

REVISED DRAFT MANAGEMENT PLAN

number 1

'Avon Valley' Nature Reserve No. 30191

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PERTH
1980



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"AVON VALLEY" NATURE RESERVE
(CLASS A RESERVE No. 30191)

BY
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1980

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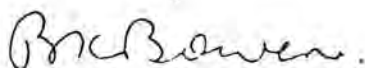
PREFACE

Class A Reserve No. 30191, known unofficially as the "Avon Valley" Nature Reserve is one of over one thousand Nature Reserves set aside in Western Australia to perpetuate areas of natural and semi-natural vegetation and their associated fauna.

The Reserve, which it is proposed to name "Moondyne Nature Reserve", has two features which single it out for special attention: it is the only Nature Reserve of significant size in the northern Jarrah forest and it is one of a select few within an easy reach of the population of the Perth Metropolitan area. These "Metropolitan" Nature Reserves are used by an increasing number of people as interest grows in natural areas and their conservation. The ability of the Metropolitan Reserves to meet this demand effectively and without environmental cost will depend on good management.

This Revised Draft Management Plan is based on "Draft Management Plan No. 1 - 'Avon Valley' Nature Reserve No. 30191" published earlier this year and which was made available for public comment for two months. Nineteen written submissions were received as well as a number of oral ones, and the Revised Draft Management Plan takes account of this extremely valuable input by Government Departments, Local Authorities, clubs and private individuals.

This plan will now be submitted to the Western Australian Wildlife Authority, and, if endorsed by the Authority, to the Hon. Minister for Fisheries and Wildlife for his approval as the working plan for the Reserve.



B.K. BOWEN

Director
Department of Fisheries and Wildlife,
July 1980.

CONTENTS

	Page
ACKNOWLEDGEMENTS	4
THE RESERVE	5
1. INTRODUCTION AND HISTORY OF THE RESERVE	8
2. TOPOGRAPHY SOILS AND VEGETATION	9
3. NATURE CONSERVATION VALUES	14
4. PAST MANAGEMENT AND FIRE HISTORY	14
5. MANAGEMENT OBJECTIVES	16
6. MANAGEMENT - FIRE PROTECTION	17
7. MANAGEMENT - DISEASE AND PEST CONTROL	22
8. MANAGEMENT - PUBLIC USE	22
9. MANAGEMENT - RESEARCH	25
10. MANAGEMENT - GENERAL	26

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Submissions to the first draft of this Plan were received from the Conservator of Forests; the Director, Department of Conservation and Environment; the Director, National Parks Authority; the Chief Executive Officer, Agriculture Protection Board; the Superintendent, Bush Fires Board; the Shires of Toodyay, Chittering and Swan; the Institute of Foresters; the Toodyay Naturalists' Club; the Tree Society; the Western Walking Club; the Bushwalkers of Western Australia; the Native Animal and Bird Rehabilitation Association; Dr P. Bridgewater, Murdoch University; Mr C.S.C. Clements; Mr K. Edwards, Moondyne Pastoral Company; Dr J. Fox, Western Australian Institute of Technology and Dr J. Majer, Western Australian Institute of Technology. These submissions included many helpful criticisms and suggestions, a number of which have been incorporated in this Revised draft.

THE RESERVE

Class A* Reserve no. 30191 (1991 ha) is the principal Nature Reserve in the central, higher rainfall (800-1400 mm/yr) area of the Darling Range between Chittering in the north and Mt. Cooke in the south (Fig. 1).

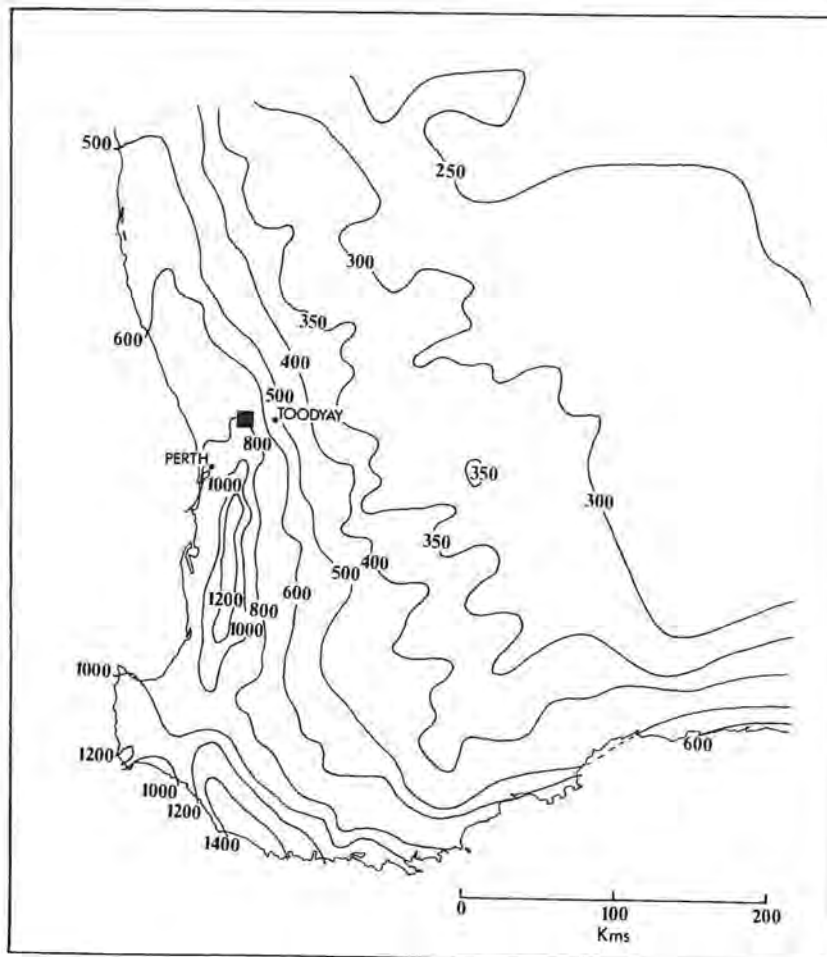


Figure 1. Rainfall map of southwestern Australia (after the Average Annual Rainfall Map of W.A. Based on complete Records to 1979. Department of Science, Bureau of Meteorology 1980) showing location of Nature Reserve A30191 (■).

* Class "A" in terms of the Land Act 1933.

The Reserve lies about the junction of Plunkett and Sapper Roads ($31^{\circ}35'S$, $113^{\circ}16'W$) north of the Avon River and Bald Hill and about 13 km east of Lower Chittering. It is bounded to the north and east by freehold farmlands mainly under cereal crops, pasture and some citrus orchards, to the south by the Avon Valley National Park (A30192) and to the west by Crown land covering mineral tenements held by Pacminex Ltd., representing a bauxite resource for a proposed smelter in the Perth area (Fig. 2).

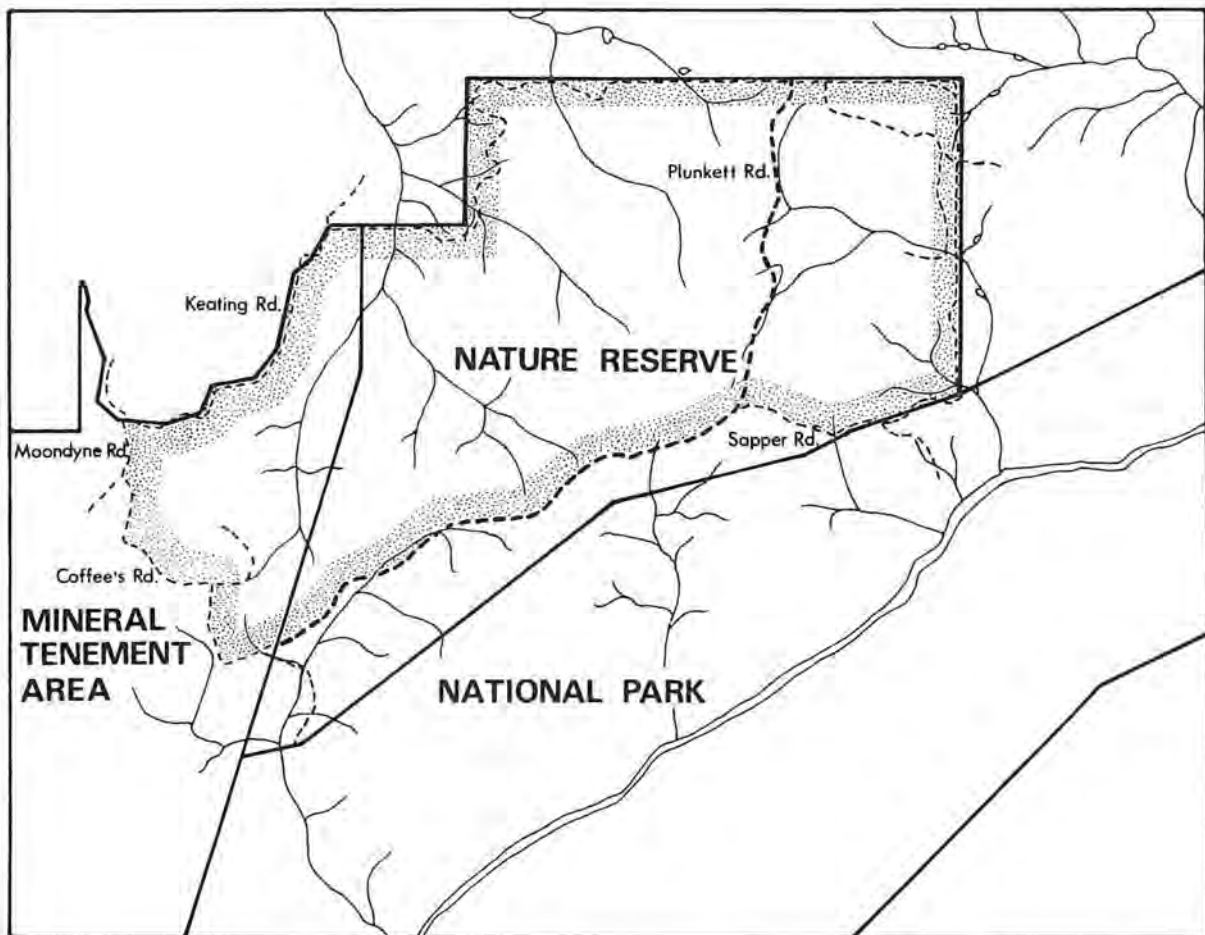


Figure 2. The "Avon Valley" Nature Reserve (solid black lines) and the "Nature Reserve Management Unit" of the Avon Region 2 Fire Protection Plan (stippled border) showing tracks and roads (dashed lines).

The Reserve lies on a gently sloping plateau 275 m - 300 m a.s.l. immediately north of the Avon River Valley, the sides of which here are steeply sloping, falling some 200 m in about 3 km, almost entirely within the bounds of the National Park.

The Reserve is thus representative of the uplands of the Darling Range in this region, the soils being principally lateritic gravels and loams with some sandy loams, particularly in the east, and the vegetation is predominantly open forest with Jarrah (*Eucalyptus marginata*), Marri (*E. calophylla*), Powderbark Wandoo (*E. accedens*) and Wandoo (*E. wandoo*) being the main tree species represented.

1. INTRODUCTION AND HISTORY OF THE RESERVE

The land now occupied by the Reserve, the Avon Valley National Park, Reserve A30193 (a timber reserve vested in the Conservator of Forests) and the mineral tenement area west of the Reserve (totalling 34 526 acres (13 970 ha) was previously a single block of Commonwealth land*, once a military training area.

In 1965 representations were made by the then Chief Secretary and MLA for Toodyay to the Minister of Lands suggesting that the military training area, which was then disused, be acquired from the Commonwealth for the purpose of establishing a National Park and Fauna Reserve (J.F. Craig (1965) *in litt.*).

During subsequent negotiations further representations were made by members of the public, some to the Department of Fisheries and Wildlife, pointing out the values of the area as a potential reserve for flora and fauna.

One of these representations contained a list of wildlife, which included the dalgyte (*Macrotis lagotis*), a marsupial once common throughout the agricultural areas of the State but now very rare and possibly extinct in the south-west.** As a consequence the Director expressed the Department's interest in the area to the Under Secretary for Lands.

It was mooted that the area then proposed as National Park could be extended to take in all the Crown land that would be available by declaring that part north of the proposed National Park a Nature Reserve.

Acquisition of the land and its subdivision was completed in 1970 with the gazetting of the National Park and Timber and Nature Reserves; and this Department later co-operated with the Forests Department, the National Parks Authority and Bush Fires Board in the production of a joint Fire Protection Scheme for the area as a whole (Avon Region 2 Fire Protection Plan).

This called for new construction and upgrading of roads and tracks throughout the Reserve complex and a programme of prescribed burning. The extended six year interval covered by the plan ended at the end of the Financial Year 1978-79.

*The present Reserve complex also includes an earlier water reserve (no.2154) adjacent to the original block of Commonwealth land.

**The report of dalgytes from this area has never been confirmed. They were quite common around Northam in 1926 but suffered a massive decline throughout the Agricultural areas shortly thereafter (Jenkins, C.F.H. 1974. W.A. Naturalist 12 : 169-172.

The present management plan is intended to supplement the revised Avon Region 2 Fire Protection Plan which came into operation on July 1, 1979. It also extends the principle of integrated management established in the Avon Region 2 Fire Protection Plan to facets of National Park and Nature Reserve Management other than fire protection and aims to ensure that nature conservation values of the Reserve are maintained and enhanced in the future.

2. TOPOGRAPHY SOILS AND VEGETATION

The Nature Reserve is part of a south-west leading ridge of the Darling Range separating the Avon and Brockman River Valleys. The Reserve is mainly a series of gently sloping ridges and gullies covering the heads of two catchments - one draining north and west into the Brockman River Valley and the other south and east into the Avon, the watershed lying north and west of Plunkett Road (Fig. 2). The southern part of the Reserve also contains limited areas of more steeply sloping land, being the upper slopes of the Avon River Valley.

The soils are predominantly exposed lateritic gravels and loams with some sandy loams. In the south-eastern corner, on the more steeply sloping edge of the Avon River Valley, outcrops of granite are partly covered by red loams.

The main vegetation formations found on the Reserve (Fig. 3) are open Jarrah/Marri forests (Fig. 4) and open forests of Powderbark Wandoo with varying amounts of Jarrah and Marri (Fig. 5). The predominantly Jarrah forest covers most of the main ridge system and the south-facing slopes, Powderbark Wandoo being mostly on the north and north-west slopes. Less extensive are areas of open Wandoo forest (Fig. 6) and *Acacia acuminata*/*Casuarina huegiana* woodland (Fig. 7) in the eastern part of the Reserve. In all cases the forests have been cut-over for Jarrah and Wandoo sawlogs.

The understoreys of the forest associations are generally of low shrubs, averaging 0.5-1.0 m in height, and sparse in density, consisting of species such as *Grevillea bipinnatifida*, *Leptospermum erubescens*, *Dryandra nivea*, *Adenanthos barbigera*, *Petrophyle* sp and *Hibbertia* spp. with varying amounts of eucalypt regeneration, *Xanthorrhoea* and *Macrozamia* palms (Figs. 4-7).

Of particular interest, also, are a number of populations of *Conostylis* species: *C. androstemma*, *C. caricina* and *C. setosa*. Those of the first two species are especially large and dense and ideally suited for research purposes. The third is endemic to the Darling Range and contributes substantially to the biological values of the Reserve.

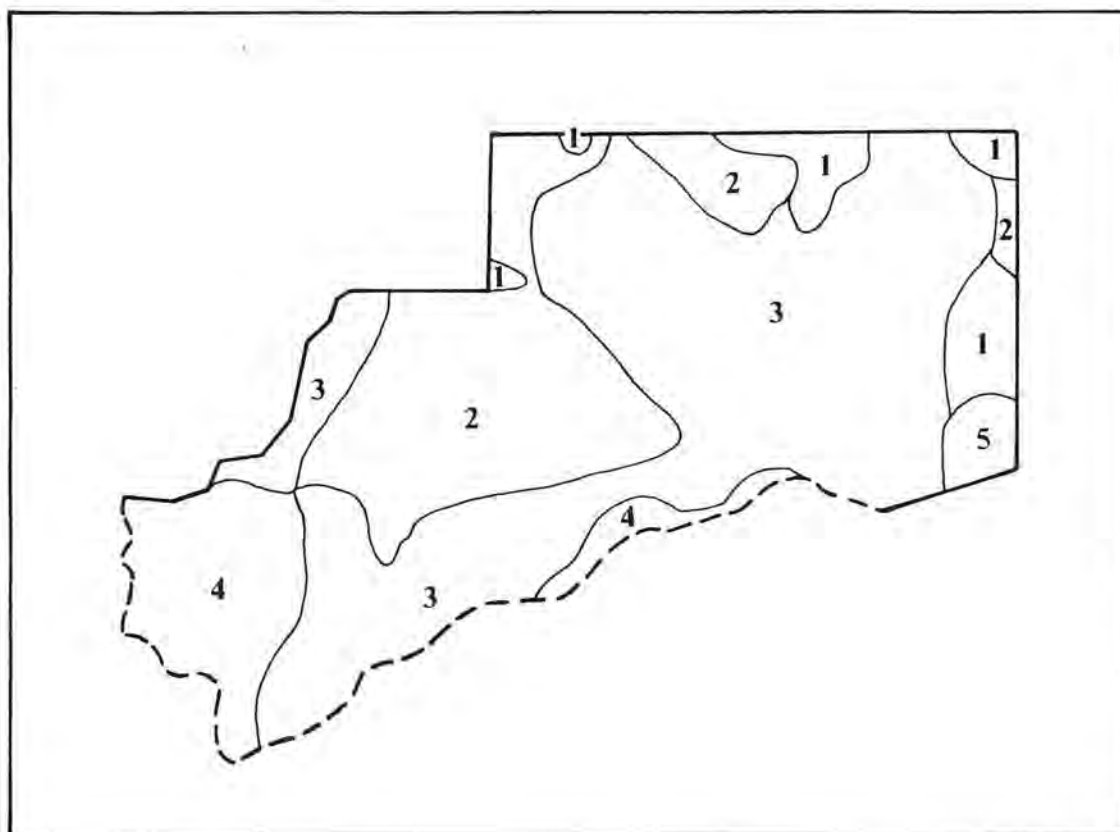


Figure 3. Vegetation of the "Nature Reserve" management unit. 1. Wandoo forest; 2. Predominantly Powderbark Wandoo forest; 3. Jarrah/Marri forest with dwarf shrub understorey; 4. Jarrah/Marri forest with *Dryandra/Banksia* understorey; 5. *Acacia acuminata/Casuarina huegliana* woodland.



Figure 4. Open forest of Jarrah and Marri with dwarf shrub understorey.



Figure 5. Open forest of Powderbark Wandoo.



Figure 6. Open Wandoo forest.



Figure 7. *Acacia acuminata*/*Casuarina huegliana* woodland.



Figure 8. Open forest of Jarrah and Marri with denser understorey of *Dryandra sessilis* and *Banksia grandis*.



Figure 9. Open forest of river gums - (*Eucalyptus camaldulensis*/*E. rudis* hybrids).

3. NATURE CONSERVATION VALUES

The landforms and vegetation of the Nature Reserve are partially representative of the mid-northern part of the Darling scarp, and the presence of plants such as *Conostylis setosa* indicates that the Reserve may be a significant refuge for some of the large number of species endemic to the region. Being situated near the northern limit of the forested part of the Range the Reserve is also likely to support species more characteristic of the northern sand-heaths and woodlands. The population of probable *Eucalyptus camaldulensis/rudis* hybrids is a subject of further study, and, as closer examination continues, there seems little doubt that such a relatively large area of northern Jarrah forest will be found to contain other similarly valuable features.

Mainly covering the upland area, however, all the landforms, soils and vegetation present in the Avon reserve complex as a whole are not well represented in the Nature Reserve. It may also lack a permanent water supply. It should therefore continue to be considered as part of a larger unit and management of the Nature Reserve should continue to recognise the integrity of the area as a whole.

Being close to Perth and adjacent to the Avon Valley National Park the Nature Reserve has considerable potential for public use. There is no focus for purely recreational activity in the Reserve to match the Avon River which winds its way through the National Park. However, the wildflowers and rich birdlife of the Reserve are centres of interest to naturalists and enhance the potential of such a large area of diverse forest and woodland vegetation so near to Perth for development for environmental education purposes. These potential values neatly complement recreational opportunities offered in the National Park. The Reserve also provides an area in which to study the effects of fire control measures involving prescribed burning rotations possibly longer than those practiced in forests managed for timber production. Populations of *Conostylis* and hybrid *Eucalyptus* species also have substantial research interest.

4. PAST MANAGEMENT AND FIRE HISTORY

The main management impetus for the Reserve during the past six years has been provided by the Avon Region Fire Protection Plan 1973-78. This divided the Crown land area of which the Reserve is a part into five management units for fire protection purposes. These are partly independent of statutory boundaries. It also allowed for improvements to access, completion of further roading of the management units, and it established cycles of prescription burning of three to seven years length in all areas covered by the Plan. Figure 2 shows how a management unit under the Plan covers most of

the Reserve plus part of the Crown land to the west of the lines of Moondyne and Coffee's Roads. This will be referred to as the "Nature Reserve" management unit.

4.1. TRACKS AND ROADS ON THE NATURE RESERVE

During the currency of the 1973-78 plan new roads were built around the northern and eastern boundaries, joining with existing roads (Sapper, Plunkett, Coffee's and Moondyne Roads) to complete a system of peripheral roads for the "Nature Reserve" management unit (Fig. 2).

In addition to the peripheral roads one north-south access route (Plunkett Road) has been maintained.

All these roads have been built and maintained to a very high standard, and problems of mis-use of the Reserve have increased with its accessibility and as a direct result of the standard of roads constructed. Increasing use of roads for speed sections of motor car rallies and for motor-cycle and off-road vehicle sporting events presents a special problem on this Reserve. Other management problems related to improved access are also apparent on the Reserve, including rubbish-dumping and illegal shooting, and the possibility of uncontrolled access increasing the risk of fire in this very vulnerable area cannot be disregarded.

4.2. FIRE HISTORY

In February 1972 a serious wildfire burnt some of the northern slopes of the Avon River Valley and the Crown land under mineral tenements to the west of the Reserve. The fire was moving in a north-west direction and a fire team from the Department prevented it from seriously damaging the Reserve by back-burning from Sapper/Plunkett Roads. The fire spread westward, through the Crown land area and affected some private holdings. It was directly as a result of this fire that the first Avon Region Fire Protection Plan was formulated and put into effect.

Since 1972 several smaller fires, the latest one in 1977, have started near the River or the railway line at the bottom of the Avon Valley and have burned up the same northern slope under prevailing wind conditions. All these fires have been stopped on the scarp itself.

During the late summer of 1978, during Cyclone "Alby", a fire entered Crown land and the extreme north-western corner of the Nature Reserve from the north-west. This fire was extinguished after having burnt over some 60 ha of Jarrah/Marri forest, an area including two spot fires which started ahead of the main fire front on the north-west slopes of the main ridge system.

Fire units from the Department attended each of these fires.

In addition, the whole "Nature Reserve" management unit set up under the Fire Protection Plan was burned during the Spring of 1975 as part of the prescribed burning programme.

5. MANAGEMENT OBJECTIVES

5.1. PROTECTION OF NATURE CONSERVATION VALUES

The objective of first priority under this Plan will be to maintain and enhance the nature conservation values of the Reserve. Management provisions for this purpose will include the following:

5.1.1. Protection from Fire

Consistent with the need to protect the assets of adjacent landholders, to take such measures as may be necessary, including prescribed burning, to prevent and control the intensity of such accidental fires as may occur on the Reserve.

5.1.2. Fire Suppression

To suppress such accidental fires as may occur on the Reserve.

5.1.3. Protection from Pests and Disease: *Phytophthora cinnamomi*.

To protect vegetation on the Reserve from damage as a result of infection with the root-rot fungus *Phytophthora cinnamomi*, taking such measures as may be necessary to prevent introduction of the fungus and to limit its spread should it be isolated from the Reserve.

5.1.4. Protection from Pests and Disease: Animal and Weed Control

To protect the Reserve and surrounding farmlands from damage as a result of infestation with such animals and plants as may be declared from time to time under the provisions of the Agriculture and Related Resources Protection Act.

5.1.5. Prevention of Mis-use

To take such measures as may be necessary to curtail mis-use of the Reserve, particularly rubbish dumping and the use of roads and tracks on the Reserve for purposes not in keeping with the status of the site as a Nature Reserve.

5.2. USE OF THE RESERVE

The objective of second priority under this Plan will be to encourage the proper use of the Reserve for educational, research and "amenity" purposes.

5.2.1. Research

To encourage research of a non-destructive nature which may increase knowledge of the Reserve, its flora and fauna and forest ecosystems generally, and which can be executed without affecting use of the Reserve for education or "amenity" purposes.

5.2.2. Public Use

To encourage use of the Reserve for environmental education purposes and to permit certain recreational activities which are consistent with management for perpetuation of the biological values of the Reserve.

6. MANAGEMENT - FIRE PROTECTION

Fire protection measures for the Reserve will include programmes of prescribed burning and maintenance of access to the Nature Reserve, these programmes to complement or replace provisions of the Avon Region 2 Fire Protection Plan.

6.1. PRESCRIBED BURNING

The "Nature Reserve" management unit delineated in the Avon Region 2 Fire Protection Plan will be maintained as a management unit for prescribed burning purposes.

Prescribed burning will be carried out under the supervision of the Department of Fisheries and Wildlife in consultation with officers of the Bush Fires Board.

The small part of the Nature Reserve outside the management unit will continue to be managed under the Avon Region 2 Fire Protection Plan for fire control purposes.

6.1.1. Prescribed Burning Intervals

Estimates of fuel loadings on the Nature Reserve using the method of Sneeuwjagt, R.J. (1973) ("Measuring Forest fuels" : Forests Department Research Paper No. 9) show that rates of fuel accumulation on the Nature Reserve are less than projected in the Avon Region 2 Fire Protection Plan.

Nine fuel assessment transects made in July 1979 in Jarrah/Marri, Powderbark/Jarrah/Marri and Wandoo forest types with typical understoreys gave a mean fuel loading of 4.5 ± 2.1 (SD) tonnes/ha for an all-foliage consuming burn (Table 1). The last prescribed fire in the area was in Spring 1975 and we estimate that fuel loadings will not reach the safe ceiling of 8-10 tonnes/ha prescribed under the Avon Region 2 Fire Protection Plan in less than ten years.

TABLE 1. FOREST FUEL QUANTITY

SITE NO.	FOREST TYPE	TOTAL FUEL [*] (Tonnes/ha)
1	Wandoo over dwarf shrubs	3.3
2	Wandoo over dwarf shrubs	3.2
3	Wandoo over dwarf shrubs	2.9
4	Jarrah/Marri over dwarf shrubs	2.8
5	Jarrah/Marri over dwarf shrubs	3.9
6	Jarrah/Marri over dwarf shrubs	3.3
7	Jarrah/Marri - <i>Dryandra sessilis</i>	6.7
8	Jarrah/Marri - <i>Banksia/Dryandra</i>	5.5
9	Jarrah/Marri - <i>Banksia/Dryandra</i>	8.8

* Total litter weight plus total scrub weight.

The estimates further show that fuel accumulation is higher in areas of Jarrah/Marri forest with *Banksia grandis* and *Dryandra sessilis* understoreys. This is a minor vegetation type in the "Nature Reserve" Management Unit (Fig. 3), the largest area being in the mineral tenement area near the western boundary. This area will probably require burning at more frequent intervals than the remainder of the management unit. The burning prescription will therefore make provision for

the isolation and separate treatment of this area.

6.1.2. The Burning Prescription

The object of the burning prescription will be to contain fuel levels on the Nature Reserve, bearing in mind the detrimental effects too frequent prescribed burning may have on the biological values of the Reserve. Fuel levels at which fuel reduction burning shall be prescribed will be determined from time to time by the Director of Fisheries and Wildlife after consultation with the Bush Fires Board, the authority co-ordinating the Avon Region 2 Fire Protection Plan. Initially fuel levels at which burning will be prescribed will be those set under the present terms of the Avon Region 2 Fire Protection Plan, i.e. when average levels reach 8-10 tonnes of litter and shrub layer fuel/ha.

Provision shall be made under this Plan for separate burning prescriptions for different types of vegetation. Initially the area of Jarrah/Marri forest with *Banksia/Dryandra* understorey previously mentioned (Area 1 of Fig. 10) will be isolated from the remainder of the Management Unit by a 3m wide firebreak and hand-burned by the Department of Fisheries and Wildlife during the spring or autumn of the year following accumulation of 8-10 tonnes/ha of litter and shrub layer fuel. It is not considered necessary to similarly isolate the narrow strip of the same vegetation type along the southern boundary of the Nature Reserve Management Unit. This is an isolated patch and surrounded by vegetation with lower fuel loadings.

The main part of the Management Unit (Area 2 of Fig. 10) will be burnt by aerial techniques by the Department of Fisheries and Wildlife in co-operation with officers of the Bush Fires Board as part of the Avon Region 2 Fire Protection Plan. The area concerned will initially be divided into two parts (Area 2a and 2b of Fig. 10) along the line of Plunkett Road. Fuel levels will be determined in each area separately, and burning will be programmed for the spring of the year or the autumn of the year following accumulation of 8-10 tonnes/ha of litter and shrub layer fuel. The burning prescription for the main part of the Management Unit will aim at burning between 70 and 80 percent of the vegetation in the area outside of any experimental "fire-free" zones which may be set up as part of the research programme for the Reserve (see Section 9 "Management - Research"). Burning

rotations will, in addition, be programmed in such a way that the maximum practicable interval is maintained between the burning of Area 2a and 2b.

Provision will be maintained under the terms of this Plan to further subdivide the area for prescribed burning purposes as resources become available to further refine fire protection management of the Reserve.

The narrow strip of the Reserve between the northern access track and the northern boundary will be burnt by hand during the spring of 1980 or the autumn of 1981. The object of this burning will be to protect the fences on private land around this part of the boundary. This northern fringe was apparently not burnt during the 1975 prescribed burn. Further burning of this fringe will be programmed as required to maintain fuel loadings at acceptable levels.

Volunteer Bush Fire Brigades in the region will be invited to assist in all burning operations on the Reserve on an *ex gratia* basis.

6.2. TRACKS AND ROADS

The Avon Region 2 Fire Protection Plan allows two levels of access on the "Nature Reserve" Management Unit on roads built or upgraded for the purpose (Fig. 2), *viz*:

- A main access along Plunkett Road adequate to carry heavy earthmoving equipment transporters, and
- Secondary tracks to provide access for fire fighting units.

Under this Plan the Department of Fisheries and Wildlife will assume responsibility for all maintenance of roads on the Nature Reserve. Roads will be maintained to standards adequate for the purposes stated above. As with the provisions for prescribed burning in this Plan close liaison will be maintained with the Bush Fires Board, co-ordinating authority for the Avon Region 2 Fire Protection Plan, concerning road maintenance specifications. Standards for maintenance will be set from time to time by the Director of Fisheries and Wildlife as a result of these consultations.

6.3. FIRE SUPPRESSION

The Department of Fisheries and Wildlife maintains two medium (1100 - 2000 l capacity) and two light (650 l capacity) fire fighting units at the Wildlife Research Centre, Wanneroo.

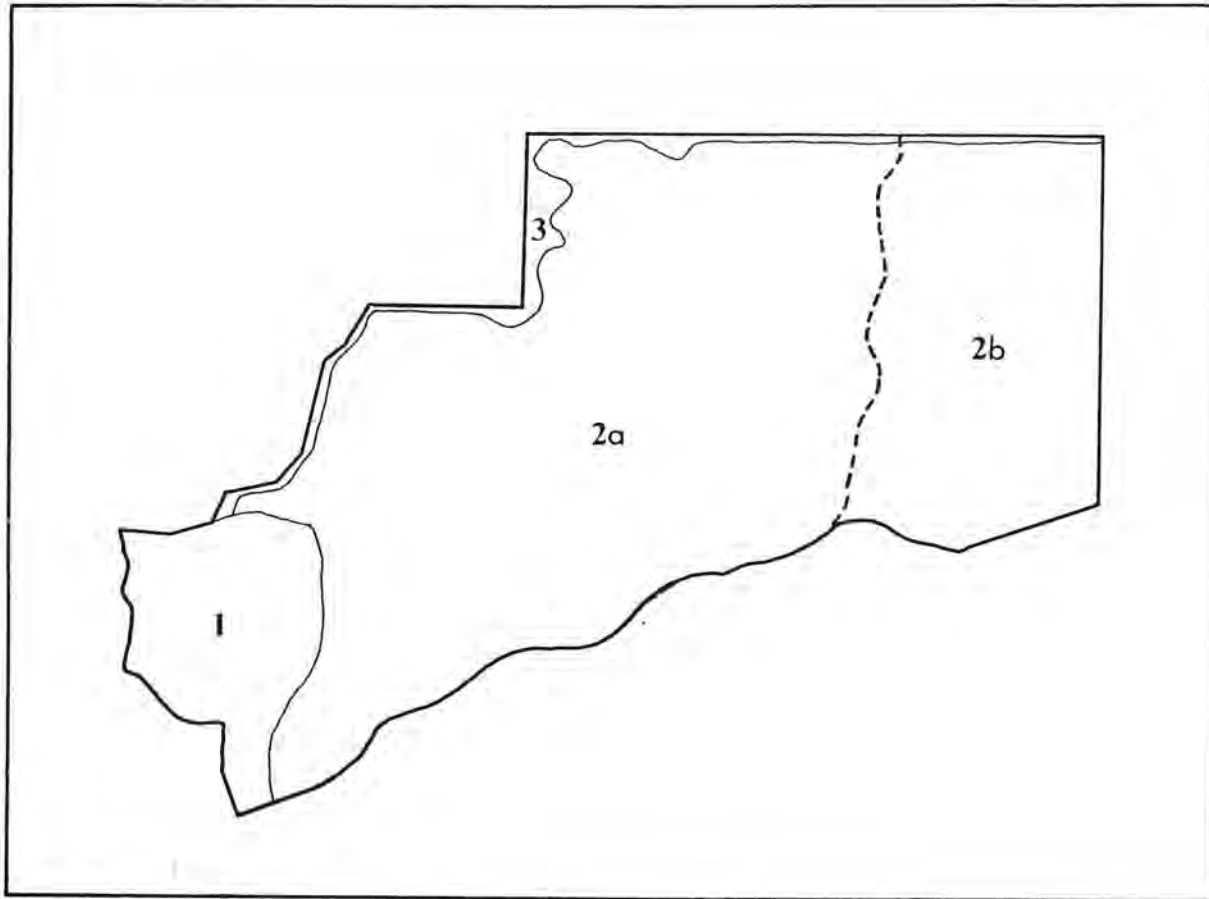


Figure 10. Prescribed burning areas for the Nature Reserve Management Unit of the Avon Region 2 Fire Protection Plan. Area 1 : "High fuel" area with dense *Dryandra/Banksia* understoreys. Area 2 : "Low fuel" area with dwarf shrub understoreys divided along the line of Plunkett Road to form two compartments for prescribed burning purposes. Area 3 : Northern fringe.

These units form part of the fire-suppression strength of the Avon Region 2 Fire protection Plan and will attend all fires on the "Avon Valley" Nature Reserve. If available units will also attend fires in the vicinity of the Nature Reserve, both on private and Crown lands.

Fire notification will be through the provisions of the Avon Region 2 Fire Protection Plan and through fire notification contacts established for the Nature Reserve to supplement the Avon Region 2 Fire Protection Plan.

7. MANAGEMENT - DISEASE AND PEST CONTROL

7.1. PHYTOPHTHORA CINNAMOMI CONTROL

Steps will be taken under the provisions of this Plan to check the Reserve periodically for presence of *Phytophthora cinnamomi* infection by monitoring the death of susceptible plant species.

Forest hygiene measures as detailed in the Forests Department "Dieback Hygiene Manual" shall be routinely applied to movement of vehicles, washing down earthmoving equipment, road maintenance and other management procedures carried out on the Reserve. The object of these measures will be to minimise the risk of introducing the pathogen.

This Plan includes provision for the Director of Fisheries and Wildlife to take such remedial measures as he may see fit should the pathogen be isolated from the Reserve.

7.2. CONTROL OF PEST PLANTS AND ANIMALS

Control of declared pest plants and animals may be necessary from time to time to protect fauna and flora and the environment of the Reserve generally, and as part of organised control of vertebrate pests or various weeds conducted in the vicinity of the Reserve.

Such arrangements as may be necessary in respect of organised pest control action shall be made by consultation and co-operation between the Agriculture Protection Board and the Department of Fisheries and Wildlife.

7.3. ADEQUACY OF CONTROL MEASURES

Owners of land in the vicinity of the Reserve are invited to draw the attention of the Director of the Department of Fisheries and Wildlife to what they consider to be inadequacies of control of pest plants and animals on the Reserve. On receipt of such a complaint the Director may organise a joint inspection of the problem or take such other action as may be necessary to remedy the situation.

8. MANAGEMENT - PUBLIC USE

8.1. SUMMARY OF RATIONALE

The "Avon Valley" Nature Reserve is about 60 km from Perth and is the major Nature Reserve in the forested

part of the Darling Range. The unofficial name "Avon Valley" is, however, somewhat misleading. The Reserve is topographically distinct from the Valley system, being part of the relatively undissected plateau of the Darling Range. It contains few scenic attractions and no focus for recreational activity comparable with the nearby Avon River. There are no firmly established patterns of use which might constrain development along particular lines.

The Reserve supports a diverse and abundant flora and fauna which is typical of the area but which includes a number of plants endemic to the region and species of scientific interest.

The Reserve therefore presents considerable potential for development for environmental education purposes while allowing a range of opportunities for research and some specialised forms of recreation (such as bushwalking). These uses have the further attribute of complementing the developing use of National Parks, State Forests and Timber Reserves in the region. The other Reserves and Crown lands in the vicinity provide opportunities for a wide range of active and passive recreational activities which it is not necessary or desirable to duplicate in the Nature Reserve.

8.2. CLASSIFICATION (SECTION 12A WILDLIFE CONSERVATION ACT)

That part of the Nature Reserve north of Plunkett Road to its junction with Sapper Road, from that point along Sapper Road to its junction with the road leading to the Avon River near the eastern boundary of the Reserve and finally following the southern boundary to the south-eastern corner of the Reserve shall be declared a Limited Access Area under Section 12A(2) of the Wildlife Conservation Act. The boundaries of the Limited Access Area are shown in Fig. 11.

This means that all the Nature Reserve inside the stipled boundaries shown in Figure 11 will be accessible to the public on foot but not in vehicles of any kind.

Permits will be granted for vehicular access under Regulation 48(2) of the Wildlife Conservation Regulations to people such as Reserve neighbours for access and volunteer Bush Fire Brigades in the course of fire protection operations. Permits may also be granted to members of the public, naturalists' clubs, research scientists and students who wish to use the Reserve for educational or study purposes.

8.3. FENCES, GATES AND SIGNS TO BE ERECTED

Gates and fences will be erected at the points shown in Figure 11, i.e. at the Keating Road (north-western) and

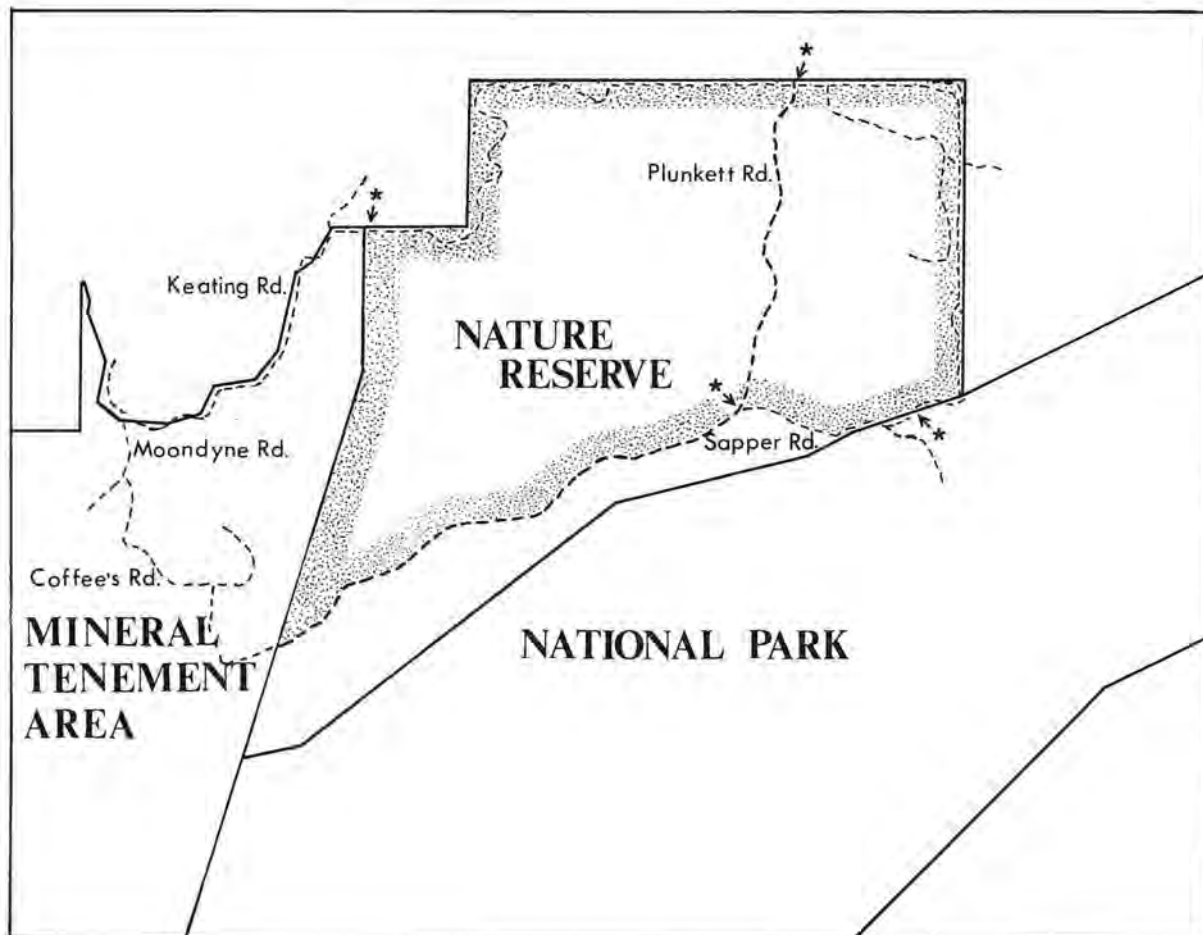


Figure 11. The proposed Limited Access Area within the Nature Reserve, showing the location of gates (⇐⇒) and lengths of fencing. Note that vehicular access to the north bank of the Avon River is not impeded.

Plunkett Road (northern) entrances of the Reserve, across Plunkett Road at the junction with Sapper Road and across the south boundary road at its junction with Sapper Road, so delineating the Limited Access Area. The gates at each end of Plunkett Road will provide a wide enough opening for the passage of a bulldozer on a transporter as required for fire protection purposes under the Avon Region 2 Fire Protection Plan. Signs will be erected at these points and in such other places as may be required giving the name of the Reserve and the nature of limitations to access.

8.4. CAMPING AREA AND LICENSES

A camping site for use by bushwalkers will be defined near the south-eastern corner of the Reserve in the vicinity of the freshwater spring in that area, and licenses will be issued by the Department permitting bushwalkers to camp on the Reserve on a number of occasions for no more than two successive nights on each occasion throughout the period May to October inclusive. The Director of Fisheries and Wildlife may limit the number of camping licenses issued for any one night or over any period according to his own discretion. Camping licenses will not be issued to persons gaining access to the Reserve by vehicle.

In all other respects public use will be controlled as per Regulation 46 of the Wildlife Conservation Regulations. During the currency of this Plan public use of the Reserve will be encouraged within the constraints of access and permitted use outlined above. The Department of Fisheries and Wildlife will, however, oversee the development and evolution of the use of the Reserve during this period, and the Director may, with the approval of the Chairman of the Wildlife Authority, take such further measures, regulatory or otherwise, which may become necessary to control public use and otherwise properly promote the stated objectives of management of the Reserve.

A booklet guide to the Reserve will be published containing location maps and a 1:25 000 scale topographic map of the Reserve for the use of bushwalkers. The guide will include information on the vegetation of the Reserve, lists and, where appropriate, details of the distribution of particular species and such other information as may be useful as resource material for environmental education purposes.

The information concerning the detailed biological features on which this publication is to be based will derive from surveys of the biota of the Reserve allowed for in Section 9 of this Plan.

9. MANAGEMENT - RESEARCH

The Department of Fisheries and Wildlife may let contracts for research on the flora and fauna of the Reserve and the ecology of the forest in relation to fire protection management.

As one preliminary step provision will be made for a further survey of the vegetation and fauna and a study of the distribution of plants on the Reserve, particularly of those restricted to the region and of those which are found only on the Darling Scarp and Plateau.

A further aim of this survey will be to delineate areas in major vegetation types which can be retained free of fire for extended periods. These "fire-free" areas will be isolated as necessary by cleared firebreaks and will provide the basis for comparative studies of the vegetation and flora under differing fire regimes.

10. MANAGEMENT - GENERAL

10.1. TERM OF THE PLAN

Unless otherwise superseded the term of this Plan will be 10 years, but its provisions will be effected as soon as possible following its approval by the Minister of Fisheries and Wildlife as a "working plan" under the Provisions of the Wildlife Conservation Act.

10.2. NAMING

Bearing in mind that the Reserve is largely outside the Avon Valley the name "Moondyne Nature Reserve" will be recommended to the Nomenclature Advisory Committee for gazettal as the official name of the Reserve.

10.3. OTHER PROVISIONS

During the currency of this Plan the Department of Fisheries and Wildlife may, with the approval of the Chairman of the Western Australian Wildlife Authority, undertake any other work or research or institute any other provisions for management which may become necessary to properly promote the objectives of management stated in Section 5 of this Plan.