultural values.*
7. *Collate existing information on historic sites located on land managed by CALM in the region and maintain an up-to-date register of them in the regional office.*
8. *In accordance with the Burra Charter¹, develop management guidelines for historic sites on land managed by CALM in the region in liaison with the W.A. Museum, National Trust, Heritage Commission, tertiary institutions and historical societies.*
9. *Maintain liaison with local historical societies regarding volunteer work and other activities.*

European cultural sites in WA were not, until recently, specifically protected by legislation (except buildings, which can be registered with the National Trust). Heritage legislation has recently been passed by the WA Parliament and this will protect certain designated Heritage Sites.

1. The Australian ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter) contains principles concerning the preservation of structures considered to have historical value.

14. ENVIRONMENTAL PROTECTION

14.1 FIRE

Fire management is a significant and controversial aspect of conservation and land management in W.A. CALM, as a major landholder, has specific responsibilities under the Bush Fires Act 1954. In particular, there exists a legal and moral obligation to comply with those provisions relating to fire prevention and control of wildfires on or near CALM lands, and protection of life and property. Policy Statement No. 19 Fire Management sets out departmental objectives and policies.

Fire has been and still is a natural phenomenon and ecological factor in the Goldfields Region. There is no doubt that in desert regions in particular the fire regime has changed dramatically since Aborigines left, so that large areas of vegetation in pyric uniformity are now subjected to intense, large summer fires usually started by lightning (see Kimber 1983 for a general discussion of this topic). These changes are now considered a major factor in the decline of desert dwelling mammals (Burbidge and McKenzie, 1989). See also Section 18.0 Research.

The other Goldfields biological sub-regions, eucalypt woodlands, mulga woodlands and the Nullarbor Plain are not as prone to fire due to less flammable fuels. However in spite of this there were major fires in all these sub-regions in the summer of 1975/76 after two well above average rainfall years caused a proliferation of native grasses.

Fire control in the Goldfields Region is carried out according to a Fire Control Working Plan which is reviewed annually. Fire suppression in the Goldfields does not assume the high priority that it does in other CALM Regions because a) vegetation is much less flammable, b) lesser values are potentially at risk and c) constraints of remoteness, lack of access, communications and sparse population apply. On account of these factors and the Region's low suppression capability in remote areas the strategy has been to conduct aerial and hand prescribed burning on Goldfields reserves. In the absence of area management plans for Goldfields reserves all prescribed burning operations are subject to approved necessary operations and Interim Management Guidelines (Section 3). Manual and aerial prescribed burning operations have so far been conducted in Gibson Desert Nature Reserve, Neale Junction Nature Reserve, Wanjarri Nature Reserve and Queen Victoria Spring Nature Reserve.

Aerial incendiary burning has been conducted on an experimental basis in Gibson Desert Nature Reserve to achieve the dual objectives of wildfire control and re-establishing environmental heterogeneity as a precursor to an experimental mammal reintroduction project.

Even for less remote reserves any effective suppression could only be carried out with liaison with and the assistance of local brigades, neighbouring pastoralists and the Bush Fires Board. See also Section 7.3 Management Capability Zones.

The overall objectives of fire management within CALM are to:

- **Protect community and environmental values on lands managed by the Department from damage or destruction from wildfire.**
- **Use fire as a management tool to achieve land management objectives, in accordance with designated land use priorities.**

STRATEGIES

Fire Suppression

1. *Meet legal obligations under the Bush Fires Act and the CALM Act by responding to fires occurring on or near CALM managed land to a degree that is appropriate to the values at risk.*
2. *Assess response to a fire in the light of potential damage to the following values, in order of priority:*
 - a) *human life*
 - b) *community assets, property or special values (including environmental values)*
 - c) *cost of suppression in relation to values threatened.*
3. *Where values dictate the Department will:*
 - a) *encourage communication and liaison which will give timely warning of the presence of a fire threatening community or environmental values;*

Use of Fire

4. *Use planned fire only where this use is in accordance with an approved management plan, or, where such a plan does not exist, to protect and maintain the designated priority land use.*
5. *Prepare written prescriptions in advance, for approval by senior designated officers, before any planned fires are undertaken.*
6. *For areas where primary land use is wildlife conservation, use fire in such a way as to promote the greatest possible diversity and variety of habitats within prevailing physical or financial constraints.*

In small conservation reserves and where information on the impact of fire is limited, fire will be used conservatively. In such areas the use of fire will be restricted to:

- a) *protection of neighbouring community assets; and*
 - b) *as far as is achievable and within safe limits, ensuring that different seral stages following fire are represented.*
7. *Use prescribed fire or other methods to reduce fuels on appropriate areas of CALM lands, where it can be demonstrated that this is the most effective means of wildfire control, and where undesirable ecological effects do not result.*

The frequency of fuel reduction measures will be governed by the rate of build-up of fuels; the degree of risk to human lives, the value of the assets to be protected; the

known sensitivity to fire, or dependence on fire, of the kinds of plants and animals presents; and the resources available to carry out the work.

Liaison

8. *Ensure effective liaison with neighbours, Bush Fires Brigades, Shires, Bush Fires Board and other fire control organisations.*
9. *Promote mutual aid interagency agreements for fire control on lands of mixed tenure with common fire problems.*

Public Awareness

10. *Provide for public education in relation to the prevention of fire and the role and use of fire in ecosystem management, and hazard and risk reduction.*

Research

11. *Undertake research into fire prevention and control, fire ecology and fire behaviour on CALM lands to improve the scientific basis for, and effectiveness of Fire Management Programs.*

REGIONAL STRATEGIES

In addition to implementing departmental policies and guidelines the Goldfields Region will:

12. *Monitor environmental conditions, particularly rainfall which might cause Goldfields vegetation to be at increased fire risk.*
13. *Maintain a program of prescribed burning of hummock grasslands in desert nature reserves.*

14.2 WEEDS

CALM has a responsibility for weed control on lands under its control for two reasons. There is legal responsibility for land-holders to eradicate plants declared under s37 of the Agriculture and Related Resources Protection (ARRP) Act. Other plants may have weed status for reasons of visitor safety or comfort, aesthetics or conservation in a local situation and may require control or eradication according to interim management guidelines or an area management plan. Policy Statement No. 14 Weeds on CALM Lands defines a weed as "any plant which is disadvantageous from the viewpoint of effective management for the land use concerned". It may be either a native or exotic species. Plants declared under the ARRP Act are:

- a) Declared plants in Goldfields Region
 - Cape tulip *Homeria breyniana* (L.) Lewis and *H. miniata* Sweet
 - Mexican Poppy *Argemone mexicana* L.
 - Hoary cress *Cardaria draba* (L.) Desv.
 - Camelthorn *Alhagi camelorum* Fisch.

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Horehound	<i>Marrubium vulgare</i> L.
Mintweed	<i>Salvia reflexa</i> Hornem.
Thornapples	<i>Datura</i> spp.
Bathurst burr	<i>Xanthium spinosum</i> L.
Saffron thistle	<i>Carthamus lanatus</i> (Tourn.) L.

b) Other introduced weeds in Goldfields Region

Nut grass	<i>Cyperus rotundus</i> L.
Onion-weed	<i>Asphodelus fistulosus</i> L.
Doublegee	<i>Emex australis</i> Steinh.
Docks	<i>Rumex</i> spp.
Sorrel	<i>Rumex acetosella</i> L.
Wild radish	<i>Raphanus raphanistrum</i> L.
Wild turnip	<i>Brassica tournefortii</i> Gouan.
Soursob	<i>Oxalis pes-caprae</i> L.
Caltrop	<i>Tribulus terrestris</i> L.
Prickly pear	<i>Opuntia</i> spp.
Paterson's curse	<i>Echium plantagineum</i> L. and <i>E. italicum</i> L.
Afghan thistle	<i>Solanum hystrix</i> R.Br.
Paddy melon	<i>Cucumis myriocarpus</i> Naud.
Stinkwort	<i>Inula graveolens</i> Desf.
Noogoora burr	<i>Xanthium pungens</i> Wallr.
Spear thistle	<i>Cirsium arvense</i> (L.) Scop.
Wards weed	<i>Carrichtua annua</i>

STRATEGIES

In addition to implementing Departmental policies and guidelines the Goldfields Region will:

- 1. Prepare a weed control management program.*
- 2. Maintain an inventory of weeds, feral animals and pests on CALM managed lands in the region.*
- 3. In conjunction with the Agriculture Protection Board and adjacent landholders, develop programs to control declared weeds and pests as resources allow.*
- 4. Maintain liaison with neighbours to optimise control of boundary weed infestations.*
- 5. Carry out monitoring and control programs, as resources allow on declared and non-declared environmental weeds.*

14.3 FERAL ANIMALS

Control of feral animals is viewed as one of the most important strategies by which conservation objectives on CALM lands can be achieved. Feral animals have potential

for serious impact on natural systems, through direct effects such as predation, habitat destruction, competition for food and territory or generally through environmental degradation by selective grazing and disease spread (eg. dieback). Feral animal control is also an issue in maintaining good relationships with neighbours.

The Department also has responsibilities for control of declared animals on CALM lands under Sections 39-41 of the Agriculture and Related Resources Protection Act 1976 (ARRP), viz “A Government Department shall control declared plants and declared animals on or in relation to public land under its control”, but notwithstanding the Agriculture Protection Board Act, 1950 Sections 22(1), (2) and (3) which preserves the “rights, powers, authorities or duties of any Government department”.

CALM distinguishes between declared native species which are dealt with under Section 13.3 Fauna Conservation, and feral animals which are introduced species that have become established as wild or naturalised populations. The following species are feral in the Goldfields:

Mammals

Rabbit*, red fox*, house mouse, feral cat, donkey*, goat*, camel*, cattle, horse, sheep and feral dog.

* Declared animals under Agriculture and Related Resources Protection Act 1976.

Note: Cattle are never legally considered feral in Australia. Control measures must be undertaken with due consideration to assumed ownership.

Birds

Feral Pigeon, Spotted Turtle-dove, Senegal Turtle-dove.

Feral animals such as the cat (*Felis catus*), fox (*Vulpes vulpes*), goat (*Capra hircus*) and rabbit (*Oryctolagus cuniculus*) cause widespread environmental problems on CALM lands, including some islands. Impacts include predation on native fauna, destruction of native vegetation, and introduction of disease and disturbance of native fauna due to the smell of scats etc.

If a species is declared, the landholder, including CALM, has a legal responsibility for control on that land. CALM also has a considerable interest in control, or eradication in some circumstances, eg. on islands, of non-declared feral animals. This applies particularly to the introduced feral cat. Research within CALM and elsewhere has documented the effects that foxes and cats can have on native fauna, eg. Jones and Coman (1981) and Kinnear et al (1988). A departmental policy statement on feral animals will be produced during the life of this plan.

CALM’s primary operational objective is to:

Achieve the systematic and safe control or eradication of feral animals on CALM managed lands, in accordance with established priorities, and consistent with Departmental conservation objectives.

STRATEGIES

In addition to implementing departmental policies and guidelines the Goldfields Region will:

- 1. Liaise closely with the Agricultural Protection Board (APB), including its Zone Control Authorities and Regional Advisory Committees.*
- 2. Maintain records of feral animal surveys. Records are to be kept of control measures undertaken, the success of the program and follow up required.*
- 3. Prepare and maintain a 5 year feral animal control plan. After consultation with an APB officer and/or the environmental protection officer the plan will form the basis for works programs.*
- 4. Use 1080 and other chemicals in accordance with 1080 guidelines, Health (pesticide regulations) and guidelines in the Chemical User Manual.*
- 5. Understand and evaluate the effects of chemicals on non-target species in considering a control program. Information is available from CALM and APB research staff.*
- 6. Provide staff with training in feral animal problems, control measures and safety aspects.*

14.4 REHABILITATION

Rehabilitation in this context is the replacement of a stable, self-regulating ecosystem following disturbance. It is necessary to distinguish between a restored ecosystem, that is, one with an identical structure and function to that which existed before disturbance, and a rehabilitated ecosystem, that is, one in which the replaced ecosystem is best suited to the conditions prevailing following disturbance. In circumstances of drastic disturbance eg. overburden or tailings dam a rehabilitated rather than a restored ecosystem is the more realistic objective. In situations of high conservation values a restored ecosystem should be the desired outcome of rehabilitation, which must always consider what the final land use will be.

The requirement for rehabilitation on lands managed by CALM derives from either an inherited situation in which disturbance occurred in the absence of any commitment to rehabilitate, or as part of a management program for activities imposed on CALM lands managed by CALM.

Departmental policy is contained in Policy Statement No. 10 Rehabilitation of Disturbed Land; it is based on three principles:

- CALM land should be managed as far as possible to avoid disturbance. Rehabilitation should be the last option in a series of management decisions designed to protect the environmental values of CALM land. (Other policy statements deal with this matter in more detail)

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- Rehabilitation should aim to restore original values, including indigenous communities where appropriate, and help to enhance all potential uses provided the priority uses are not adversely affected
- Policies on rehabilitation must be consistent with the five primary objectives of the CALM Strategic Plan (Section 1.0).

STRATEGIES

In addition to implementing departmental policies and guidelines the Goldfields Region will:

- 1. Develop a working plan for rehabilitation within the Region, allocate priorities, write prescriptions and commence works as resources become available.*
- 2. Negotiate with mining companies or other corporate sponsors to contribute to rehabilitation programs on lands managed by CALM.*
- 3. Apply and assess time-bound, measurable performance indicators before bonds are restored in situations where performance bonds are applied to rehabilitation on lands managed by CALM*
- 4. Be represented, where possible, at Land Conservation District Committee meetings, with the purpose of being involved in rehabilitation and land care in the wider context. Five Land Conservation District Committees operate within CALM's Goldfields Region.*

14.5 MINING ON RESERVES

The issue of mining on lands managed by CALM has been the subject of a recent Government policy review (Resolution of Conflict - A Clear Policy For National Parks). Operational guidelines have been produced by the Environmental Protection Branch of CALM.

Mining, which within the terms of the Mining Act 1978 includes exploration and fossicking, can be undertaken on lands managed by CALM under two principal statutes:

- CALM Act - Leases can be issued for basic raw materials (ie. gravel, sand, stone) in accordance with Policy No. 2, and subject to Sections 97 to 100 of the Act.
- Mining Act 1978 - Section 24 of the Act defines Ministerial responsibilities for approving mining on various land classes.

Special Agreements Acts are generally enacted for major resource projects (bauxite and coal), with the Department of Resources Development as the principal managing authority assisted by Department of Mines. The Environmental Protection Act 1986 takes precedence over most other Acts. The Department of Mines refers "significant"

projects to the EPA according to agreed guidelines. The Department of Conservation and Land Management and individuals can also refer proposals for assessment.

MINING IN NATIONAL PARKS AND NATURE RESERVES

Government Policy on mining in nature reserves has the following implications for CALM's Goldfields Region:

1. National Parks

There will be no mining or exploration in Boorabbin or Goongarrie National Parks.

2. A Class Reserves

- Mineral exploration in A class reserves will continue to be subject to the agreement of the Minister for the Environment and a formal assessment by the EPA.
- Mining will require consent of both Houses of Parliament.

3. B & C Class Reserves

- Exploration and mining will be allowed subject to agreement of the Minister for the Environment and the Minister for Mines, and EPA approval for production mining.
- Areas identified by the EPA in its 12 Systems reports - the Red Books - will be immediately classified as C class reserves where such classification has been previously delayed by mineral resource issues.
- Any upgrading of B and C class reserves will be processed through the Ministerial Council (comprising the Ministers for the Environment, Resources Development and Mines and chaired by the Premier or Deputy Premier).

State Forests and Timber Reserves are exempted from this policy but are subject to operational guidelines produced by CALM and the Department of Mines.

As national parks occupy only 1.2% of the conservation estate on the Goldfields, and the remainder, 98.8%, is available for mining, the management of mining on nature reserves is likely to become a large component of the Goldfields Region's operations. This new direction in policy also means that for the first time the Region has the possibility of a representative reserve system, as the Government has indicated that outstanding Conservation Through Reserves Committee recommendations will now be implemented (Section 11.0).

STRATEGIES

In addition to implementing departmental policies and guidelines the Goldfields Region will:

- 1. Liaise with mining companies on an individual basis and the Department of Mines, on matters of impact assessment and environmental management on lands managed by CALM*
- 2. Monitor existing mining and exploration activities that impact directly or indirectly on CALM managed lands and take any necessary action to regulate them.*

3. *Evaluate the likely impact of any proposed mineral resource development activities on lands managed and proposed for management by CALM and make recommendations within the context of Government policy.*

14.6 GRAVEL AND INDUSTRIAL MINERALS

Separate policy and procedures applies to extraction of certain raw materials for prescribed purposes on lands managed by CALM according to Policy No 2 Basic Raw Materials.

The Departments of Conservation and Land Management and Mines have agreed to a strategy concerning the extraction of certain minerals from land managed by CALM. The particular minerals involved are gravel, shale (not being oil shale), sand, clay, limestone or rock, that is, those materials which are not minerals when on private land, but are minerals when on Crown land or reserved land as defined under the Mining Act.

It is proposed that such minerals on lands managed by CALM can be used by CALM or its authorised agents for any agricultural, pastoral, household, road making, or building purpose on that land if no mining tenement has been granted over the land, eg. CALM may authorise gravel to be obtained from one part of a State forest, national park or nature reserve in order to effect road works in other parts of that forest, park or reserve, [Section 9(2) of the Mining Act]. In the case of gravel, sand etc. being required from national parks or nature reserves, requests may be accommodated by the issue from CALM of a lease (CALM Act, Section 100) provided that the use of the gravel is "necessary" for the management of the national park or nature reserve [CALM Act, Section 33(3)]. Doubtful cases are to be referred to the General Manager, CALM.

In the case of gravel, sand etc., being required by various shires, Main Roads Department, State Energy Commission or other agencies for services adjacent to, on, or servicing State forests and timber reserves, it is proposed that they be accommodated by the issue from CALM of a lease (CALM Act, Section 97). The creation of such a lease will mean that the land will fall within the Mining Act definition of private land. Accordingly, any gravel, shale etc. will no longer be minerals and the provisions of the Mining Act will not apply.

All operations of a commercial nature involving gravel and industrial minerals will be controlled under the Mining Act, and for this purpose a mining tenement will need to be obtained by the operator. These will be subject to approval by CALM's Minister, to conditions and to the payment of appropriate compensation to CALM, and royalties to the Mines Department.

The CALM policy and conditions on rehabilitation, compensation and royalties are stated in Policy No 2 Basic Raw Materials.

STRATEGIES

In addition to implementing Departmental policies and guidelines the Region will:

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- 1. Develop working arrangements with agencies extracting gravel and industrial minerals from lands managed by CALM.*
- 2. Assess all requests for access to gravel and industrial minerals on CALM managed land within the context of Departmental policy.*
- 3. Ensure that correct rehabilitation procedures are undertaken at extraction sites at the expense of the extracting agency.*

14.7 PUBLIC UTILITIES

Public utilities provide essential community needs but can have serious visual effects, and may cause permanent loss of conservation values. The main public utilities with responsibilities affecting land managed by CALM are:

WA Water Authority
State Energy Commission
Local Government Authorities
Westrail
Telecom
Main Roads Department
Department of Land Administration.

Existing public utilities will be maintained and new developments will be proposed during the period of this plan.

STRATEGIES

In addition to implementing departmental policies and guidelines the Goldfields Region will:

- 1. Investigate alternative locations for public utilities consistent with sound environmental management and cost/benefit constraints.*
- 2. Monitor the impacts of public utility developments on CALM lands.*
- 3. Liaise with officers in charge of key public utilities to ascertain whether any proposals are likely to affect land managed by CALM.*
- 4. Ensure that land disturbed by the installation and/or maintenance of public utilities is adequately rehabilitated at the expense of the responsible authority.*

14.8 VISUAL RESOURCE (LANDSCAPE) MANAGEMENT

The Departmental objective on visual resource management is to:

Ensure that all uses on lands and waters managed by CALM are planned and carried out in ways that sustain the beauty of the natural environment.

The term "landscape" refers to the appearance or visual quality of an area as determined by its geology, soils, landforms, vegetation, water features and land use history. Visual Resource Management is based on the premise that the visual quality of a landscape is a resource in its own right. This resource can be assessed and managed in much the same way as other resource values such as fauna, flora, water, timber and recreation.

Managing the visual resource is dependent on a knowledge and assessment of the landscape itself as well as a thorough understanding of proposed land use(s). After the various landscape elements have been identified and assessed, it is possible to evaluate how particular management alternatives will affect the appearance of any landscape, and subsequently to develop appropriate landscape prescriptions compatible with other resource management objectives.

STRATEGIES

In addition to implementing departmental policies and guidelines the Goldfields Region will:

- 1. Classify landscape features on lands managed by CALM according to the Departmental system.*
- 2. Identify and protect important landscape in the region.*
- 3. Ensure that any developments on lands managed by CALM, such as road construction, and recreation sites and are undertaken with due regard to their potential impact upon visual qualities of the environment.*
- 4. Provide advice to neighbours and other agencies on minimising the visual impact of operations, especially on lands adjacent to or within the viewshed of lands managed by CALM.*

14.9 DISEASE

The Goldfields Region is outside the area of Western Australia considered susceptible to Dieback Disease due to both its aridity and the nature of the vegetation. In the south-west this disease is caused by a variety of soil-borne pathogens; the principal one being *Phytophthora cinnamomi*. Agents of spread are earthmoving machinery, vehicles and to a lesser extent bushwalkers. Infection will also spread in moist soil conditions along drainage lines. Once infected the vegetation of an area will undergo considerable change in vegetation floristics and structure due to the differing susceptibility of plant species. Strategies to reduce the risk of infection, and contain it in already infected areas, are now the major consideration in management of some south-west forests, national parks and nature reserves. In spite of the Goldfields Region's reduced risk to Dieback a high standard of hygiene is required in operations involving earthmoving machinery to prevent spread of plant propagules and possible un-identified soil-borne pathogens.

15. RECREATION AND TOURISM

Traditionally some categories of lands managed by CALM, particularly national parks, are extensively used for both recreation and tourism. There is a developing trend towards recreational and tourist use of other lands entrusted to CALM due to increasing interest in the natural environment, and improved access, particularly private use of four wheel drive vehicles. In response to this trend CALM includes recreation management as one of its five primary objectives. Policy Statement No. 18 Recreation, Tourism and Visitor Services establishes the following general principles:

- **Preservation of Land Values**

The values of the land as a whole should be maintained. The natural systems (including landscapes, particular sites, biota) should be able to sustain the form of recreation, or ancillary activity, which is occurring or proposed).

Consistent with preservation of land values, facilities associated with recreation should be carefully controlled. Facilities for organised sports for example, should generally be minimal on most categories of land (see (ii)).

Consistent with preservation of land values, Section 33 of the CALM Act circumscribes the ability of the Department to carry out other than "necessary operations" unless there is an approved management plan in place.

The intensity of recreational activity should be controlled if necessary to ensure that it does not destroy the value and nature of the activity.

- **Consistency of Recreation with Purpose of Vesting**

Recreational activity should be compatible with the vesting purpose of the land or the established land use priority. This includes the relatively well known categories of land such as State forest, national park and nature reserve, but also includes allowance for new categories which may arise.

- **Equity**

The widest range of activities consistent with the purpose of vesting should be allowed, but uses which impair other forms of use to an unreasonable extent or place the safety of other users in jeopardy, should be controlled or eliminated.

- **Management**

The Department should be capable of providing any necessary degree of supervision of the activity, particularly where land values may be impaired. If this cannot be done the activity should be restricted, relocated or eliminated.

POLICY GUIDELINES FOR RECREATION ON CALM-MANAGED LANDS

1. **Recoup of Fees and Charges**

No entry or facilities fees are charged at present in the Goldfields Region, though this could change in the life of this plan if the need arose.

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2. Commercial Concessions

Commercial activities on lands managed by CALM are subject to conditions and permits, which are available on request.

3. Leases for Associations and Clubs

None current or proposed in the Goldfields Region.

4. Overnight Stays

Campsites with facilities are provided at Burra Rock, Cave Hill, Rowles Lagoon and Victoria Rock Nature Reserves. Bushcamping is permitted in other reserves subject to certain conditions. Accommodation is only available at Wanjarri Nature Reserve and Jaurdi pastoral lease where permission is required for use.

5. Visitor Safety

CALM has a "duty of care" to users of its lands under the Owners' Liability Act. Concession holders will be required to indemnify CALM against their activities and carry their own insurance cover.

6. Special Groups and Events

Special groups or events will be accommodated if they are not contrary to management plans or the four general principles listed above.

7. Filming and Photography

Filming and photography are recognized as a major component of recreation and a significant aspect of visitor use of lands managed by CALM. Filming and photography for commercial purposes are subject to a separate policy.

8. Public Access

Lands and waters entrusted to the department are generally open to public use. There are some areas restricted to the public for reasons of safety, disease control, water quality, protection of species, maintenance, etc. Access is generally determined by roads or tracks.

Access policies

- a. Access to all areas of lands and waters entrusted to the department will be open to public use, except where this contravenes the general principles discussed at the beginning of this document. In practice this allows access on foot to most areas and access by vehicle to many parts of reserves.
- b. Subject to Section 33 of the CALM Act, access on foot will be encouraged by construction of walking trails in areas where features of interest justify their construction. Where appropriate, interpretive trails will be constructed; construction standards will be determined from time to time by the Manager, Recreation and Landscape Branch. Construction will accord with policy on visitor safety (see above) and will, where possible, provide appropriate access for disabled people.
- c. Vehicle access will be generally determined within the constraints of Section 33 of the CALM Act. In most areas a system of roads and/or tracks exists

before a management plan is prepared. Generally access along such roads/tracks will be permitted until a management plan is prepared, but in circumstances where the values of the land are under threat (eg. for disease control) it may be necessary to close or restrict vehicle access. In general vehicular access to nature reserves will be discouraged.

- d. Subject to resource constraints, and to urgency as "necessary operations" tracks will be upgraded, realigned or closed through the management plan process.
- e. Design standards will be determined from time to time by the Manager, Recreation and Landscape Branch, in conjunction with the Main Roads Department.
- f. Access by vehicles off roads and tracks will be limited to designated areas.
- g. Use of unregistered vehicles will not be permitted except in compliance with the Off Road Vehicles Act. Where a permit is provided under that Act by the Minister for Local Government, departmental approval is required for use on lands managed by this department. Such approval will be issued by Regional Managers. Guidelines for approval will be issued separately.
- h. Access by aircraft is subject to regulation by the Commonwealth Department of Transport. The department may impose additional conditions for access. At other than established airstrips, access by aircraft, including helicopters, will be by permit from Regional Managers.
 1. Airstrips will be constructed only in accordance with an approved management plan.
 - j. Power boats will not be permitted in areas where their use is not already established. Permission will not be withdrawn except through the area management plan process. Management plans may seek to vary existing use where such use is not in accord with the principles discussed at the beginning of this document.

9. **Facilities and Buildings**

Facilities and building on lands managed by CALM will be constructed and maintained to a high standard, except in the case of feature buildings, eg. Wanjarri Field Studies Centre which will be maintained in keeping with its rustic and historic value. Facilities and buildings not complying with above standards will be demolished.

10. **Protection of Recreation Site Values**

Recreation sites will be selected and developed according to the criteria and procedures laid down in the Recreation Operations Manual of the Department. All recreation sites will be continually monitored to assess usage which may result in deterioration. Where there is evidence of recreation site deterioration or it is anticipated, visitor use will be directed to another site rotation of use and/or there will be temporary closure and rehabilitation of the site. Recreation sites and

facilities will be protected from wildfires by the development of fuel reduced zones, prescribed burning or mechanical means.

11. Visitor Information

Dissemination of information is an integral part of management of lands managed by CALM. It informs the public of opportunities for recreation and services available. Visitor information and interpretation are the responsibility of all departmental staff backed by the expertise of Landscape and Recreation Branch specialist staff. In the Goldfields visitor information is provided at the Regional office as pamphlets or informal advice and at designated recreation sites as information/display panels. Pamphlets are also currently available at Victoria Rock Nature Reserve, and others will be provided as demand dictates.

12. Domestic Animals

Dogs, cats, horses and other domestic animals are prohibited from national parks and nature reserves, with the following exceptions:

- i) use of dogs in those nature reserves defined as game reserves
- ii) seeing eye dogs for blind persons in national parks
- iii) where specified zones are established in national parks.

Dogs and other domestic animals may be allowed on other types of reserves or specified zones in other reserves according to the plan for that reserve. For example exercising of dogs is an acceptable activity in Kalgoorlie Arboretum.

13. Visitor Interaction

CALM recognizes that staff are a major resource for visitor interaction and provision of information in field encounter situations. Staff are required to be well-informed and have the necessary interactive skills to positively promote CALM's objectives.

14. Research and Monitoring

The use of departmental lands for recreation is increasing in many areas and ways. To assist in the planning and development of recreational opportunities there is a need to have measures of overall demand for outdoor recreation. As well as predictive studies there is a need for information on current visitors levels, type of use, frequency and duration of use. This information is essential in ongoing management and should lead to improved allocation of resources and the identification of revenue opportunities.

Information on recreation is important to the establishment of the recreational value of the resources managed by the Department, and therefore in demonstrating the contribution of recreation to the economy of the State as a whole. Research is required to establish the attitudes and preferences of users so management can be responsive to user needs. There is a requirement for monitoring the capacity of various environments to cater for various recreational activities and the impact of activities themselves.

In the Goldfields Region visitor use is assessed at three levels: by using traffic recorders at frequently used sites; by recording visitor inquiries in an office log book; and opportunistically, by using a prescribed form (VISTATS) when visiting recreation sites for maintenance and other purposes.

15. Liaison with other Agencies

Many other agencies are equally involved in the planning and provision of outdoor recreation opportunities in this State. It is recognised that there is a need to plan with local authorities and State Government Departments to ensure that recreational developments are complementary to those planned by other agencies and that management objectives are not compromised by lack of co-operation or joint planning.

Similarly consultation is required with groups having commercial interests to ensure recreation developments and information services are compatible with management objectives.

User groups such as local clubs, State associations and community interest groups should have their aspirations represented in the planning and management of recreation resources. A considerable contribution to ongoing planning and management of recreation on Departmental land can be achieved through effective liaison with such bodies.

STRATEGY

In addition to implementing departmental policies and guidelines the Goldfields Region will prepare a Regional Recreation Plan to provide a conceptual framework for recreational activities and opportunities throughout the region.

16. PUBLIC PARTICIPATION AND LIAISON

16.1 COMMUNITY INVOLVEMENT

The CALM Act (Sections 13, 33A and 57-59) makes statutory provision for public participation in the preparation of management plans and proposals for compatible operations. A range of less formal public involvement in other Departmental planning matters is also desirable. The Department wishes to co-operate with local communities and establish projects of mutual interest where appropriate.

Examples of community involvement include:

- staff involvement on local tourist committees and with agricultural shows
- advice about landscaping and tree planting and assistance to bodies such as “Greening Australia”
- co-operating with schools, e.g. work experience and Arbor Day.

Various advisory committees, “Friends of the Park”, and volunteer groups;

- involvement with land conservation district committees and catchment management advisory bodies
- liaison with bushfire brigades
- public workshops, seminars and talks to interested groups.

Public participation programs require considerable staff resources to plan, implement, review and follow-up. Volunteer programs require staff time for supervision and materials for the implementation of works programs.

STRATEGIES

In addition to implementing Departmental policies and guidelines the Region will:

- 1. Continue existing involvement with local individuals and organisations with an interest in conservation and land management.*
- 2. In conjunction with the preparation of management plans, foster the establishment of advisory committees or other appropriate community involvement programs and continue to hold public workshops, seminars and other forums.*
- 3. Establish Advisory Committees or other appropriate community involvement programs to provide ongoing local advice where appropriate.*
- 4. Seek regular feedback from the community on Departmental policies and management practices through both formal and informal contacts.*

16.2 ABORIGINAL LIAISON

CALM is committed to the principle that it is managing public lands and indigenous wildlife on behalf of the people of Western Australia. Aboriginal people are of particular importance in land use planning because of their historical association with the land over a period estimated at 40 000 years. The reservation of lands and waters as conservation reserves recognises the natural and cultural significance of these areas and their relative immunity from changes imposed upon the landscape elsewhere. Aboriginal people maintain their traditional interest in the land, its resources and management. Thus CALM and Aboriginal people have a common interest in land management. This is particularly evident in remoter parts of WA where CALM is entering into various management agreements with traditional Aboriginal custodians of the land. Now that CALM is putting resources into the management of desert nature reserves - with further reserves proposed in this plan - it is vital that Goldfields Region liaise and negotiate with Aboriginal people on land management and tenure issues.

There are two principal pieces of legislation which govern CALM in carrying out its responsibilities - the Conservation and Land Management Act 1984, and the Wildlife Conservation Act 1950. The CALM Act does not provide specific mechanisms to recognise traditional Aboriginal land ownership, nor does it provide for boards or other statutory bodies to be established over individual reserves, which could provide the opportunity for Aboriginal people to participate with CALM in land management. Furthermore the hunting and gathering of native food species on reserves managed by CALM is not specifically addressed in the Act, though the Executive Director may consent to hunting and gathering activities on CALM managed lands except nature reserves. However, s23 of the Wildlife Conservation Act exempts Aboriginal people from the general provisions relating to the taking of flora and fauna, and allows them (with permission of the land owner) to take food from all land excepting nature reserves providing that food taken is not for sale. The Act does provide for this general right of Aboriginal people to take flora and fauna for food to be restricted in certain circumstances and, under this provision, the right to take threatened and specially protected species (other than the Dugong) has been suspended.

These situations are complicated by different land tenure arrangements and varying degrees of Aboriginal involvement in conservation management in South Australia and the Northern Territory, which are confusing and inconsistent to traditional custodians of land abutting state borders.

In spite of these administrative difficulties CALM has negotiated formal management arrangements with Aboriginal people in Purnululu and Karijini National Parks. In both cases State Cabinet has approved the establishment of a Park Council, comprising three CALM representatives, three representatives of the traditional Aboriginal owners and a non-voting representative of the Aboriginal Affairs Planning Authority. The Park Councils' functions include:

- to prepare and advise upon proposals for management plans
- to participate in the implementation of management plans, including the development of policy in relation to Aboriginal interests
- to provide advice to the Minister in all matters relating to Aboriginal involvement in the park.

Subject to an approved management plan and a formal Agreement between the Minister and the respective Aboriginal Corporation, living areas will be provided within the National Parks concerned, and traditional hunting, gathering and other ceremonial and social activities will be allowed so long as they are consistent with the protection and management of the reserve.

From 1987-1989 CALM provided Aboriginal Community Ranger Training for remote Goldfields communities. This program proved difficult to sustain in the central reserves, but was eagerly received by Aboriginal people in the Great Victorian Desert region and has led to a strong relationship between the Department and people with traditional affiliation to the southern desert nature reserves.

These people have indicated that they would like to negotiate some mutually satisfactory arrangement which enables Aboriginal participation in the management of traditional lands and also provides secure tenure for residents.

Such management arrangements do not currently exist in the Goldfields Region, although Aboriginal groups have established unofficial outcamps on two Nature Reserves. The Region does involve Aboriginal people in management operations in the Gibson Desert Nature Reserve, and offers contract employment (with the assistance of Commonwealth funds) for ethnobotanical studies in the Great Victoria Desert Nature Reserve. Further contract employment has also arisen during prescribed burning operations in the Neale Junction Nature Reserve.

STRATEGIES

In addition to implementing departmental policies and guidelines the Goldfields Region will:

- 1. Liaise and negotiate with Aboriginal people regarding land and wildlife management and tenure issues in the Goldfields.*
- 2. Promote opportunities for Aboriginal people to actively participate with CALM in management of the conservation estate.*
- 3. Continue contract employment of Aboriginal people for projects involving cultural resources management and seek opportunities for increasing funding of these projects.*

16.3 COMMUNITY EDUCATION AND INTERPRETATION

There is an excellent opportunity to promote an awareness of conservation, land management and natural systems and processes within both the regional community, and visitors to the Region. All CALM personnel in the Goldfields Region have some involvement with community education and interpretation work, mainly through provision of information to visitors, informal contact and presentations to community and school groups. A range of publications on recreation facilities and activities, and technical information, is available from the Regional office.

STRATEGIES

In addition to implementing Departmental policies and guidelines the Region will:

- 1. Prepare interpretive and community education plans for the Goldfields Region if resources permit..*
- 2. Increase and improve on-site interpretive facilities in the region as resources permit.*
- 3. Develop improved interpretive material, especially for high use areas.*
- 4. Develop the Regional library to cover information and advisory needs.*
- 5. Prepare a communications plan and distribute information on conservation and land management issues through various media.*
- 6. Liaise closely with other agencies, organisations and individuals who have similar interests in the interpretation of land managed by CALM, such as tourism agencies, schools and museums.*

16.4 VOLUNTEERS

CALM has traditionally enjoyed support from volunteers working as groups or as individuals. Until now these activities have been organised at a local level without a departmental policy and administrative framework. Volunteer activities are of value to CALM not only because the department's work capabilities and skills base are expanded at minimal cost, but also because such activities build communication links and understanding between the department and the community. A volunteer may be defined as someone who undertakes work of their own free will, without payment for the benefit of the community.

CALM has a formal policy and administrative framework for volunteer activities (Policy No 32 Volunteers) which includes initiatives to provide more volunteer opportunities, and to provide training to both volunteers and CALM staff in their management. Matters including industrial relations aspects of volunteer activities, workers compensation insurance and public liability are managed by a Perth based Community Involvement Co-ordinator.

Recent changes to the CALM Act will provide for an honorary Conservation and Land Management officer, a position of considerable responsibility and privilege for volunteers of exceptional commitment.

STRATEGY

In addition to implementing departmental policies and guidelines the Goldfields Region will provide opportunities for volunteers, in particular by organising events in which local groups and individuals can contribute to reserve management.

16.5 INFORMATION AND ADVISORY SERVICES

The public, other Government departments, local authorities, farmers and business people are provided with a wide range of information and advice from the Department on matters of conservation, wildlife, land management and tree establishment. A Vegetation and Tree Planting Advisory Service (VATPAS) was established within the Department in 1990.

Information and advice is provided at local, regional and Departmental level. Enquiries are referred to other departments and authorities when appropriate.

STRATEGIES

In addition to implementing Departmental policies and guidelines the Region will:

- 1. Continue to provide information and advisory services on conservation, tree planting, wildlife management and land management matters on request.*
- 2. When appropriate, continue to participate in workshops, seminars and displays.*

16.6 GOLDFIELDS DUST ABATEMENT COMMITTEE

Since the first prospectors rushed to the Goldfields more than 90 years ago, dust has been an ever increasing problem. Trees were removed for firewood and mining timber and extensive domestic grazing occurred. The landscape became more barren as more domestic and industrial pressures were placed upon it. As a result severe dust storms occurred caused by the wind blowing across the mine dumps and exposed ground around and in the residential areas. A number of attempts were made in the past to overcome the serious problem.

In 1972, the State Government was approached and provided financial and technical assistance for further positive action. The outcome was the formation of the Goldfields Dust Abatement Committee (GDAC) in 1973, a body with representation from the Chamber of Mines, City of Kalgoorlie-Boulder, WA School of Mines, Environmental Protection Authority, and Department of Conservation and Land Management, Department of Agriculture and Department of Mines. Extensive study and experimentation by the GDAC and the adoption of a Strategic Plan (1988 - 2000) has allowed the Committee to take positive steps towards dust abatement. These include soil protection by fencing to exclude grazing animals and vehicles, direct seeding with funds from Greening Australia and dust monitoring. A Dust Abatement officer was appointed in 1989; originally under the Department of Agriculture, the officer is now responsible to the Regional Manager, Department of Conservation and Land Management and to the Goldfields Dust Abatement Committee.

STRATEGY

CALM will continue active involvement in the Goldfields Dust Abatement Committee.

17. FOREST PRODUCTS

In addition to Sandalwood Conservation and Management (Section 13.2), there are a range of industries and activities involving harvest of forest produce.

Forest produce, as defined under the CALM Act

includes trees, timber, sawdust, chips, firewood, charcoal, gum, kino, resin, sap, honey, seed, bees-wax, rocks, stone and soil, in or on any Crown land as defined in the CALM Act. It does not include:

- *minerals within the meaning of the Mining Act; or*
- *protected flora for the time being within the meaning of that term in the Wildlife Conservation Act.*

Forest produce on reserves, vacant Crown land and pastoral leases is controlled by CALM under the Act. Harvest of forest produce where permitted is controlled by issue of a Forest Produce Licence (FPL) or contract including payment of royalty. Forest Produce Licence harvesting in the Goldfields Region includes:

Firewood

The Regional policy is:

- Householders who wish to obtain small quantities of firewood for their own use may do so without special written authority.
- Anyone who obtains firewood for sale is required to take out a Forest Produce Licence. This licence allows a specified amount of firewood to be cut under certain conditions over a specific area. A royalty is payable.

General Conditions

Conditions are imposed on all firewood cutting domestic and commercial. These conditions are:

- The cutting of any green timber or trees is restricted to special circumstances. Only dead wood may be cut and trees must be 100% dead.
- Pastoralists permission is required for cutting on pastoral leases. All improvements on pastoral leases must be respected, gates closed and fences not interfered with.
- No debris or logs should be left on roads or tracks.
- Cutting is not allowed on certain reserves or within 2 km of station homesteads.

Conditions on Commercial Licences

In addition to the general conditions for commercial Forest Produce Licences, the following conditions apply:

- Forest Produce Licences will only be issued to genuine operators for a minimum of 30 tonnes.
- Holders of commercial firewood Forest Produce Licences and their workers are required to be registered Timber Workers. The licence holder will be issued with a carter's book which must be produced with the expired licence before a licence is renewed or another issued.
- No commercial firewood cutting is allowed within the 20 km radius green belt around Kalgoorlie or a 7 km radius around Kambalda.

Part D. Issues of Conservation and Land Management on the Goldfields

- Firewood cutters must investigate and locate the resource and obtain written permission to cut from the pastoralist before a licence is issued. The licence will be issued with an accompanying map locating the licenced cutting area.
- Registration numbers, make and colour of vehicles used in the operation will be endorsed on the licence along with any phone numbers used for advertising and contact.

Demand for firewood will continue to be satisfied by cutting dead wood. As resources diminish thinning of regrowth woodland will be considered for areas outside green belts and conservation areas.

Mining Timber

The majority of mining timber demands for the underground mines within the region are supplied by Golden Mile Timber who cut on CALM contract. As a second option, small amounts of mining timber to individuals can be supplied on Forest Produce Licence. A royalty is payable. Supplies will continue to be met by thinning regrowth woodland and minor cutting in uncut stands. Current operations are west of Higginsville. Products cut are firing sticks, lagging and logs. The industry is not expanding, with a current cut around 1 500 tonnes per annum.

Fenceposts

There is a small demand for mulga fenceposts to the Wheatbelt and Esperance agricultural area. Harvest is on Forest Produce Licence, and a royalty is payable. Cutting will be permitted to meet demand, with cutting directed to areas where environmental, land use and product requirements can be met.

Pastoralists cutting posts for use on their pastoral lease can do so with FPL. This provision will continue.

Speciality Timber

Supplies of forest produce will be made available on Forest Produce Licences to satisfy the developing craftwood and specialty timber trade. Products harvested from a range of species include burls, logs, walking sticks, craftwood and other minor forest produce. A royalty is payable.

Apiary Sites

All apiary sites on Crown lands and pastoral leases are allocated and registered by CALM. At present there are 252 registered apiary sites in the Goldfields Region; of these 13 are on lands managed by CALM. As a general rule beekeeping is an acceptable activity in State forest or timber reserve but not in national parks or nature reserves, due to possible direct and indirect effects on conservation values.

STRATEGY

The Region will provide minor forest produce for public use and commercial sale according to Departmental policies and guidelines.

18. RESEARCH

18.1 RESEARCH IN CALM

Research in the Department of Conservation and Land Management is conducted from Woodvale Research Centre, Como, three regional centres, Manjimup, Dwellingup and and the WA Herbarium. The Research Division Five Year Plan (1991-1996) contains a comprehensive review of CALM's research programs. Regional staff in the Goldfields are not actively involved in research except to provide operational support. A Regional Ecologist provides liaison between Research Division and Regional operations staff.

Research is conducted in 13 separate research programs; of these the following are relevant to the Goldfields Region:

- Biogeography
- Fauna conservation
- Fire
- Flora conservation.

The following indicates current CALM research in the Goldfields Region:

Program	No.	Research Project
Biogeography	63/91	Heterogeneity of Nullarbor quadrats
Biogeography	58/91	Eastern Goldfields Biological Survey
Biogeography	7/90	Landuse advice, Plumridge Lakes
Fauna Conservation	---	Nullarbor Quail Thrush Conservation
Fauna Conservation	---	Kangaroo management programs.
Fire	20/88	Effects of mosaic burns on birds
Fire	32/88	Effects of season of burn and fire size on desert vertebrates
Fire	38/88	Effects of fire season on medium-sized desert mammals
Fire	33/88	Effects of fire season on flora succession
Fire	34/88	Effects of patch-burning on lizards
Fire	60/90	Effects of patch-burning and feral predator control on the survival of rare mammals re-introduced to the Gibson Desert Nature Reserve
Flora	---	Merredin district survey
Flora	---	<i>Tetratheca</i> species
Flora	120/91	Rare and poorly known WA eucalypt survey.

A project combining aspects of the Fire and Fauna Conservation research programs is the proposal to re-introduce two species of locally extinct mammal, the Burrowing Bettong (*Bettongia lesueur*) and the Golden Bandicoot (*Isodon auratus*) into the Gibson Desert Nature Reserve.

In addition to these structured programs within Research Division there is the opportunity for silvicultural research in the Goldfields Region involving sandalwood

growth rate, phenology and effect of grazing herbivores on germination and recruitment (Kealley 1991). Much of these data were completed and reviewed in a recent report (Loneragan 1991). In addition a Salmon Gum research plot established in 1917 provides the opportunity for on-going growth rate studies of this species, which are not available elsewhere in WA.

18.2 RESEARCH IN OTHER INSTITUTIONS

In addition to CALM other government departments, organisations and individuals conduct research in the Goldfields Region which is applicable to land management. Current projects include the monitoring of rangeland condition (Department of Agriculture), and rehabilitation of minesite operations (Minerals and Energy Research Institute of WA, in association with Department of Agriculture).

The Curtin University of Technology Mulga Research Centre is doing research into Mulga regeneration, and provides consultancy service including biological surveys and rehabilitation programs to mining companies operating in the Region.

Other current university sponsored research in the Region includes a study of species diversity and ecology of desert reptiles, by Professor Eric Pianka of the University of Texas.

STRATEGY

The regional strategy for research is to provide logistical support for relevant projects conducted in the Goldfields Region.

PART E. IMPLEMENTING THE PLAN

Part E. Implementing the Plan

19.0 TERM OF PLAN

This plan once finalised and approved will commit the Goldfields Region to a course of action for the life of the plan - a period not to exceed 10 years. There is provision under Section 61 of the CALM Act for the plan to be amended as required. If changes were to be proposed, a revised draft plan would be released for public comment.

Integrated Regional Planning

Since other government agencies, and private enterprise produce various types of management plans it is desirable that this plan, as far as possible, be part of an integrated planning process for the Region. Examples of the types of plans which may affect CALM in the Goldfields Region are:

Commonwealth Government

Telecom: microwave links, optic fibre and telephone cable developments.

Australian National Railways: counter disaster plans and access to the Trans Australian Railway.

State Government

Environmental Protection Authority: environmental protection policies and assessment reports.

Main Roads Department: proposals for major roadworks.

State Energy Commission: proposals for new electricity or gas pipelines.

Tourism Commission: regional and local tourist development plans.

Water Authority: proposals for new developments, storages and pipelines.

Goldfields Esperance Development Authority: regional and local development plans.

Department of Industrial Development: regional and local development plans.

Department of Mines: regional mining planning committee reports.

Department of Land Administration: townsite and development plans.

Department of Planning and Urban Development: region plans.

Local Government

Shire plans for new townsites or developments.

Private Enterprise

Mining Companies: Environmental Impact Assessment documentation for new developments.

Tourist Industry: accommodation and concession proposals.

Area Management Plans

Section 1.3 of this plan indicates the relationship of regional management plans to area management plans. To facilitate area management planning in the Goldfields Region the following is the priority - ordered list at March 1992, to be reviewed annually:

1. Wanjarrri Nature Reserve
2. Rowles Lagoon, Clear Muddy and Carnage Lakes Nature Reserves

Part E. Implementing the Plan

3. Goongarrie National Park
4. Goldfields State Forests (and proposed State Forests) including:
Kangaroo Hills, Yellori, Calooli, Scahill, Karramindie, Lakeside, Randell,
Majestic, Kambalda, Bullock Holes, Coonana, Wallaby Rock and Emu Rock.
5. Goldfields Nature Reserves including:
Kurrawang, Binaronca Rock, Dordie Rock and Kambalda.
6. Proposed Woodland National Park and adjacent Conservation Parks including:
Woodland National Park, Boorabbin National Park, Cave Hill Conservation
Park, Burra Rock Conservation Park, Wallaroo Rock Conservation Park and
Victoria Rock Nature Reserve.
7. Mount Manning Range Nature Reserve and proposed extensions and the adjacent
Mt Elvire and Jaurdi proposed State Forests.
8. Queen Victoria Spring Nature Reserve.
9. Great Victoria Desert Nature Reserve.
10. Gibson Desert Nature Reserve.

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APPENDICES

**GOLDFIELDS REGION
EXISTING PUBLIC LANDS MANAGED BY CALM**

NATIONAL PARKS

Name/Shire	Number	Vesting	Area (Ha)	Purpose
Coolgardie Shire				
Boorabbin Nt. Pk.	35004	NPNCA	26 000.0	National Park
Menzies Shire				
Goongarrie Nt. Pk.	35637	NPNCA	<u>60 335.5</u>	National Park
			<u>86 335.5</u>	

STATE FORESTS AND TIMBER RESERVES

Name/Shire	Number	Vesting	Area (Ha)	Purpose
City of Kalgoorlie - Boulder				
Majestic	195/25	LFC	2 226.2	Flora, Fauna and Landscape
Randells	194/25	LFC	16 350.0	Flora, Fauna and Landscape
Coolgardie Shire				
Kambalda	199/25	LFC	3 342.5	Flora, Fauna and Landscape
Kangaroo Hills	198/25	LFC	<u>6 600.0</u>	Flora, Fauna and Landscape
			<u>28 518.7</u>	
Karramindie SF		LFC	781.0	Flora, Fauna and Landscape

SANDALWOOD RESERVES

Name/Shire	Number	Vesting	Area (Ha)	Purpose
City of Kalgoorlie - Boulder				
Emu Rock	19645	LFC	8 186.0	Timber - Sandalwood.
Quartz Peak	19764	LFC	4 556.0	" "
Coonana	19640	LFC	37 061.0	" "
Bullock Holes	19825	L ACT (NV)	13 313.0	" "
Lakeside	19214	LFC	3 787.0	" "
Coolgardie Shire				
Calooli	19211	LFC	3 121.0	" "
Yellari	19212	LFC	6 102.0	" "
Scahill	19621	LFC	<u>6 916.0</u>	" "
			<u>83 042.0</u>	

NATURE RESERVES

Name/Shire	Number	Vesting	Area (Ha)	Purpose
City of Kalgoorlie - Boulder				
Rowles Lagoon	4274	NPNCA	404.0	Flora & Fauna
Clear & Muddy Lakes	7634	NPNCA	1 926.0	Flora & Fauna
Queen Victoria Spring	A30491	NPNCA	272 607.0	Flora & Fauna
Cardunia Rocks	39148	NPNCA	38.0	Flora & Fauna
Coolgardie Shire				
Kurrawang	35453	NPNCA	621.0	Flora & Fauna
Burra Rock	7038	WSSD	809.0	Water, Flora & Fauna
Kambalda West	33300	NPNCA	3 680.0	Flora & Fauna
Binaronca Rock	32552	NPNCA	185.0	Flora & Fauna
Victoria Rock	8480	NPNCA	258.0	Flora & Fauna
Dordie Rock	3211	WSSD	121.0	Water, Flora & Fauna
Cave Hill	17804	WSSD	202.0	Water, Flora & Fauna
Menzies Shire				
Northern Nullarbor (Great Victoria Desert)	A30490	NPNCA	2 495 777.0	Conservation, Flora & Fauna
Plumridge Lake	A34605	NPNCA	308 990.0	Conservation, Flora & Fauna
Mt. Manning	36208	NPNCA	153 293.0	Conservation, Flora & Fauna
Niagara Dam	5062	NPNCA	477.0	Water, Flora & Fauna
Laverton Shire				
Neale Junction	A34720	NPNCA	723 073.0	Flora & Fauna
Yeo Lake	A36271	NPNCA	321 946.0	Flora & Fauna
De La Poer Range	41831	NPNCA	75 000.0	Flora & Fauna
Leonora Shire				
Malcom Dam	8946	WSSD	400.0	Water, Flora & Fauna
Wanjarri	A30897	NPNCA	53 248.0	Flora & Fauna
Wiluna Shire				
Mangkili Clay Pan	34604	NPNCA	3 635.0	Flora & Fauna
Gibson Desert	34606	NPNCA	1 859 286.0	Flora & Fauna
Yilgarn Shire				
Yellowdine	41936	NPNCA	<u>32 798.0</u>	Flora & Fauna
			<u>6 308 774.0</u>	

ARBORETA

Name/Shire	Number	Vesting	Area (ha)	Purpose
City of Kalgoorlie - Boulder				
Kalgoorlie Aboretum	23 840	CALM	24	
Coolgardie Shire				
Coolgardie Aboretum	31 983	CALM	29	

FORMER PASTORAL LEASES

Coolgardie/Menzies/Yilgarn Shire	
Jaurdi	321 000.0 ha
Menzies Shire	
Mt. Elvire	155 000.0 ha