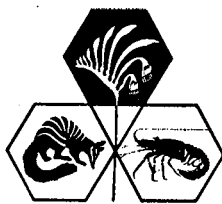


Cover illustration

The eleven orchids currently gazetted as 'rare flora' under the Western Australian Wildlife Conservation Act (shown at approximately 50% of natural size):

A, Salmon Sun Orchid *Thelymitra macmillanii*; B, Star Orchid *Thelymitra fuscolutea* var. *stellata*; C, Dwarf Spider Orchid *Caladenia bryceana*; D, Sandplain Sun Orchid *Thelymitra psammophila*; E, Brown Leek Orchid *Prasophyllum lanceolatum*; F, Dark Leek Orchid *Prasophyllum triangulare*; G, Underground Orchid *Rhizanthella gardneri*; H, Purdie's Donkey Orchid *Diuris purdiei*; I, Lavender Spider Orchid *Caladenia lavandulacea*; J, Shy Spider Orchid *Caladenia triangularis*; K, Yellow China Orchid *Caladenia gemmata* forma *lutea*.

Drawings by S.J. Patrick with the exception of G and I, which are by L.F.S. Braganca and B.L. Rye.



DEPARTMENT OF FISHERIES AND WILDLIFE
108 Adelaide Terrace, Perth
Western Australia.

**Western Australian
Wildlife Authority**

ANNUAL REPORT

1982

Published by the Director of Fisheries and Wildlife, Perth, under the authority of
the Hon. Minister for Fisheries and Wildlife

DEPARTMENT OF FISHERIES AND WILDLIFE

108 ADELAIDE TERRACE

PERTH

The Honourable R.C. Old M.L.A.
Minister for Fisheries and Wildlife

Sir,

In accordance with the requirements of Sub-section (5) of Section 7 of the Wildlife Conservation Act 1950, I have pleasure in submitting to you my report on the proceedings and work of the Western Australian Wildlife Authority for the period ending June 30, 1982, together with comments relating to the administration of this Act.


B.K. Bowen
CHAIRMAN

Western Australian Wildlife Authority

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1 WESTERN AUSTRALIAN WILDLIFE AUTHORITY AND COMMITTEES

1. MEMBERSHIP

Names and Organisation

Ex officio Members -

Chairman - B.K. Bowen, Director, Department of Fisheries and Wildlife

Mr B.J. Beggs - Conservator of Forests
Deputy - Mr P.J. McNamara, Deputy Conservator

Mr A.W. Hogstrom - Chief Agriculture Protection Officer, Agriculture Protection Board

Mr A.J. Mearns - Conservator of Wildlife, Department of Fisheries and Wildlife

Appointed Members -

Mr R.A. Aitken - Retired School Teacher

Mr N.A. Beeck - Farmer

Dr P.F. Berry - Head of Division of Natural Sciences - Western Australian Museum

Dr S.J.J. Davies - Zoologist - Officer in Charge - CSIRO, Division of Wildlife Research

Dr A.J. McComb - Botanist - Head of the Department of Botany - University of Western Australia (Vice Dr J.W. Green, resigned)

Mr H.G. Hall - Farmer

Mr W.H.B. Lacy - Pastoralist

Professor A.R. Main - Zoologist, University of Western Australia

Executive Officer -

Mr D.W. Arnold - Administrative Officer, Department of Fisheries and Wildlife

Names of Committees

Reserves Committee

Bird Committee

Flora Committee

Membership -

RESERVES COMMITTEE -

Chairman - Mr B.K. Bowen - Director, Department of Fisheries and Wildlife

Deputy Chairman - Mr A.J. Mearns - Conservator of Wildlife, Department of Fisheries and Wildlife

RESERVES COMMITTEE (Contd) -

Mr N.A. Beeck - Authority Member
Dr A.A. Burbidge - Chief Research Officer, Western
Australian Wildlife Research Centre
Dr I.G. Crook - Chief Reserve Management Officer,
Western Australian Wildlife Research Centre
Dr E. Hopkins - Chief of Division (Planning),
Forests Department
Dr D. Kitchener - Curator of Mammals, Western
Australian Museum
Executive Secretary - Mr R.J. Powell - Department
of Fisheries and Wildlife

BIRD COMMITTEE -

Chairman - Mr D.W. Arnold - Administrative Officer,
Department of Fisheries and Wildlife

Mr N.A. Beeck - Authority Member
Mr B.A. Carmichael - Chief Wildlife Officer,
Department of Fisheries and Wildlife
Dr S.J.J. Davies - Officer in Charge, CSIRO,
Division of Wildlife Research, Helena Valley
Deputy - Mr I. Rowley
Mr H.G. Hall - Authority Member
Mr A.W. Hogston - Chief Agriculture Protection
Officer, Agriculture Protection Board
Deputies - Mr A.J. Oliver
Mr J. Long
Mr J.A.K. Lane - Research Officer, Western Australian
Wildlife Research Centre
Mr J.R. Masters - Farmer (Ornithologist)
Dr D.L. Serventy - Zoologist
Mr T. Spence - Director, South Perth Zoological
Gardens
Dr G.M. Storr - Curator of Birds and Reptiles,
Western Australian Museum
Executive Secretary - Mr L.W. Marrable - Department
of Fisheries and Wildlife
(Vice - Mr A.J. Goadby)

FLORA COMMITTEE -

Chairman - Mr B.K. Bowen - Director, Department of
Fisheries and Wildlife
Mr R. Aitken - Retired School Teacher
Mr D.W. Arnold - Administrative Officer, Department
of Fisheries and Wildlife
Mr B.J. Beggs - Conservator of Forests
Mrs M. Blackwell - Botanist
Dr J.W. Green - Botanist - Curator, Western
Australian Herbarium
Mr P.N. Hewett - Forest Department
Deputy - Mr F. Batini
Mr A.J. Hopkins - Research Officer, Western
Australian Wildlife Research Centre

FLORA COMMITTEE (Contd.) -

Dr N. Marchant - Botanist - Western Australian
Herbarium
Mr A.J. Mearns - Conservator of Wildlife,
Department of Fisheries and Wildlife
Dr S.D. Hopper - Research Officer, Western
Australian Wildlife Research Centre
Professor J.S. Pate - Officer in Charge, Department
of Botany, University of Western Australia
Mr R. Shaw - Main Roads Department
Dr P.R. Wycherley - Director, Kings Park Board
Executive Secretary - Mr B. Martin - Department
of Fisheries and Wildlife

Secretariat

Messrs A.J. Goadby, P.S. Knapp and P.B. Kelly carried
out the secretarial functions for the Authority and
its various committees.

2. MEETINGS

The Western Australian Wildlife Authority

The Authority met on five occasions during 1981/82.

Committees

Reserves Committee - met on one occasion during
1981/82.

Bird Committee - met on two occasions during
1981/82.

Flora Committee - met on one occasion during
1981/82.

II THE FAUNA

1. NUMBER OF INDIGENOUS SPECIES OF:

Birds	475
Marsupials	68
Other Mammals	66
Reptiles	359
Amphibia	67
	1 035

2. LIST OF UNPROTECTED INDIGENOUS SPECIES AS AT 30.6.82

Mammals

Wild Dog (Dingo) *Canis familiaris dingo*

Reptiles

Common Death Adder	<i>Acanthophis antarcticus</i>
Desert Death Adder	<i>Acanthophis pyrrhus</i>
Northern Death Adder	<i>Acanthophis praelongus</i>
Black Whip Snake	<i>Demansia atra</i>
Spotted-headed Snake	<i>Demansia olivacea</i>
Papuan Whip Snake	<i>Demansia papuensis</i>
Green Whip Snake	<i>Demansia reticulata</i>
Northern Whip Snake	<i>Demansia simplex</i>
Bardick	<i>Brachyaspis curta</i>
Tiger Snake	<i>Notechis scutatus</i>
Taipan	<i>Oxyuranus scutellatus</i>
Mulga (or King Brown Snake)	<i>Pseudechis australis</i>
Dugite	<i>Pseudonaja affinis</i>
Gwardar	<i>Pseudonaja rughalis</i>
Five-ringed Snake	<i>Pseudonaja modesta</i>
Eastern Brown Snake	<i>Pseudonaja textilis</i>

All Sea Snakes of the family Hydrophiidae.

All invertebrate fauna other than Jewel Beetles of the family Buprestidae and Ants of the genus *Nothomyrmecia*.

3. LIST OF SPECIES RARE OR OTHERWISE IN NEED OF SPECIAL PROTECTION AS AT 30.6.82

Birds

		<u>Government Gazette</u>
Red-tailed Tropic-bird	<i>Phaethon rubricauda</i>	3.2.78
White (Mute) Swan	<i>Cygnus olor</i>	"
Freckled Duck	<i>Stictonetta naevosa</i>	"
Cape Barren Goose	<i>Cereopsis novaehollandiae</i>	"
Burdekin Duck	<i>Tadorna radjah</i>	"

Birds (Contd.)

Crested Hawk	<i>Aviceda subcristata</i>	3.2.78
Red Goshawk	<i>Accipiter radiatus</i>	"
Peregrine Falcon	<i>Falco peregrinus</i>	"
Grey Falcon	<i>Falco hypoleucos</i>	"
Scrub Fowl	<i>Megapodius freycinet</i>	"
Lesser Noddy	<i>Anous tenuirostris</i>	"
Red-crowned Pigeon	<i>Ptilinopus regina</i>	"
Green-winged Pigeon	<i>Chalcophaps indica</i>	"
Partridge Pigeon	<i>Geophaps smithii</i>	"
Mangrove Kingfisher	<i>Halycon chloris</i>	"
Alexandra (Princess) Parrot	<i>Polytelis alexandrae</i>	"
Naretha Bluebonnet	<i>Psephotus haematogaster</i> <i>narethae</i>	"
Ground Parrot	<i>Pezoporus wallicus</i>	"
Night Parrot	<i>Geopsittacus occidentalis</i>	"
Grass Owl	<i>Tyto longimembris</i>	"
Rufous Owl	<i>Ninox rufa</i>	"
Noisy Scrub-bird	<i>Atrichornis clamosus</i>	"
Cicadabird	<i>Coracina tenuirostris</i>	"
Western Whip-bird	<i>Psophodes nigrogularis</i>	"
Purple-crowned Wren	<i>Malurus coronatus</i>	"
Thick-billed Grass- wren	<i>Amytornis textilis</i>	"
Rufous Bristle-bird	<i>Dasyornis broadbenti</i>	"
Brown Bristle-bird	<i>Dasyornis brachypterus</i>	"
Lemon-breasted flycatcher	<i>Microeca flavigaster</i>	"
White-browed (Buff- sided) Robin	<i>Poecilodryas supercili- osa</i>	"
Rufous Fantail	<i>Rhipidura rufifrons</i>	"
Shrike Tit	<i>Falcunculus frontatus</i>	"
Red-eared Firetail	<i>Emblema oculatum</i>	"
Yellow-rumped Finch	<i>Lonchura flaviprymna</i>	"
Major Mitchell	<i>Cacatua leadbeateri</i>	"
Goulds Petrel	<i>Pterodroma leucoptera</i> <i>leucoptera</i>	29.8.80
Providence Petrel	<i>Pterodroma solandri</i>	"
Lord Howe Island Fleshy-footed Shearwater	<i>Puffinus carneipes</i> <i>hullianus</i>	"
Abbot's Booby	<i>Sula abbotti</i>	"
Christmas Island Frigatebird	<i>Fregata andrewsi</i>	"
Plains Wanderer	<i>Pedionomus torquatus</i>	"
Lord Howe Island Woodhen	<i>Tricholimnas sylvestris</i>	"
Norfolk Island Parrot	<i>Cyanoramphus novaezelandiae</i> <i>cookii</i>	"
Coxens Fig Parrot	<i>Cyclopsitta diopthalma</i> <i>coxeni</i>	"
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	"
Golden-shouldered Parrot	<i>Psephotus chrysoptery- gius</i>	"
Hooded Parrot	<i>Psephotus dissimilis</i>	"
Paradise Parrot	<i>Psephotus pulcherrimus</i>	"

		<u>Government Gazette</u>
<u>Birds (Contd.)</u>		
Norfolk Island	<i>Ninox novaeseelandiae</i>	"
Boobook Owl	<i>royana</i>	
Christmas Island Owl	<i>Ninox squamipila natalis</i>	"
Plumed Frogmouth	<i>Podargus ocellatus</i>	"
	<i>plumiferus</i>	
Dorothys Grass-wren	<i>Amytornis dorotheae</i>	"
Lord Howe Island	<i>Strepera graculina</i>	"
Currawong	<i>crissalis</i>	
Forty-spotted	<i>Pardalotus quadragintus</i>	"
Pardalote		
Norfolk Island	<i>Zosterops albogularis</i>	"
Silvereye		
Helmeted	<i>Lichenostomus melanops</i>	"
Honeyeater	<i>cassidix</i>	
Black-eared Miner	<i>Manorina flavigula</i>	"
	<i>melanotis</i>	
Northern Scrub	<i>Drymodes superciliaris</i>	"
Robin	<i>colcloughi</i>	
<u>Mammals</u>		
Barrow Island Euro	<i>Macropus robustus</i>	3.2.78
	<i>isabellinus</i>	
Crescent Nail- tailed Wallaby	<i>Onychogalea lunata</i>	"
Spectacled Hare- Wallaby	<i>Lagorchestes conspicillatus</i>	"
Western Hare- Wallaby	<i>Lagorchestes hirsutus</i>	"
Banded Hare-Wallaby	<i>Lagostrophus fasciatus</i>	"
Brush-tailed Rock Wallaby	<i>Petrogale penicillata</i>	"
Woolie	<i>Bettongia penicillata</i>	"
Boodie	<i>Bettongia lesueur</i>	"
Broad-faced Potoroo	<i>Potorous platyops</i>	"
Gilbert's Potoroo	<i>Potorous tridactylus</i>	"
	<i>gilberti</i>	
Rock-haunting Ringtail	<i>Petropseudes dahli</i>	"
Marl	<i>Perameles bougainville</i>	"
Pig-footed Bandicoot	<i>Chaeropus ecaudatus</i>	"
Dalgyte	<i>Macrotis lagotis</i>	"
Rusty Numbat	<i>Myrmecobius fasciatus</i>	"
	<i>rufus</i>	
Dibbler	<i>Antechinus apicalis</i>	"
Long-tailed Dunnart	<i>Sminthopsis longicaudata</i>	"
Ingram's Planigale	<i>Planigale ingrami</i>	"
Pygmy Marsupial- Mouse	<i>Planigale maculata</i>	"
Big-eared Hopping- Mouse	<i>Notomys megalotis</i>	"
Long-tailed Hopping-Mouse	<i>Notomys longicaudatus</i>	"
Dusky Hopping Mouse	<i>Notomys fuscus</i>	"

		<u>Government Gazette</u>
<u>Mammals (Contd.)</u>		
Stick-Nest Rat	<i>Leporillus conditor</i>	3.2.78
White-tipped Stick-nest Rat	<i>Leporillus apicalis</i>	"
Shark Bay Mouse	<i>Pseudomys praeconis</i>	"
Gould's Native Mouse	<i>Pseudomys gouldii</i>	"
Shortridge's Native Mouse	<i>Pseudomys shortridgei</i>	"
Dugong	<i>Dugong dugon</i>	"
<u>Reptiles</u>		
Salt-water Crocodile	<i>Crocodylus porosus</i>	"
Fresh-water Crocodile	<i>Crocodylus johnstoni</i>	"
Western Swamp (Short-necked) Tortoise	<i>Pseudemydura umbrina</i>	"
Leathery Turtle	<i>Dermochelys coriacea</i>	"
Lancelin Island Skink	<i>Ctenotus lancelini</i>	"
Linked Skink	<i>Lerista lineata</i>	"
Carpet Snake	<i>Python spilotus</i>	"
<u>Amphibians</u>		
Round Frog	<i>Arenophryne rotunda</i>	"

4. OPEN SEASONS

Open seasons declared in 1981/82	
Finch Trapping Season 1 September to 15 November 1982	18.6.82
Management of Populations of White Tailed Black Cockatoos spp. - (<i>Calyptorhynchus baudinii</i> and <i>Calyptorhynchus latirostris</i>)	17.7.81
Management of Populations of Black Cormorant - (<i>Phalacrocorax carbo</i>) and Pied Cormorant - (<i>Phalacrocorax varius</i>)	20.11.81
Waterfowl Population Management (South-West and Eucla Land Divisions) 13 November 1981 to 8 January 1982. (Mountain Duck and Maned Goose)	13.11.81
Waterfowl Hunting Season (Kimberley, North-West and Eastern Land Divisions) 1 January 1982 to 31 December 1982	18.12.81
Waterfowl Hunting Season (South-West and Eucla Land Divisions) 10 January 1982 to 7 February 1982	24.12.81
Waterfowl Population Management (South-West and Eucla Land Divisions) 22 February 1982 to 31 December 1982 (Mountain Duck and Maned Goose)	19.2.82

<u>Existing Open Seasons</u>	<u>Government Gazette</u>
Hunting Season - Brown Quail (<i>Synoicus ypsilophorus</i>) and Stubble Quail (<i>Coturnix pectoralis</i>) 1 January to 30 June each year	25.6.71
Management of certain species of birds of prey, parrots, cockatoos, crow species and Silvereyes in various Shires	16.6.78
Management of Populations of Red Kangaroo (<i>Megaleia rufa</i>) and Euro (<i>Macropus robustus</i>)	21.11.80
Management of Populations of Emu (<i>Dromaius novaehollandiae</i>)	21.11.80
Management of Sulphur-crested Cockatoos (Eastern sub-species) (<i>Cacatua galerita queenslandica</i> , <i>Cacatua galerita rosinae</i> , <i>Cacatua galerita melvillensis</i> , <i>Cacatua galerita interjecta</i>)	22.5.81
Management of Agile Wallabies (<i>Macropus agilis</i>)	21.11.80
Management of Populations of Grey Kangaroo (<i>Macropus fuliginosus</i>)	21.11.80

5. IMPORTATION AND KEEPING OF MONKEYS AND OTHER PRIMATES

By notice in the *Government Gazette* on 5 January 1979, the Hon. Minister for Fisheries and Wildlife prohibited the import into Western Australia and the keeping of any animal of the order 'Primates', unless specific authorisation is obtained.

6. SPECIES DECLARED TO BE FAUNA UNDER SECTION 6(2) OF THE WILDLIFE CONSERVATION ACT

(Notice in *Government Gazette* on 23 November 1979)

White Swan (*Cygnus olor*)
Peafowl and Pheasants of the genera *Pavo* and *Phasianus* respectively on Rottnest Island.

III THE FLORA

The following classes of flora are declared to be protected flora (Government Gazette 18 April 1980):

<i>Pteridophyta</i>	(ferns and fern allies)
<i>Gymnosperms</i>	(conifers and cycads)
<i>Angiosperms</i>	(flowering plants)

Protected flora of the taxa listed below, growing in a natural state and not in a domesticated or cultivated state, are declared to be rare throughout Western Australia. (Government Gazette 12 March 1982)

<i>Acacia anomala</i>	Chittering Grass Wattle
<i>Acacia aphylla</i>	Leafless Rock Wattle
<i>Acacia argutifolia</i>	East Barrens Wattle
<i>Acacia depressa</i>	Echidna Wattle
<i>Acacia guinetii</i>	Guinet's Wattle
<i>Acacia simulans</i>	Barrens Kindred Wattle
<i>Adenanthos cunninghamii</i>	Albany Woollybush
<i>Adenanthos detmoldii</i>	Yellow Jugflower
<i>Adenanthos dobagii</i>	Fitzgerald Woollybush
<i>Adenanthos ellipticus</i>	Oval-leaf Adenanthos
<i>Adenanthos eyrei</i>	Toolinna Adenanthos
<i>Adenanthos ileticos</i>	Club-leaf Adenanthos
<i>Adenanthos pungens</i>	Spiky Adenanthos
<i>Adenanthos velutinus</i>	Velvet Woollybush
<i>Aponogeton hexatepalus</i>	Stalked Water-Ribbons
<i>Asplenium obtusatum</i>	Shore Spleenwort
<i>Baeckea arbuscula</i>	Albany Baeckea
<i>Banksia brownii</i>	Feather-leaf Banksia
<i>Banksia chamaephyton</i>	Fishbone Banksia
<i>Banksia cuneata</i>	Quairading Banksia
<i>Banksia goodii</i>	Good's Banksia
<i>Banksia meisneri</i>	Meisner's Scott River
var. <i>ascendens</i>	Banksia
<i>Banksia sphaerocarpa</i>	Ironcap Banksia
var. <i>dolichostyla</i>	
<i>Banksia tricuspis</i>	Pine Banksia
<i>Boronia tenuis</i>	Blue Boronia
<i>Caladenia bryceana</i>	Dwarf Spider Orchid
<i>Caladenia gemmata</i>	
forma <i>lutea</i>	Yellow China Orchid
<i>Caladenia lavandulacea</i>	Lavender Spider Orchid
<i>Caladenia triangularis</i>	Shy Spider Orchid
<i>Casuarina fibrosa</i>	Woolly Sheoak
<i>Conostylis misera</i>	Grass Conostylis
<i>Conostylis pauciflora</i>	Dawesville Conostylis
<i>Cooperookia georgei</i>	Mauve Cooperookia

declared rare flora (continued)

<i>Coopernookia georgei</i>	Mauve Coopernookia
<i>Darwinia acerosa</i>	Fine-leaved Darwinia
<i>Darwinia carnea</i>	Mogumber Bell
<i>Darwinia collina</i>	Yellow Mountain Bell
<i>Darwinia macrostegia</i>	Mondurup Bell
<i>Darwinia masonii</i>	Mason's Darwinia
<i>Darwinia meeboldii</i>	Cranbrook Bell
<i>Darwinia oxylepis</i>	Gillham's Bell
<i>Darwinia squarrosa</i>	Fringed Mountain Bell
<i>Darwinia wittwerorum</i>	Wittwer's Mountain Bell
<i>Daviesia euphorbioides</i>	Wongan Cactus
<i>Diuris purdiei</i>	Purdie's Donkey Orchid
<i>Dodonaea hackettiana</i>	Perth Hop Bush
<i>Drosera occidentalis</i>	Minute Pygmy Sundew
<i>Drummondita ericoides</i>	Moresby Range Drummondita
<i>Drummondita hassellii</i>	Peak Charles Drummondita
var. <i>longifolia</i>	
<i>Eremophila denticulata</i>	Fitzgerald Eremophila
<i>Eremophila inflata</i>	Swollen-flowered Eremophila
<i>Eremophila merrallii</i>	Bruce Rock Eremophila
<i>Eremophila microtheca</i>	Heath-like Eremophila
<i>Eremophila resinosa</i>	Resinous Eremophila
<i>Eremophila serpens</i>	Snake Eremophila
<i>Eremophila virens</i>	Campion Eremophila
<i>Eremophila viscida</i>	Varnish Bush
<i>Eucalyptus aquilina</i>	Mt Le Grand Mallee
<i>Eucalyptus bennettiae</i>	Bennett's Mallee
<i>Eucalyptus brachyphylla</i>	Binyarinrinna Mallee
<i>Eucalyptus burdettiana</i>	Burdett Gum
<i>Eucalyptus caesia</i>	Caesia
<i>Eucalyptus calcicola</i>	Hamelin Bay Mallee
<i>Eucalyptus carnabyi</i>	Carnaby's Mallee
<i>Eucalyptus coronata</i>	Crowned Mallee
<i>Eucalyptus desmondensis</i>	Desmond Mallee
<i>Eucalyptus exilis</i>	Boyagin Mallee
<i>Eucalyptus insularis</i>	Twin Peak Island Mallee
<i>Eucalyptus johnsoniana</i>	Johnson's Mallee
<i>Eucalyptus kruseana</i>	Bookleaf Mallee
<i>Eucalyptus pendens</i>	Badgingarra Mallee
<i>Eucalyptus rhodantha</i>	Rose Mallee
<i>Eucalyptus steedmani</i>	Steedman's Gum
<i>Franklandia triaristata</i>	Plumed Lanoline Bush
<i>Gastrolobium appressum</i>	Scale Leaf Poison
<i>Gastrolobium glaucum</i>	Wongan Poison
<i>Grevillea Baxteri</i>	Cape Arid Grevillea
<i>Grevillea cirsiifolia</i>	Varied-leaf Grevillea
<i>Grevillea drummondii</i>	Drummond's Grevillea
<i>Grevillea dryandroides</i>	Phalanx Grevillea
<i>Grevillea inconspicua</i>	Cue Grevillea
<i>Grevillea infundibularis</i>	Fan-leaf Grevillea

declared rare flora (continued)

<i>Grevillea involucrata</i>	Lake Varley Grevillea
<i>Grevillea prostrata</i>	Pallarup Grevillea
<i>Grevillea ripicola</i>	Collie Grevillea
<i>Grevillea saccata</i>	Pouched Grevillea
<i>Hakea aculeata</i>	Column Hakea
<i>Hakea megalosperma</i>	Lesueur Grevillea
<i>Halosarcia bulbosa</i>	Large-articled Samphire
<i>Halosarcia entrichoma</i>	Eyelash Samphire
<i>Hibbertia bracteosa</i>	Porongurups Hibbertia
<i>Hibbertia miniata</i>	Orange Hibbertia
<i>Hydrocotyle lemnoides</i>	Aquatic Pennywort
<i>Kennedia beckxiana</i>	Cape Arid Kennedia
<i>Kennedia glabrata</i>	Northcliffe Kennedia
<i>Kennedia macrophylla</i>	Augusta Kennedia
<i>Lambertia echinata</i>	Prickly Honeysuckle
<i>Lambertia orbifolia</i>	Round-leaf Honeysuckle
<i>Lambertia rariflora</i>	Green Honeysuckle
<i>Lasiopetalum bracteatum</i>	Helena Velvet Bush
<i>Lechenaultia pulvinaris</i>	Cushion Lechenaultia
<i>Lechenaultia superba</i>	Barrens Lechenaultia
<i>Leucopogon obtectus</i>	Hidden Beard-heath
<i>Myoporum salsoloides</i>	Jerramungup Myoporum
<i>Pityrodia augustensis</i>	Mt Augustus Foxglove
<i>Pomaderris bilocularis</i>	Tutanning Pomaderris
<i>Pomaderris grandis</i>	Large Pomaderris
<i>Prasophyllum lanceolatum</i>	Brown Leek Orchid
<i>Prasophyllum triangulare</i>	Dark Leek Orchid
<i>Ptychosema pusillum</i>	Dwarf Pea
<i>Pultenaea skinneri</i>	Skinner's Pea
<i>Rhizanthella gardneri</i>	Underground Orchid
<i>Ricinocarpus trichophorus</i>	Barrens Wedding Bush
<i>Roycea pycnophylloides</i>	Saltmat
<i>Sowerbaea multicaulis</i>	Many-stemmed Lily
<i>Spirogardnera rubescens</i>	Spiral Bush
<i>Stachystemon axillaris</i>	Leafy Stachystemon
<i>Stawellia dimorphantha</i>	Arrowsmith Stilt-lily
<i>Stylidium coroniforme</i>	Wongan Triggerplant
<i>Stylidium expeditionis</i>	Tutanning Triggerplant
<i>Stylidium galioides</i>	Yellow Mountain Triggerplant

declared rare flora (continued)

<i>Synaphea pinnata</i>	Helena Synaphea
<i>Tegicornia uniflora</i>	Mat Samphire
<i>Thelymitra fuscolutea</i> var. <i>stellata</i>	Star Orchid
<i>Thelymitra macmillanii</i>	Salmon Sun Orchid
<i>Thelymitra psammophila</i>	Sandplain Sun Orchid
<i>Urocarpus niveus</i>	Bindoon Starbush
<i>Urocarpus phebaliioides</i>	Gairdner Range Starbush
<i>Verticordia helichrysantha</i>	Barrens Feather Flower
<i>Verticordia staminosa</i>	Wongan Feather Flower
<i>Villarsia calthifolia</i>	Mountain Villarsia
<i>Wurmbea humilis</i>	Wongan Dwarf Nancy
<i>Wurmbea tubulosa</i>	Long-flowered Nancy

IV NATURE RESERVES

1. INTRODUCTION

The Wildlife Conservation Act defines a Nature Reserve as "land reserved to Her Majesty, or disposed of, under the Land Act 1933 or any other Act, for the conservation of flora and fauna".

Prior to 1975 Nature Reserves were known as "Wildlife Sanctuaries" and included only reserves set aside for the conservation of fauna.

2. TABLE OF RESERVES

Year 30 June	Total Number	Area (ha)	Vested in the W. A. Wildlife Authority	
			No.	Area (ha)
1969	278	2 342 966	127	818 442
1970	315	2 100 318	156	867 362
1971	359	4 955 893	213	4 415 595
1972	404	5 077 224	242	4 533 944
1973	440	5 013 287	265	4 607 266
1974	454	5 033 935	281	4 626 617
1975	491	5 103 037	320	4 713 482
1976	918	5 339 947	351	4 747 403
1977	946	7 520 839	385	6 927 627
1978	995	8 398 648	412	8 086 314
1979	1016	8 536 654	493	8 205 197
1980	1036	9 065 634	555	8 805 310
1981	1062	9 883 231	620	9 663 637
1982	1069	9 889 474	645	9 683 211

3. SUMMARY OF NATURE RESERVES - JUNE 30, 1982.

As at June 30, 1981	1062 reserves	9 883 231.4174 ha
New Reserves 1981/82	8 reserves	+5 015.2045 ha
Amendments 1981/82	15 reserves	+ 1 252.7132 ha
Cancelled Reserves 1981/82	1 reserve	- -25.1511 ha
TOTAL	1069 reserves	= 9 889 474.1840 ha

4. NATURE RESERVES VESTED IN WESTERN AUSTRALIAN WILDLIFE AUTHORITY - JUNE 30, 1982.

As at June 30, 1981	620 reserves	9 663 637.0334 ha
New reserves 1981/82	8 reserves	5 015.2045 ha
Amendments 1981/82	11 reserves	-180.0343 ha
Existing reserves vested 1981/82	17 reserves	14 738.7299 ha
TOTAL	645 reserves	= 9 683.210.9335 ha

5. NEW RESERVES 1981/82

NO	NAME	AREA	VESTING	GAZETTED
27384		625.0066	W.A.W.A.	14.08.81
37289		768.0283	W.A.W.A.	14.08.81
37306		1 307.3644	W.A.W.A.	14.08.81
37316		60.7028	W.A.W.A.	14.08.81
2069		206.1271	W.A.W.A.	04.09.81
2096		80.5961	W.A.W.A.	25.09.81
5796		41.0755	W.A.W.A.	25.09.81
7634		1 926.3037	W.A.W.A.	25.09.81

TOTAL : 8 New Reserves 5,015.2045 ha

TOTAL of New Reserves Vested in W A.W A. = 8

TOTAL Area of New Reserves Vested in W A.W.A. = 5 015.2045

6. OTHER CHANGES

(i) Amendments to Area 1981/82

NO	NAME	VESTING	OLD AREA	NEW AREA	DIFFERENCE	DATE,
17778	-	W A.W.A.	11.8700	27.2430	+15.3730	03.07.81
31743	-	W.A.W.A.	93.6620	95.6854	+2.0234	03.07.81
31880	-	W A.W.A.	12 136.0000	11 310.8318	-825.1682	03.07.81
23128	-	Shire of Kondinin	114.0000	112.8837	-1.1163	21.08.81
12277	Bruce Rock N.R.	W.A.W.A.	40.4686	39.5302	-0.9384	04.09.81
26381	-	W A.W A.	239.0633	335.6415	-3.4218	25.09.81
19613	-	W.A.W.A.	8.9815	7.9916	-0.9899	09.10.81
9935	-	W.A.W.A.	254.9520	243.7918	-11.160	16.10.81
32549	-	W.A.W.A.	1 773.7661	3 609.7211	+1 835.9550	16.10.81
16235	-	W.A.W.A.	1329	1 298.6040	-30.3960	23.11.81
22792	Boolanelling N.R.	W A W A	227.5208	668.8153	+441.2945	05.02.82
22739	-	Shire of Kulin	13.9414	13.9632	+ .0218	26.02.82
17617	Lake Bidy	W.A.W.A.	40.4686	50.6445	+10.1759	28.05.82
24534	-		332.7502	307.3009	-25.4493	14.05.82
24496	-		70 012.6577	69 859.1672	-153.4905	18.06.82

Total - = -1 052.1304
 Total + = +2 304.8436
 Total area amended = +1 252.7132

Total 11 W.A.W.A Reserves amended = -180.0343

(ii) Existing Reserves Vested 1981/82

NO.	NAME	VESTING	AREA (ha)	DATE
17778	--	W.A.W.A.	27.2430	03.07.81
31743	--	W.A.W.A.	95.6854	03.07.81
A.16714	--	W.A.W.A.	27.5378	14.08.81
17923	--	W.A.W.A.	438.4339	14.08.81
21153	--	W.A.W.A.	40.4686	14.08.81
23325	--	W.A.W.A.	23.4718	14.08.81
26266	--	W.A.W.A.	148.4741	14.08.81
26410	--	W.A.W.A.	157.5487	14.08.81
34295	--	W.A.W.A.	929.0621	14.08.81
A.12098	Boyermucking N.R	W.A.W.A.	35.6123	21.08.81
A.27310	--	W.A.W.A.	42.8967	21.08.81
28715	--	W.A.W.A.	434.3036	21.08.81
12277	Bruce Rock N.R	W.A.W.A.	39.5302	04.09.81
23366	--	W.A.W.A.	937.2260	04.09.81
28047	--	W.A.W.A.	628.2921	04.09.81
29451	--	W.A.W.A.	212.8520	04.09.81
A.24869	Bernier Is. & Dorre Is. Nature Reserve	W.A.W.A.	10 521.8266	08.01.82
27304	--	Shire of Collie	1.7350	22.01.82

TOTAL = 18 Reserves = 14 740.4649 ha

TOTAL = 17 W.A.W.A. Reserves = 14 738.7299 ha

(iii) Existing Reserves Made Class "A" or "B" 1981/82

NO.	NAME	VESTING	AREA (ha)	GAZETTED
A.16104	Sorensens N.R.	W.A.W.A.	107.9853	14.08.81
A.25681	West Bending	W.A.W.A.	1 601.8925	21.08.81

TOTAL Made Class "A" = 2 reserves = 1 709.8778 ha

TOTAL Made Class "B" = nil.

(iv) Existing Reserves, Change of Purpose 1981/82

NO.	NAME	VESTING	FROM	TO	AREA	GAZETTED
17778	-	W.A.W.A.	Flora	Cons. of Flora & Fauna	27.2430	03.07.81
A.16714	-	W.A.W.A.	Prot. of Flora	Cons. of Flora & Fauna	27.5378	14.08.81
17923	-	W.A.W.A.	Cons. of Flora	Cons. of Flora & Fauna	438.4339	14.08.81
23325	-	W.A.W.A.	Cons. of Flora	Cons. of Flora & Fauna	23.4718	14.08.81
26266	-	W.A.W.A.	Cons. of Flora	Cons. of Flora & Fauna	148.4741	14.08.81
26410	-	W.A.W.A.	Flora & Fauna	Cons. of Flora & Fauna	157.5487	14.08.81
34295	-	W.A.W.A.	Cons. of Flora	Cons. of Flora & Fauna	929.0621	14.08.81
A.12098	Boyermucking N.R.	W.A.W.A.	Prot. of Flora	Cons. of Flora & Fauna	35.6123	21.08.81
A.27310	-	W.A.W.A.	Pres. of Indigenous Timber	Cons. of Flora & Fauna	42.8967	21.08.81
28715	-	W.A.W.A.	Cons. of Flora	Cons. of Flora & Fauna	434.3036	21.08.81
12277	Bruce Rock N.R	W.A.W.A.	Sewerage & Prot. of Flora	Cons. of Flora & Fauna	39.5302	04.09.81
23366	-	W.A.W.A.	Flora & Fauna	Cons. of Flora & Fauna	937.2260	04.09.81
28047	-	W.A.W.A.	Cons. of Flora	Cons. of Flora & Fauna	628.2921	04.09.81
A.24869	Bernier Is. & Dorre Is. N.R.	W.A.W.A.	Cons. of Flora	Cons. of Flora & Fauna	10 521.8266	08.01.82

(v) Existing Reserves Cancelled 1981/82

RESERVE NO.	PREVIOUS PURPOSE	AREA (ha)	DATE GAZETTED
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22312	Protection of Flora	2.8277	03.07.81
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TOTAL Reserves cancelled = 1

Area = 2.8277

(vi) Existing Reserves Purpose Changed to Outside Interests 1981/82

RESERVE NO.	PURPOSE CHANGED TO	AREA (ha)	DATE GAZETTED
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28666	Parkland	7.7497	03.07.81
24828	Park and Recreation	2.6304	14.08.81
23856	Parkland	11.9433	24.06.81

TOTAL of Existing Reserves Purpose Changed
To Outside Interests = 3

Area = 22.3234

7. CLASSIFICATION

The Wildlife Conservation Act allows Nature Reserves to be classified into various access categories (Section 12A). As at 30.6.81 the following reserves were subject to classifications:

(a) Prohibited areas

<u>Reserve No.</u>	<u>Name</u>	<u>Local Authority</u>	<u>Comment</u>
A. 23187	Nangeen Hill	Bruce Rock	
A. 24869	Bernier & Dorre Is.	Carnarvon	Dorre I. only
A. 25113	Lake Magenta	Kent, Lake Grace	excludes protected road
A. 26808	Barlee Range	West Pilbara	
27164	Prince Regent	West Pilbara	
A. 27956	Two Peoples Bay	Albany Shire	part only

(b) Limited Access Areas

A. 15556	Thomsons Lake	Cockburn	excludes boundary strip
23586	Yorkrakine Rock	Tammin	
A. 24556	Toolibin Lake	Wickepin	
A. 24869	Bernier & Dorre Is.	Carnarvon	Bernier I. only
25886	Modong	Serpentine-Jarrahdale	excludes boundary strip
A. 27620	Ellen Brook	Swan	
A. 27621	Twin Swamps	Swan	
A. 27956	Two Peoples Bay	Albany Shire	part only
A. 30191	Moodyne	Toodyay	

(c) Shooting or Hunting Areas

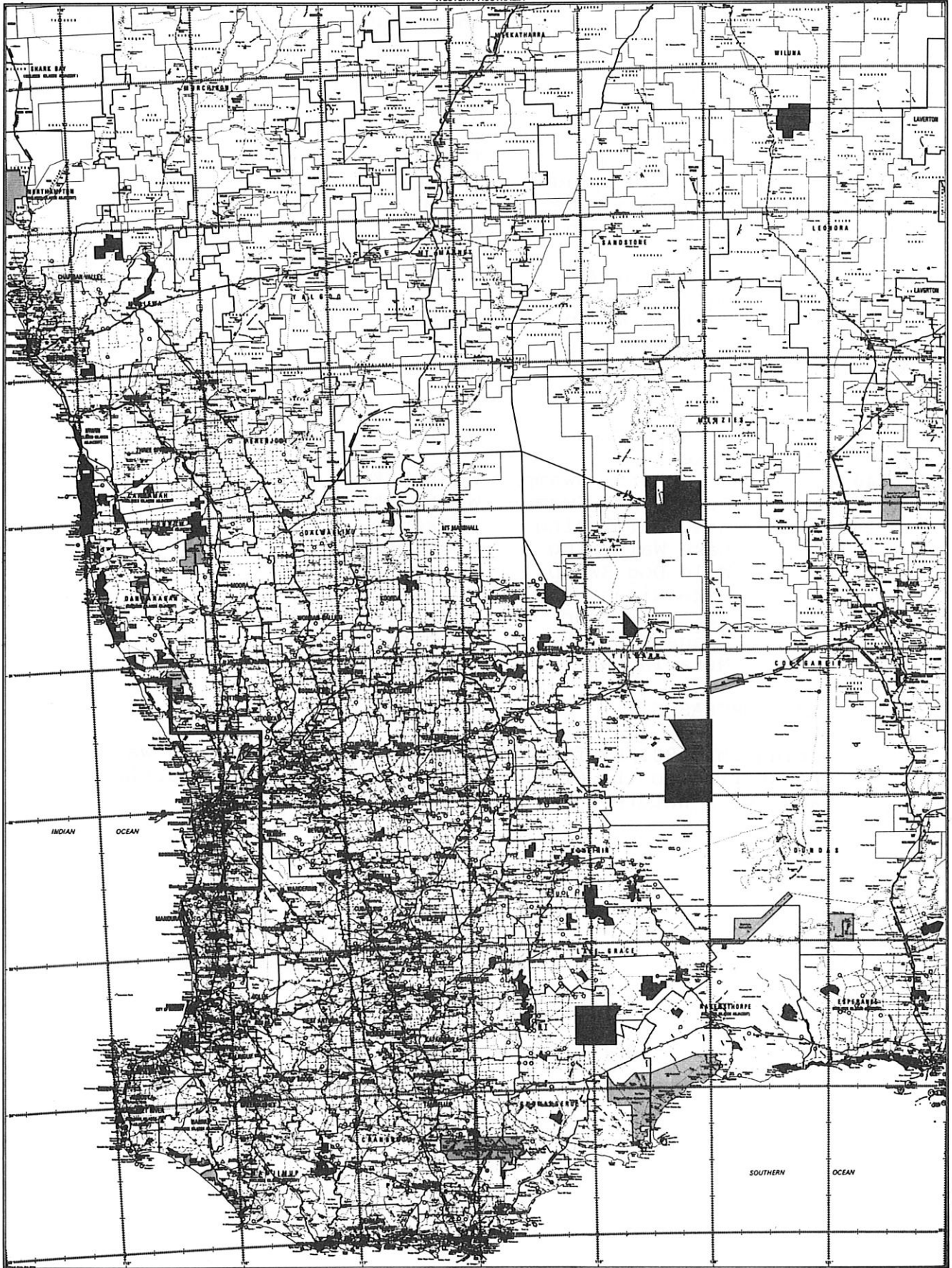
A. 15107	Lake Pleasantview	Albany	
36550	-	Albany	
12398	Lake Mears	Brookton	
28088	Channel Lakes	Brookton, Beverley, Quairading	
31837	Beverley Lakes	Beverley	
7634	-	Boulder	
36324	-	Broomehill	
25210	Pinjarrega Lake	Coorow	
24428	Nonalling and Whitewater Lakes	Corrigin	
18468	Lake Balicup	Cranbrook	
A. 25798	Lake Unicup	Cranbrook	
A. 26160	Lake Jebarjup	Cranbrook	
A. 26161	Camel Lake	Cranbrook/Gnowangerup	
26687	Lake Kulunilup	Cranbrook	
26679	Lake Pindicup	Cranbrook	
26680	Lake Noojubup	Cranbrook	
26682	Pinticup Swamp	Cranbrook	

<u>Reserve No.</u>	<u>Name</u>	<u>Local Authority</u>	<u>Comment</u>
26681	East Pinticup Swamp	Cranbrook	
26901	Yarnup Swamp	Cranbrook	
30018	Lake Mordalup	Cranbrook	
27393	Eneminga Brook	Dandaragan	
27394	Eneminga Brook	Dandaragan	
5999	Lake Dumbleyung	Dumbleyung	
26664	Lake Dumbleyung	Dumbleyung, Wagin	
A.25133	Cobline Flats	Dumbleyung	
A.25134	Cobline Flats	Dumbleyung	
10472	Coomelberrup Lk	Dumbleyung	
32339	Lake Shaster	Esperance, Ravensthorpe	
A.15231	Woody Lake	Esperance	
A.23825	Mullet Lake	Esperance	
4182	-	Esperance	
A.32419	Lake Gore	Esperance	
9676	Bootine Swamp	Gingin	
A.9838	Wannamal Lake	Gingin	part only
A.17186	Walyormouring Lake	Goomalling	
34811	Benger Swamp	Harvey	
A.7535	Carrolup Rd Swamp	Katanning	
A.25136	Cobline Flats	Katanning	
A.28552	Lake Coyrecup	Katanning	
26020	Lake Coyrecup East	Katanning	
9508	Arthur River Flats	Narrogin	
26788	Arthur River Flats	Narrogin	
26789	Arthur River Flats	Narrogin	
26790	Arthur River Flats	Narrogin	
9550	Lake Taarblin	Narrogin	
10631	Lake Taarblin	Narrogin	
20692	Lake Taarblin	Narrogin	
9552	Lake Lukin	Narrogin	
9628	Billy Lake	Narrogin	
9629	Ibis Lake	Narrogin	
10016	South of White Lake	Narrogin	
9551	Lake Bokan	Narrogin	
17339	between Bokan & Nomans Lake	Narrogin	
26785	Nomans Lake	Narrogin	
21284	White Lake	Narrogin	
26786	west of White Lake	Narrogin	

<u>Reserve No.</u>	<u>Name</u>	<u>Local Authority</u>	<u>Comment</u>
24789	Brown & Campion Lakes	Nungarin	
28286	Jerdacuttup River	Ravensthorpe	
26162	Three Swamps	Tambellup	
10313	Lake Nooriying	Tammin	
24373	Gundaring Lake	Wagin	
2085	east of Wagin Lake	Wagin	
2086	east of Wagin Lake	Wagin	
2087	east of Wagin Lake	Wagin	
2088	east of Wagin Lake	Wagin	
9098	-	Wagin	
A.10733	Parkeyerring Lake	Wagin	
1740	Wild Horse Swamp	West Arthur	
A.5456	Dead Man's Swamp	West Arthur	
A.9617	Lake Dulbinning	Wickepin	
A.14396	Lake Walbyring	Wickepin	
A.27286	Wild Dog Swamp	Wickepin	
A.27026	Lake Ninan	Wongan-Ballidu	
17055	Lake Martinup	Woodanilling	
27609	Flagstaff Lake	Woodanilling	
17257	Murapin Lake	Woodanilling	

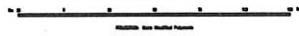
8. LAND PURCHASES

During the 1981/82 financial year a sum of \$19 000 was transferred to the Crown Law Department for the purchase of land for a nature reserve in the Wongan Hills.



DEPT. OF FISHERIES AND WILDLIFE
 Prepared by the Geographical Names, Planning, Research and
 Information Services Branch, Department of Fisheries and
 Wildlife, Perth, Western Australia, 1974

NATURE RESERVES
 NATIONAL PARKS
 LOCAL AUTHORITY BOUNDARIES



LOCAL AUTHORITY BOUNDARIES
 DISTRICTS
 TOWNS

SOUTH WESTERN SECTION
 WESTERN AUSTRALIA

MAP OF WESTERN AUSTRALIA

Scale: 1:1,000,000
Vertical Datum: Mean Sea Level
Horizontal Datum: GDA 1984

SHOWING LOCAL AUTHORITY BOUNDARIES

As at June 1982

Local Authority Boundaries

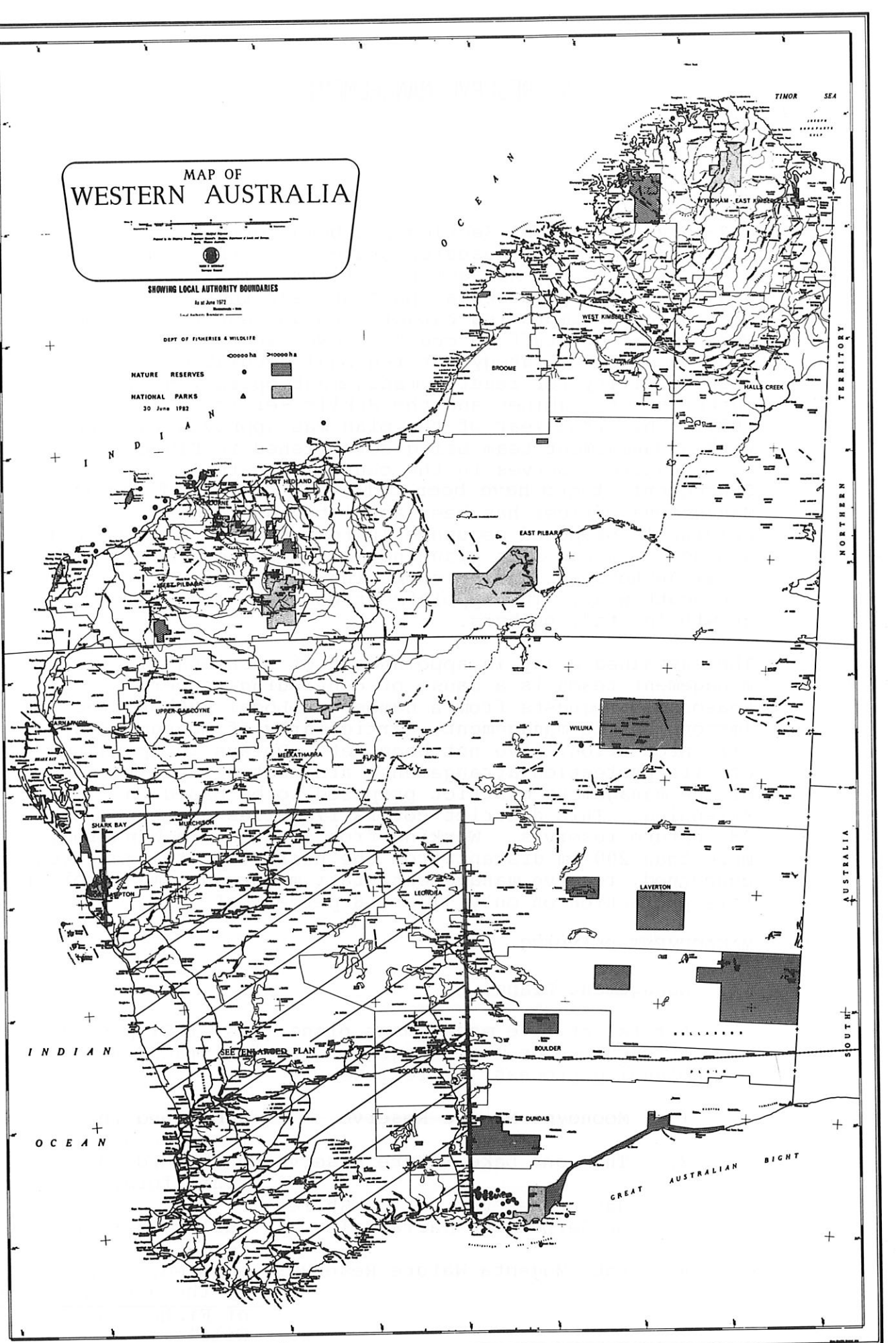
DEPT. OF FISHERIES & WILDLIFE

0-10000 ha 10000-20000 ha

NATURE RESERVES

NATIONAL PARKS

30 June 1982



V RESERVE MANAGEMENT

1. INTRODUCTION

A Reserve Management Section has been formally established within the Wildlife Research Branch with the appointment of a Chief Reserve Management Officer. This development was originally proposed as part of year four of a four year plan for improving capacity to do reserve management work by basing staff in country towns and on nature reserves. The strategy for regional devolution of responsibility for reserve management operations was authorised by Cabinet and the Public Service Board in 1977. The first year of the plan was approved in 1977-78 with a management team being established in Pingelly to cover nature reserves in the central wheatbelt. Subsequent stages have been deferred. The Chief Reserve Management Officer has been appointed out of the originally proposed sequence in response to accelerating demand for management planning and operations activity by Local Authorities and neighbouring landholders throughout the south-west. The appointment was obtained without growth in staff numbers.

The sustained delay in appointment of rural-based management teams is a cause of continuing concern. Reasonable requests from a number of Local Authorities for improvement to management, particularly of measures for fire protection, have not been met. Delays in upgrading of fire protection arrangements are most serious in parts of the management district proposed to be based in Katanning. This district covers 17 Shires and contains 284 nature reserves. Working from its base in Wanneroo, more than 200 km distant from the nearest of the reserves concerned, reserve management staff maintain some level of fire protection on only 51 or 18 percent of these.

2. MANAGEMENT PLANNING

(i) Management Plans.

A total of five management plans (Nos. 1-5) passed through one or more stages of the full management planning process, as follows:

1. Moondyne Nature Reserve published in final form.
2. Thomsons Lake Nature Reserve: published in final form.
3. Nature Reserves of the Shire of Serpentine-Jarrahdale: published in final form.
4. Lake Magenta Nature Reserve: adopted. Approved by the Hon. Minister of Fisheries and Wildlife.

5. Nature Reserves of the Shire
of Dandaragan:

published in draft
form for public
comment following
prior circulation
for comment to the
Shire of Dandaragan.

(ii) Management Standards and Guidelines

Many management measures can be applied in a standard way to all or to large groupings of nature reserves. Standards covering interactions with the public and specifications for construction and maintenance of firebreaks are examples.

A method for agreeing standards and guidelines for management procedures with broad application was pioneered with the adoption of guidelines under which apiary sites can be established on nature reserves. These guidelines are being applied with the result that 32 nature reserves in the south-west land district will be available for use by apiarists.

3. OFFSHORE ISLANDS

There are approximately 1 000 separate offshore islands around the coast of Western Australia which have nature reserve status. Growing demand for recreational and other use of islands can conflict with their biological values especially as breeding sites for sea birds, as habitats for rare animals and as areas free of many influences of human origin which pertain in all mainland situations.

During the year major issues of management importance arose for several islands and island groups:

Bedout Island:

In August 1981 the Department was advised of a plague of Black Rats (Rattus rattus) on Bedout Island Nature Reserve, an important breeding place for seabirds which is situated 100 km north-east of Port Hedland.

Following consultations with Agricultural Protection Board Research Officers a Wildlife Research Technical Officer spent 10 days on Bedout Island in September 1981 laying poisoned oats. During his stay rat numbers dropped dramatically.

A follow up visit in June 1982 did not reveal any sign of rats and it would appear that eradication may have been achieved. Further inspections will be necessary in another year or two to confirm this.

Introduced rats occur on several other islands, including some important nature reserves, e.g. the Lacepede Islands near Broome and islets adjacent to Barrow Island. Further control measures will be instituted when staff and funds are available.

Pelsart Island, Houtman Abrolhos Nature Reserve

Proposals by the Geraldton Fisherman's Cooperative to construct an airstrip on Pelsart Island led to the production of a report on the island's sea birds by Wildlife Research staff. The Chief Research Officer accompanied the Hon. Minister for Fisheries and Wildlife, Mr R.C. Old M.L.A., on an inspection of Pelsart and other Southern Group islands in May 1982. Data on the conservation value of many Houtman Abrolhos islands were also supplied to the Geraldton mid-west Regional Development Committee.

Adele Island

In August 1981, Oberon Oil N.L. applied to the Mines Department for permission to drill an exploratory oil well on Adele Island, an important sea bird breeding place off the Kimberley coast. The island is owned freehold by the Commonwealth and the Commonwealth Department of Administrative Services asked the Department of Fisheries and Wildlife to take responsibility for environmental aspects of the operation.

Environmental conditions were developed by Departmental staff during 1982 and Brunswick Oil N.L. (the operator) agreed to them. Drilling was to commence in July 1982.

Salisbury Island

During 1980 two mineral claims were lodged covering Salisbury Island, the largest of the South East Islands, Archipelago of the Recherche. Salisbury Island is part of a Class A Nature Reserve. The claims, in the name of Genesis Pty. Ltd., were for guano, phosphate and limestone rock.

The Western Australian Wildlife Authority and the Conservator of Wildlife lodged objections to the claims and arranged for W.A. Wildlife Research Centre staff to examine the island's plants and animals and assess possible impact if mining were to proceed. Scientists visited the island in April 1982 and prepared a report on its nature conservation values. The Warden's Court hearing is to be held during the latter part of 1982.

Dampier Archipelago

Management of these islands continued to be complicated by the absence of any physical definition of areas set aside for recreation on the one hand and conservation of natural values on the other.

The need to avoid conflicts between use and conservation management in these and similar situations requires careful planning and has led to the replacement of the Reserves Officer based in Karratha to oversee management of the Dampier Archipelago nature reserves with a professionally qualified Reserves Management Officer whose

responsibilities will be based on the need to develop comprehensive management programmes for the Archipelago. This officer will progressively assume overall responsibility for management of offshore island nature reserves.

4. MANAGEMENT OPERATIONS: PINGELLY MANAGEMENT DISTRICT

The management team based at Pingelly, which is responsible for management of 256 Nature Reserves, comprised two members throughout the year and thus continued to be under strength by one wages staff.

(i) Biological Survey

During the past year eight areas of reserved bushland have been examined and of these seven were recommended as Nature Reserves to be vested in the Western Australian Wildlife Authority. One unvested Nature Reserve was surveyed and recommended for vesting in the Western Australian Wildlife Authority.

(ii) Firebreak Construction

Within the 1981/82 period firebreaks were constructed on the following Nature Reserves. The length of firebreaks constructed is also shown.

<u>Reserve No.</u>	<u>Name</u>	<u>Length (km)</u>	<u>Shire</u>
36742	-	9	Brookton
20339	-	18	Kondinin
36003	-	14.5	Kondinin
28715	--	1.5	Kondinin

The total length of firebreaks managed from Pingelly is now about 990 kilometres.

(iii) Firebreak Maintenance

Once again the good condition of many firebreaks enabled the Pingelly Management Team to discontinue some maintenance work for the 1981/82 season. It is estimated that some 500 km of firebreaks were maintained under contract during the 1981/82 period, and that a further 100 km of firebreaks were maintained by the Pingelly Management Team.

The use of herbicides and heavy implements, such as blade ploughs, is now an integral part of firebreak maintenance as practiced by the Pingelly Team.

(iv) Wildfires and Fire Control

During the 1981/82 period a major wildfire occurred on the Dunn Rock Nature Reserve (Reserve No. 36445). This fire entered the Reserve from a clearing burn on an adjoining property. Three fire units from the Department helped suppress the wildfire in concert

with local fire units. Five personnel from the Department attended the wildfire. The Chief Fire Control Officer for the Shire of Lake Grace estimated that some 3 000 ha of reserved land were burnt in the wildfire.

More time has been spent in attending clearing burns adjoining or near Nature Reserves during 1981/82. While this is time consuming work, it is hoped that our efforts will:

- (a) improve the working relationships between the Department and adjoining landholders, particularly with respect to wildfires on and adjoining Nature Reserves; and
- (b) demonstrate the very real concern the Department has for the proper management and protection of Nature Reserves.

Two minor wildfires on land adjoining the Boyagin Nature Reserve (Reserve No. 20610) were also attended by a unit from the Department.

(v) Prescribed Burns

A unit from the Pingelly Team assisted with a prescribed burn at the Two Peoples Bay Nature Reserve during 1981/82.

(vi) Other Activities

Due to a staff vacancy at Pingelly for most of the year, much of the work carried out by the Pingelly Team during 1981/82 has focused on immediate, practical problems. However, work on an operations manual, and on a biological survey at Boyagin, have continued, albeit at a lower level. Pit-trapping work being carried out at Tutanning is expected to provide a more complete inventory of the fauna on the Tutanning Nature Reserve.

As in previous years liaison with Local Government, landholders adjoining Nature Reserves, and with other Government Departments has continued to be an important function of management. The Pingelly Team has continued to assist research workers carrying out studies within the Pingelly District. It is interesting to note that the Pingelly District has received a number of visitors from both interstate and overseas during 1981/82.

Recommendations have been made with respect to a number of proposals for Nature Reserves including land exchanges and gravel mining.

5. WANNEROO AND OTHER DISTRICTS

Management operations work carried out from the Wanneroo base of the Section is done by a single General Division officer assisted by temporary labourers during the summer fire season.

(i) Firebreaks

A total of 2 206 km of firebreaks on 104 nature reserves are now managed from Wanneroo, an increase of 174 km on the preceding year. A total of 1 024 km of firebreaks were maintained during the year, 34 km by Departmental staff and 990 km under contract. This represents a reduction of 67 km over the previous year although available funds were fully expended.

New firebreaks were constructed as follows:

<u>Reserve No.</u>	<u>Name</u>	<u>Length (km)</u>	<u>Local Authority</u>
2218	Round Swamp	3.2	Cranbrook
16144	Capel Rifle Range	5.0	Capel
21429	-	8.3	Toodyay
22096	Flat Rock Gully	1.0	Toodyay
22199	Buller Road	7.5	Waroona
26161	Camel Lake	33.0	Cranbrook/Tambellup
28167	Banksia Road	1.6	Serpentine-Jarrahdale
29601	Yarnup Swamp	2.0	Cranbrook
36203	-	5.0	Irwin

Further upgrading of firebreaks took place on Thomsons Lake Nature Reserve (No. 15556, City of Cockburn) for a total distance of 5 km.

(ii) Wildfires

Six wildfires were reported on or in the vicinity of nature reserves. A further five fires are known to have occurred on nature reserves which were not reported. All reported wildfires were attended by fire crews based at Wanneroo or by District Wildlife Officers or both. Wildfires known to have occurred on or near nature reserves are as follows:

<u>Reserve No.</u>	<u>Name</u>	<u>Local Authority</u>	<u>Attended by</u>
Reported fires:			
1. 32339	Lake Shaster	Ravensthorpe/ Esperance	D.W.O.
2. 30626	Gingilup Swamps	Nannup	D.W.O.
3. Adjacent to 15556	Thomsons Lake	Cockburn	Wanneroo fire teams

4.	16144	-	Capel	Wanneroo fire teams
5.	Adjacent to 31241	-	Gingin	Wanneroo fire teams
6.	36445*	Dunn Rock	Lake Grace	Wanneroo fire teams

Unreported fires:

7.	27632	Nuytsland	Dundas/Esperance
8.	26680	Lake Noobijup	Cranbrook
9.	26385	North Sister	Albany
10.	35168	"Sheepwash Creek"	Plantagenet
11.	33842	Quarram	Denmark
12.	36093	-	Dandaragan

*Assistance requested by Pingelly management district.

It is perhaps significant that four of the unreported fires occurred in the area of the proposed Katanning Reserve Management Team.

(iii) Prescribed Burning Programme

Fire units attended prescribed burns and clearing fires adjacent to the following reserves:

<u>Reserve No.</u>	<u>Name</u>	<u>Local Authority</u>
1. 30191	Moondyne	Toodyay
2. 26248	Wongonderrah	Dandaragan
3. 29806	-	Three Springs/Carnamah
4. 25113	Lake Magenta	Kent

No damage to nature reserves resulted from these fires.

(iv) Implementation of Management Plans

Moondyne Nature Reserve. Signposting and fences and gates for control of public use completed.

Thomsons Lake Nature Reserve. Fence construction completed. Perimeter horse-riding trail complete and in use. Car park and associated walking trails complete and in use.

Modong Nature Reserve. Signposting and fences and gates for public use control completed. Perimeter horse-riding track in use.

(v) Signposting of nature reserves

A new sign standard based on routed wooden signs with a distinctive colour scheme (green and gold) and bearing an emblem of the Department of Fisheries and Wildlife was introduced on a trial basis. A total of 52 signs were erected on five nature reserves which

are subject to high levels of public use. The signs include a variety of advisory and information signs as well as standard signs bearing the name of the reserve and the words "NATURE RESERVE".

A high level of public acceptance of this new approach to signposting has been reported.

6. TWO PEOPLES BAY

Two Peoples Bay Nature Reserve was again subjected to intensive use during the year by many sectors of the public and research bodies.

Public Visitors

11 000 vehicles (estimated to be carrying 35 000 persons) entered the reserve over the past year. These figures include 80 tourist 'buses which include the reserve in their itinerary.

The international status of the reserve was evident again with ornithologists and birdwatchers from nine overseas countries making their visits known to the Reserves Officer.

Education

Lectures and activities on natural history were conducted with several classes from three Albany schools. This form of activity is encouraged. Day visits by schools and organised groups are increasing.

Research

Noisy Scrub Bird - The Noisy Scrub Bird population continues to be monitored annually and number of male Noisy Scrub birds holding territories and giving territorial song has again shown a substantial increase from 85 in June 1981 to approximately 100 in June 1982.

Fire - The study plots on heathland regeneration post fire have continued to be monitored this year.

Other - The collection of data to provide factual information on which to base management planning was increased during the year and research officers from the Western Australian Wildlife Research Centre, C.S.I.R.O., Government Departments and tertiary institutions carried out projects on the following subjects:

Reserve history, geology, landforms and soil, flora (general), flora - eucalypts, banksias and related habitats, flora - fungi, molluscan fauna, banding of sea birds and the collation of other general observations.

Research Station - was occupied 29 times throughout the year by various research and management personnel.

Management - major projects.

Dieback - recently discovered occurrences of the root rot fungus Phytophthora cinnamomi were defined in areas north of Moates Lake on the reserve. A new Limited Access area was declared and fences and information signs erected. Information was distributed through various sources and public co-operation has been excellent.

Prescribed burns - a further block in the strategic fire buffer zone was burnt in September 1981.

Firebreaks - three kilometres of firebreaks were bulldozed during the year bringing the total now maintained on the reserve to 60 km.

Firefighting - Water - the construction of an overhead fast fill system for firefighting vehicles has completed the planned fire control facilities.

Roadworks - public access - major roads within the reserve continue to be maintained. The increase in 4WD traffic in recent years has demanded greater effort in maintaining coastal tracks and eroded areas.

Fishing

Licensed professional fishermen netted 30 tonnes of salmon from Two Peoples Bay this year. Herring and other small fish are also netted by professionals. Tuna boats regularly use the safe anchorage throughout the year.

7. GENERAL

- (i) Metropolitan and near Metropolitan Nature Reserves.

Work continued on a management plan for 15 nature reserves in the region of Perth, to create a series of reserves, already subject to high public interest and use, in which the predominant form of use is environmental education.

- (ii) Benger Swamp Nature Reserve

There was no further land acquisition during 1981/82. Management of the swamp is not progressing due to lack of staff.

- (iii) Lake Toolibin Nature Reserve

Data on water flows and salt levels collected in 1981 and additional data from 1982 are being appraised by

the Northern Arthur River Wetlands Rehabilitations Committee. The study was complicated by the construction of an "interceptor" drain system by an adjoining landholder which was illegally discharged into Lake Toolibin. A final report is expected in the forthcoming year.

(iv) Carnac Island Nature Reserve

Signposts and fences to channel public use of the island were installed.

VI WILDLIFE RESEARCH

1. BIOLOGICAL SURVEY

Field studies associated with the regional survey of the Eastern Goldfields were finalised with winter and spring collections of plants and vertebrate animals in the Wanjarri/Erlistoun (August 1981) and Southern Cross/Coolgardie (October 1981) cells.

Tabulation of data from the Kalgoorlie/Kurnalpi cell (species versus habitat versus season) were completed for reptiles, mammals and birds although publication has been delayed because of taxonomic difficulties in species belonging to four of the mammal genera - Sminthopsis (S. murina), Ningau (N. ridei), Pseudomys (P. albocinereus) and Mormopterus (M. planiceps). Species boundaries need to be clearly defined before sound ecological conclusions on appropriate habitats, and therefore conservation needs, can be drawn. With the co-operation of the Western Australian Museum (morphology) and the Veterinary Science Division of the South Australian Department of Agriculture (electrophoresis) these problems are being resolved.

The North Kimberley biological survey program continued with, in June 1982, an expedition to the islands of the Buccaneer Archipelago. The Fisheries patrol vessel "Dirk Hartog" provided logistical support. Plant and vertebrate animals were collected, from thirteen larger islands of the group, to provide a data base for decisions on future conservation needs. Among the more interesting animals recorded were the Little Rock Wallaby (Peradorcas concinna), Brush-tailed Tree Rat (Conilurus penicillatus), Woodward's Rock Rat (Zyzomys woodwardi), Mangrove Kingfisher (Halcyon chloris) and Brown-tailed Flycatcher (Microeca tormenti).

Results of the biological survey programme in the South-west Kimberley are currently being published: the Edgar Ranges study was published in early 1982 and the Dampier Peninsula study is in press. A general account of the biogeography and conservation status of the mammals of the district was published in late 1981.

2. ANIMAL ECOLOGY

(i) Kangaroo Management Programmes

Monitoring of the commercial red kangaroo harvest was continued. Maintenance of the data base on which the harvest monitoring system depends has been impeded by shortage of staff since the end of 1981.

The good rainfall and breaking of the drought in 1980 was succeeded by relatively dry conditions through 1981 and the Red Kangaroo harvest for 1981 increased by one-third relative to 1980. The total harvest taken was approximately 133 000 kangaroos.

Results of the aerial survey of kangaroo abundance carried out by Dr Graeme Caughley of C.S.I.R O. Division of Wildlife Research, Canberra, in autumn 1981 revealed a State Red Kangaroo population of about 1 000 000 at average stocking densities generally less than 3 kangaroos per square kilometre. The commercially exploited sector of this population included approximately 750 000 kangaroos, so the 1981 harvest accounted for approximately 18% of this stock.

It is probable that harvesting during 1981 further reduced the numbers.

The Western Grey Kangaroo programme continued as before, but the total harvest fell by 40% from 1980 figures, to 34 000.

A Western Grey Kangaroo population of approximately 500 000 animals was suggested by results of the 1981 aerial survey.

Relaxation of the United States of America ban on trade in kangaroo products had little effect on the Western Australian kangaroo trade during 1981.

(ii) Wheatbelt Rock Wallaby Project

The effect of the 1980-81 drought on the Rock-wallaby populations was followed through the 1981 winter season and on into the 1982 summer period. Population estimates were down when compared to pre-drought years, but the declines were not catastrophic. Weight losses of marked animals were minor and body condition of trapped animals was uniformly good. It would appear, therefore, that at present population densities, rock-wallabies are drought tolerant; this finding is of considerable interest in view of the earlier loss of two rock-wallaby populations in the study area - both populations disappearing sometime during (or following) a drought affected year (1969).

This last factor, i.e. the effect of severe drought, can now be dismissed or at least down-graded as a major factor in causing the decline of rock-wallabies in the study area. The factor which remains untested at this stage is predation by foxes and/or feral cats.

Various kinds of baits have been tested or are currently under test. Fresh meat baits have proven to be attractive to both foxes and feral cats. Most

of the Agriculture Protection Board factory baits have been tested with two types or 'flavours' being preferred.

The active substance used in all baits has been sodium fluoroacetate ('1080'); the chemical stability of '1080' is seldom questioned, but we have some evidence that loss of potency may occur with time; arrangements have been made with Dr R. Meade of Murdoch University to analyse all types of baits used.

Results to date have revealed that it is possible to eliminate most foxes and cats on the rock-wallaby Nature Reserves but recolonization was complete by about 60 days.

Future work on the project will be scaled down and will be restricted to predator control. An evaluation of the control programme will be made in two to three years time.

(iii) Dampier Archipelago Rock Wallaby Project

Research in the Archipelago has focused on the importance of the sand plain habitat on Enderby Island. This habitat is subject to mining leases and is in demand for recreational purposes.

Radio-tracking of Rock-wallabies has been curtailed because of the lack of permanent staff based in the Dampier area.

Dietary studies have yielded useful information about the importance of sand plain plant associations. These communities provide a more diverse food source.

Additional surveys of Enderby and Rosemary Island were carried out; on Enderby a helicopter survey covered the entire island and two new high density sub populations were discovered; it is perhaps significant that these two areas are associated with sand plain habitat.

Rosemary Island presents a similar picture: sand plain habitat is always used by rock-wallabies if not too far from shelter.

Future field work will concentrate on sand plain use by rock-wallabies; the project is to be completed by mid-1983.

(iv) Numbat Research

The population of numbats at Dryandra State Forest has been the subject of intensive study over the last twelve months.

During this time, vehicle surveys have yielded twelve sightings, most of which were in areas of wandoo (Eucalyptus wandoo) woodland and within a few metres of extensive thickets of sandplain poison, Gastrolobium micocarpum. This seems to be an important cover species in this area. Two sightings were in the powderbark (Eucalyptus accedens) woodland on the upper slopes, in a forest block which was burnt last spring.

One male and two females with young were captured and radio-tracked during early 1982. One female was caught in the recently burnt area and used a much larger area, including more powderbark woodland, than the female in the unburnt area.

These females have been recaptured at regular intervals to monitor the growth of the young. This has been consistent with the theory that females produce only one litter each year, which is carried from late summer through until late winter.

Radio-tracking has allowed seasonal studies of feeding to be carried out, and extensive data on patterns and location of feeding and on scat contents, are being generated. This aspect of the study is continuing.

Feeding studies and radio-tracking have enabled the easy recognition of numbat diggings. This will be extremely important in the survey of other areas of woodland to determine numbat presence. These surveys will be commenced over the next year.

- (v) Banded Hare Wallaby Reintroduction Programme - Dirk Hartog Island.

No solutions to problems identified previously were forthcoming. The project presently suspended.

- (vi) Dugong

No further survey work was undertaken by Departmental officers during the year.

Further research work on the Shark Bay dugong population has been undertaken by Professor Paul Anderson during the past year.

- (vii) Waterbird and Wetland Research

- (a) Installation and maintenance of depth-gauges on Western Australian Wildlife Authority-vested Wetland Nature Reserves in the South West and Eucla Land Divisions of the State continued during 1981-82. The total number of lakes now gauged is 117. Depths, salinities and pH were monitored in July, September and November 1981,

and January, March and May 1982. It is proposed to continue the same level of monitoring in 1982-83.

The West Australian Field and Game Association has provided reliable assistance in the collection of data.

All data are now on computer and available on request in either tabular or graphical form.

The data obtained from the monitoring programme provide a sound basis for decisions concerning annual duck shooting seasons. The data also provide an essential basis for studies of the biology of wetlands and in the long term will enable the Department to more confidently predict the impact of changes in catchment use on wetlands, particularly Wetland Nature Reserves.

Monitoring of wetland condition during the Royal Australasian Ornithologists' Union's "Waterbird Usage" project is also provided for by the present programme.

- (b) Rainfall and wetland monitoring data were compiled and presented in the 1981-82 Rainfall and Wetland Review. The report was submitted to the Bird Committee of the Western Australian Wildlife Authority in support of a recommendation for a Restricted duck-shooting season in the South West and Eucla Land Divisions for 1981-82.
- (c) Wetland Nature Reserves which are under application to lease for peat mining in the Lake Muir area (Manjimup Shire) were monitored for water depth and quality at three-monthly intervals in accordance with the conditions of a proposed agreement between the Department of Mines, the Department of Fisheries and Wildlife and Magnet Industries Pty. Ltd.
- (d) The programme for culling of exotic duck species from metropolitan wetlands which was initiated in January 1978 and deferred in 1979 and 1980 due to insufficient manpower was deferred again in 1981 for the same reason.

The Department has had some success in encouraging members of the public to assist in duck culling.

- (e) During 1981-82 Research Staff continued to assist amateur ornithologists of the W.A. Wader Study Group with wader counting, catching and banding activities. Study Group members were further instructed in the use of cannon-nets for

wader catching and the Group now makes regular use of the Department's mist-netting and cannon-netting equipment with considerable success.

- (f) In April 1981 the Department contracted the Royal Australasian Ornithologists' Union to undertake a four-year assessment of waterbird usage of W.A. W.A.-vested Wetland Nature Reserves (WNRs) in the South-West and Eucla Land Divisions of the State. The objectives of the project are:
- (i) To provide information on waterbird usage to assist in the management of WNRs and in the resolution of conflicts between different uses.
 - (ii) To assess the role and importance of the WNR system in the conservation of waterbird populations.
 - (iii) To provide appropriate experience for future monitoring of waterbird abundance.

A full-time Field Officer has been employed by the R.A.O.U. to administer the project. He has two main roles: to coordinate the activities of a team of amateur observers, and to design, test and report on census techniques and results. The R.A.O.U. will produce annual summaries of the information obtained and a final report at the end of the four years discussing the methods employed, the results, and their implications for management both of waterbirds and Wetland Nature Reserves.

117 of the 180 WNRs to be surveyed have had depth gauges installed and Departmental Research Staff are monitoring water levels and quality (initially salinity and pH) during the course of the study as outlined in (a) above. Research staff also contribute waterbird usage data to the R.A.O.U. project.

To June 1, 1982, 55 of the reserves to be surveyed had been allocated to observers and 173 completed survey forms had been received by the project officer.

- (g) Research staff continue to operate the "check structure" (adjustable height weir) at Lake Chittering so that the Lake holds water right through summer, thus providing a valuable refuge for waterbirds.

(viii) Western Swamp (Short-necked) Tortoise

During the 1981 winter seven animals were captured at Ellen Brook Nature Reserve but only one at Twin Swamps. Updated population estimates for Ellen Brook are consistent with previous ones and suggest a population of 15 to 30 animals. The Twin Swamps population continues to decline and is almost extinct.

Hatchlings obtained from captive breeding experiments in 1980 and 1981 have had a high mortality rate and only one remains alive. No eggs were obtained from captive females in 1981. Experiments on captive breeding will continue.

The Western Swamp Tortoise is very close to extinction.

(ix) Pesticides and the thinning of birds' eggs

Analysis of data collected in 1980, which is being carried out by C.S.I.R O. Division of Wildlife Research personnel in Canberra, is incomplete.

(x) The Dibbler (Antechinus apicalis)

An area of Crown land at Jerdacuttup was examined in December 1981 but no Dibblers were located. Habitat on this block did not appear good and the Department of Lands and Surveys was advised that there were no good nature conservation reasons why the land should not be released for agriculture.

A single animal, believed to be a Dibbler, was trapped by a National Park Ranger and consultant biologist A.V. Milewski near East Mount Barren in the Fitzgerald River National Park in April 1982.

(xi) Mangrove Bats

Analysis of the data has been completed and a paper on community structure drafted. Further field work is envisaged prior to publication to confirm the presence of species predicted in the North-west Kimberley and to improve the sample sizes of observed species belonging to the East Kimberley mangroves.

(xii) Bat Taxonomy

Electrophoretic studies of the three species of Western Australian Mormopterus recognised on the basis of morphometric analysis indicated that a fourth species, within the M. planiceps group, occurs in the Eastern Goldfields. Specimens belonging to this newly recognised form need to be incorporated in the morphological analysis.

3. PLANT ECOLOGY

(i) Fire Ecology

One block of the strategic fire buffer at Two Peoples Bay Nature Reserve was burnt in September 1981. Eleven of the twelve blocks have now been burnt in this way. Both plots established in the buffer to study regeneration of the vegetation (burnt spring and autumn) were harvested in October 1981 and the material has been sorted, dried and weighed. Effects of kangaroo grazing and trampling on regenerating vegetation were also studied. Data from the study await analysis.

Comprehensive sampling of the systematic grid points at Tutanning Nature Reserve was completed in this year. All plant identifications have been made and data record sheets are currently being sorted for punching.

The study of shrubland vegetation (kwongan) at Tutanning was completed and has been submitted for publication.

PREPLAN, the computer-based land management information system has been further enhanced through use of digitised map records together with a digital elevation model (DEM). Analysis of the new vegetation data will permit the PLANTS module to be improved.

Two paired areas of burnt and long-unburnt vegetation at Eneabba were sampled to gain insight into the dynamics of this vegetation. Many obligate seed regenerating species have occasional recruits. Recurrent fire is implicated in causing major changes in floristics and structure of the vegetation.

(ii) Eneabba

Work continues on the preparation of reports on the kwongan vegetation of the Mt Lesueur - Cockleshell Gully area. Some early results were incorporated in a paper presented at the Ecological Society of Australia Symposium in Canberra, May 1982 entitled "Species-rich uplands of south-western Australia" (with G.J. Keighery & N.G. Marchant).

Results of the Allied Eneabba Ltd South East Factorial Experiment have been analysed and written up for discussion with the Company. This study has highlighted the important roles to be played by brush matting and proper topsoil handling techniques in achieving optimum rehabilitation after sandmining at Eneabba.

A paper delivered at the XIII International Botanical Congress (Sydney, August 1981) on "Effects of aseasonal drought on distribution patterns of perennial species, south western Australia" (with E.M. Heddle) encapsulated observations on drought effects and rooting patterns at Eneabba and Gnangara.

(iii) Middle Island

Preparation of material for publication is continuing. Some early results were published in SWANS and a poster was presented at the XIII International Botanical Congress (Sydney, August 1981).

4. FLORA CONSERVATION

(i) Atlas of the Western Australian Flora - Pilot Project

A Tektronix 4054 graphics mini computer system was installed at the Wildlife Research Centre to service this project. It was purchased with funds granted by the Australian Biological Resources Study.

Most of the year was spent developing programmes to plot distribution data on maps of the State. This aspect was facilitated by the appointment in April of a computing consultant, Mr P. Gioia, to work on the project.

Members of the W.A. Native Orchid Study and Conservation Group continued sending in Sight Record Sheets which provide locality and habitat details on orchids. A survey of orchids on conservation reserves in the Perth metropolitan region was initiated.

(ii) Licensing and Management of the Wildflower Industry

With the assistance of Mr M.A. Burgman, a consultant botanist, the first 15 months' data on flora returns were analysed and a critical appraisal was undertaken on the effectiveness of the current wildflower picker's return system in providing meaningful statistics on (a) the species being exploited, (b) quantities of parts taken, and (c) the economic value of the wildflower industry to the State.

Monthly returns from ca. 550 licensed commercial wildflower pickers indicated that 13 814 000 flowering stems, 2 613 kg of seed and 6 054 kg of Boronia megastigma blossoms were harvested between June 1980 to August 1981. A comparison of pooled wholesalers' data for August 1981 with pickers' data for the same month suggested that the pickers' figures underestimated actual quantities harvested by as much as 37%.

A total of 588 species were used by the industry, 288

as cut flowers, 308 for seed and 166 for nursery cuttings. Boronia megastigma was the most heavily exploited species. Exploitation of the genera Verticordia, Stirlingia, Agonis, Banksia and Dryandra accounted for 52% of all cut flowers harvested, while the genera Banksia, Acacia, Kennedia, Eucalyptus and Helipterum accounted for 61% of the total weight of seed collected. Most picking activity of all plant parts is concentrated around Perth and around Mount Barker. Totals of 50% of all cut flowers and 80% of all seed were taken from Crown land.

Almost all heavily exploited species have widespread distributions. A few are geographically restricted and may require intensive research and management. The Black Kangaroo Paw Macropidia fuliginosa stands out as one such species. Only in the case of Boronia megastigma is there any data on the effects of picking.

Exploitation of Western Australian native plants for cut flowers, seed and nurseries was worth \$1.5 m, \$0.7 m and at least \$3.0 m respectively at the wholesale level in the 1980/81 financial year. There were five major cut flower wholesalers, four major seed wholesalers and about 200 nurseries in operation employing 1 300 people.

(iii) Conservation Status and Biology of Rare Plants

As in previous years, information on rare species was obtained through literature searches, consultation with local botanists, active field programmes, and through the letting of consultancies for surveys of particular species. Attempts to acquire reserves for rare plants were initiated. A major effort to prepare material for publication was undertaken. Applications for grants for research on rare plants were made to the World Wildlife Fund and to the Australian Heritage Commission.

(a) Systematics

Studies on morphological variation, allozyme variation, population phylogeny and the conservation status of Eucalyptus caesia were written up and the manuscripts submitted for publication. The following abstract summarises this work.

"A survey of granite rocks in the wheatbelt of south-western Australia during 1978-81 resulted in the location of 2 117 adult plants of E. caesia distributed among 15 locations. Population sizes ranged from 1-580 plants. The species formed small groves of mallee at the base of extensive granite slopes at all locations inspected. The geographical

distribution of genetic variation in the species was investigated using morphometric techniques and in an electrophoretic study of allozymes. The existence of two subspecies distinguished by differences in leaf, bud, flower and fruit size was established. The allozyme study showed that while levels of polymorphism within populations were low when E. caesia was compared with other eucalypts, the species has the highest level of genetic variation between populations on record. Levels of polymorphism within even the smallest populations of E. caesia (7 plants) were considerably higher than those seen in the herb Isotoma petraea and in the rock wallaby Petrogale penicillata, both of which are confined to granite rocks. This suggests that minimum population sizes for the conservation of genetic variation vary themselves depending upon the genetic system of the organisms concerned.

The highly differentiated population system of E. caesia requires reserves scattered throughout its range for effective conservation of its gene pool. It was found that all morphometrically identifiable variants and all allozyme alleles were present in populations on at least one of the nine reserves on which the species occurred. Attempts to acquire two more reserves to improve representation of uncommon allozyme alleles were successful for a population on vacant Crown land but not for populations on private property. Observations on the reproductive biology of E. caesia indicate that it shows prolific germination and regenerates from lignotubers after fire, and that it is unusual among eucalypts in being predominantly pollinated by birds. On present information there seems no need for active management of wild populations to boost their reproductive capacities. The species is widely grown in cultivation".

Morphometric studies of the taxonomic status of Eucalyptus rhodantha and E. carnabyi suggested that the latter is probably a rare hybrid of E. macrocarpa x E. drummondii.

Descriptions of several rare Conostylis species and Anigozanthos subspecies were compiled and all necessary herbarium work was completed.

A field trip undertaken in November by Dr S.D. Hopper with Dr M.I.H. Brooker of the CSIRO Division of Forest Research enabled a comprehensive reference collection of eucalypts to be made. Preliminary data were gathered on several rare unnamed eucalypts with a view to collaborative taxonomic studies.

(b) Survey

Largely through the labours of consultants, survey information on rare plants was obtained from herbarium records and through field work. The projects undertaken varied from a general view of geographically restricted plants through to detailed searches for individual species.

Dr B.L. Rye compiled a list of geographically restricted plants for southern W.A. and prepared a Departmental report with the following abstract:

"This publication lists 527 angiosperm species native to southern Western Australia whose known geographical ranges are less than 100 kilometres long. A further 128 angiosperms are listed with geographical ranges between 100 and 160 kilometres. No fern or gymnosperm species in the region are known to be geographically restricted. Apart from the presently unnamed species, a large majority of the rare plants of southern Western Australia are believed to be listed, including 86 of the species that have been gazetted as rare flora. Less than 40% of the listed species are known to occur on conservation reserves and less than 20% have been grown in cultivation."

E.A. Griffin, J. Lewis and G.J. Barrett followed up Rye's report in more detail by compiling all published literature, drawings, photographs and herbarium records for geographically restricted plants of the northern sandplains, southern sandplains (excluding the Stirling Range) and Swan Coastal Plain - Darling Scarp respectively.

Griffin found 84 described taxa and 66 undescribed taxa to be geographically restricted to the northern sandplains between the Moore and Irwin Rivers. Twenty-four of the 84 described plants had ranges of less than 50 km. The Mt Lesueur region had the greatest concentration of these restricted plants.

Lewis summarised his study of restricted southern sandplain plants as follows:

"Collection details of herbarium specimens, original and some subsequent published descriptions, and distribution maps are provided for 124 geographically restricted, including 20 gazetted rare plants occurring on the southern sandplains of Western Australia. Rarity, range, geographical restriction, conservation status and flowering period data are given. 41% of the species have a range less than 50 km; that is,

are classified as very geographically restricted. 69% occur in part, or wholly, on existing conservation reserves and 58% of the species are spring flowering. Areas to the south and south-west of Ravensthorpe, in particular the Fitzgerald River National Park, contain the majority of the geographically restricted species. 26 species occur at only one locality, which is often an isolated mountain".

Barrett listed 110 taxa which appeared to be rare or geographically restricted to the Swan Coastal Plain and Darling Scarp. Forty-nine of these had known ranges of less than 50 km, most being endemic to the Darling Range near Perth.

Detailed field surveys of rare plants were undertaken by S.D. Hopper, J. Lewis, E.M. Bennett and departmental Wildlife Officers. Lewis searched for three rare plants in the sandplains north of Eneabba in May - July 1981. Leucopogon obtectus, a gazetted rare plant previously only known from less than ten plants, was located in 25 populations consisting of a total of 200-300 plants. It had a geographical range of only 24 km. The other two species, Isopogon tridens and an undescribed Conostylis had ranges of 50 km and 26 km respectively but were locally abundant.

Lewis also undertook one of two consultancies aimed at locating rare plants in the Ravensthorpe area where land releases for agriculture are under consideration. He summarised his work as follows:

"This report examines four geographically restricted species in the Ravensthorpe Range, and sandplain region north-east of Ravensthorpe. These include three undescribed and one described species; Leucopogon aff. bossiaea, Billardiera 'mollis' and Acacia provisional species No. 32. (Acacia p. 32) and Boronia ternata var. elongata. Field surveys were conducted between November 1981 and January 1982 to determine the distribution, abundance and conservation status of these four species within their known distribution and in an area of sandplain north-east of Ravensthorpe under developmental pressure. All four species have very geographically restricted distributions (< 50 km). Leucopogon aff. bossiaea is threatened by proposed land releases and is, as yet, inadequately protected. Billardiera 'mollis' also occurs adjacent to areas proposed for release. However, populations of this species also occur within the Ravensthorpe Range which is under less pressure. Boronia ternata

var. elongata and Acacia p. 32 are more abundant and widespread, and are not considered endangered. Recommendations regarding the gazettal and protection of these four species are given".

E.M. Bennett searched for three restricted eucalypts in the Ravensthorpe Range. E. desmondensis (gazetted as rare) and E. megacornuta were each found to be locally abundant but restricted to the range. E. bennettiae, a recently gazetted rare species, is known from only 3 plants.

Field surveys by S.D. Hopper established that:

(1) The Arrowsmith Spider Orchid Caladenia crebra is restricted to near coastal limestone between Leeman and the Mt Adams Road. The species is abundant in total but locally scarce.

(2) The gazetted rare Acacia aphylla was seen on private property near Clackline and discovered in collaboration with J.T. Goodsell on Mokine Nature Reserve.

(3) Hibbertia miniata was found to be locally abundant at several localities in the Wannamal area, including a flora reserve vested in the Shire of Chittering.

(4) Known localities of a number of rare south coastal eucalypts were inspected - E. insularis, E. aquilina, E. ligulata, E. acies, E. newbeyi, E. bennettiae, E. calcicola.

Geraldton D.W.O. D. Mell searched the Moresby ranges for the recently gazetted rare plant Drummondita ericoides and for other endemics to the ranges. D. ericoides is only known from ca. 300 plants near White Peak. Wildlife Officers B. Haberley, D. Coughran and R. Piggott searched for Eucalyptus kruseana and E. brachyphylla east of Kalgoorlie, locating ca. 800 and 30 plants respectively of each. Searches for local rare plants were also initiated by wildlife officers at Busselton, Wongan Hills, Albany, Moora and Perth.

Close liaison was maintained with Dr K. Dixon, a research fellow of the Botany Department, University of W.A., employed on a World Wildlife Fund grant to search for the underground orchid Rhizanthella gardneri. In collaboration with Professor J.S. Pate and members of the W.A. Native Orchid Study and Conservation Group, Dr Dixon has now observed this orchid at three localities near Munglinup and two near Babakin.

A total of ca. 150 plants have been observed this past year.

(c) Reserve acquisition and management

Reserve proposals have been prepared for several areas of land to conserve rare plants: these include proposed reserves north of Eneabba, north-east of Ravensthorpe, in the Moresby Range and near Munghlinup. Liaison with Reserve Management Officers was maintained, particularly in relation to threats to rare plants posed by firebreak construction.

(d) Administration and legislation

Advice was given on a number of applications to take gazetted rare plants. Administrative arrangements to notify landowners of the presence of gazetted rare plants on their properties were initiated for 31 species.

Research on additions and deletions to the gazetted rare flora led to the deletion of Dryandra comosa, D. pulchella, Melaleuca baxteri and Pentapeltis silvatica and the addition of 36 taxa to the gazetted list by proclamation in the Government Gazette of 12 March 1982.

(e) Extension and publicity

The first eight colour leaflets on rare W.A. plants were published. A consultant botanical artist (Mrs S. Patrick) was commissioned to prepare descriptions and drawings of the 36 new additions to the gazetted rare flora. These will be used in a departmental report as a supplement to Report 42. A number of talks were given to amateur and scientific bodies interested in rare plants.

(iv) Reserve Survey

Over the past year the following reserves or proposed reserves were surveyed or visited to inspect flora:

Two Peoples Bay Nature Reserve
Beekeepers Reserve
Chiddarcooping Nature Reserve
Baker's Junction Nature Reserve
Mokine Nature Reserve
Mt Ney area

A paper on the banksias and eucalypts of Two Peoples Bay Nature Reserve was prepared for publication.

(v) Biology of Kangaroo Paws and Conostylis

Opportunistic field observations on several species of kangaroo paws and Conostylis were made in the course of routine field work on other projects. Descriptions of several new taxa were drafted.

(vi) Pollination Ecology of the Australian Flora

Further original observations of honeyeaters and honey possums feeding on flowers were made. These, together with published observations and numerous personally communicated records from interested colleagues have been collated in draft form for a proposed departmental report. A paper coauthored with A.A. Burbidge on feeding behaviour of birds and mammals on flowers of Banksia grandis and Eucalyptus angulosa was delivered at the XIII International Botanical Congress in Sydney and submitted for publication.

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VII ENFORCEMENT

1. ACTIVITIES

In May 1982, the Department of Fisheries and Wildlife became responsible for the enforcement and inspection of aviaries holding introduced species of birds in Western Australia. The Vermin (Declared Birds) Regulations were previously administered by the Agriculture Protection Board. As a result of a Cabinet decision and talks between the Agriculture Protection Board and the Department of Fisheries and Wildlife, agreement was reached to allow Wildlife Officers to carry out all future inspections of aviaries holding Declared Birds. This new facility has made it easier for members of the public to be able to deal with one Government department with respect to inspection requirements and licensing, instead of the previous two departments. Additional staff were transferred from Agriculture Protection Board to facilitate the arrangement. A two day training school for Wildlife Officers was held in May to assist them to understand the appropriate Act and Regulations and recognition of the many species of exotic birds involved. Since then numerous sightings and reports have been made concerning illegal holding of some prohibited species contrary to the aforementioned Regulations. Regular airport inspections for all incoming fauna (mostly birds) are being maintained on a twenty four hours a day, seven days a week basis.

Patrols by Wildlife Officers involving supervision of commercial pickers taking protected flora on Crown land were stepped up this year and many breaches were detected and reported. In March 1982, a revised list of 132 species of Rare Flora was published. A penalty of \$1,000 is prescribed for persons convicted of taking Rare Flora unless the person has first obtained the written consent of the Minister.

Private wildlife parks continue to steadily increase throughout the south west. Wildlife Officers carry out regular inspections of these parks. All new applicants are interviewed by senior personnel and properties and facilities inspected by Wildlife Officers prior to the granting of any licenses.

Taking of fauna from the wild is continually monitored by Wildlife Officers throughout the State. Taking of young immature parrots from nesting sites and the associated destruction of nesting hollows is rigidly policed. Co-ordinated patrols by groups of Wildlife Officers are one of the most effective methods of controlling this activity.

2. RESERVES

Inspections of existing and proposed nature reserves take up a lot of a District Wildlife Officer's time.

The number of reserves vested in the Western Australian Wildlife Authority has again increased.

Illegal activities such as erecting of beach huts on some coastal reserves, dumping of rubbish, grazing of sheep and cattle from adjoining properties and illegal erection of makeshift fences, has created many problems.

As conservation and survival of indigenous fauna and flora in the long term will be dependent on the existence of nature reserves, these reserves are regarded as extremely important. Wildlife Officers devote a lot of their field time to their management and duties associated with the preservation of the species.

Aerial patrols were also used this year to more thoroughly survey and patrol nature reserves. Firebreaks, illegal occupations of buildings, illegal grazing, etc were noted. These types of patrols were very efficient and will be continued subject to availability of funds.

3. MANAGEMENT PROGRAMME

Duck Shooting Season

An open season for the taking of mountain ducks and wood ducks (maned geese) was declared from 12 November 1981 to 8 January 1982 and from 19 February 1982 to 31 December 1982. (The intermediate period being for the declaration of an open duck shooting period for other normal game species). The open season for mountain duck and wood duck was designed to assist landholders and lease-holders to control these two species where damage was being caused to primary production and water storage. Other special control measures also applied during the open season.

A duck shooting season for other game species was declared open in the South West and Eucla Land Divisions. Because of drought conditions, this was the first open season for several years. It opened from 6.00 am Sunday 10 January 1982 to midnight Sunday 21 February 1982. Wildlife Officers were allocated various lake systems throughout the South West and Eucla divisions for the opening shoot. Some indiscriminate shooting of protected species occurred. Rare Freckled Duck were also unfortunately shot in some areas.

The open season for duck shooting in the Kimberley, North West and Eastern Land Division was again declared for the period 1 January 1982 to 31 December 1982.

Grey and Red Kangaroos

The conditions applicable to the Grey Kangaroo and Red Kangaroo Management Programmes are continually checked and enforced by Wildlife Officers. Licensed chillers in remote field locations are monitored as are all licensed processing establishments in metropolitan and country areas. Shooting operations by professional shooters operating in 'open areas' are also subject to checks by Wildlife Officers as are illegal shooting operations where the kangaroo is still protected.

Finch Trapping

No additional Finch Trappers licenses have been issued. Seven persons operated during the 1981 open season in the Kimberley Division of Western Australia from 1 September to 15 November. 23,450 finches of various species were taken. This total was over 2,000 more than the 1980 open trapping season.

The activities of other trappers permitted to trap parrots causing damage to orchard products in shires where an open season is permitted is also regularly policed by Wildlife Officers.

PROSECUTIONS - JULY 1, 1981 TO JUNE 30, 1982

Various offences against the Wildlife Conservation Act and Regulations occurred throughout the year. Of these, some 45 were considered to be of a less serious nature and warning letters were sent. In addition, in many instances, verbal warnings given by the Wildlife Officer were considered sufficient.

Details of prosecutions are recorded as follows:

DISTRICT NO. 1 - WYNDHAM Prosecutions - Nil	
DISTRICT NO. 2 - KARRATHA Prosecutions - 1	Fines - \$100.00 Costs \$28.50
DISTRICT NO. 3 - MT MAGNET Prosecutions - Nil	
DISTRICT NO. 4 - CARNARVON Prosecutions - Nil	
DISTRICT NO. 5 - GERALDTON Prosecutions - 1	1 Case Pending
DISTRICT NO. 6 - MOORA Prosecutions - 20	20 Cases Pending
DISTRICT NO. 7 - WONGAN HILLS Prosecutions - Nil	
DISTRICT NO. 8 - WAROONA Prosecutions - 5	Fines - \$40.00 Costs \$47.20 4 Cases Pending
DISTRICT NO. 9 - PINGELLY Prosecutions - Nil	
DISTRICT NO. 10 - KALGOORLIE Prosecutions - 2	Fines - \$100.00 Costs \$94.20
DISTRICT NO. 11 - BUSSELTON Prosecutions - Nil	
DISTRICT NO. 12 - ALBANY Prosecutions - 2	2 Cases Pending
DISTRICT NO. 13 - PERTH Prosecutions - 10	Fines - \$810.00 Costs \$196.90 4 Cases Pending
DISTRICT NO. 14 - MANJIMUP Prosecutions - 3	3 Cases Pending
DISTRICT NO. 15 - ESPERANCE Prosecutions - Nil	
GRAND TOTALS	
PROSECUTIONS - 44	FINES \$1 050.00 COSTS \$ 366.80 34 Cases Pending

SECTION OF ACT OR REGULATION	NO.	DESCRIPTION	FINES	(TOTAL) COSTS
			\$	\$
DISTRICT NO. 2 - KARRATHA				
Section 16A(1)	1	Possession of Protected Fauna (3 Kangaroo Skins)	100.00	28.50
DISTRICT NO. 5 - GERALDTON				
Regulation 28(1)	1	Keeping fauna in captivity without a license	Case Pending	
DISTRICT NO. 6 - MOORA				
Section 16A(1)	1	Possession of Protected Fauna (Galah)	Case Pending	
Section 16(1)	1	Taking of Protected Fauna (Galah)	Case Pending	
Section 16A(1)	1	Possession of Protected Fauna (Kangaroo)	Case Pending	
Sections 25(1)(a), 25(1)(f), 25(1)(g), Reg. 46(b)	1	Obstruction; Abusive Language; Failing to Observe Conditions on a License; Picking on a Nature Reserve	Case Pending	
Section 23B(1)	3	Breaching Conditions on License when Taking Flora on Crown Land	Case Pending	
Regulation 44(2)(B), 44(4)	13	Building on a Nature Reserve; Non-compliance with Notice of Removal	Cases Pending	
DISTRICT NO. 8 - WAROONA				
Section 16A(1)	1	Possession of Protected Fauna (Kangaroo)	\$40.00	\$47.20
Section 16A(1)	1	Possession of Protected Fauna (Musk Duck)	Case Pending	
Regulation 56(3)(a)	3	Exceeding Bag Limit on the Opening Day of the Season	Case Pending	
DISTRICT NO. 10 - KALGOORLIE				
Section 16(1)	1	Taking of Protected Fauna (Kangaroo)	\$50.00	\$37.20
Section 16A(1)	1	Possession of Protected Fauna (Kangaroo)	\$50.00	\$57.00

SECTION OF ACT OR REGULATION	NO.	DESCRIPTION	FINES	(TOTAL) COSTS
			\$	\$
DISTRICT NO. 12 - ALBANY				
Regulation 46(b)	2	Picking Flora on a Nature Reserve	Case Pending	
DISTRICT NO. 13 - PERTH METROPOLITAN AREA				
Section 16A(1)	1	Possession of Protected Fauna (Kangaroo)	\$100.00	\$28.50
Section 16A(1)	1	Possession of Protected Fauna (Kangaroo)	\$150.00	\$28.70
Section 16A(1)	1	Possession of Protected Fauna (Kangaroo)	\$ 60.00	\$28.70
Section 16A(1)	1	Possession of Protected Fauna (Kangaroo)	\$150.00	\$32.00
Section 16(1)	1	Taking of Protected Fauna (Kangaroo)	\$150.00	\$32.00
Section 16A(1);17(2)(E)	1	Taking of Protected Fauna and Attempting to Sell (Galahs)	\$200.00	\$47.00
Section 23B(1)	2	Taking Protected Flora on Crown Land Without a License	Case Pending	
Section 16(1)	1	Taking of Protected Fauna (Long Billed Corellas and Galahs)	Case Pending	
Section 23B(1)	1	Breaching Conditions on License When Taking Flora on Crown Land	Case Pending	
DISTRICT NO. 14 - MANJIMUP				
Section 23B(1)	1	Breaching Conditions on License When Taking Flora on Crown Land	Case Pending	
Section 16(1)	1	Taking of Protected Fauna (1 Aust. Coot)	Case Pending	
Section 16A(1)	1	Possession of Protected Fauna (1 Pink Eared Duck)	Case Pending	

VIII LICENSING

The keeping of or dealing with fauna not in its natural environment is controlled under the licensing system. During the twelve months ending 30 June 1982, the following licenses were issued.

1. SCIENTIFIC PURPOSES - REGULATION 17

These licenses were issued mainly to official scientific organisations or their employees. 107 licenses were issued to take fauna for general scientific purposes.

2. EDUCATIONAL AND PUBLIC PURPOSES - REGULATION 15

There were 17 licenses issued for the following purpose:

Care of derelict fauna	3
Collection and Study	2
Study and Display	5
Educational	2
Photography	2
Miscellaneous	3

3. AVICULTURE

(i) Licenses to Keep and Breed Fauna in Captivity - Regulation 12

4 214 licenses were issued, mainly to aviculturists.

(ii) Licenses to Deal in Avian Fauna - Regulation 13

99 were issued.

(iii) Licenses to Trap Avian Fauna - Regulation 11

12 were issued.

List of Parrots Trapped

Ringneck Parrots	1 004
Western Rosella	608
Red-capped (WA King)	665
Galaha	4

List of Finches Trapped

Long-tailed (Black heart)	8 543
Masked	2 409
Star	4 107
Gouldian	1 054
Crimson (Blood)	1 735
Double-barred Mannikin	2 786
Chestnut-breasted Mannikin	1 179
Pictorella Mannikin	1 637

4. GAME

Licenses to Take Game - Regulations 21 and 22

61 quail shooters' licenses were issued.
4 217 duck shooters' licenses were issued.

5. KANGAROOS

Licenses to Take Red Kangaroos for Sale - Regulation 6

156 licenses were issued.

Licenses to Deal in Kangaroo Carcasses - Regulation 8

23 licenses were issued.

Licenses to Deal in Kangaroo Skins - Regulation 10

19 licenses were issued.

Licenses to Process Fauna - Regulation 7

22 licenses were issued to process kangaroos.

6. IMPORTS AND EXPORTS OF FAUNA

The Wildlife Conservation Regulations provide that no fauna shall be imported or exported from this State without a license.

(i) Export Interstate

Finches:

Crimson (Blood)	1 281
Chestnut-breasted Mannikin	677
Double-barred Mannikin	1 113
Gouldian	420
Long-tailed (Black-heart)	5 772
Masked	1 696
Pictorella Mannikin	661
Star	3 087
Painted	47

Parrots:

Ringneck Parrots	1 446
Western Rosella	759
Budgerygah	34
Red-capped (WA King)	771
Red-collared Lorikeet	12
Purple-crowned Lorikeet	150
Elegant	118
Bourke's	2
Mulga	17
Green Rosella	6
Northern Rosella	2
Rainbow Lorikeet	28

Export Interstate (Contd.)

Parrots (Contd.)

Regent	8
Red-rumped	2
Alexandra's (Princess)	4
Superb	18
Cockatiel (Weero)	3
Pale-Headed Rosella	1
Varied Lorikeet	1
Red-tailed Black Cockatoo	5
White-tailed Black Cockatoo	3
Galah	17
Little Corella	5
Long-billed Corella	2
Sulphur-crested Cockatoo	2

Other Species:

Crested Tern	2
Red-rumped Pigeon	2
Banded Land Rail	2
Singing Honeyeater	6
Plumed Pigeon	4
Cape Barren Goose	22
Pink-eared Duck	1
Emu	3
Yellow-winged Honeyeater	2
Brown Honeyeater	6
King Quail	4

Exotics:

Indian Ringneck	10
Canary	7
African Fire Finch	30
Love Birds - Peach Face	108
Masked	147
Nyassa	14
Java Sparrow	2
White Barbary Dove	3
Jacarini Finch	8
Bleeding Heart Pigeon	3

Mammals:

<i>Macropus parryi</i>	2
<i>Macropus irma</i>	2
<i>Macropus fuliginosus</i>	3
<i>Macropus robustus</i>	10
<i>Setonix brachyurus</i>	6
<i>Lagorchestes conspicil-</i> <i>latus</i>	1
<i>Bettongia penicillata</i>	5
<i>Trichosurus arnhemensis</i>	1
<i>Tarsipes rostratus</i>	6
<i>Isoodon obesulus</i>	1
<i>Macrotis lagotis</i>	1
<i>Sminthopsis hirtipes</i>	2

Export Interstate (Contd.)

Mammals (Contd.)

<i>Sminthopsis longicaudata</i>	4
<i>Sminthopsis murina</i>	1
<i>Sminthopsis granulipes</i>	2
<i>Mesembriomys macrurus</i>	1
<i>Leggadina</i> sp.	1
<i>Pseudomys chapmani</i>	1
<i>Pseudomys</i> sp.	2
<i>Melomys burtoni</i>	1
<i>Melomys</i> sp.	1

Reptiles:

<i>Crocodylus porosus</i>	4
<i>Diplodactylus stenodactylus</i>	3
<i>Diplodactylus spinigerus</i>	2
<i>Diplodactylus granariensis</i>	1
<i>Crenadactylus ocellatus</i>	4
<i>Aprasia repens</i>	1
<i>Gehyra xenopus</i>	2
<i>Oedura marmorata</i>	1
<i>Phyllodactylus marmoratus</i>	2
<i>Phyllurus millii</i>	1
<i>Heteronotia binoei</i>	33
<i>Aprasia repens</i>	1
<i>Tiliqua rugosa</i>	2
<i>Amphibolurus minimus</i>	1
<i>Amphibolurus minor</i>	1
<i>Varanus glauerti</i>	1
<i>Varanus mitchellii</i>	1
<i>Varanus</i> sp.	1
<i>Python</i> sp.	2
<i>Python spilotes</i>	1
<i>Python oenpelliensis</i>	1
<i>Liasis gilberti</i>	1
<i>Eplapognathus minor</i>	1
<i>Denisonia monachus</i>	1
<i>Drysdalia coronata</i>	1
<i>Demansia olivaceous</i>	2
<i>Demansia psammophis</i>	1
<i>Acanthophis pyrrhus</i>	3
<i>Oxyuranus scutellatus</i>	2
<i>Pseudonaja affinis</i>	2
<i>Pseudonaja modesta</i>	1
<i>Notechis scutatus</i>	15
<i>Gehyra australis</i>	3
<i>Gehyra variegata</i>	41
<i>Gehyra nanus</i>	2
<i>Hemiergus peronii</i>	1
<i>Egernia napoleonis</i>	1

2 500 reptiles were exported to the Australian Museum, Sydney, to be accessed to its collection. They have not been listed.

Amphibians:

<i>Arenophryne rotunda</i>	2
<i>Crinia georgiana</i>	5

Export Interstate (Contd.)

Amphibians (Contd.)

<i>Geocrinia rosea</i>	2
<i>Geocrinia leai</i>	3
<i>Heleioporus eyrei</i>	5
<i>Heleioporus inornatus</i>	5
<i>Heleioporus barycragus</i>	1
<i>Heleioporus psammophilus</i>	4
<i>Heleioporus albopunctatus</i>	4
<i>Litoria cavernicola</i>	1
<i>Litoria cyclorhynchus</i>	2
<i>Litoria adelaidensis</i>	3
<i>Litoria moorei</i>	2
<i>Metracrinia nichollsi</i>	6
<i>Myobatrachus gouldii</i>	5
<i>Neobatrachus centralis</i>	6
<i>Neobatrachus pelobatoides</i>	1
<i>Neobatrachus</i> sp.	18
<i>Pseudophryne occidentalis</i>	3
<i>Ranidella bilingua</i>	5
<i>Ranidella glauerti</i>	35
<i>Ranidella insignifera</i>	30
<i>Ranidella pseudinsignifera</i>	30
<i>Ranidella subinsignifera</i>	15
<i>Uperoleia crassa</i>	4

Insects:

Beetles (<i>Tenebrionidae</i>)	49
Jewel Beetles (<i>Buprestidae</i>)	20

(ii) Import Interstate

Finches:

Plum-headed	39
Gouldian	79
Long-tailed (Blackheart)	14
Blue-faced	30
Black-throated	8
Star	12
Painted	60

Parrots:

Alexandra's (Princess)	12
Blue-Bonnet	3
Budgerygah	120
Cockatiel (Weero)	149
Red-winged	25
Eastern King	10
Hooded	12
Ringneck Parrot	6
Red-rumped	2
Adelaide Rosella	14
Crimson Rosella	35
Eastern Rosella	24
Pale-headed Rosella	23
Varied Lorikeet	8

Import Interstate (Contd.)

Parrots (Contd.)

Scarlet-chested	86
Bourke's	89
Northern Rosella	1
Rainbow Lorikeet	6
Green Rosella	1
Little Corella	578
Galah	1 569
Sulphur-crested Cockatoo	7
Major Mitchell	2
Yellow-tailed Black Cockatoo	2

Other Species:

King Quail	80
Diamond Dove	145
Brown Quail	8
Bar-shouldered Dove	1
Glossy Ibis	8
White-quilled Rock-Pigeon	1
Sooty Oyster-Catcher	1
Hooded Robin	1
Crested Bellbird	1
White-headed Pigeon	3
Peaceful Dove	39
Stubble Quail	9
Wonga Pigeon	5
Painted Quail	5
Squatter Pigeon	4
Spinifex Pigeon	1

Exotics:

Canary	74
Melba Fince	104
Cordon-bleu Finch	120
Aurora Finch	148
Orange-breasted Waxbill	58
Cuban Finch	6
Cut-throat Finch	32
African Firetail	12
Bleeding Heart Pigeon	6
Love Bird	2
Jacarine	26
Red-faced Parrot Finch	58
Alexandrine Parrot	4
Blue-capped Waxbill	8
Siamese Fire-back Pheasant	2
Ostrich	7
Blue-breasted Waxbill	32
Yellow-rumped Finch	12
Scaup Duck	2
Lady Amherst Pheasant	10
Hooded Siskins	3

Mammals:

<i>Macropus eugenii</i>	20
<i>Vombatus ursinus</i>	6

Import Interstate (Contd.)

Mammals (Contd.)

<i>Rattus</i> sp.	6
<i>Macrotis lagotis</i>	2
<i>Ningau</i> sp.	6
<i>Uromys caudimaculatus</i>	3
<i>Notomys alexis</i>	3 (+ 25 skulls)
<i>Notomys mitchellii</i>	3
<i>Pseudomys higginsii</i>	6
<i>Pseudomys australis</i>	3
<i>Pseudomys apodemoides</i>	3
<i>Pseudomys nanus</i>	3
<i>Chalinolobus nigrogriseus</i>	20

Reptiles:

<i>Crocodylus porosus</i>	4
<i>Python oenpelliensis</i>	1
<i>Python spilotes</i>	1
<i>Python</i> sp.	2
<i>Acanthopis pyrrhus</i>	2
<i>Oxyuranus scutellatus</i>	2
<i>Varanus varius</i>	1
<i>Diporiphora</i> sp.	1
<i>Carlia</i> sp.	1
<i>Ctenotus</i> sp.	2
<i>Amphibororus</i> sp.	1

Amphibians:

<i>Ranidella parinsignifera</i>	130
<i>Ranidella signifera</i>	115
<i>Ranidella sloanei</i>	15

(iii) Export Overseas

Birds:

Galah	33
Budgerygah	3
Major Mitchell Cockatoo	4
Sulphur crested Cockatoo	6
Little Corella	4
Long-billed Corella	5
Red-capped Parrot	4
White-tailed Black Cockatoo	4
Splendid Wren	4
Black Duck	24
Cape Barren Goose	2
Laughing Kookaburra	2
Blue-winged Kookaburra	2
Wedge-tailed Eagle	1
Emu	4
Emu Eggs	7
Canary	2

Mammals:

<i>Macropus fuliginosus</i>	4
<i>Aepyprymnus rufescens</i>	2

Export Overseas (Contd.)

Mammals (Contd.)

<i>Cercartetus concinnus</i>	2
<i>Trichosurus vulpecula</i>	2

Reptiles:

<i>Liasis childreni</i>	1
<i>Chilodina oblonga</i>	2

7. LICENSES TO KEEP FAUNA - REGULATION 16

35 issued in the year.

8. EMUS

Licenses to Process Fauna - Regulation 7

3 licenses were issued to process Emu eggshells.

9. FLORA

During the twelve months ending 30 June 1982, the following licenses were issued.

Commercial Purposes License

551 licenses were issued authorising the taking of protected flora for sale from Crown land only.

Commercial Producer's License

118 licenses issued authorising the taking of protected flora for sale from Private land only.

Scientific or Prescribed Purposes License

687 licenses issued authorising the taking of protected flora from Crown land for the following purposes: Scientific, educational, hobby, propagation, personal enjoyment. Holders of this license are not permitted to sell flora taken.

IX LEGISLATION

1. WILDLIFE CONSERVATION ACT AMENDMENTS

No amendment to the Wildlife Conservation Act was made during the period of this Report.

2. WILDLIFE CONSERVATION REGULATION AMENDMENTS

The Wildlife Conservation Regulations were amended to exclude the need for licensing of caged zebra finches and budgerygahs in relation to keeping, sale, commercial dealing and interstate movement. The amendments to exclude the need for licensing those species also applied to the interstate movement of the domestic canary.

Appendix C detailing the licensing classification of avicultural species was amended in Part D by deleting the short-billed form of the White-tailed Black Cockatoo (Carnaby's Cockatoo). The inclusion of the species in Part D had incorrectly indicated that the species was considered rare and in need of special protection.

Fees for licenses required under the legislation were increased for the first time since 1978.

X STAFF

1. ADMINISTRATION

The Wildlife Conservation Act is administered by Mr B.K. Bowen, Director of the Department of Fisheries and Wildlife and Chairman of the Western Australian Wildlife Authority; Mr A.J. Mearns, Secretary and Conservator of Wildlife; Mr D.W. Arnold, Administrative Officer of the Department of Fisheries and Wildlife and Executive Officer of the Western Australian Wildlife Authority; and clerical staff of the Department of Fisheries and Wildlife.

2. ENFORCEMENT

Disposition of Wildlife Officers at 30 June 1982

<u>Perth</u>	Chief Wildlife Officer	B.A. Carmichael
	Supervising Wildlife Officer	A.R. Marshall
	Senior Wildlife Officer	J. Wilson
	Wildlife Officer (Special Invest.)	D. Mell
	Wildlife Officer	P. Counsel
	Wildlife Officer	M. Mahoney
	Wildlife Officer	T. Walley
	Wildlife Officer	R. Gueho
	Wildlife Officer	A. Shields
	Wildlife Officer (Rel.)	G. Hanley
	Wildlife Officer (Rel.)	D. Noble
	Wildlife Officer (Flora)	S.J. Hancocks (B. App. Sc.)
	Wildlife Officer (Flora)	D. Coughran
	Trainee Wildlife Officer	S. Smyth
	Trainee Wildlife Officer	Vacant

Districts

Wyndham	Wildlife Officer	M. Osborn
Karratha	Wildlife Officer	P. Pennings
Carnarvon	Wildlife Officer	K. Marshall
Mt. Magnet	Vacant	
Geraldton	Wildlife Officer	K. Miller
Moora	Wildlife Officer	B. Haberley
Wongan Hills	Wildlife Officer	P. Roberts
Kalgoorlie	Wildlife Officer	P. Collins
Pingelly	Wildlife Officer	L. Silvester
Waroona	Wildlife Officer	R. Fitzgerald
Busselton	Wildlife Officer	P. Lambert
Esperance	Wildlife Officer	I. Cooke
Manjimup	Wildlife Officer	R. Coughran
Albany	Wildlife Officer	R. Smith
Albany	Wildlife Officer	L. Coyne

3. RESEARCH AND RESERVE MANAGEMENT

The Wildlife Research Section comprises eight Research Officers and eight Technical Officers, all of whom are based at the Western Australian Wildlife Research Centre, Woodvale.

The Reserve Management Section comprises five professional Reserve Management Officers, four Reserves Officers and one Technical Officer. Two officers are based at Pingelly, one at Karratha, one at Two Peoples Bay Nature Reserve, one in Perth and the remainder at Woodvale.

During the year the Reserves Officer position at Karratha became vacant and was reclassified to Reserve Management Officer. The position was advertised and a new appointee will take up duties in the near future.

XI EXTENSION AND PUBLICITY

The growth in demand for information material on wildlife conservation, which has been noted in previous reports, continued during 1981-82.

Numerous requests and enquiries are received each day by the Extension and Publicity Office from students, teachers, government departments, businesses and other sectors of the community.

Increased interest in wildlife conservation is reflected in the many additions made to the distribution lists for the department's research publications and the wildlife journal, *SWANS*. These publications are issued to many individuals and organisations in Australia and throughout the world.

Additions to the Department's wildlife conservation publications in 1981-82 were:

- Report 44 Fuller, P. and Burbidge, A.A. (1981) The Birds of Pelsart Island, Western Australia.
- Report 45 Griffin, E.A. and Hopkins, A.J. (1981) The short term effects of brush harvesting on the Kwongan vegetation at Eneabba, Western Australia.
- Report 47 Lane, J.A. and Munro, D.R. (1981) 1980 review of rainfall and wetlands in the south-west of Western Australia.
- Report 49 Rye, B.L. (1982) Geographically restricted plants of southern Western Australia.

Wildlife Research Bulletin No. 10

McKenzie, N.L. (Ed.) (1981) Wildlife of the Edgar Ranges Area, South-West Kimberley, Western Australia.

Western Australian Nature Reserve Management Plans

1. Crook, I.G. and Evans, T. (1981) Moondyne Nature Reserve.
2. Crook, I.G. and Evans, T. (1981) Thomsons Lake Nature Reserve.
3. Crook, I.G. (1981) Nature Reserves of the Shire of Serpentine-Jarrahdale.
5. (DRAFT) Crook, I.G., Williams, A.A. and Chatfield, G.R. (1982) Nature reserves of the Shire of Dandaragan, Volume 1.

Rare Western Australian Plants (leaflets)

1. Caesia (*Eucalyptus caesia*)
2. Green Honeysuckle (*Lambertia rariflora*)
3. Fitzgerald Eremophila (*Eremophila denticulata*)
4. Good's Banksia (*Banksia goodii*)
5. Lesueur Hakea (*Hakea megalosperma*)
6. Mogumber Bell (*Darwinia carnea*)
7. Augusta Kennedia (*Kennedia macrophylla*)
8. Underground Orchid (*Rhizanthella gardneri*)

Four editions of the wildlife journal, *SWANS*, were published during 1981-82 (Vol. 11 nos 2, 3 and 4, Vol. 12 no. 1).

Stocks of leaflets and other information material were reprinted and revised as necessary throughout the year.

Static displays with captioned colour photographs showing native mammals and rare flora species have been prepared. They are available for loan to schools and other interested bodies.

XII FINANCE

1. WILDLIFE CONSERVATION ACT

The demands on the Department to continually expand its involvement in the areas of wildlife conservation, research and enforcement, and the requirement to maintain existing activities, require increasing expenditure each year from the Consolidated Revenue Fund. This trend has continued in 1981-82.

2. WILDLIFE CONSERVATION TRUST FUND

A financial statement as at 30 June 1982 is presented on the following page.

WILDLIFE CONSERVATION TRUST FUND

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED JUNE 30, 1982

		\$	¢
	BALANCE AS AT JULY 1, 1981		66 486.01
ADD	RECEIPTS	\$	¢
	Interest on Investments	8 013.03	
	Flora Licenses	3 979.00	
	Duck Shooters Licenses	21 220.00	
	Quail Shooters Licenses	360.00	
	Gifts, Bequests and Other	124.00	
		<u>33 696.03</u>	
			100 182.04
LESS	PAYMENTS		
	Depth Guage Installations	1 542.49	
	Analysis of Data from Wildlife		
	Pickers Returns	8 000.00	
	Survey of Waterbird Usage		
	of Wetland Nature Reserves	11 000.00	
		<u>20 542.49</u>	
	BALANCE AS AT JUNE 30, 1982		<u><u>79 639.55</u></u>

B. Bowen

Director
DEPARTMENT OF FISHERIES AND WILDLIFE

WILDLIFE CONSERVATION TRUST FUND

The accounts of the Wildlife Conservation Trust Fund have been audited for the period July 1, 1981 to June 30, 1982 and were found to be in order.

W.F. Rolston
W.F. ROLSTON
AUDITOR GENERAL