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FORESTS DEPARTMENT

MANJIMUP RESEARCH Office,

To SUPT. HAVEL

FEBRUARY 2ND 19 76

Western Australia

FORESTS DEPARTMENT, COMO

Reference—H.O. 30/75.

Local.....

SUBJECT: PERUP FAUNA PRIORITY AREA WORKING PLAN 1976-81

Please find enclosed the Perup Fauna Priority Area Working Plan 1976-81 from Peter Kimber. The maps to accompany it will be sent on later.

K. PENTONY
A.D.F.O.

*Di Ho plan
Kimber* *W.P. for* *report* *the Perup Fauna Priority Area.*
JR 572

PERUP FAUNA PRIORITY AREA

WORKING PLAN 1976 - 81

1. INTRODUCTION

The Perup Fauna Priority Area is part of an area of State Forest approaching 50,000 hectares or more which is unusually rich in numbers and diversity of native fauna. It represents a unique opportunity to exercise the principles of multiple land use with regard to fauna conservation and commercial timber production, and it provides an ideal study area for basic and applied ecology studies to determine the effects of forest operations on the fauna and flora. The broad aim of this working plan is to take advantage of these opportunities, and in so doing to maintain the rich fauna populations, to maintain the forest as a commercial proposition, and to ensure the continuance and expansion of established research projects.

The area is situated 50 km. east of Manjimup and is located on the eastern edge of State Forest.

2. OBJECTS OF MANAGEMENT

2.1 General

In broad terms the management of the Perup Fauna Priority Area shall aim at maintaining, and where possible increasing the native fauna populations in general and the Woylie (Bettongia penicillata) population in particular. A secondary aim shall be the management of the area for commercial timber production. This latter process shall be adapted to suit the commitment to fauna conservation when the two aims are found to be in conflict.

2.2 Maintenance of Existing Ecosystems

Management shall aim at maintaining the existing ecosystems in so far that :

1. A tree canopy is maintained where such already exists.
2. The composition of species forming the tree canopy shall not be markedly changed from that naturally occurring in this area.
3. Plant communities, and native fauna habitats and populations are kept at a viable level.

2.3 Forest Management

The forest shall be managed for commercial timber production. Such management shall be subject to any constraints imposed in achieving the objectives outlined in section 2.2.

2.4 Research and Investigation

The objectives shall be:

1. To establish basic principles for sound fauna management in forest areas.
2. To define the use of fire as a tool in ecosystem management, and in particular its effects on fauna movements and population levels.
3. To develop fire management techniques for application on an operational scale.
4. To determine the effects of trade cutting on fauna movements and population levels.
5. To determine the possible effects of public recreational use on fauna movements and population levels.

3. MANAGEMENT PRESCRIPTIONS

3.1 The Forest Estate

1. No alienation of land from State Forest shall be permitted within the area covered by this plan,
2. No alienation of land from State Forest shall be permitted adjacent to the area covered by this plan where such alienation would effect the closure of corridors passing between freehold lands and joining the Perup Fauna Priority Area to other State Forest areas.
3. Grazing Lease 976/40 at ^{Hearthea} Hasltea, which covers one such corridor, shall be terminated or shall be so reduced in area that an adequate corridor for the free movement of indigenous fauna is left.
4. Almost the entire wetland component of the area is freehold land. The following freehold properties, containing significant areas of wetlands, shall be purchased and incorporated in the Perup River Fauna Priority Area.

Nelson Locations 2039, 3707, 11865, 2038, 9262,
3681, 7115, 3109, 8824.

5. No mineral exploration or mining shall be permitted. The implementation of this prescription is subject to changes in legislation. Until adequate legislation has been enacted, all applications associated with mining shall be opposed in the Mining Warden's Court.
6. Extensions.

The feasibility shall be investigated of extending the Perup Fauna Priority Area to include the entire range of the Woylie in the region. Such an extension shall be made if shown to be practicable. The forest blocks involved are likely to be Dwalgan, Walcott, Winnejup, Dudijup, Kingston, Corbal, Yerramin, Weinup, Coonan, Warrup, Yardup, Yeticup, Topanup and Meribup.

3.2 Fire Protection and Habitat Management

1. Standard prescribed burning on a 6 year rotation shall be used as a protection measure and for the maintenance of a viable flora cover and fauna habitat.

This prescription amounts to a first approximation with regard to flora and fauna habitat maintenance. Its amendment, based on the results of investigations being made at present, will be permitted at any time during the period of this plan.

2. All prescribed burning shall be done in spring with the exception of parts of Camelar and Yackelup Blocks (see burning plan) which shall be burned in autumn.
3. Two areas, shown on the burning map appended to this plan, will be maintained unburnt permanently on an experimental basis.
4. Two lots of freehold property are adjacent to fire protected area No. 1 and will require additional fire protection measures. The properties are Location 7115 and the group of Locations 2038, 3681, 9262 and 11865. These have a system of fire-break tracks surrounding them approximately 400 metres outside their boundaries. The forest between the fire-break and the freehold boundaries shall be burned on a 3 year rotation.

3.3 Other Protection

1. No further establishment of trial plots of exotic tree species shall be permitted.
2. The poisoning of ~~possum~~^{vermin} by the Agricultural Protection Board shall be confined to zones one kilometer wide bordering freehold land. The Board shall be requested to confine its activities to the use of 1080 poison which is apparently less harmful to native fauna.
3. The Department of Fisheries and Wildlife shall be requested to confer with the Forests Department on any proposal to control the grey kangaroo in the area.
4. The movement of domestic livestock through the area shall be by vehicle only.
5. Normal departmental hygiene practice against dieback shall be followed in the area.

3.4 Trade - Cutting and Silviculture

1. The forest shall be managed on the group selection system with the following constraints on trade cutting -
 - (a) No Wandoo may be cut.
 - (b) Not more than one third of the standing basal area of both merchantable and non-merchantable trees shall be removed in trade cutting. Tree markers shall use a wedge-prism to effect the control of the prescription.
2. Apart from normal top-disposal practise, no other silvicultural operations are prescribed.
3. Supplies of timber, currently marketable as sawlogs, in the area are expected to be exhausted by late 1976 when cutting will cease. The areas remaining to be cut in 1976 are parts of Yackelup, Yendicup and Balkan Blocks.

3.5 Roading and Access

1. No major road construction is prescribed for the period of this plan.
2. Approximately 10 kilometers per annum of minor track will be prepared for access to experimental areas.
3. The planned maintenance of existing roads and tracks will be confined to those forming important access and to those forming the boundaries of prescribed burning units. Other tracks will be maintained only when required for access to specific research projects.

The schedule of maintenance is as follows:-

a) Annual maintenance.

<u>Name of Road</u>	<u>Length to be maintained (km)</u>	<u>Remarks</u>
Mordalup	-	Shire responsible.
Lake View	10	
De Landgroff	20	
Boyup/Cranbrook	-	Shire responsible.
Distributor	10	
Northern	20	
Balbamup	10	
Stretch (to Balbamup junction)	5	
Glendale)	10) Part of boundary of unburnt area No.1
Ross)		
Unnamed track north from Ref. tree GT.97.2	20) Boundaries of unburnt area No.2
N. boundary of Area 2		
Spencer Stretch		
Firebreaks round Locations: 7115, 2038, 3681, 9262, 11865.	10	
Sundry access tracks	20	Vary from year to year.
TOTAL	135	

b) Periodic Maintenance.

Includes all tracks and roads bordering prescribed burning units in the year that burning is proposed. (for location see burning plan).

<u>Year</u>	<u>Length to be maintained (km)</u>
1975/76	70
1976/77	150
1977/78	--
1978/79	35
1979/80	--
1980/81	100

4. FINANCIAL CONSIDERATIONS

Financial budgeting and an annual works programme shall be the responsibility of the Officer in Charge of Manjimup Forest Division. This prescription is made on the basis that nearly all the day to day management at present prescribed will be integrated with adjacent forest areas also under the control of Manjimup Division.

1. THE FOREST ESTATE

The Perup Fauna Priority Area comprises the forest blocks of Chariup, Boyicup, Camelar, Yackelup, Moapinup, Yendicup and the southern parts of Divalgan and Balban. The boundaries of the area are formed by freehold land to the east, Mordalup Road to the south, freehold land and the Perup River to the west, and Distributor and Westbourne Roads to the north. The total area is approximately 38,000 hectares.

The status of the area is State Forest and Timber Reserve F130/25

2. TOPOGRAPHY, SOILS AND WATER

The area is part of the catchments of the Perup and Tone Rivers and is drained by tributaries of these rivers. The terrain is undulating, with low ridges separated by wide flat valleys.

Soils are largely lateritic on slopes and ridges. The gullies are sandy, frequently developing into a reddish sandy loam. A few granite ~~outcrops~~ ^{outcrops} occur in the western portion.

Permanent water is scarce in the area. The tributaries of the Tone and Perup Rivers flow only during winter. Apart from a few places in the south, permanent pools on the Perup and Tone Rivers are enclosed by freehold land. A number of swamps and small, semi-permanent lakes occur in the south west of the area.

The annual rainfall is between 650mm. and 750mm.

3. FLORA AND FAUNA3.1 Vegetation

The predominant vegetation is Jarrah forest. It varies from fairly poor quality JC type forest in some of the eastern portions to better class JB type in the western section. Although Marri is present especially in the western areas it is nowhere dominant. Small areas of Wandoo are present in the east and along some of the watercourses in the north.

The understorey scrub varies from dense Bossiaea linophylla in the South western areas to low open scrub types, e.g. Bossiaea orpata dominant types in the east and north. In some areas there are dense thickets of Acacia pulchella and Heartleaf or box poison (Gastrolobium bilobum) is also common in many areas especially along watercourses. Along some of the watercourses in the north are thickets of Melaleuca sp. There are small areas of Carex swamp surrounding the small semi-permanent swamps in the south west

Jarrah trees in this area are subject to annual, moderate to severe infestation by the jarrah leaf miner (Perthida glyphopa). When severe infestations occur the trees may become completely defoliated.

3.2 Fauna

Surveys within, and adjacent to the area have indicated it to be rich in species and numbers of native fauna. These surveys were conducted by Mr. H. Butler, Conservation Consultant, and by Forests Department personnel. A check list of mammal species identified appears as an appendix to this plan.

Of greatest interest is the presence of the Woylie (Bettongia penicillata), and the population of this species occurring in and adjacent to the Perup Fauna Priority Area is the largest known of the three or four localities inhabited by this species. That the Woylie is classed as a rare and endangered species emphasises the importance of the Perup population.

The Numbat (Myrmecobius fasciatus), another rare and endangered species, is widespread and the Tammar Wallaby (Macropus engenii) population is probably the largest remaining on the mainland of Western Australia.

Large populations of the Brush-tailed possum (Trichosurus ~~estipicola~~ ^{obius} ~~estipicola~~) and Ring-tailed possum (Pseudocheirus peregrinus) are found in some localities in the area.

Other species are typical of the medium to low rainfall jarrah forest. The area is outstandingly suitable for the study of the management of forest faunas.

The species so far identified comprise:

Mammals	-	28 (including 4 introduced species)
Birds	-	86
Reptiles	-	1 tortoise
	-	9 lizards
	-	4 snakes
Frogs	-	6
Fish	-	5
Crustaceans	-	2

4. FIRE HISTORY

The present practice of fuel reduction burning has been developed in order to protect the timber crop from excessive periodic damage resulting from wildfires. It is also necessary in order to protect the surrounding farms and settlements from serious damage which could result from the spread of uncontrolled wildfires from state forests.

Fire records of the area are available dating back to 1938 (See Table 1). Although early records are incomplete they leave little doubt that the area has been subjected to fire at frequent intervals. The edges of the area were continually burnt by the adjoining property owners, and fire appears frequently to have escaped and spread.

The worst recorded fires were in 1949-50 when the entire area appears to have been swept by wildfires. According to eye witnesses much of the area was totally defoliated. The northern part was again swept by wildfire in 1954-55. And from the late 1950's onwards control burning has been carried out.

Thus the area has been subjected to fire for at least the last thirty years. Many of these fires occurred during summer or autumn and it can therefore be assumed that they were severe. Considering the abundant and varied fauna of the area it must be assumed that this history of wildfires, and later prescribed burning, has had little or no effect on the survival of the species of fauna known to be in the area at present. It may however, have affected their abundance.

In view of the lack of evidence to the contrary it must be assumed for the present that current prescribed burning practices, whilst they may not be beneficial, at least do not have any disastrous effects on the majority of the fauna within the area.

TABLE 1

Fire History - A brief summary of the fire history of the area extracted from Divisional plans.

<u>Year</u>	<u>Description of fire</u>
1938	Yackelup block - N.W. corner burnt by wildfire.
1940	Boyicup and Camelar - Autumn burn, western edge.
1941	Weinup block - spring edge burn on eastern edge.
1941-42	Boyicup, Camelar and Yackelup blocks - western edge burnt in spring.
1943	" " " "
1946	" " " "
1949	" " " "
1947	Camelar block - S.W. corner burnt in late autumn (controlled burn).
1949	Edging done along cup and Northern roads.
1949-50	The entire area comprising the proposed Fauna priority area was swept by wildfire during summer and autumn.
1954-55	Boyicup and the south eastern half of Camelar block were swept by wildfire. The central portion of Yendicup block also burnt.
1957	The eastern $\frac{3}{4}$ of Yackelup block was control burnt in October. Edge burn along Parkinson road.
1963-64	Boyicup block - western section control burnt. Since then the area has been burnt on a 5 to 6 year cycle.

5. TRADE CUTTING

Cutting in the area has always been on the selection system, but the intensity of cutting has varied greatly with varying forest quality. Most stands containing merchantable timber were cut over approximately 25 years ago. A second cut was started 10 years ago and has continued sporadically until the present. The resource of currently saleable sawlogs is expected to be exhausted by late 1976.

6. MANAGEMENT PROPOSALS

6.1 Protection

Fire protection of the area will be integrated with the protection of adjacent forest areas under the control of Manjimup Division. Particular attention must be paid to protection of the two areas nominated for the permanent seclusion of fire and special prescriptions have been made along these lines where the areas adjoin freehold land.

The protection of fauna from human interference is adequately catered for by the Fauna Conservation Act administered by the Department of Fisheries and Wildlife. The protection of fauna habitats and the flora will be covered by prescriptions added to this plan from time to time as results of appropriate research become available.

6.2 Timber Management

Although the area will be managed for commercial timber production, this will be a secondary objective to fauna conservation. The present level of knowledge of fauna management is based on past experience only which indicates that past selection type management of the forest has not depleted fauna populations to low levels. Future timber management will continue along the lines of a selection system with a limit on the amount of forest canopy that may be removed by cutting and the proviso that as little ground disturbance as possible takes place. This can be achieved by constructing the minimum number of tracks for a logging operation. More stringent prescriptions may be found necessary when results are available from research on logging effects.

6.3 Publicity and Public Access

Publicising the Perup Fauna Priority Area and the aims of management is recommended for good departmental public relations. However, the general public should not be encouraged to visit the area on two counts:

1. The effect of heavy recreational useage on the fauna is not yet known.
2. The great majority of animals ^{are} ~~is~~ nocturnal and therefore difficult to see.

6.4 Research

It is considered that this area will become the centre of research on fauna, fire ecology, and the ecological effect of forest operations in south west forests.

The research programme will have two main objectives,

- (i) To determine the short term, or immediate effects of fire on native fauna, i.e. the effect of the fire itself.
- (ii) To determine the long term effects, i.e. the indirect effects of fire caused by changed habitat.

There are two main techniques which can be employed to achieve these two objectives.

- (i) The trap, mark and re-trap method.
- (ii) Radio tracking.

It is considered essential that both methods be employed since they are complementary. Whilst the trap, mark, re-trap method may be suitable for long-term studies on animals which are abundant and easily tagged, e.g. the woylie, it is not suitable for studies on the direct effect of fire, nor can it be used on rarer less easily trapped animals, e.g. Numbats, and Native cats.

Because the initial expense of radio-tracking equipment is high, it may seem an unnecessary expense. However once the equipment has been purchased and the animals tagged, the increased observation rate, possible with radio location, reduces the cost per unit by 200-300 times. Radio location by means of triangulation is also the only technique which will allow direct observation of the behaviour of an animal during a fire. This is considered most important not only in the case of the woylie which is considered to rely on its speed to escape, but also in the case of numbats and other animals which are considered to hide during fires. Details of the equipment needed with a detailed cost/benefit analysis will be submitted later in support of this.

The studies on the effects of fire on the fauna will be carried out within both the spring and autumn burning blocks using the unburnt areas as control plots. Supplementary information will be obtained from the northern control block on the effects of logging.

Supplementary studies will include detailed mapping of burnt and unburnt areas after fires, periodic mammal surveys, and the regeneration requirements of the main ground vegetation and shrub species of plants.

APPENDIX

MAMMAL CHECKLIST - PERUP FAUNA PRIORITY AREA

The following check-list does not necessarily represent the entire species representation.

1. Echidna (Tachyglossus aculeatus)
2. Mardo (Antechinus flavipes)
3. Wambenger (Phascogale tapoatafa)
4. Mouse dunnart (Sminthopsis murina)
5. Chuditch (Dasyurus geoffroii)
6. Numbat (Myrmecobius fasciatus)
7. Quenda (Isaodon obesulus)
8. Brush-tail possum (Trichosurus vulpecillus)
9. Ringtail (Pseudocheirus occidentalis)
10. Mundarda (Cercantetus concinnus)
11. Grey kangaroo (Macropus fuliginosus)
12. Brush wallaby (M. irma)
13. Tamar wallaby (M. eugenii)
14. Wylie (Bettongia penicillata)
15. Pipistrelle (Pipistrellus tasmaniensis)
16. Little Cat (Eptesicus pumilis)
17. Goulds Cat (Chalinolobus gouldii)
18. Chocolate bat (C. monio)
19. Long-eared bat (Nyctophilus timorensis)
20. Lesser long-eared bat (N. geoffroii)
21. White-striped bat (Tadarida australis)
22. House mouse (Mus musculus)
23. Bush rat (Rattus fuscipes)
24. Water rat (Hydromys chrysogaster)
25. Rabbit (Oryctolagus cuniculus)
26. Dingo (Canis familiaris)
27. Fox (Vulpes vulpes)
28. Cat (Felis catus)