LAND USE MANAGEMENT PLAN FOR DRYANDRA FOREST

FOREST DEPARTMENT, W.A.

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DRAFT MANAGEMENT PLAN FOR THE DRYANDRA FOREST

CONTENTS

CONTENTS PAGE NO.

INTRODUCTION

Objectives

This management plan examines environmental features, current land uses and management constraints for the Dryandra Forest. Using this information the objective is to allocate land use priorities to particular areas and develop guidelines for ongoing management. Management strategies are derived in accordance with the Forests Department's multiple land use policy (G.W.P. No. 87 of 1982).

History

The Dryandra Forest is one of the few remnants of the original wheatbelt vegetation found in the Narrogin District of the south west of Western Australia. The forest is isolated from the main south west forest belt. It is made up of discontinuous blocks totalling approximately 28,000 ha.

The forest is predominantly Wandoo (E.wandoo) woodland with occurrences of Brown Mallet (E.astringens). There are also open areas of woodland with Powderbark Wandoo (E.accedens), Marri (E.calophylla) and Jarrah (E.marginata).

Early this century when vast areas of the wheatbelt were being developed for agriculture the Dryandra Forest and similar areas were unattractive to clear because they contained a lot of high ground unsuitable for agriculture. This high ground generally contained rocky breakaways, poorer soils and had heavy infestations of plants poisonous to stock (Gastrolobium species). These areas also contained stands of Mallet and in particular Brown Mallet.

In this period Mallet Bark was exported as part of a thriving tannin industry and provided a valuable source of income to those developing the land. As a result vast tracts of Mallet were stripped for their bark to the extent that the future of the industry was threatened. In particular the Brown Mallet was exploited because of its superior tannin content and its tendancy to grow in pure stands.

In 1924 the Forests Department recognized that over-exploitation of the Mallet resource was rife and took steps to control the stripping of Mallet bark from areas of crown land reserved for Mallet production. A plantation scheme was initiated to extend the range of mallet, to ensure the supply of tannin bark for export. These areas were dedicated State Forests Nos. 51, 52 and 53 in 1934 and 1935. Some 8,000 hectares were established between 1926 and 1957.

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Although the tannin bark industry was the major reason for dedication of these forests and the establishment of plantations, the situation has now changed at Dryandra. Mallet bark export ceased in 1969 because of the decline in world demand for natural tannins and competition from synthetic materials. Today, the Mallet Plantations constitute a useful resource for tool handles, fence posts and firewood.

As well as the tannin bark industry, the Dryandra Forest supported a small salvage mill for wandoo cutting.

In 1927 a resident overseer was stationed at the Dryandra Settlement by the Forests Department to administer matters associated with the Mallet Plantations. In 1952 the Department established its second commercial nursery at the Dryandra Settlement to provide plants at cost to foster tree growing in the rural areas to the south and the east. The nursery was subsequently transferred to the present Narrogin headquarters site in 1967 to provide better social and community amenities for the workforce. The Settlement at Dryandra then became redundant. Today the old Dryandra Forestry Settlement is under long term lease to Lions International Service Club. The Settlement is managed as a recreational village jointly by a committee comprising nominees from the Lions Club and the Forests Department. The lease for 34 hectares was issued in February 1972.

The Dryandra Forest is significant for the floral diversity represented in it. Not only are mallet areas represented but interesting associations of Wandoo, Jarrah and Marri woodlands are found. These are associated with a diverse range of understorey vegetation including the very poisonous plants which rendered the area unsuitable for agriculture. It is ironical that this vegetation is now highly valued for its potential to conserve native fauna populations.

This forest represents one of the few sites where this particular ecotype remains. More significantly it has the potential to remain an important habitat for endemic species of fauna, some of which are considered rare and endangered.

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PART A

BACKGROUND TO THE DRYANDRA FOREST

1. LOCATION & TENURE

The main part of the Dryandra Forest is located approximately 25km north west of Narrogin on the Narrogin-Wandaring Road, and 145km south east of Perth. (Figure 1)

The total area known as Dryandra Forest is comprised of many separate areas of forest which collectively cover some 27,950 hectarea. Most of the area is classified as State Forest No's 51, 52 and 53 plantation area . These forests were dedicated in 1934 and 1935 for the purpose of preserving a source of mallet.

As can be seen from figure 2 the Dryandra Forest is made up of a number of discontinuous forested blocks surrounded by private property.

Within the main block there is an area of 1,270 hectares (Reserve 16201) which is held in trust by the Minister for Water Supply for the purposes of water and timber. This is virgin Wandoo Forest and is currently managed in conjunction with adjacent State Forest by the Forests Department.

The tenure of the forest is illustrated in Figure 2 and Appendix I lists areas for each forest block comprising Dryandra Forest.

2. DESCRIPTION OF THE AREA

2.1 Climate

The area is characterized by a Mediterranean climate with a marked winter rainfall and hot dry summers. This is typical of that found in the 500mm wheatbelt zone. The average annual rainfall for Narrogin is 507mm. More limited records indicate the annual average rainfall for Dryandra to be 530mm.

The main maximum temperature for January is 31°C and for July 14°C. The mean minimums in January & July are 14°C and 5°C respectively. An average of 7 frosts occur annually.

2.2 Soil and Geomorphology

In general geomorphology of this area consists of the laterite mantled plateau, modified by erosion and deposition (McArthur, et al, 1977). This is the basis for subdivision into landform units. This units have a characteristic range of soils, which are described using the CSIRO notation (Northcoate, et al, 1967). Delineation requires recognition of plateau, slope and valley floor. The units have been given local geographic names.

The elevation of these landform units varies about 100m above and below Narrogin, which is 340m above sea level. These landform units make up gently undulating countryside sometimes interrupted with sharp breakaways midslope.

(i) Plateau Type

This (norrine unit) occupies the upper landscape of the Dryandra area and comprises small, gently sloping laterite residuals, bounded in parts by duricrust, small escarpments and spurs which may reach the valley floor. The associated soils are gravelly sands, sand, duplex yellow soils, laterite boulders and duricrust.

(ii) Slope Type

This (Noombling unit) comprises gently sloping terrain, which may extend over local divides from one valley to the next (and includes the local interfluves). Yellow earths exist on slopes below scarps, with associated granite and dolerite outcrops.

(iii) Valley Type

This (Biberkine unit) consists of valley floors, major tributary streams and has an irregular outline because it extends into minor tributaries. The valley floor has gradients of about 1:300 in the Dryandra area. It consists of alluvial material which generally forms a simple soil pattern whereby the upper terraces have a yellow duplex soil and the lower terrace adjacent to the stream consists of undifferentiated alluvium.

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2.3 Vegetation

The indigenous vegetation is typical of that found on the western margins of the wheatbelt in the south west of Western Australia. It is generally of low open woodland interspersed with areas of more open forest and sometimes dense thickets. The vegetation types are closely associated with soils and topography and distinct vegetation types can be found on the 3 landforms identified.

(i) Plateau Type (Norrine Unit)

A high lateritic plateau which usually contains an open woodland of Powderbark Wandoo, Jarrah and Marri. The latter two species are relatively common where sandy soils predominate. A mixed scrub layer is usual and is often dominated by thickets of Dryandra nobilis and occasionally the non-commercial Sandalwood (Santalum murrayanum).

Low, dense E.drummondii mallee associations without tree overstorey development occupy part of this landform.

(ii) Slope Type (Noombling Unit)

From the lip of the breakaways the land usually falls steeply for a short distance, then gradually becomes more gentle and eventually merges imperceptibly with the Valley Type. Brown Mallet (E.astringens) is common in small pockets immediately below the breakaways but gives way to Wandoo and Powderbark Wandoo downslope.

The open woodlands of Wandoo and Powder bark Wandoo on the slopes are usually associated with a dense thicket of sandplain poison (Gastrolobium microcarpum) understorey. In other areas Casuarina huegeliana forms thickets in association with granite outcrops.

(iii) Valley Type (Biberkine Unit)

The main vegetation component on this landform unit is an open Wandoo woodland with a ground cover of grasses and sedges. The form and vigour of Wandoo is best developed in these areas. On heavier soils Wandoo is replaced by thickets of Raspberry Jam (Acacia acuminata). Where granite is exposed or overlain by shallow sands, these stands are replaced by Casuarina huegeliana.

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(iii) Valley Type (biberkine Unit) Cont.

Much of the Valley type has been alienated because of the ease of access and high water retention properties of the soils which explains the fragmented nature of forest blocks.

The forest includes a great diversity of vegetation types and a large number of species are represented. An appreciation of this representation is given in Appendix II.

2.4 Fauna

From fauna studies carried out, a wide range of mammals, frogs, lizards, snakes and birds have been recorded in the area. These are listed in Appendix III.

This list includes introduced species such as foxes, rabbits and feral cats. Although concentrated mainly around the boundaries close to private property they constitute a threat to some native fauna species. Initially fox populations and introduced preditors were kept to a low level because they were killed by preying on native fauna which had browsed on the Gastrolobium species. Whereas the native fauna have evolved a resistance to this poisonous species, the foxes and similar predators are highly susceptible and as a result are killed as the poison is passed through the food chain.

However, more recently with the decline of poisons in the vegetation, the native fauna populations appear to be threatened by the increase in fox numbers.

2.5 Hydrology

The majority of areas comprising the Dryandra Forest lie within the Murray River drainage system and more particularly, between the main eastern branches of the Hotham and Williams Rivers. Borgey and Highbury Blocks are located within the Blackwood drainage system.

Due to the vast amount of agricultural clearing that has occurred in the past all of the major streams are saline, particularly the eastern tributaries. Domestic supplies are obtained by piping from the Wellington Reservoir.

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3. CURRENT LAND USES AND DEMANDS

3.1 Conservation

The Dryandra Forest is recognised as containing some rare and endangered species of flora and fauna. There is a need to conserve these species and this forest represents the best opportunity to do so.

- Flora

Apart from this State Forest area, the only other areas of crown land of importance for these vegetation types are small areas of Flora and Fauna Reserves vested in the Department of Fisheries and Wildlife.

With such a small area of native vegetation reserved in this part of the wheatbelt the Dryandra Forest is of great significance to floral conservation. One can assume that this will continue to be the case.

Of particular singificance in Dryandra are the representation of the following species:-

- Areas of virgin Wandoo exist.
- The principal remaining areas of Brown Mallet are within the forest.
- It contains some specimens of Blue Mallet (E.gardneri).
- Some of the most easterlyoccurrences of species such as Jarrah, Powderbark Wandoo & Marri are contained.

Natural mallet areas are characterised by a lack of an understorey or ground flora. In natural non mallet areas, the reverse is true, especially in the sandy soils and near granite outcrops. These areas contain dense thickets of poisons (Gastrolobium species) and are believed to contain a number of very rare plant species (eg. the red flowering Leschenaultia formosa). More investigation is required on collection and identification.

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The Brown Mallet plantations are also of significance to the Dryandra Forest vegetation. The plantations were generally sown on or near the original mallet sites as well as on some of the better wandoo sites. It is significant that these mallet areas planted off-site no longer carry the dense thickets of native poisonous plants which had previously existed. ~~With this decline in understorey also went the abundance of fauna in these areas.~~

Fauna

The importance of the fauna of Dryandra is inherently related to the flora and the habitat it provides. Early reports from inland parts of W.A., before European settlement of the area between the 400mm and 650mm rainfall, confirm that the area was very rich in native mammals and birds. Following agricultural development with its extensive clearing of bushland and the introduction of exotic animals, plants and disease, both the number of native species and the area inhabited by them has been reduced.

Some of the species which inhabit the forest are considered to be relatively rare, eg. Woylie (Bettongia penicillata), Numbat (Myrmecobious fasciatus), Quenda (Isoodon obsesulus). The area also provides a valuable habitat for the Mallee Fowl.

Studies have shown (Christensen, Burbidge) the survival of the Woylie is very dependant on the maintenance of dense thickets for protection from predators and as a food source.. Concern is mounting that unless these thickets are preserved and regenerated the Woylie and native mammals associated with this habitat may be endangered.

In the wheatbelt few pockets of bushland remain which are large and varied enough to provide an adequate habitat for the remaining species. Of these areas, Dryandra Forest is the largest and most diverse and it therefore presents the best long term chance of continuing to provide for the species now present. For this reason, the proper management of the area, as well as its permanent retention as bushland, is of great importance.

As has been outlined, the Dryandra Forest contains some very rare flora and fauna types. They make the area of high value for conservation. In summarising the importance of this area for conservation purposes the following 2 factors should be recognized.

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1. It is a remnant of a rich natural ecosystem which is very rare in the south west of W.A. In this case management practices should not be permitted which may affect the floral distribution and diversity in the long term.

2. It has the potential to maintain viable populations of rare mammals found in few areas. The maintenance of the habitat is therefore important and places an obligation on management to ensure the habitat needs of fauna are not jeopardized.

Any plan to manage this area must recognize these demands. Sound management can ensure the long term survival of the rare and endangered species existing in the Dryandra Forest.

3.4 Recreation Demand

The importance of the Dryandra Forest for recreation can be inferred by records on the use of the Lions Club. For the past three years the village has received in excess of 1900 overnight visitors annually (Appendix IV).

The forest, with it's open woodland character, is popular for it's aesthetic and recreational appeal. It is used for many forms of recreation including picnicking, nature study, photography, art, camping, orienteering and bushwalking. It has also been used for navigational car rallying.

If day-use visitors to the forest, as well as users of the Lions Club Village are taken into account, the demand on the Dryandra Forest for recreational activities is very high. This demand is expected to increase as the forest becomes more widely known for its recreation potential.

3.5 Timber Production

3.5.1 Tool Handles: Higher quality mallet stems for tool handles are removed from the mallet plantations. Mr. A.B. Hunter of Narrogin is currently licensed to remove 800 tonnes of mallet per annum. The operation is very selective, taking only the larger stems which are free of defects. This operation directly employs 7 workers.

3.5.2 Fence Posts: A licence is issued annually to Dryandra Timber Products, for 100,000 posts. These posts are usually supplied from thinning and the operation follows the tool handle operation. 5 people are employed by Dryandra Timber Products.

3.5.3 Firewood: Minor Forest Produce licences are issued for commercial and domestic firewood demand. This operation is conducted behind thinnings for posts and tool handles. Only residue from these operations is utilized.

3.5.4 Salvage Sawlogs: Although there is a continuing demand for Wandoo sawlogs, no licence is current. Only trees which are blown over or are the result of silvicultural operations may be salvaged. Little of this material has been available in the past.

3.6 Gravel

There is an ongoing demand from local Shires for gravel for new road construction and repairs. Local Shires and Government Departments only have been supplied with gravel.

3.7 Honey Production

Apiary sites are currently issued where there is no conflict with the primary land use of recreation. There are currently 44 apiary sites current in Dryandra Forest. The current policy is to space sites no less than 3km apart. Dryandra Forest is almost saturated with sites. In addition many beekeepers place hives on private property adjacent to forest blocks.

The frequency of site use is usually low. Flowering cycles tend to be erratic and hence sites are mainly used as a reserve by beekeepers holding sites elsewhere.

3.8 Wildflowers

There are no commercial wildflower picking licenses issued, although the Forests Department usually supplies specimens for the Kings Park and Royal Show wildflower displays.

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3.9 Seed Orchard

At present the Narrogin Division has plans to establish a seed orchard in the paddock adjacent to Tomingley Road within the Settlement area. This is to be used to grow seed of local species for which seed is presently difficult to obtain. It is intended that seed obtained from this orchard will ultimately be used in the Narrogin Nursery.

3.10 Scientific Study

A number of scientific study areas exist throughout the Dryandra Forest. These areas have been selected to satisfy experimental requirements.

(i) Silviculture: A mallet spacing study is being carried out by the Narrogin Division. Five thinning plots exist in the Mallet Plantation along Siding Road in Stokes Block.

(ii) Sandalwood: Sandalwood (Santalum spicatum), an original component of the Dryandra vegetation, is now relatively rare after being heavily exploited. Various Sandalwood study areas are presently in existance.

Research is being carried out into its growth and development. Some areas are being considered as potential sites for a Sandalwood seed production area.

(iii) Fire Research: Research programs are being undertaken in Dryandra to study more closely the ecological effects of fire on flora and fauna. A number of fuel datum areas have been retained to study long term effects of fire exclusion on vegetation successional changes and fuel accumulation.

A major aim is to find the most suitable fire regime to protect and enhance the flora and fauna values. Only with continued research will the most appropriate fire management strategies be evolved.

3.11 Utilities

There are a number of roads both within and surrounding the Dryandra Forest. These have been constructed and maintained by the Forests Department and the relevant Shires. Most roads and forest tracks are navigable with convential vehicles throughout the year.

One S.E.C. line runs through part of the forest to the Settlement. A Forests Department earth-return line exists between the Dryandra Fire Lookout and the Settlement.

Telecom communications are also available at the Settlement.

PART B

MANAGEMENT OF THE DRYANDRA FOREST

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1. ALLOCATION OF LAND USE PRIORITIES

Having identified the major demands or potential land use of the Dryandra Forest it is evident that some of these demands compete for use in the same area.

In some situations multiple use of an area will be possible without detriment to any of the uses. However, in other cases it is not possible to reasonably satisfy both demands on a particular area of forest. Some examples are recreation and honey production, or timber production and fauna habitat.

In order to resolve any conflicts over competing demands, areas with a priority for management have been allotted. The priority determined for the majority of the forest is the conservation of flora and fauna. This priority was allocated because of the high value placed on the forest for Nature Conservation. It is in keeping with current management practices and with the System 4 recommendations made by The Conservation Through Reserves Committee to The Environmental Protection Authority (1974.) These priority areas, to be referred to as Nature Conservation Forests comprise of a Forest Sanctuary and areas of Managed Nature Conservation Forest.

Two other priority uses have been allocated to different areas within the Dryandra Forest. These are Recreation and Scientific Study (See figure 3).

For any uses, other than the primary use, to be permitted in the Forest they must be compatible with the primary use.

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These shall be referred to as a secondary and tertiary uses. Secondary uses are those largely compatible with the primary use. Tertiary uses may be permitted if no significant harm to the primary use results. The secondary and tertiary land uses permitted in each priority area will be looked at in a later section. The extent of activities permitted will depend on the zones in which they fall. These zones have been allocated according to the potential of the area to meet the priority designated. This potential will be partly affected by activities carried out in Dryandra Forest in the past.

2. EFFECTS OF PAST MANAGEMENT

2.1 The History of the Settlement

The process by which land was alienated in this area has affected the distribution of forested areas. Since the forest is largely made up of discontinuous blocks in a sea of farmland the effect of outside influences cannot be ignored when constructing a management plan. The introduction of predators, weeds and disease from neighbouring areas will affect the creation of a realistic fauna habit. In particular outlying forest blocks cannot be regarded as a realistic longterm fauna habitat. They are too small.

2.2 Establishment of Mallet Plantations Off Site

The brown mallet plantations in most cases were established on sites where brown mallet was not previously growing. These sites were predominantly upper slope wandoo which contained in the understorey a high component of poisons, often in thickets. Apart from being on some of the better wandoo sites, these plantations are also on, what were, some of the better sites for native mammals.

Because Brown Mallet is very susceptible to fire, burning has been excluded from the plantations. As a result of this the poisons and dense thickets have largely disappeared. Studies have shown that the mallet plantations are poor habits for native mammals, providing limited food and no shelter.

It should be noted that not all areas planted to mallet succeeded. It is estimated that approximately 50% of the planted area failed These areas, some to a greater degree that others, will slowly return toward the native vegetation.

2.3 Fire Management

Prescribed burning in the Dryandra Forest was initiated to protect neighbours and the mallet plantations, however this protection policy has not proved optimal for maintenance of a desirable fauna habitat.

The forest surrounding the plantations has been burnt at regular intervals in spring and autumn by prescribed burns. The only exception being some scientific 'no burn' areas and small wildfires.

Research has shown these prescribed burns of low intensity and short rotation do not favour the formation of Dryandra species thickets on the plateau and poison thickets on the slope areas. Low intensity fires do not stimulate regeneration of thickets and only tend to destroy existing thickets.

2.4 Timber Production

In addition to the present timber demands and procurement on the Dryandra Forest, most of the forest was cut over for salvage wandoo sawlogs between 1950 and 1969. This was a very light selection cut and will not create a constraint to management of the area in the future. The only area of virgin Wandoo is in Reserve No. 16201 which is presently vested in the Minister for Water Supply.

3. MANAGEMENT ZONES & OBJECTIVES

As a result of past management, some areas of the forest now have different potentials to satisfy each of the primary land uses. These potentials have been been identified and the following management zones have been allocated accordingly:-

1. Forest Sanctuary.
2. Managed Nature Conservation Forest.
3. Recreation Forest.
4. Scientific Forest.

These are described in table 1.

ZONE	PRIMARY LAND USE	DESCRIPTION OF ZONE	AREA *
Forest Sanctuary	Nature Conservation (Preservation Component)	Natural Wandoo woodland including Virgin Wandoo. also natural mallet and mallet plantations.	4,073 ha
Managed Nature Conservation Forest	Nature Conservation	- Mallet Plantations including failed and successful. - Native Forest surrounding the sanctuary and outlying areas which were not converted to Mallet plantations.	22,042 ha
Recreation Forest	Recreation	Area in and around the Dryandra Settlement	447 ha
Scientific Forest	Scientific Study	Specific areas as in figure 3.	1,385 ha

TABLE 1 - Description of Management Zones and allocated primary land uses. (* = Areas to be checked).

3.1 Forest Sanctuary

The objective of the Forest Sanctuary at Dryandra is to preserve the native vegetation within this forest ecotype in the least disturbed condition as possible, whilst optimizing the potential of this habitat to support viable populations of small native mammals.

The main single block of continuous forest is an area surrounding the Settlement. The dispersed nature of the forest leaves this area as the only area where a viable Sanctuary for fauna conservation could be maintained. The focal point is the area of virgin Wandoo in Reserve 16201.

The Sanctuary area has been chosen to represent most significant forest ecotypes within Dryandra Forest as well as a portion of Mallet Plantation for use as a historical reference.

3.2 Managed Nature Conservation Forest

The sanctuary area is to be protected or buffered from the influences of alienation and fires by creating a Managed Nature Conservation Forest around it.

Within the Managed Nature Conservation Forest are the Mallet Plantations and all other forested areas outside the Sanctuary including the outlying blocks.

3.2.1 Non Mallet Areas

The objective of these areas is to buffer the Forest Sanctuary and its values from the impact of external management practices while at the same time providing an important source for the conservation of the original forest ecotype and speciation.

3.2.2 Mallet Plantation

The objective of these areas is to buffer the Forest Sanctuary and its values from the impact of external management practices while at the same time providing a genetic source for the conservation of brown mallet.

3.3 Recreation Forest

The Lions Club Settlement and areas surrounding it have been an important part of past recreational activities in the Dryandra Forest. Because of this historical significance and the established facilities around the Settlement a separate zone was created for recreation.

The boundary of the zone is given in figure 3. It is planned that by using appropriate management techniques recreation can be encouraged to stay within this zone.

The management objective is to cater for recreation demand whilst conserving the forest environment.

3.4 Scientific Forest

These areas have been zoned to meet specific scientific requirements, mostly involving fire and fauna research.

The objective of this zone is to provide the necessary scientific investigation required for effective future management of this forest.

4. MANAGEMENT GUIDELINES

The following management guidelines give a general indication of how each priority use forest area should be managed. They also give an indication of the compatibility of various uses to the primary use allocated to each zone (See table 2).

4.1 Forest Sanctuary

This area is to be managed for the Conservation of flora and fauna. Management should be such that the long term survival of the rare and endangered species of flora and fauna is ensured.

4.1.1 Fire

Fire management in this Sanctuary must cater for the habitat requirements of the native mammals in Dryandra as well as maintain the ecotypes recognized as being of floral significance. Fire should be used to encourage a full range of successional stages of the important understorey species on which fauna are dependant. More specifically, this will entail the promotion of Gastrolobuim species in the understorey.

The most appropriate fire regime for these requirements is still the subject of research. Therefore, effective management of the Sanctuary will require close liason with the Research Branch. This will ensure that the fire management techniques most suited to the objective of the Sanctuary are implemented. It will be necessary to protect the Forest Sanctuary from outside fire.

4.1.2 Scientific Study

Studies permitted in the Sanctuary are restricted to monitoring and observation only. Experimentation likely to cause significant disturbance shall not occur.

Researchers carrying out studies in this area should liase closely with The Forests Department.

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4.1.3 Logging and Silviculture

There will be no logging or silviculture activities permitted in the Forest Sanctuary.

4.1.4 Roading and Access

Roading within the Forest Sanctuary should be kept to a minimum. Public access should be limited to the York-Williams Road and Tomingley Rd. These roads are used for access to the Lions Club Settlement. They should be maintained to avoid any impact on the surrounding Sanctuary through drainage and erosion.

Other existing roads within the sanctuary should not be used for public access, only for protection purposes. Their use by the public should be discouraged. No other roads are to be created within the Sanctuary, unless for protection.

4.1.5 Reserve 16201

Although the reserve is vested in the Minister for Water Supply, there is no active management for the purpose of water. The C.T.R.C. recommended that it be altered to the same tenure as the rest of the priority area.
In the past this reserve has been managed by the Forests Department in conjunction with the adjacent forest. This should continue to be the case. As the reserve contains virgin wandoo forest, management should ensure the structure and composition of this area is not altered.

4.1.5 Minor Produce

The removal of gravel from the Forest Sanctuary shall be prohibited, and no apiary sites should exist. Wildflowers will not be provided from this zone.

4.1.6 Recreation

Any recreation activity within the Sanctuary must have very low impact. Activities such as bushwalking and photography would be of little concern or effect if they were to occur. However, no effort should be made to cater for any type of recreation within the Sanctuary. Efforts are to be concentrated in the zone surrounding the Lions Club Settlement which has been specifically allocated for recreation.

It is forseen that some of the more passive recreational activities, such as bushwalking, will filter into the Sanctuary from the Recreation Zone. It is not intended that this should be prevented. However, any activity likely to have any damaging effects should be prevented. ...22/-

4.2 Managed Nature Conservation Forest

4.2.1 Fire

A different fire strategy is necessary in the areas zoned as a Managed Nature Conservation Forest. The areas concerned here form a direct interface with adjacent private property. Fire should be used:-

(i) To protect life and property within the forest.

(ii) To prevent fires from within the forest extending into adjacent property.

(iii) To protect the forest values from the adverse effects of fire.

Fire is to be excluded from mallet plantations because of the fire sensitivity of the species. Protection will be provided by prescribed burning in the surrounding native hardwoods and by an extensive system of well maintained fire breaks.

In failed areas of mallet plantations fire should be used in conjunction with logging to ~~return~~ regenerate the original vegetation.

4.2.2 Scientific Studies

. The Mallet Spacing Trials currently under way should be permitted to continue and be excluded from any trade operations. Sandalwood trials being conducted in this zone may continue provided that they are not in conflict with the primary use. Any new initiatives must also suit this requirement if they are to be permitted.

4.2.3 Recreation

Generally only low impact activities will be permitted in this zone. Certain locations will be used specifically for picnic areas (figure 3). Picnicking will be confined to those areas which have been specifically created for that purpose and have the facilities to cater for the activity.

4.2.4 Logging & Silviculture

Logging will not be permitted in the native hardwood stands except where necessary regenerative and silviculture treatments yield merchantable timber which would otherwise be wasted. It is anticipated that such parcels of timber will be small and intermittent.

Silvicultural and regeneration treatments are likely to be required where stands have been damaged by wildfire, have become moribund, or have been degraded through disease.

Mallet will continue to be made available for fencing materials, tool handle production and firewood, under prescriptions which will aim to minimise waste and which are compatible with the allocated land use objective.

Mallet planted off-site and which is of low quality should be cut according to prescriptions which will favour growth and development of the original tree species on these sites.

4.2.5 Roading and Access

The existing roads should be maintained to be accessible for protection and treatment within the Managed Nature Conservation Forest. Public access to the picnic sites will require well maintained roads. Apart from travel to these specific locations public access need not be promoted.

4.2.6 Control of Vermin and Feral Animals

A poisoning program to minimise numbers of feral animals and vermin, particularly foxes, will be maintained with the co-operation of the Agriculture Protection Board. This is imperative to ensure that the threat to native mammals is reduced.

4.2.7 Minor Produce

Honey production is permitted in the Managed Nature Conservation Forest. However, apiary sites should be kept away from the recreation zone.

Gravel may be supplied from within this zone. Wildflowers may be continued to be supplied for Exhibitions under the Supervision of the Forests Department.

4.2.8 Utilities

The S.E.C. line which runs through the Managed Nature Conservation Forest to the Settlement should be adequately protected from fire.

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4.3 Recreation Forest

4.3.1 Recreation

Any recreational activities to be carried out in the Dryandra Forest should be encouraged to take place within this zone. It has been created specifically for that purpose with the aim of directing activity away from the Sanctuary.

A detailed recreation plan will be prepared for the Forest in accordance with regional recreation strategies.

Close liason should be maintained with Lions' Administration to ensure:-

(i) Any development plans are consistent with Forest Management Objectives.

(ii) Co-ordination of recreation and education development effort.

(iii) Correct information is used for public education on matters pertaining to forest and land use management.

4.3.2 Flora & Fauna

In this zone flora and fauna takes on a secondary role. Recreational activities in accordance with an approved plan will have priority if any conflict should arise between these and flora and fauna. However, the recreation plan should have due regard for flora and fauna and other environmental considerations. Some consideration should be given to wildflower management in this zone to increase the aesthetic appeal in spring.

4.3.3 Fire

Special prescriptions are needed to cater for aesthetics and hazard reduction. It is important that the Lions Club Settlement be protected from wildfire.

4.3.4 Seed Orchard

The seed orchard being planned in the Settlement area is not seen to be a conflict with recreation objectives, except in its initial years. During this time the orchard should be protected from any activity until the trees have adequately established themselves. After this time the orchard could serve as an arboretum to enhance the recreation experience.

...25/-

4.3.5 Scientific Study

Scientific study will be low priority in the Recreation Zone. Activity will be permitted if the recreation priority is not diminished.

4.3.6 Logging and Silviculture

Such activities may be necessary to cater for aesthetic recreation or hazard reduction. Otherwise they should be excluded.

4.3.7 Roading and Access

Existing roading should be maintained and signposted clearly to cater for the public. Roading systems should also cater for fire protection. Efforts should be made to ensure that roading and access are both at an acceptable standard of safety and efficiency.

4.3.8 Minor Produce

No apiary sites will be permitted in this zone or in areas adjacent to it. Gravel extraction or wildflower picking should not occur.

4.3.9 Facilities

Adequate facilities must be supplied and maintained to cater for visitors. Such facilities would include ablution blocks, firewood provision, and barbecues.

Any facility provided should have no impact on the adjacent Forest Sanctuary or Managed Nature Conservation Forest.

...26/-

4.4 Scientific Forest

Scientific studies will have priority over other forms of land use in this zone. The areas in Figure 3 have been allocated to meet specific research requirements.

The main thrust of the research deals with fire and fauna studies.

Detailed plans for the management of each of these areas should be prepared by the Research Branch of the Forests Department. This branch should liase with other bodies carrying out any study in the area and incorporate their requirements into this plan.

4.4.1 Fire

Fuel datum areas are being studied and exclusion from fire is imperative. Areas of fauna study should be burnt according to information supplied by Research Branch.

4.4.2 Sandalwood

The Sandalwood Studies being carried out in this zone may continue. Jam sites should be managed to ensure that their potential to serve as a seed production area is not lost. Outside organizations involved in Sandalwood Study should work closely with The Research Branch of The Forests Department.

4.4.3 Other Demands and Activities

The extent of use of these areas will depend on prescriptions for the area. Close liason should be kept with Research Branch to confirm what activities are permitted in this zone.

PRIORITY USE MANAGEMENT ZONES	SECONDARY USES Ø	TERTIARY USES *	INCOMPATIBLE USES
Forest Sanctuary	Catchment Protection Scientific Study (monitoring only)	Recreation Seed Collection	Activities which alter the structure and composition of the vegetation or introduce disease.
Managed Nature Conservation Forest	Catchment Protection Scientific Study Recreation Mallet Timber Production	Seed Collection Wildflower Management Honey Production Gravel Supply	Activities which will result in a change to the vegetation composition or structure of the Sanctuary or which will significantly reduce the ability of this zone to protect the Sanctuary.
Recreation Forest	Flora & Fauna Conservation Catchement Protection Wildflower Management	Scientific Study Mallet Timber Production Seed Collection	Activities which permanently destroy the aesthetic appeal of the Landscape or require the cessation of recreation activities.
Scientific Forest	Catchment Protection Flora & Fauna Conservation	Recreation Honey Protection	Activities detrimental to the objectives of the Scientific Study.

Ø - Secondary Uses are those which are largely compatible with the Primary Use.

* - Tertiary Uses may be permitted as long as they cause no significant harm to the primary use.

.../28/-

5. IMPLEMENTATION AND CONTROL

5.1 Implementation

The responsibility for implementation of the Dryandra Management Plan rests with the Superintendant Northern Region in liason with specialist branches.

5.2 Hardwood Operation Control Systems

In mallet plantation areas the major operational control system is known as the Hardwood Operations Control System (H.O.C.S.).

The main feature of this Operations Control System are:-

- Provision for using the forest block (H.O.C.S.). Planting year will also be shown for plantation areas.
- Provision of a complete, compact and convenient record and control system for both the operational and planning requirements to the Forests Department.
- Provision of data for yield control by continual testing of actual values against estimates.

Using the Hardwood Operational Control System and other long term "master" plans (eg. prescribed burning, plantation establishment, utilization master plans, etc.), all forest operations in an area are planned and suitable prescriptions prepared. Prescriptions are modified, as required, to account for the "influence" of other activities or features. The H.O.C.S. sheets are then used to record the implementation of those operations in the field.

The system has been used for several years on State Forest and has been shown to cope with the more intensive aspects of multiple use forest management.

5.3 Other Control Systems

Many other control systems are used, covering other management activities, eg. budgetary control, log quality controls, prescribed burning controls, etc.

...29/-

5.4 Liaison with other Organisations

Liaison will be maintained at all levels with organisations and authorities which affect, or in turn are affected by, management of Dryandra Forest. Refer to Appendix VI for a list of known users of the forest.

5.5 Plan Review

This plan will be reviewed should any change occur to the key considerations of:-

(i) Site suitability.

(ii) Constraints to management.

(iii) Demand for various land values.

(iv) Protection requirements.

~~A formal review will also be undertaken at each re-write of the Forests Department's General Working Plan~~.

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APPENDICES

APPENDIX I

A LIST OF THE AREA MANAGED BY THE FORESTS DEPARTMENT

Forest Block Name	Area (ha)	Remarks
BALD ROCK	3 049	
BORGEY	2 057	Includes 813 ha proposed S.F.
CONTINE	3 025	
DRYANDRA	6 615	Includes 1 150 ha Reserve 16201
DWARDA	1 146	
HIGHBURY	2 151	Includes 435 ha proposed S.F.
LOL GRAY	2 444	
PENNY	1 769	
SKELTON	3 253	Includes 120 ha Reserve 16201
STOKES	2 438	
	27 947	

(Still waiting for updated versions)

APPENDIX II

AN EXAMPLE OF THE RANGE OF PLANT SPECIES AT DRYANDRA

(i) Tree Species

Acacia acuminata	Raspberry jam
Acacia microbotrya	Manna gum
Casuarina huegeliana	Granite sheoak
Eucalyptus accedens	Power bark
Eucalyptus astringens	Brown mallet
Eucalyptus calophylla	Marri
Eucalyptus drummondii	Drummond's gum
Eucalyptus falcata	White mallet
Eucalyptus gardneri	Blue mallet
Eucalyptus loxophleba	York gum
Eucalyptus marginata	Jarrah
Eucalyptus oleosa	Giant mallee
Eucalyptus rudis	Flooded gum
Eucalyptus salmonophloia	Salmon gum
Eucalyptus wandoo	Wandoo
Santalum murrayanum	Bitter quandong
Santalum spicatum	Sandalwood

(ii) Other Plants

Acacia dentifera Benth.
Acacia drummondii Lindl. ssp. drummondii
Acacia gilbertii Meisn.
Acacia lasiocarpa var. sedifolia (Meisn.) B.R. Maslin
Acacia ? myrtifolia Willd.
Adenanthos sp.
Astroloma epacridis (DC.) Druce
Baeckia crispiflora F. Muell.
Baeckia fumana (Schau.) F. Muell.
Banksia sphaerocarpa R.Br.
Beaufortia incana (Benth.) George
Bossiaea sp.
Conospermum amoenum R.Br.
Dampiera sp.

Other Plants continued

Diuris longifolia R.Br.
Dodonaea sp.
Dryandra fraseri R.Br.
Dryandra nivea (Labill.) R.Br.
Dryandra nobilis Lindl.
Dryandra subpinnatifida CA. Gardn.
Gastrolobium microcarpum Drumm.
Gastrolobium spathulatum Benth.
Grevillea acerosa F. Muell.
Grevillea tenuiflora (Lindl.) Meisn.
Hakea gilbertii Kippist ex Meisn.
Hakea lissocarpha R.Br.
Kibbertia exasperata (Steud.) Briq.
Hibbertia montana Steud.
Hibbertia rupicola (S.Moore) C.A. Gardn.
Hypocalymma angustifolium Endl.
Lambertia ilicifolia Hook.
Lasiopetalum microcardium E. Pritz.
Leschenaultia formosa R.Br.
Leptospermum erubescens Schau.
Leucopogon minutifolius W.V. Fitz.
Petrophile divaricata R.Br.
Petrophile ericifolia R.Br.
Petrophile heterophylla Lindl.
Petrophile squamata R.Br.
Petrophile striata R.Br.
Pimelea sauveolens (Endl.) Meisn.
Pultenaea sp.
Synaphea reticulata (Sm.) C.A. Gardn.
Trymalium ledifolium Fenzl.
Urocarpus squamuligerus (Hook.) P.G.Wils.

APPENDIX III (awaiting update)

ANIMALS OF DRYANDRA FOREST

MAMMALS

Echidna - *Techyglossus aculeatus*
Mardo - *Antechninus flavipes*
Red Tailed Phascogale - *Phascogale calura*
Dunnart - *Sminthopsis murina*
Native Cat - *Dasyurus geoffroii*
Numbat - *Myrmecobius fasciatus*
Short-nosed Bandicoot - *Isoodon obesulus*
Brush Tailed Possum - *Trichosurus vulpecula*
Pigmy Possum - *Cercartetus concinnus*
Honey Possum - *Tarsipes spencerae*
Ring Tailed Possum - *Pseudocheirus peregrinus*
Grey Kangaroo - *Macropus fuliginosus*
Western Brush Wallaby - *Macropus irma*
Tammar - *Macropus eugenii*
Woylie - *Bettongia penicillata*
Tasmanian Pipistrelle - *Pipistrellus tasmaniensis*
Little Bat - *Eptesicus pumilus*
Gould's Wattle Bat - *Chalinolobus gouldii*
Chocolate Bat - *Chalinolobus morio*
Long-eared Bat - *Nyctophilus timoriensis*
White Striped Bat - *Tadarida australis*
Little Flat Bat - *Tadarida planiceps*
Dingo - *Canis familiaris*

EXOTIC SPECIES

Cat - *Felis cattus*
Mouse - *Mus musculus*
Rabbit - *Oryctolagus cuniculus*
Fox - *Vulpes vulpes*

LIZARDS

GECKOS

Barking gecko - *Gymnodactylus milii (Phyllurus milii)*
Festooned gecko - *Diplodactylus vittatus (D. polyopathalmus)*

LEGLESS LIZARDS

Fraser's scale-footed lizard - *Delma fraseri*

DRAGON LIZARDS

Ornate dragon - *Amphibolusus ornatus*
Mountain Devil - *Moloch horridus*
Western jew lizard - *Amphibolurus barbatus minor (Amphibolurus minor minor)*

SKINK LIZARDS

Bobtail - *Trachysaurus rugosa (Tiliqua rugosa)*
Smith's skink - *Egernia carinata (Egernia napoleonis)*
King skink - *Egernia kingii*
Wood skink - *Ablepharus boutonii (Cryptoblepharus plagiocephalus)*
Ablepharus elegans (Lerista elegans)
Bungarra - *Varanus gouldii*

FROGS

Green and gold tree frog - *Hyla moorei*
Banjo frog - *Limnodynastes dorsalis*
Heleioporus albopunctatus
Crinea pseudinsignifera
Heleioporus barycragus

SNAKES

Death adder - *Acanthopis antarticus*
Carpet snake - *Morelia variegata*
Dugite - *Demansia nuchalis affinis*
Little whip snake - *Denisonia gouldii*

The list of reptiles would appear to be incomplete for the area.

BIRDS

Little grebe - *Podiceps novaehollandiae*
White-faced heron - *Ardea novaehollandiae*
Nankeen night heron - *Nycticorax caledonicus*
Black duck - *Anas superciliosa*
Grey teal - *Anas gibberifrons*
Maned goose or Wood duck - *Chenonetta jubata*
Whistling eagle - *Haliastur sphenurus*
Australian goshawk - *Accipiter fasciatus*
Collared sparrow hawk - *Accipiter cirrocephalus*
Wedge tailed eagle - *Aquila audax*
Brown hawk - *Falco peregrinus*
Nankeen kestrel - *Galco cenchroides*
Mallee fowl - *Leipoa ocellata*
Brown quail - *Synoicus ypsilophorus*
Painted quail - *Turnix varia*
Banded plover - *Zonifer tricolor*
Black-fronted dottered - *Charadrius melanops*
Common bronzewing - *Phaps chalcopters*
Purple crowned lorikeet - *Phaps elegans*
White tailed black cockatoo - *Calyptorhynchus baudini*
Western rosella - *Platycercus icterotis*
Red-capped parrot - *Purpureicephalus spurius*
Twenty-eight or Port Lincoln parrot - *Barnardius zonarius*
Elegant parrot - *Neophema elegans*
Pallid cuckoo - *Cuculus pallidus*
Boobook owl - *Ninox novaeseelandiae*
Tawny frogmouth - *Podargus strigoides*
Owlet-nightjar - *Aegotheles cristatus*
Laughing kookaburra - *Cacelo gigas*
Sacred kingfisher - *Halcyon sancta*
Rainbow bee-eater - *Merops orgatus*
Welcome swallow - *Hirundo neoxena*
Tree martin - *Petrochelidon nigricans*
Blackfaced cuckoo-shrike - *Coracina novaehollandiae*
White-winged triller - *Lalage suerii*
Brush bronzewing - *Phaps elegans*
Purple crowned lorikeet - *Glossopsitta porphyrocephala*
Golden bronze cuckoo - *Chrysococcyx lucidus*

BIRDS continued

Chestnut quail-thrush - *Cinclosoma castanotum*
White-browed babbler - *Pomatostomus superciliosus*
Splendid blue wren - *Malurus splendens*
Blue-breasted wren - *Malurus pulcharrimus*
Western warbler - *Gerygone fusca*
Western thornbill - *Acanthiza inornata*
Yellow-rumped thornbill - *Acanthiza chrysorrhoa*
Spotted scrub-wren - *Sericornis maculatus*
Weebill - *Smicrornis brevirostris*
Scarlet robin - *Petroica multicolor*
Red-capped robin - *Petroica goodenovii*
Hooded robin - *Petroica cucullata*
Western yellow robin - *Eopsaltria griseogularis*
Grey fantail - *Rhipidura fuliginosa*
Willy wagtail - *Rhipidura leucophrys*
Restless flycatcher - *Seisura unquieta*
Golden whistler - *Pachycephala pectoralis*
Rufous whistler - *Pachycephala rufiventris*
Western shrike-thrush - *Colluricinicla rufiventris*
Western shrike-tit - *Falcunculus frontatus*
Crested bellbird - *Oreoica gutturalis*
Rufous tree-creeper - *Climacteris rufa*
Striated paradalote - *Pardalotus substriatus*
Silvereye - *Zosterops gouldi*
Brown honeyeater - *Lichmera indistincta*
Singing honeyeater - *Meliphaga virescens*
Yellow-plumed honeyeater - *Meliphaga ornata*
White-naped honeyeater - *Melithreptus lunatus*
Spinebill - *Acanthorhynchus superciliosus*
Tawny crowned honeyeater - *Gliciphila melanops*
New Holland honeyeater - *Phylidonyris novaehollandiae*
White-checked honeyeater - *Phylidonyris niger*
Red wattle-bird - *Anthochaera carunculata*
Little wattle-bird - *Anthochaera chrysoptera*

BIRDS continued

White-eared honeyeater - *Lichenostomus leucotis*
Magpie lark - *Grallina cyanoleuca*
Black-faced wood-swallow - *Artamus cinereus*
Dusky wood-swallow - *Artamus cyanopterus*
Squeaker or grey currawong - *Strepera versicolor*
Western magpie - *Gymnorhina dorsalis*
Raven - *Corvus coronoides*
Hoary headed grebe - *Poliocephalus poliocephalus*
Australian little eagle - *Hieraaetus morpnoides*
Peregrine falcon - *Falco peregrinus*
Little falcon - *Falco longipennis*
Little quail - *Turnix velox*
Southern stone curlew - *Burhinus magnitostris*
Regent parrot - *Polytelis anthopeplus*
Fan-tailed cuckoo - *Cacomantis pyrrhophanus*
Narrow-billed bronze cuckoo - *Chrysococcyx basalis*
Spotted nightjar - *Eurostopoclus guttatus*
Fairy martin - *Petrochelidon ariel*
White-fronted chat - *Apithianura albifrons*
Black-capped sitella - *Neositta pileata*
Spotted pardalote - *Pardalotus punctatus*
Brown headed honeyeater - *Melithreptus brevirostris*
Grey butcher bird - *Cracticus torquatus*
Little pied cormorant - *Phalacrocorax melanoleucos*
White-fronted honeyeater - *Phylidonyris albifrons*
Gilbert whistler - *Pachycephala incornata*

VISITORS TO DRYANDRA VILLAGE

USERS	1980			1981			1982		
	TYPE OF BOOKING	NO OF BOOKINGS	NO OF PEOPLE	TYPE OF BOOKING	NO OF BOOKINGS	NO OF PEOPLE	TYPE OF BOOKING	NO OF BOOKINGS	NO OF PEOPLE
1. Children homes' & Underprivaledged children groups	W.E.	6	181	W.E.	5	135	W.E.	10	281
2. Schools & Universities	W.E. + W.D.	12	596	W.D.	12	481	W.E. + W.D.	14	427
3. Naturalists, Bush-walkers & other groups	W.E.	21	697	W.E.	21	631	W.E.	21	550
4. Church Groups	W.E.	4	187	W.E.	4	340			
5. Private families	W.E.	7	40	W.E.	16	101	W.E.	40	215
6. Service Clubs	W.E.	10	160	W.E.	14	182	W.E.	16	221
7. Scouts, Brownies & Children groups'	W.E.	12	322	W.E.	13	611	W.E.	12	258
8.									
9. Other Groups	W.E.	1	300						
TOTAL		72	2,483		85	2,481		113	1,952

W.E. = Weekend + School holidays.
W.D. = Weekdays.

In addition many weekend picnic groups visit Dryandra.

APPENDIX V

THE EXTENT OF USE OF DRYANDRA FOREST

Apart from numerous individuals, many organisations use the northern jarrah forest. Below is a list of known groups and organisations, classified according to their legal authority:

A. WITH STATUTORY AUTHORITY

Public Works Department
Mines Department
Department of Agriculture
Agricultural Protection Board
Department of Conservation and Environment
Department of Fisheries and Wildlife
Forests Department
Geological Survey
Lands & Surveys Department
Local Authorities
(Shires of Williams, Narrogin, Cuballing and Wandering, Town of Narrogin)
Town Planning Department
Police Department
Telecom Australia
State Energy Commission
State Emergency Service
Department of Defence
Alwest (Worsley)
Department of Services and Property
Main Roads Department
Department of Science and Meteorology
Environmental Protection Authority
Soil Conservation Advisory Committee
Conservation Through Reserves Committee
Public Health Department
Road Traffic Authority
Department of Industrial Development

B. LIMITED STATUTORY POWERS

Bush Fires Board
C.S.I.R.O.
National Parks Board
Community Recreation Council
Department of Tourism
Forest Produce License holders
Apiary Site lessees
Forest Lease holders
Meteorological Bureau
Bureau of Mineral Resources
W.A. Wildlife Authority

C. WITHOUT STATUTORY AUTHORITY

Hunt Inter-Departmental Committee
Water Purity Committee
Recreation and sporting bodies (motorised and non-motorised)
University of Western Australia
Western Australian Institute of Technology
Murdoch University
W.A. Museum
Charter Tours Companies
Education Department
Kings Park Board (seed collection)
Various conservation bodies (Wildflower Society, Naturalist Club)
Scouts/Guides
Darling Range Advisory Committee
Forest Products Association
Farmers' Union

FIGURES

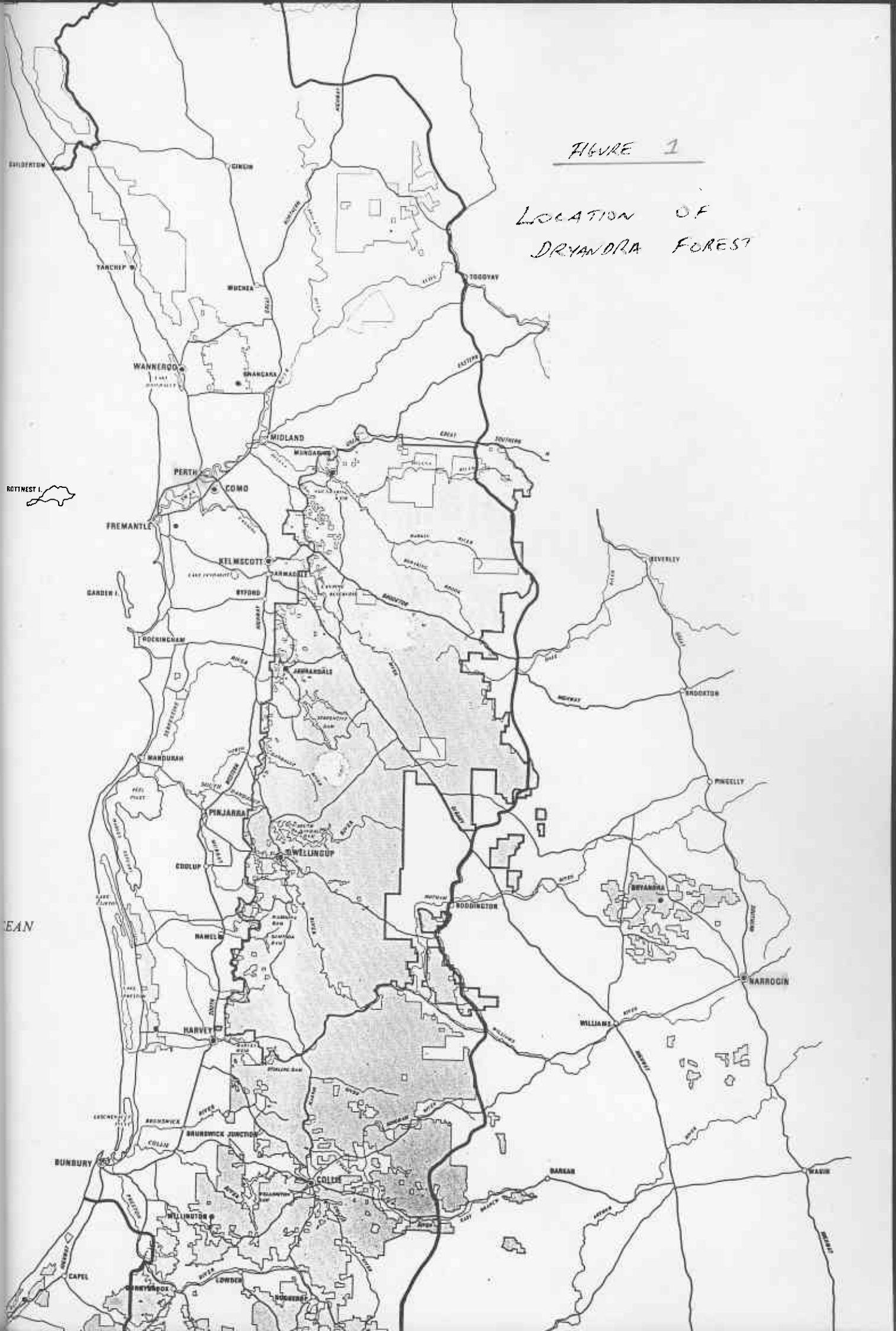


FIGURE 1

LOCATION OF DRYANDRA FOREST

"A NOTE ON THE DRAFT OF LAND USE
MANAGEMENT PLAN FOR DRYANDRA FOREST"

Figures

Only Figures 1 & 3 have been included in your copy of the draft (Figure 3 is separate).

Figure 2 (Land Tenure) is to be produced by Mapping Branch.

Appendices

Appendix II & III need to be updated. An improvement in presentation of the lists will also be made.

Appendix V may also need updating.

R Germantse

Robert Germantse.
A.D.F.O.,
KELMSCOTT I. & P

RG:er

Enclosure

FIGURE 3 — MANAG

LEGEND

FOREST SANCTUARY

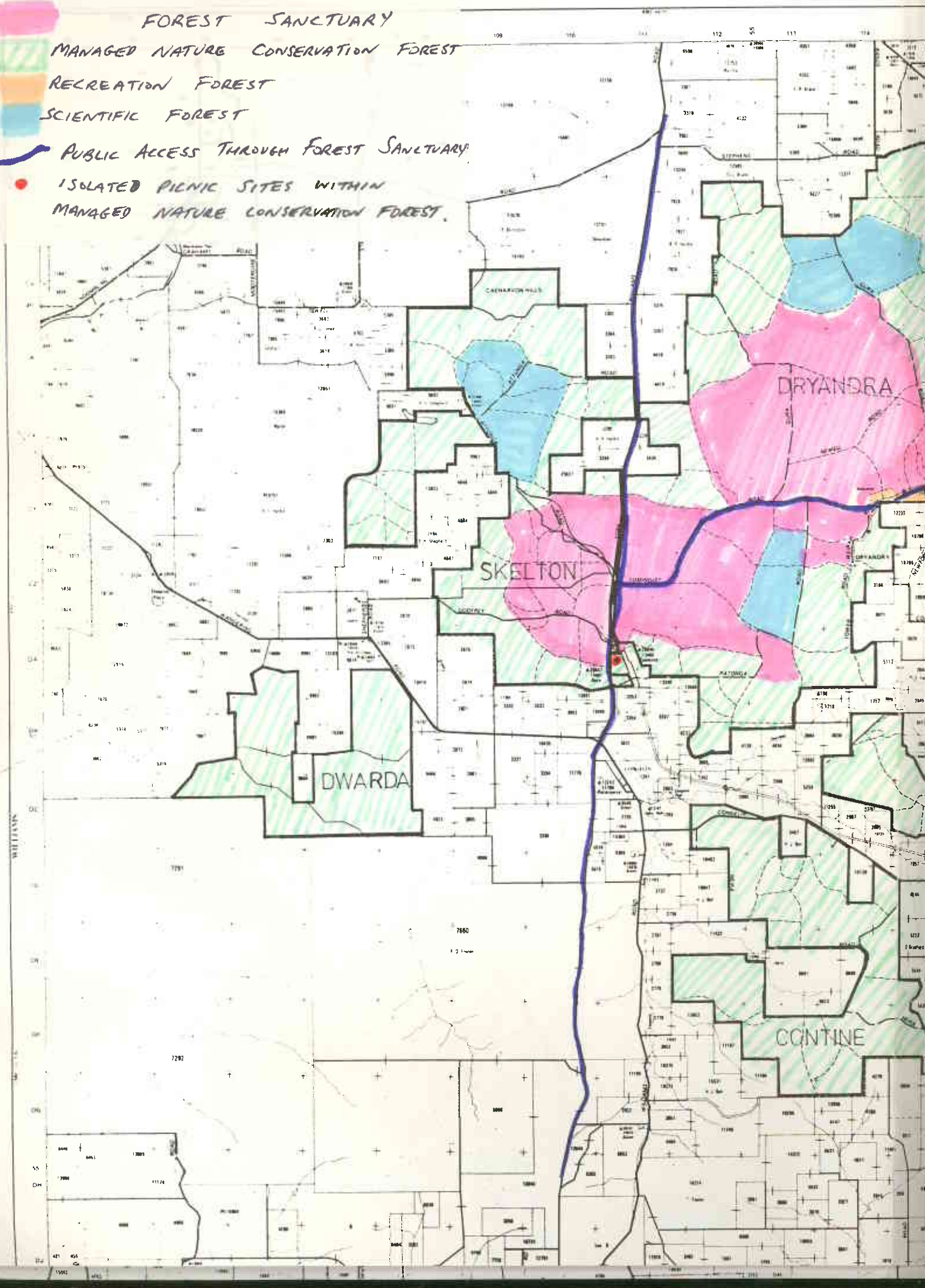
MANAGED NATURE CONSERVATION FOREST

RECREATION FOREST

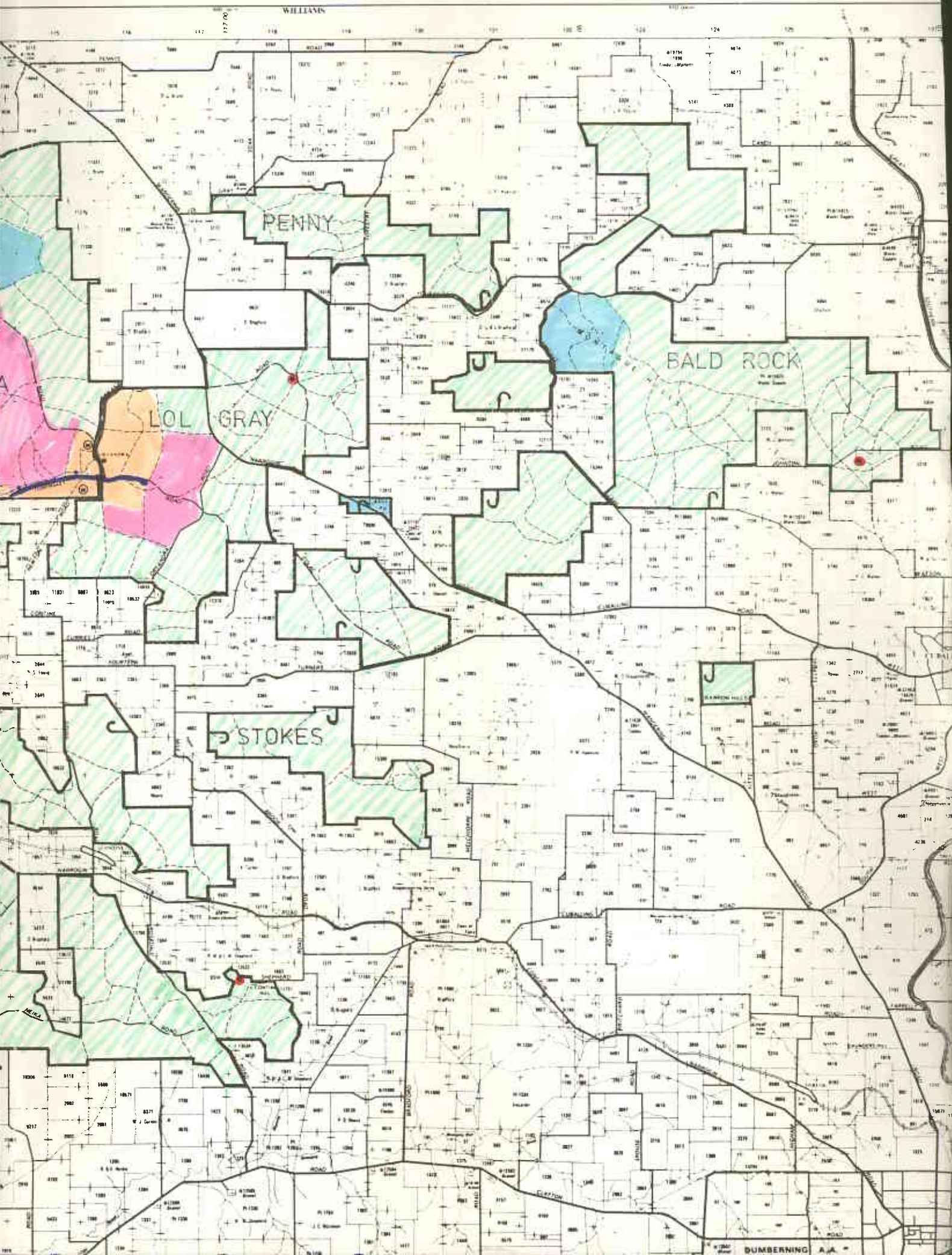
SCIENTIFIC FOREST

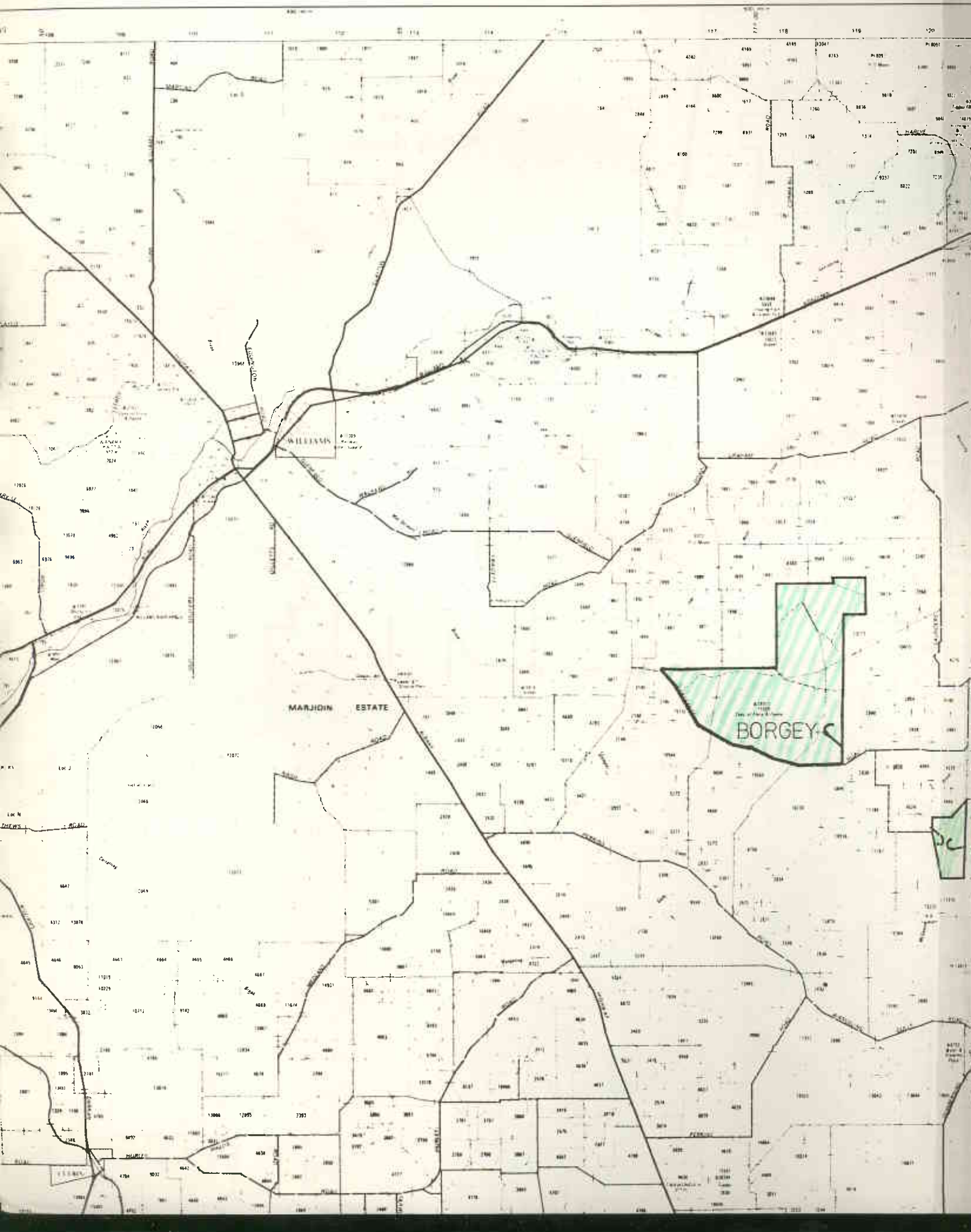
PUBLIC ACCESS THROUGH FOREST SANCTUARY

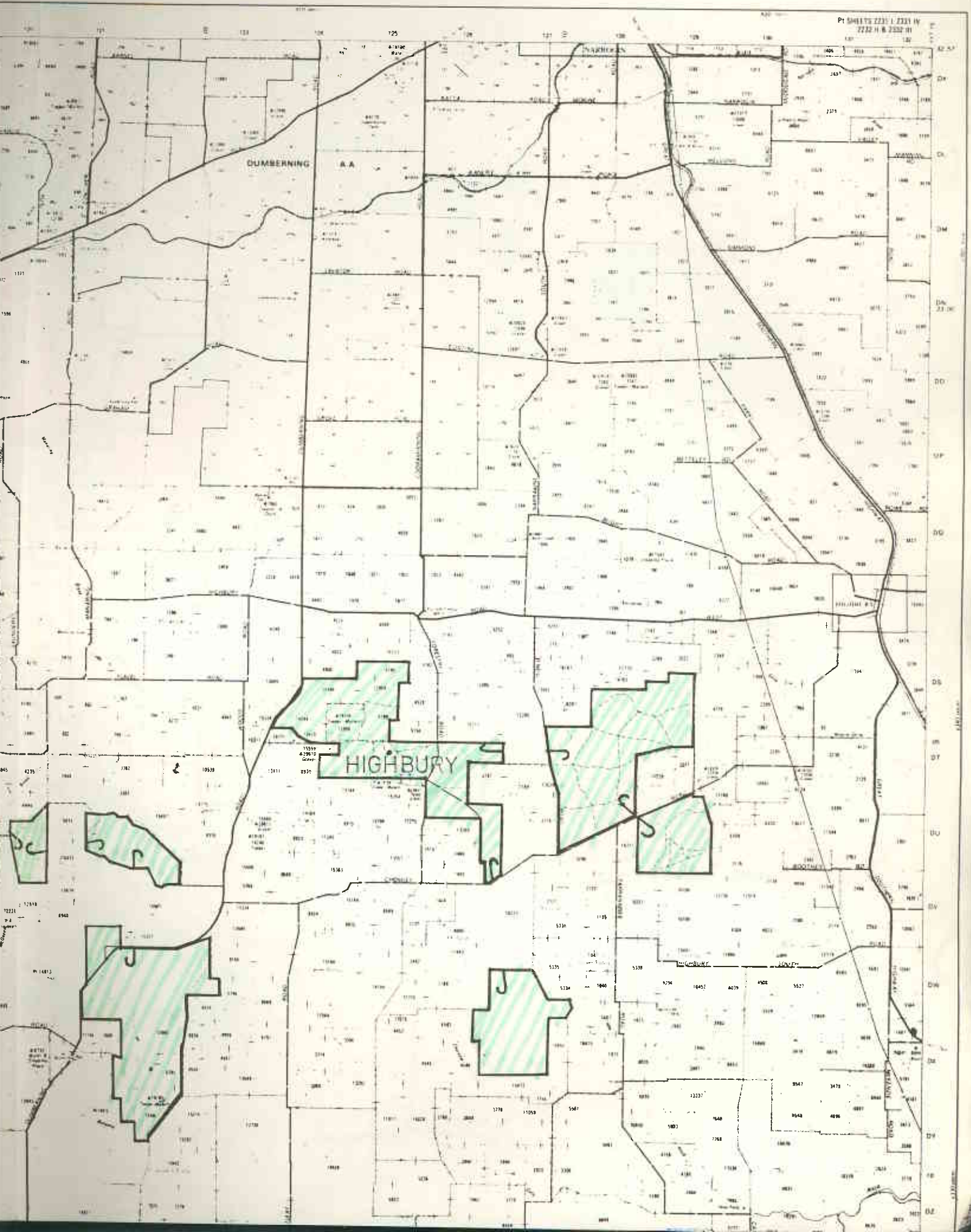
ISOLATED PICNIC SITES WITHIN MANAGED NATURE CONSERVATION FOREST.



AGEMENT ZONE BOUNDARIES




WILLIAMS
MARJOIN ESTATE
BORGEY


Pt SHEETS 2231 I 2331 IV
2232 II & 2332 III
DUMBERNING
A A
HIGHBURY