

FIRE ECOLOGY STUDY OF THE MARNINGERUP SECTION, FITZGERALD
RIVER NATIONAL PARK, WESTERN AUSTRALIA. PART 1: FIRE-BURN
VEGETATION AND FLORA SURVEY

K.R. Newbey

PO Box 42, Ongerup WA 6536

Report prepared for the Department of Conservation and Land
Management, Perth.

28 July 1985

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K.R. Newbey

1. INTRODUCTION

The Fitzgerald River National Park (FRNP) covering approximately 243,000 ha is situated along the south coast between Albany and Hopetoun (Figure 1). The vegetation consists mainly of mallee and tall shrublands on plains, stony hills and gorge floors. Low woodlands occur along the major drainage lines and in some swamps on the plains.

The Marningerup section consists of two parts:

- (1) Marningerup area is roughly triangular in shape and covers about 29,200 ha. It is bounded on the north-west by the abandoned No 2 Rabbit Proof Fence, and on the west and south by a low fuel zone between two ploughed firebreaks. This area is to be trial burnt.
- (2) Boggy Pool Spring area (about 3,300 ha) is in the process of being added to the FRNP.

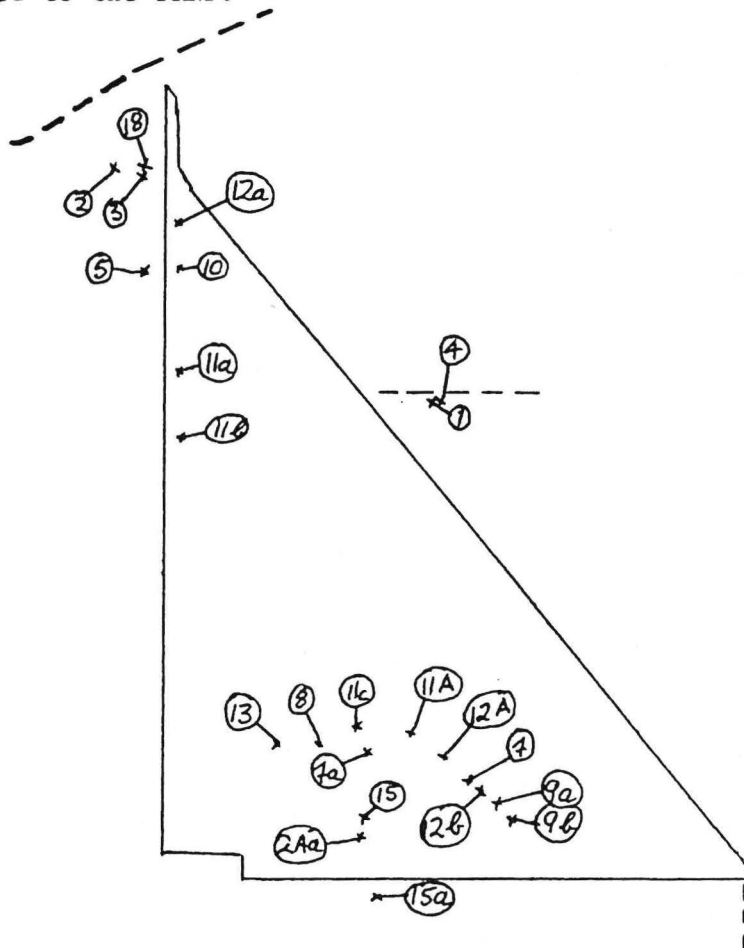


FIGURE 1. Location of Marningerup section, Fitzgerald River National Park. MFS site numbers in circles.

Fire management of mallee and shrubland vegetation types for conservation purposes in southern Western Australia is in its infancy. The only studies are those at present under way near Ravensthorpe and Beaufort Inlet. The former commenced in 1980 and the latter in 1981. Neither survey has been under way long enough to provide even a basic understanding of the fire ecology of mallee and shrublands (B. Schneider Bush Fires Board, pers. comm.). Monitoring of tall woodlands and tall forest for timber production has been in process for many years. Recently, these vegetation types have been studied for conservation management e.g. Chistensen (1980 1982).

The FRNP was gazetted in 1972 as two "A" class reserves for the conservation of flora and fauna. It was placed under the management of the National Parks Authority of Western Australia. In 1979, a fire management plan was drawn up by the then Director of the National Parks Authority but never published. The plan provided for a peripheral low fuel zone between two firebreaks, with an internal traditional chequer-board system where "squares" were to be burnt in rotation. Efforts by FRNP Rangers have concentrated on the main priority of establishing a peripheral low fuel zone.

With the peripheral section of the fire management plan near completion, internal control burning was to be initiated. Head Ranger, George Duxbury, felt that the chequer-board system of burning was not suited to the landforms and vegetation of the FRNP. It involved the initial establishment of a grid of double firebreaks with a low fuel zone. Such a grid had many disadvantages:

- (a) burning in "squares" does not take into account either the distribution of the different ecological types present or that they may have different fire regime requirements.
- (b) straight firebreaks are difficult to construct on a landscape with large areas dissected by drainage lines. Wind or water erosion have high potentials, and access by fire-fighting equipment would be impossible in some areas.
- (c) any internal firebreak can provide access to areas not suited to public use (fragile or scientific areas), as well as being aesthetically undesirable (especially in wilderness areas).
- (d) the cost of constructing and maintaining firebreaks is relatively high i.e. ploughing, repairing gully crossings.

Straight firebreaks were not desirable and the construction of any firebreaks had some serious problems. Some form of internal fire control was essential both to the biota of the park and to surrounding farmland. George Duxbury felt that burning narrow strips across the FRNP in an approximate north-west - south-east direction may be an alternative. This was evident from his experience in burning the low fuel zone during winter on cool days just prior to the arrival of a cold front.

As a cold front approached, a dry wind blows strongly and consistently from the north-west. This may last 1-3 hours. A fire lit at one spot may travel 1-5 km in a narrow strip during this period. Most cold fronts bring light falls of rain (1-10 mm) which would extinguish the fire, or severely dampen it. Winter nights are cold and dew often forms so that the fire would be extinguished even if sufficient rain did not fall. During the passage of the cold front, the wind direction changes from north-west to west.

Lighting fires for control by an approaching cold front requires that personnel can move quickly into position to make the best use of wind direction. Travel along firebreaks and tracks is slow. Also, much of the FRNP is not accessible. During 1984, the National Park Authority suggested the alternative of aerial burns (Bradbury 1981) instead of traditionally by personnel on the ground. Because aerial burns had not been attempted in the mallees and tall shrublands of the south coast, a trial burn was considered necessary before undertaking aerial strip burning of the whole park. The Marningerup section was selected as a trial area. If the strip burn became a wildfire, it would travel further into the park and not endangered nearby farmland.

Landform, flora, fauna and fire history data were required as a basis for both predicting fire behaviour and assessing the trial burn. Very few of these data existed and the National Parks Authority of Western Australia offered contracts to:

- a) map fire history based on aerial photography flown at various times since 1956, and information from the Rangers.
- b) record and collate landform, vegetation and flora data, as follows:
 - (i) describe the landforms in relation to fire behaviour;
 - (ii) describe the vegetation on a structural basis with special emphasis on vertebrate fauna sites;
 - (iii) map the vegetation;
 - (iv) search for both fire sensitive and rare plants;
 - (v) record fire fuel loadings.
- c) document the vertebrate fauna with special emphasis of site data.

This report covers section (b) above. Field surveys were carried out during 8-13 November 1984 and 8-15 April 1985. The fire history map has been completed, and the vertebrate fauna report completed (Chapman 1985).

Most of the data collecting, collating and report compilation was carried out under contract. However, my personal contributions were (i) data from an additional 15 vegetation sites, (ii) assessing frequency and cover/abundance for floristics (Appendix II), and (iii) listing minor species in Appendices I and III.

2. METHODS

All cadastral boundaries, geographic co-ordinates, descriptions, selection of sites and the recording of opportunistic data, were based partially or wholly on field traverses, aerial photo interpretation and contours on 1:50,000 topography maps (Series R712, Edition 1, Department of Lands and Surveys, Perth). The aerial photography was black and white, at the scale of 1:50,000, and flown 9 November 1983 and 9 January 1984. Field data recorded for the plant ecology of central south coastal Western Australia (Newbey 1979) were also examined.

Fourteen typical sites were selected subjectively to represent the main vegetation types and periods since the last fire. Landform, soil profile, vegetation structure, floristics, vertebrate fauna and fuel loading data were recorded at each site. Two other sites were recorded briefly in relation to landform, soil profile, vegetation structure and floristics.

LANDFORM

Descriptions and mapping of the main landforms were based on map contours and "spot" inclinations.

SOIL PROFILE

A hole 62 mm in diameter was augered to 1 m wherever possible. Data recorded included horizon thickness, colour, texture, inclusions, pH and calcareousness (Northcote 1971). On the soil surface, rock, stone, pavement and litter (Muir 1977) were recorded.

VEGETATION

Vegetation sites were of two sizes: (a) 40 m x 90 m for fenced pit traps, and (b) 40 m x 140 m for trap lines. Vegetation data followed the structural classification of Muir (1977): life form, height classes, degree of clumping, species present in each stratum and their canopy cover, and phenology.

Vegetation was mapped assuming maturity and followed a modified form of Muir (1977). The modifications were that:

- (i) only the upper stratum was assessed;
- (ii) the term "Low Woodland A" is replaced by "Low Woodland", and "Low Forest B" is replaced by "Dwarf Forest";
- (iii) some vegetation types were sub-divided on the angle of slope e.g. gully and plain, or physical feature e.g. creek or swamp. The mapping format was also designed for use as a management tool.

One permanent plot 1 m x 5 m was sited (subjectively) close to each fenced pit-traps or trap lines but far enough away not to interfere with their purpose. Within each plot, the position of each plant and a single stylised outline of its foliage were plotted. On 4-year old burnt areas, the seedlings of some species were too dense to plot individually on graph paper. An outline of the clump and the estimated number were recorded. The average height for each species was estimated. Each plot has steel posts driven into the ground at the corners for easy location for future monitoring.

FLORA

Species recorded at each site, and opportunistically, were assessed for fire sensitiveness.

FUEL LOADING

Data were recorded using the drop plate method of Schneider and Bell (in edit) and the pole contact method of Jones (1974). Litter was collected under some mallees and large shrubs (Banksia media), dried and weighed.

3. CLIMATE

According to classification of Koppen, the Marningerup area is near the inland boundary of Warm Temperate Western Maritime Climate (Dick 1975). The weather pattern is largely controlled by the west-east movement of "highs" during summer and sub-polar "lows" during winter. The summers are warm to hot but modified by an afternoon sea breezes. The winters are cool and about 60% of the average annual rainfall occurs during this period. Average maximum temperatures range from 14 to 18 degrees C. Nights are cold with occasional frosts.

There are no weather recording stations in the Marningerup or Boggy Pool Spring areas. Presented below (Table 1) are the average annual rainfall and monthly totals (January 1984 to March 1985) for Gairdner River, the nearest recording station.

TABLE 1
RAINFALL DATA FOR GAIRDNER RIVER (mm)

Month	J	F	M	A	M	J	J	A	S	O	N	D	Year
Average	29	24	25	38	40	49	46	48	52	47	36	14	448
1984	16.4	6.7	15.0	18.5	59.4	32.1	70.1	65.8	68.0	20.0	25.1	2.0	399
1985	N/A	4.2	58.0										

4. PHYSICAL ENVIRONMENT

GEOLOGY

The area has been mapped at 1:250,000 and described by Thom and Chin (1982) and Thom *et al.* (1984). Briefly, gneisses and migmatites underlay the whole area. The Stirling Fault, barely evident, divides the area into two sections. North of the fault is the Archaean Yilgarn Block, while south is the Proterozoic Albany-Fraser Province. The former has not experienced marine transgression while the latter has twice (Proterozoic and Eocene). During the Eocene transgression, spongolite of the Plantagenet Group was laid down resulting in an almost flat land surface. A few dolerite dykes have intruded the Yilgarn Block (age unknown), and a small area of Archaean greenstone is present.

During the last major Ice Age (about 120,000 years ago), a fall of about 80 m in sea level resulted in river rejuvenation. Lower and middle slopes of the Gairdner River and its main tributaries were stripped of their soil. Some minor drainage lines were cut into the spongolite beds of the Plantagenet Group.

LANDFORMS

They have been described by valley type by Newbey (1979). Most of the Yilgarn Block has a subdued landform pattern of gently undulating plain, while south of the Stirling Fault is level plain (McDonald *et al.* 1984). Most of the slopes of gently undulating plain are 1-3 degrees while the plain is less than 1 degree. Relief of both is mainly less than 9 m. Present on the latter are swamps 50-1,000 m across that are only filled by very heavy rains. Their maximum water depth is mainly 30-70 cm.

Two drainage line types traverse the subdued landform. The first has been cut into gneisses and migmatites forming V-shaped valleys 500-2,000 m wide, 30-50 m deep with stripped slopes of up to 12 degrees and have a south-west trend. The second type have been eroded into spongolite. They are U-shaped, 400-1,500 m wide, 10-30 m deep with maximum slopes of 20 degrees and trend south-east to south.

The landforms of the Boggy Pool Spring area are generally different to the Marningerup area. The Gairdner River meanders across the former about 20 m below the general plain level. The river flows most winters and may rise up to 7 m during floods. Most of the year, the river is reduced to permanent, sinuous, saline pools 1-3 m deep with steep sides. In between the pools are exposed bedrock and sheets of coarse alluvium. A fossil flood plain, about 5 m above river channel level, is present on the inside of meanders. A rounded gneissic hill rising about 40 m above the river channel, is present in the south-west corner.

SOIL

The physical properties of most soils in the area have been described by Newbey (1979). The main types are outlined briefly below. On the gneisses and migmatites of the Yilgarn Block, well-drained duplex soils formed in situ dominate. They have an A horizon 10-30 cm thick of loamy sand, or gravelly sand, over a sandy clay B horizon at least 1 m thick. Sometimes extensive colluvial sand sheets, to 1 m thick covers lower places in the landscape. Duplex slopes have also developed in situ over spongolite. Their A horizon is similar to the above soils but the B horizon is 70-100 cm thick. Most are well-drained, a few areas are poorly drained with their A horizon of sandy loam to clay loam. Gilgai is sometimes present and developed to varying degrees.

5. VEGETATION

The vegetation has been mapped at the scale of 1:250,000 based on black and white aerial photo mosaics (Beard 1972). The main species in each vegetation type are listed. The FRNP has also been mapped at the same scale but using the classification of Specht (1970) and the main genera listed for each vegetation type (Aplin & Newbey in edit). While the latter mapping is more detailed than the former, the scale of both maps was too coarse for this study.

According to the classification of Muir (1977) and the restriction of mapping scale (1:50,000), 17 plant associations were mapped (Table 2). Low woodlands (5-15 m high) were restricted to major drainage lines and swamps where Eucalyptus occidentalis low woodland (canopy cover up to 30%) occurred on alluvium next to the river channel. The vegetation was often mosaic and included small patches of Allocasuarina huegeliana dwarf woodland (less than 5 m high) and dense patches of Acacia saligna 2-3 m high. On swamps E. occidentalis low woodland had a variable sub-strata related to the depth of water when the swamps are full. Where the water depth exceeded about 70 cm, most of the floor was bare with peripheral sedges of Gahnia decomposita and tall shrubs of Melaleuca preissiana on higher ground. With a water depth of 30-70 cm Lepidosperma leptophyllum was present, or Anarthria laevis if the depth was less than 30 cm. E. astringens low woodland (canopy cover 10-30%) was present on some steep spongolite slopes.

Allocasuarina huegeliana dwarf forest also occurred along some major stripped drainage lines over gneisses and migmatite. E. platypus dwarf forest was present on some of the valley middle slopes on clayey soils, over both gneisses and migmatites and spongolite. Of rare occurrence were small patches on colluvium at the base of some steep spongolite slopes.

TABLE 2

VEGETATION TYPES & VETEBRATE FAUNA RECORDING

Vegetation structural classification is slight modified Muir (1977).

FAUNA RECORDING

- O = Opportunistic
 P = Fenced pit traps & transportable bird quadrats
 T = Trap line & transportable bird quadrat

VEGETATION TYPE	FAUNA RECORDED			
	Years since last fire			
	5	15	26	27+

LOW WOODLAND (Lai)				
<u>Eucalyptus astringens</u>	.	.	.	x
<u>Eucalyptus occidentalis</u> (creek)	.	.	O	O
<u>Eucalyptus occidentalis</u> (swamp)	.	.	.	O
DWARF FOREST (Lbc)				
<u>Allocasuarina huegeliana</u>	.	.	.	O
<u>Eucalyptus platypus</u>	.	.	x	x
SHRUB MALLEE (KSc)				
<u>Eucalyptus annulata</u>	.	.	x	x
OPEN SHRUB MALLEE (KSi)				
<u>Eucalyptus conglobata</u>	.	x	x	x
<u>Eucalyptus eremophila</u>	.	.	T	O
<u>Eucalyptus redunca</u> (gully)	.	x	x	O
<u>Eucalyptus redunca</u> (plain)	.	x	T	O
<u>Eucalyptus transcontinentalis</u>	P	.	.	.
VERY OPEN SHRUB MALLEE (KSr)				
<u>Eucalyptus annulata</u>	.	.	.	P
<u>Eucalyptus decipiens</u> (colluvial slope)	.	.	x	x
<u>Eucalyptus decipiens</u> (plain)	.	P	P	O
<u>Eucalyptus redunca</u> (gully)	.	x	x	x
<u>Eucalyptus redunca</u> (plain)	x	x	P	P
<u>Eucalyptus tetragona</u>	.	.	.	P
TALL SHRUBLAND (Si)				
<u>Melaleuca hamulosa</u>	.	.	.	x
<u>Melaleuca cuticularis</u>	.	.	.	O
COMPLEX				
Granite	.	.	.	O

The mallee vegetation was mainly 3-5 m tall and varied widely in density. The densest (E. eremophila open shrub mallee) occurred along minor drainage lines, or on rare dolerite dykes (E. annulata shrub mallee). Both had a canopy cover of 30-50%. The former was intermixed with dense stands of tall shrubs (Melaleuca spp. and Banksia media) on sinuous alluvial flats.

Both the gently undulating and level plains have similar groups of mallee vegetation types. Eucalyptus redunca open shrub mallee (canopy cover 10-30%) and very open shrub mallee (canopy cover less than 10%) were on duplex soils with a shallow A horizon of loamy sand or gravelly sand. E. decipiens very open shrub mallee was on the deeper sandy loam A horizons. Over spongolite, E. transcontinentalis open shrub mallee was present on the poorly-drained duplex soils. On shallow stony soils over greenstone was E. annulata very open shrub mallee. This plant association was a mosaic that included small dense patches of Allocasuarina campestris ssp. campestris and Melaleuca uncinata tall shrublands (1-2 m high).

E. conglobata open shrub mallee was presented on some of the stripped slopes of gullies on the Yilgarn Block. On some stony spongolite slopes near the Gairdner River, a few small patches of the same vegetation were present.

E. tetragona very open shrub mallee consist of mosaic and complex vegetation on the stripped slopes of valleys of gneisses and migmatites. The soil depth often varied widely over distances of less than a metre. This complex vegetation also included Allocasuarina campestris ssp. campestris or Grevillea hookeriana tall shrublands, Dryandra cirsioides low shrubland, as well as annuals and geophytes on skeletal soils.

Another complex vegetation (Melaleuca viminea tall shrubland) occurred along the river channels and on alluvial deposits less than 2 m above the channel. East of Calyerup Rock, a small patch of Melaleuca hamulosa tall shrubland was present on a saline minor drainage line.

Granite Complex was present on some excessively stripped valley slopes, and where drainage lines had cut into gneiss or migmatite bedrock. Many areas were too small to map and they are included in vegetation types such as E. tetragona very open shrub mallee.

PROBLEMS

The following problems were encountered while mapping the vegetation:

- (a) The siting of boundaries of some plant associations was difficult. For instance, Eucalyptus redunca open shrub mallee graded into E. redunca very open shrub mallee without any corresponding change in position in the landscape.
- (b) Because of the scale of aerial photography (1:50,000), mosaic vegetation had to be treated as a complex.
- (c) Some plant associations occurred on more than one soil type but they could not be consistently separated on aerial photography.
- (d) In some very open shrub mallees, the presence or absence of certain tall shrub species (either Lambertia inermis or Banksia media) were critical to the presence of some nectivorous birds and mammals. The vegetation types could not be consistently separated.
- (e) The density of the low shrub stratum in some open and very open shrub mallees influenced the presence of some bird species. Mapping the low shrub stratum, with greater than 50% or less than 50% canopy cover, was not possible.
- (f) My previous vegetation mapping experience had been with black and white aerial photography flown about 1970 and at the scale of 1:40,000. Mapping on this photography was easier and more accurate than on the 1:50,000 scale aerial photography used for the present study.

The vegetation types sampled for vertebrate fauna (and their fire age) are listed in Table 2.

6. FLORA

The flora had not previously been documented and only a few sites recorded in detail before the present study (K.R. Newbey unpublished data). One species of fern, and 553 species, 5 subspecies and 14 varieties of flowering plants are listed (Appendix II). Most were recorded at vegetation sites as time was not available for extensive field searches.

RARE SPECIES

Twelve species (Table 3) recorded are considered rare (Newbey in edit); none have been gazetted as rare.

TABLE 3

RARE PLANT SPECIES

<u>Acacia</u> aff. <u>biflora</u> (KRN 4287)
<u>Drosera</u> <u>stolonifera</u> ssp. <u>compacta</u>
Epacridaceae genus indet. (KRN 3191)
<u>Haloragis</u> <u>dygyna</u>
<u>Leucopogon</u> sp. (KRN 9608)
<u>Melaleuca</u> <u>apodocephala</u>
<u>Opercularia</u> <u>apiciflora</u>
<u>Pimelea</u> sp. (KRN 1339)
<u>Schoenus</u> sp. (KRN 4138)
<u>Spyridium</u> sp. (KRN 5007)
<u>Stylidium</u> <u>pseudohirsutum</u>
<u>Thysanotus</u> <u>gageoides</u>

FIRE SENSITIVE SPECIES

None of the taxa recorded are considered fire sensitive for the purpose of the trial burn. However, this is for a single burn only and taxa would need to be assessed on some additional criteria if the periods between burning is considered.

7. STANDING FUEL

Estimates of standing fuel and litter by pole contact and drop plate methods are presented by Table 4.

Estimated tonnes/ha are less for drop plate method than contact pole. Eucalyptus tetragona very open shrub mallee has the closest estimates: 4.5 to 5.1 tonnes. E. decipiens very open shrub mallee (MFS11b) has the largest difference: 7.3 t to 16.0 t. Discussion on the differences is beyond the scope of this paper. From personal experience, it appears that 4.0 t (drop plate) is the minimum required to carry a wildfire.

TABLE 4

STANDING AND LITTER FUEL
(Tonnes per ha)

MFS number: without lower case letter (Appendix I)
with lower case letter (Appendix III)

Method: Drop Plate (Schneider & Bell in edti)
Contact Pole (Jones 1974)

MFS No	Vegetation Type	Year Burnt	Drop Plate	Contact Pole

OPEN SHRUB MALLEE (KSi)				
7	<u>Eucalyptus</u> <u>eremophila</u>	1969	N/A	10.3
7A	<u>Eucalyptus</u> <u>eremophila</u>	1957	N/A	21.9
8A	<u>Eucalyptus</u> <u>redunca</u>	1957	N/A	7.2
9a	<u>Eucalyptus</u> <u>transcontinentalis</u>	1979	3.1	5.3
9b	<u>Eucalyptus</u> <u>transcontinentalis</u>	1979	3.7	5.3
VERY OPEN SHRUB MALLEE (KSr)				
10	<u>Eucalyptus</u> <u>annulata</u>	1957	8.2	7.0
11A	<u>Eucalyptus</u> <u>decipiens</u>	1969	8.8	13.0
11a	<u>Eucalyptus</u> <u>decipiens</u>	1957	6.2	8.0
11b	<u>Eucalyptus</u> <u>decipiens</u>	1957	7.3	16.0
11c	<u>Eucalyptus</u> <u>decipiens</u>	1969	5.0	7.8
12A	<u>Eucalyptus</u> <u>redunca</u>	1957	7.5	9.2
12a	<u>Eucalyptus</u> <u>redunca</u>	1957	8.8	10.0
12b	<u>Eucalyptus</u> <u>redunca</u>	1957	8.0	16.6
13	<u>Eucalyptus</u> <u>tetragona</u>	1969	4.4	5.1

8. DISCUSSION

The following factors need consideration when planning the experimental burn.

LANDFORMS

Most of the area is either flat or gently undulating which would have little influence on fire spread. Exceptions are a few, shallow V-shaped gullies with slopes of about 5 degrees. They are mainly at right angles to the proposed strip burn and would slow the fire velocity when burning downslope. Alternatively, upslope velocity would be increased.

A few, small patches of exposed bedrock (gneiss) are the only unvegetated areas present. The old "Quaalup"- "Jarramongup" track consists of two wheel tracks and has been abandoned for many years. As the track runs in the same general direction as the proposed burn, it should not interfere with fire spread.

VEGETATION

Almost all the vegetation contains sufficient standing fuel and litter to burn. The exception is an area in the SW corner burnt by wildfire in 1979.

A few areas of *Eucalyptus tetragona* very open shrub mallee may contain scattered small areas of bedrock exposure that would interfere with fire travel.

FLORA

During the survey (incomplete) no fire sensitive species were noted even though 12 rare species were recorded.

It is IMPORTANT to note that any planning for periodic burning of the area would require that the assessment base for vegetation and flora include additional criteria not considered for a once-off, experimental aerial burn.

9. ACKNOWLEDGEMENTS

This report was enhanced by the the contributions of the following people. Survey design was discussed with Barry Muir (National Parks Authority) and Andy Chapman (consultant zoologist). George Duxbury outlined his experiences of protective burning in FRNP. Brian Cornell (National Parks Authority) discussed the concepts of aerial burning. Brian Schneider (Bush Fires Board) discussed the measurement of fuel loadings. My wife, Brenda, accompanied me in the field and assisted with some of the recording and searching for rare plant species.

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APPENDIX I

Descriptions of Vegetation Sites

EXPLANATION OF SYMBOLS

Listed below are descriptions of typical vegetation sites including data on geology, landforms, land surface and soils. Soil data are incomplete for some sites. The vegetation is classified according to the system of Muir (1977). Vegetation structural descriptions differ from the concept of Muir (1977) who only lists strata with canopy cover of 2 or higher. This report lists all strata. Site descriptions are ordered as follows: first, tallest to lowest formation; second, densest to sparsest canopy cover class; and third, by alphabetical order of the most prominent species in upper stratum. If the vegetation structure and species composition are highly variable, the vegetation is referred to as a complex and named according to the characteristic bedrock or physical feature e.g. granite complex.

MUIR = Muir (1977) notation; PROVINCE and SYSTEM refer to Beard (1975). * indicates an introduced taxon. "Misc." (miscellaneous) plants includes annuals, climbers, ferns, geophytes, parasitic climbers, perennial grasses, sedges and sedge-like (plants). Figures in brackets following plant names are per cent canopy cover (CC). Taxa with less than 0.1% CC are indicated by a (+). "KRN" numbers are K.R. Newbey collecting numbers. Taxa listed as "aff." have their voucher specimen numbers quoted in Appendix II.

The period since the last fire (LAST BURNT) is estimated from observations in nearby areas where the year of the last fire is known. MODIFICATION refers to by Europeans and their introduced flora and fauna.

BEDROCK refers to major rock type. GEOLIGICAL SURFACE is that shown on 1:250,000 geological maps; (Bb) = Bremer Bay (Thoma & Chin 1982), and (Ne) = Newdegate (Thom et al. 1984). UNIT and ELEMENT refers to landform units described in text.

The cover of rock, stone and pavement is visually estimated. For explanation of litter see Muir (1977). Note that the present study divides leaves into broad, narrow and terete, while Muir (1977) separates them only into broad or terete.

Soil profile is sampled by augering a hole, 62 mm in diameter, to a depth of 1 m where possible. Soil colour is determined in a moist condition using Fujihira Standard Soil Colour Charts. Munsell colour names are listed for most colours and used whenever possible. Where Munsell names are not listed, P.C.C.S colour names listed on the charts are used and enclosed in " ". The degree of calcareousness is according to the system of Northcote (1971). pH is estimated to nearest 0.25 using Soil pH Testing Kit (Inoculo Laboratories, Melbourne). Soil nomenclature generally follows Northcote (1971). GROUP refers to Newbey (this publication). Comments on soil profiles more than 1 metre thick are based on observations nearby where similar profiles were exposed e.g. road cutting.

DISTRIBUTION refers to within the Study Area. Major variations in the structure of lower vegetation strata, soil type, landform unit, or bedrock, observed within the Study Area are listed under GENERAL.

LOW WOODLAND (trees 5-15 m, canopy cover 11-30%)

MFS1 Eucalyptus astringens Low Woodland

LOCATION: 6 km WNW of Bivouac Rocks (33° 58' 30"S lat., 119° 11' 20"E long.)

FAUNA SAMPLED: No AREA: Plotless, 0.2 ha DATE: 7-10-1977

VEGETATION

MUIR: LAi

PROVINCE: South-west

SYSTEM: Jerramungup

Stratum 1: Trees 5-8 m, CC = 20, clumping slight
Eucalyptus astringens (20).

Stratum 2: Shrubs 2.1-2.5 m, CC = +, clumping none
Hakea laurina (+).

Stratum 3: Shrubs 1.1-1.5 m, CC = +, clumping none
Persoonia teretifolia (+).

Stratum 4: Shrubs 0.6-1.0 m, CC = +, clumping none
Banksia caleyi (+).

Stratum 5: Shrubs 0.0-0.5 m, CC = 0.5, clumping moderate
Melaleuca aff. pentagona (0.4), Boronia inconspicua (0.1),
Acrotriche ramiflora (+).

No of TAXA: 7

LAST BURNT: more tahn 50 years

MODIFICATION: None evident or known

LANDFORM

BEDROCK: Kaolinized granite

GEOLOGICAL SURFACE: (Ne) Czo in Agv

UNIT: Breakaway

ELEMENT: Rubble slope and rim

SOIL

GROUP: Gritty Loams

NORTHCOTE: Not recorded

MAIN ORIGIN: In situ weathering

DRAINAGE: Excessive

MAIN ATTRIBUTE: Shallow

SURFACE: Hardsetting

ROCK: 10% cover, patchy

STONE: 15% cover of irregular kaolinite 2-12 cm across, patchy.

PAVEMENT: 10-60% cover of material 5-15 mm across.

LITTER: Leaves broad, deposits 2-3 cm thick, 1-8 m apart.

SOIL PROFILE

A 0-16 cm Light reddish brown sandy loam; friable; inculsions 5-10%
angular kaolinite 1-3 cm long; pH 6.0; not calcareous.

B 16-26 cm Light orange brown sandy loam; as above but 30-40%
inclusions; grades into saprolite.

COMMENTS

DISTRIBUTION: Common on rubble slope and rim of breakaways, either over
kaolinised granite or spongolite, 0.1-0.8 ha

PROFILE THICKNESS: 15-35 cm

GENERAL: Recorded 1.5 km east of Marningerup Area.

MFS2A Eucalyptus occidentalis Low Woodland (creek)

LOCATION: 16 km ENE of Jerramungup (33° 54' 20"S lat., 119° 04' 42"E long.)

FAUNA SAMPLED: No AREA: Plotless, 0.5 ha DATE: 25-9-1975

VEGETATION

PROVINCE: South-west

SYSTEM: Jerramungup

MUIR: LAi.Si.SCr.SDr.GLr.Ji.VLr

- Stratum 1: Trees 8-12 m, CC = 25, clumping slight
Eucalyptus occidentalis (25).
- Stratum 2: Trees 4-6 m, CC = +, clumping moderate
Allocasuarina huegeliana (+).
- Stratum 3: Shrubs 2.1-3.0 m, CC = 16, clumping strong
Acacia saligna (5), Melaleuca cuticularis (5), M. hamulosa (5), A. cyclops (1).
- Stratum 4: Shrubs 1.6-2.0 m, CC = 1.7, clumping slight
Actinostrobos pyramidalis (1), Jacksonia furcellata (0.5),
Acacia harveyi (0.2), Callistemon phoeniceus (+).
- Stratum 5: Shrubs 1.1-1.5 m, CC = 0.7, clumping none
Hakea lissocarpa (0.5), Kunzea micromera (0.2), Dodonaea amblyophylla (+).
- Stratum 6: Shrubs 0.6-1.0 m, CC = 3.9, clumping moderate
Astartea fascicularis (3), Baeckea crispiflora (0.5), Calytrix tetragona (0.2), Brachysema celsianum (0.1), Acacia pulchella var. glaberrima (+), Kunzea recurva (+), Melaleuca lateriflora (+), M. uncinata (+).
- Stratum 7a: Shrubs 0.0-0.5 m, CC = 4, clumping slight
Lysiosepalum involucratum (1), Velleia trinervis (1), Calytrix leschenaultii (0.5), Conostylis seorsifolia (0.2), Dodonaea pinifolia (0.2), Oxylobium tricuspdatum (0.2), Stypantra imbricata (0.2), Acacia lasiocarpa var. bracteolata (0.1), Astroloma compactum (0.1), A. epacridis (0.1), Grevillea acerosa (0.1), Samolus junceus (0.1), Stackhousia pubescens (0.1), Carpobrotus modestus (+), Disphyma clavellatum (+), Eutaxia densifolia (+), Melaleuca pentagona (+), Muehlenbeckia adpressa (+), Persoonia striata (+), Spyridium DJ (+).
- Stratum 7b: Misc. plants, CC = 33, clumping slight
Annuals: Brachycome pusilla (3), Centrolepis polygyna (3), Hyalochlamys globifera (3), Chrysocoryne unifolia (2), Haloragis nodulosus (2), Helipterum demissum (2), Millotia tenuifolia (2), *Parentucellia latifolia (2), Mitrasacme paradoxa (0.5), Triglochin mucronulata (0.5), Cotula cotuloides (0.2), Helicgrysum leucopsidium (0.2), Podolepis lessonii (0.2), Schoenus nanus (0.2), S. sculptus (0.2), Senecio glossanthus (0.2), Triglochin minutissima (0.2), Cotula coronopifolia (0.1), Daucus glochidiatus (0.1), Podotheca angustifolia (0.1), Schoenus odontocarpus (0.1), Siloxerus pygmaeus (0.1), Trachymene pilosa (0.1), Triglochin centrocarpa (0.1), *Anagallis arvensis (+), Angianthus preissianus (+), Bolboschoenus caldwellii (+), Brachycome ciliaris (+), *Briza minor (+), Centrolepis humillima (+), Helipterum laeve (+), Hydrocotyle diantha (+), H. alata (+), *Juncus bufonius (+), Rutidotis multiflora (+), Schoenus cernuus (+).
- Geophytes: Thelymitra antennifera (0.3), Chamaescilla corymbosa (0.1), Oxalis corniculata (0.1), Drosera neesii ssp. neesii (+).
- Parasitic Climbers: Cassytha melantha (+).
- Perennial Grasses: Amphipogon debilis (1), Neurachne alopecuroidea (1), Sporobolus virginicus (0.5), Stipa trichophylla (0.5).

Sedges: *Chorizandra enodis* (2), *Gahnia decomposita* (2),
Lepidosperma drummondii (1), *L. brunonianum* (0.5), *Cladium*
junceum (0.2), *G. ancistophylla* (0.2), *Juncus krausii* (0.2),
L. tenue (0.2), *Lepidobolus preissianus* (+), *Loxocarya*
cinerea (+).

Sedge-like: *Lomandra micrantha* (0.1), *Patersonia occidentalis*
(0.1), *Dianella revoluta* (+).

No of TAXA: 99

LAST BURNT: more than 50 years

MODIFICATION: None evident or known

LANDFORM

BEDROCK: Granite

GEOLOGICAL SURFACE: (Bb) Qa in Agv

UNIT: Major tributary

ELEMENT: Drainage line

SOIL

GROUP: Alluvium

NORTHCOTE: Ucl.21

MAIN ORIGIN: Alluvial

DRAINAGE: Variable

PROFILE ATTRIBUTE: Coarse

SURFACE: Loose or hardsetting

ROCK: 5-10% cover, patches few.

STONE: 5-10% cover; material subangular, 15-25 cm long; patches rare.

PAVEMENT: 10-50% cover, angular quartz and feldspar 4-20 mm across,
 patchy.

LITTER: Flood debris, small heaps, scattered; leaves broad, deposits 2 cm
 thick, 3-10 m apart.

SOIL PROFILE

A 0-72 cm Brown sandy loam; friable; roots fine, few; humus content
 low, evident in upper 10-12 cm.

COMMENTS

DISTRIBUTION: Linear along the river and major tributaries, common, almost
 continuous.

PROFILE THICKNESS: 5-150 cm - variable from unsorted alluvium (sub-saline
 in places) to duplex soils formed in situ over gneisses or migmatites.

GENERAL: (a) Situated 2 km west of Marningerup area.

(b) See also MFS2Aa in Appendix III.

MFS2B Eucalyptus occidentalis Low Woodland (swamp)

LOCATION: 17 km W of Red Peak (34° 03' 47"S lat., 119° 13' 57"E long.)

FAUNA SAMPLED: Opportunistic AREA: Plotless, 2 ha DATE: 13-10-1978

VEGETATION

MUIR: LAi.Sr.VLr

PROVINCE: South-west

SYSTEM: Qualup

Stratum 1: Trees 8-15 m, CC = 20, clumping none
Eucalyptus occidentalis (20).

Stratum 2: Shrubs 2.1-4 m, CC = 2, clumping strong
Melaleuca preissiana (2).

Stratum 3a: Shrubs 0.0-0.5 m, CC = 1, clumping strong
Goodenia viscida (1), *Centipeda minima* (+).

Stratum 3b: Misc. plants, CC = 4.1, clumping strong (margin)
 Sedges: *Gahnia decomposita* (3), *Chorizandra enodis* (1),
Eleocharis acuta (0.1).

No of TAXA: 7
 MODIFICATION: Old rabbit proof fence and track through middle of swamp

LAST BURNT: No evidence of burning

LANDFORM

BEDROCK: Spongolite
 UNIT: Swamp Large

GEOLOGICAL SURFACE: (Bb) Qrp
 ELEMENT: Whole unit

SOIL

GROUP: Alluvium
 MAIN ORIGIN: Alluvial
 MAIN ATTRIBUTE: Unindurated
 ROCK: Nil STONE: Nil
 LITTER: None

NORTHCOTE: Not sampled
 DRAINAGE: Variable
 SURFACE: Cracking
 PAVEMENT: Nil

SOIL PROFILE (Not sampled)

COMMENTS

DISTRIBUTION: Round to oval-linear, mainly on marine plain, 0.2-75 ha
 PROFILE THICKNESS: 70-100 cm. A horizon 5-20 cm of sandy loam to clay loam, over 50-95 cm of sandy clay loam grading into spongolite.
 GENERAL: (a) Floor of the swamp was well-developed gilgai.
 (b) When full (about once every 4 years) the water depth would be 1-3 m. Water would last 18-24 months without additional run-off. This swamp was the largest in the Marningerup area.
 (c) Swamps varied widely in size and depth of water when full (30-200 cm). Canopy cover of sedges increased as maximum water depth decreased. Soils present varied widely. A few shrubs were present around the margins of some swamps. The vegetation of each swamp tends to be unique.

DWARF FOREST (trees <5 m, canopy cover 31-70%)

MFS3 Allocasuarina huegeliana Dwarf Forest

LOCATION: Near Calyerup Rock, 17 km ENE of Jerramungup (33° 54' 30"S lat., 119° 06' 19"E long.)

FAUNA SAMPLED: No AREA: Plotless, 0.4 ha DATE: 25-9-1975

VEGETATION

PROVINCE: South-west

MUIR: LBd.SCi.SDi.VLr.Jr

SYSTEM: Jerramungup

Stratum 1: Trees 4-5 m, CC = 35, clumping slight
 Allocasuarina huegeliana (35).

Stratum 2: Shrubs 2.1-2.5 m, CC = 1, clumping strong
 Acacia saligna (1).

Stratum 3: Shrubs 1.1-1.5 m, CC = +, clumping none
 Kunzea recurva (+).

Stratum 4: Shrubs 0.6-1.0 m, CC = 2, clumping moderate
 Melaleuca uncinata (2).

Stratum 5a: Shrubs 0.0-0.5 m, CC = 2.3, clumping slight
 Thomasia angustifolia (2), Stypanandra imbricata (0.2), Astoloma epacridis (+), Carpobrotus modestus (+), Muehlenbeckia adpressa (+), Pimelea argentea (+).

Stratum 5b: Misc. plants, CC = 17, clumping moderate

Annuals: *Helipterum demissum* (2), *Millotia tenuifolia* (2),
Actinobole uliginosum (1), *Haloragis nodulosus* (1), *Podotheca*
angustifolia (0.5), **Anagallis arvensis* (0.2), *Rutidotis*
multiflora (0.2), *Waitzia citrina* (0.2), *Podolepis lessonii*
(0.1), *Hydrocotyle scuttelifera* (+), *Levenhookia dubia* (+),
Parietaria debilis (+), *Ptilotus humilis* (+), *Trachymene*
pilosa (+).

Ferns: *Cheilanthes austrotenuifolia* (+).

Geophytes: *Chamaescilla corymbosa* (0.5), *Oxalis corniculata*
(0.5), *Caladenia roei* (0.1), *Wahlenbergia gracilentata* (0.1),
C. dilata var. *falcata* (+), *C. doutchae* (+), *C. filamentosa*
var. *tentaculata* (+), *Thysanotus patersonii* ssp. *patersonii*
(+).

Perennial Grasses: *Neurachne alopecuroidea* (5), *Stipa*
hemipogon (+).

Sedges: *Lepidobolus preissianus* (3), *Gahnia ancistrophylla*
(+).

Sedge-like: *Lomandra effusa* (0.5), *Dianella revoluta* (+).

No of TAXA: 41

LAST BURNT: more than 50 years

MODIFICATION: None evident or known

LANDFORM

BEDROCK: Gneiss

GEOLOGICAL SURFACE: (Ne) Agv

UNIT: Granite Exposure

ELEMENT: Outer apron

SOIL

GROUP: Granitic Soils

NORTHCOTE: Not recorded

MAIN ORIGIN: In situ weathering

DRAINAGE: Moderate

MAIN ATTRIBUTE: Shallow

SURFACE: Hardsetting

ROCK: Nil

STONE: Nil

PAVEMENT: 5-10% cover of material 4-12 mm across, whole site.

LITTER: Leaves terete, deposits 1-2 cm thick, almost continuous.

SOIL PROFILE

(Not recorded)

COMMENTS

DISTRIBUTION: Common around granite exposures, 0.2-2 ha

PROFILE THICKNESS: 50-120 cm

GENERAL: (a) Recorded 1 km west of Marningerup area

(b) Height of stratum 1 occasionally to 7 m.

MFS4 Eucalyptus platypus Dwarf Forest

LOCATION: 6 km WNW of Bivouac Rocks (33° 58' 20"S lat., 119° 58' 30"E
long.)

FAUNA SAMPLED: No AREA: Plotless, 0.6 ha DATE: 7-10-1977

VEGETATION

MUIR: LBc.KSr

PROVINCE: South-west

SYSTEM: Jerramungup

Stratum 1: Trees 3-4 m, CC = 60, clumping slight
Eucalyptus platypus (60).

- Stratum 2: Mallees 3-4 m, CC = 2, clumping none
Eucalyptus transcontinentalis (2).
- Stratum 3: Shrubs 1.1-1.5 m, CC = +, clumping slight
Melaleuca pentagona var. subulifolia (+).
- Stratum 4: Shrubs 0.0-0.5 m, CC = 1, clumping moderate
Siegfriedia darwinoides (0.6), Acacia ferocior (0.4),
Acrotriche ramiflora (+).

No of TAXA: 6 LAST BURNT: more than 50 years
MODIFICATION: None evident or known

LANDFORM

BEDROCK: Kaolinized granite GEOLOGICAL SURFACE: (Ne) Czo in Agv
UNIT: Breakaway ELEMENT: Summit

SOIL

GROUP: Gritty Loams NORTHCOTE: Not recorded
MAIN ORIGIN: In situ weathering DRAINAGE: Good
MAIN ATTRIBUTE: Clay content SURFACE: Hardsetting
ROCK: Nil STONE: Nil
PAVEMENT: 5-15% cover of material 4-12 mm long, patchy.
LITTER: Leaves broad, deposits 3-4 cm thick, continuous.

SOIL PROFILE

(Not recorded)

COMMENTS

DISTRIBUTION: Occasional in granite valleys, 2-20 ha
PROFILE THICKNESS: 50-120 cm
GENERAL: Recorded 1.5 km east of Marningerup area.

SHRUB MALLEE (mallees up to 6 m high, 30-70% canopy cover)

MFS5 Eucalyptus annulata Shrub Mallee

LOCATION: 17 km E of Jerramungup (33 55' 58"S lat., 119 05' 40"E long.)
FAUNA SAMPLED: No AREA: Plotless, 0.3 ha DATE: 25-11-1974

VEGETATION

MUIR: KSc.SCr.SDi
PROVINCE: South-west SYSTEM: Jerramungup
Stratum 1: Mallees 2.5-3.2 m, CC = 50, clumping moderate
Eucalyptus annulata (40), E. conglobata (10).
Stratum 2: Shrubs 2.1-2.6 m, CC = 0.1, clumping none
Acacia cyclops (+), Exocarpus sparteus (+).
Stratum 3: Shrubs 1.6-2.0 m, CC = 0.1, clumping slight
Acacia harveyi (+), Alyogyne huegelii (+), Dodonaea
ptarmicifolia (+).
Stratum 4: Shrubs 0.6-1.0 m, CC = 2.5, clumping slight
Cassia nemophila var. nemophila (1), Melaleuca lateriflora
(0.5), M. uncinata (0.5), M. erucaeformis (0.2), Hakea
commutata (0.1), H. lissocarpa (0.1), Allocasuarina
campestris ssp. campestris (+), Calothamnus quadrifidus (+),

Stratum 5a: Shrubs 0.0-0.5 m, CC = 11, clumping moderate
 Acacia glaucoptera (3), Oxylobium microphyllum (2), Acacia
 congesta (2), Dodonaea pinifolia (1), Haloragis hamata (1),
 Pultenaea rotundifolia (1), Halgania preissiana (0.2),
 Goodenia concinna (0.1), Thomasia foliosa (0.1), Acacia
 bidentata (+), Acrotriche cordata (+), Astroloma epacridis
 (+), Boronia scabra (+), Cooperookia polygalacea (+),
 Kennedia eximia (+), Lysiosepalum involucratum (+),
 Muehlenbeckia adpressa (+), Opercularia vaginata (+),
 Phyllanthus calycinus (+), Ptilotus spathulatus (+), Thomasia
 angustifolia (+).

Stratum 5b: Misc. plants, CC = 3.3, clumping moderate
 Annuals: Ducus glochidiatus (0.1).
 Geophytes: Anthropodium preissii (+).
 Parasitic Climbers: Cassytha melantha (0.2), M. glabella (+).
 Perennial Grasses: Neurachne alopecuroidea (1).
 Sedges: Lepidosperma aff. resinsum (2), Gahnia ancistrophylla
 (1).

No of TAXA: 43 LAST BURNT: more than 50 years
 MODIFICATION: None evident or known

LANDFORM

BEDROCK: Dolerite GEOLOGICAL SURFACE: (Ne) Pd
 UNIT: Gentle undulating plain ELEMENT: Dyke

SOIL

GROUP: Cracking Clays NORTHCOTE: Not recorded
 MAIN ORIGIN: In situ weathering DRAINAGE: Good
 MAIN ATTRIBUTE: Self-mulching SURFACE: Cracking
 ROCK: 3% cover, scattered
 STONE: 2-10% cover, sub-rounded to sub-angular dolerite 2-20 cm long,
 patchy.
 PAVEMENT: 5-20% cover of sub-angular dolerite 5-20 mm long, whole site.
 LITTER: Leaves broad, deposits 2-3 cm thick, almost continuous.

SOIL PROFILE

A 0-45 cm Red medium clay; very firm; roots fine, few; inclusions
 1-5% sub-rounded to sub-angular dolerite 1-5 cm long; pH
 8.0; not calcareous.
 B 45-87 cm Light orange medium clay; very firm; pH 8.0; slightly
 calcareous; too hard to auger deeper.

COMMENTS

DISTRIBUTION: Single linear strip, 0.4 ha
 PROFILE THICKNESS: 45-120 cm
 GENERAL: Recorded 1 km west of Marningerup area.

OPEN SHRUB MALLEE (mallees up to 7 m high, 10-30% canopy cover)

MFS6 Eucalyptus conglobata Open Shrub Mallee
 (Not sampled)

MFS7 Eucalyptus eremophila Open Shrub Mallee

LOCATION: 25 km NW of West Mt. Barren (34° 06' 14"S, 119° 12' 39"E)

FAUNA SURVEYED: Trap line AREA: 40 m x 140 m DATE: 12-11-1984

VEGETATION

MUIR: KSi.Sr.SAr.SBi.SCi.SDi.VTr.VLi

- Stratum 1: Mallees 4-5 m, CC = 15, clumping moderate
Eucalyptus eremophila (15), E. uncinata (+).
- Stratum 2: Shrubs 2.1-2.7 m, CC = 8, clumping strong
Melaleuca pauperiflora (3), Hakea corymbosa (2), M. uncinata (2), Acacia harveyi (1), Callitris roei (+).
- Stratum 3: Shrubs 1.6-2.0 m, CC = 5, clumping slight
Leptospermum erubescens (2), Acacia aff. lineolata (1), Callistemon phoeniceus (1), Hakea nitida (1), Calothamnus quadrifidus (+), Persoonia teretifolia (+).
- Stratum 4: Shrubs 1.1-1.5 m, CC = 11, clumping strong
Kunzea jucunda (4), Leptospermum oligandrum (3), Melaleuca brevifolia (2), Labichea lanceolata (1), M. calycina (1), Acacia pulchella var. glaberrima (0.1), Grevillea concinna (+), Isopogon buxifolius (+), Santalum acuminatum (+).
- Stratum 5: Shrubs 0.6-1.0 m, CC = 13, clumping moderate
Astartea fascicularis (4), Melaleuca pentagona sens. lat. (4), Calytrix tetragona (2), Melaleuca aff. pentagona (1), A. ambigua (0.5), Comesperma scoparium (0.5), Baeckea corynophylla (0.1), Brachysema lanceolatum (0.1), Petrophile seminuda (0.1), Pultenaea adunca (+), Sollya heterophylla (+), Templetonia retusa (+).
- Stratum 6a: Shrubs 0.0-0.5 m, CC = 12, clumping slight
Conostylis seorsiflora (4), Amperea ericoides (1), Hibbertia enervia (1), Melaleuca scabra (1), Calytrix leschenaultii (0.5), Verticordia plumosa (0.5), M. pentagona (0.4), Logania micrantha (0.3), Brachysema latifolium (0.1), Hakea marginata (0.1), Spyridium ????? (0.1), Agrostocrinum scabrum (+), Astroloma compactum (+), A. microphyllum (+), Baeckea fumana (+), Chorizema aciculare (+), Conospermum floribundum (+), Dampiera lavandulaceae (+), Dodonaea pinifolius (+), Glischrocaryon aureum var. angustifolium (+), Goodenia concinna (+), Halgania preissiana (+), Isopogon longifolius (+), Opercularia apiciflora (;), Platysace deflexa (+), Samolus junceus (+), Stylidium repens, Synaphea favosa (+).
- Stratum 6b: Misc. plants, CC = 23, clumping moderate
Annuals: *Arctotheca calendula (+).
Parasitic Climbers: Cassytha glabella (0.1).
Perennial Grasses: Neurachne alopecuroidea (+).
Sedges: Gahnia decomposita (8), Lepidosperma leptophyllum (3), Chorizandra enodis (2), G. ancistrophylla (2), Hypolaena exsulca (2), L. aff. resinosum (2), L. brunonianum (1), L. drummondii (0.2), Loxocarya cinerea (0.2).

No of TAXA: 74

LAST BURNT: 1969

MODIFICATION: None

LANDFORM

BEDROCK: Spongolite

GEOLOGICAL SURFACE: (Bb) Tp

UNIT: Spongolite Valley

ELEMENT: Drainage line

SOIL

GROUP: Alluvium NORTHCOTE: (Not classified)
 MAIN ORIGIN: Alluvial DRAINAGE: Moderate
 MAIN ATTRIBUTE: Additional moisture SURFACE: Hardsetting
 ROCK: Nil STONE: Nil PAVEMENT: Nil
 LITTER: Branches few; leaves broad, deposits 3 cm thick, continuous.

SOIL PROFILE

A1 0-35 cm Grey loamy sand.
 A2 35-65 cm Light grey loamy sand.
 B 65-100 cm Light brownish red sandy clay.

COMMENTS

DISTRIBUTION: Linear (often too narrow to map), most minor drainage lines, 0.4-5 ha
 PROFILE THICKNESS: 50-200 cm
 GENERAL: Similar vegetation occurs in Granite Valleys.

MFS8A Eucalyptus redunca Open Shrub Mallee (plain)

LOCATION: 2 km N of Boggy Pool Spring (Gairdner River) (34° 05' 25"S lat., 119° 10' 05"E long.)

FAUNA SAMPLED: Trapline AREA: ca 140 m x 40 m DATE: 10-11-1984

VEGETATION

MUIR: KSi.SAr.SBr.SCr.SDi.VLr

PROVINCE: South-west

SYSTEM: Qualup

Stratum 1: Mallees 2.3-2.8 m, CC = 30, clumping moderate
 E. redunca (15), Eucalyptus falcata (12), E. uncinata (2), E. incrassata (1), E. leptocalyx (+), E. tetragona (+).

Stratum 2: Shrubs 2.1-2.3 m, CC = 1, clumping none
 Hakea laurina (1), Exocarpos sparteus (+).

Stratum 3: Shrubs 1.6-2.0 m, CC = 4, clumping none
 Acacia leptoneura (2), Banksia media (1), Hakea nitida (1).

Stratum 4: Shrubs 1.1-1.5 m, CC = 2.2, clumping slight
 Melaleuca uncinata (2), Callitris roei (0.2), Hakea varia (+).

Stratum 5: Shrubs 0.6-1.0 m, CC = 5.2, clumping slight
 Kunzea jucunda (2), Banksia caleyi (1), Hakea lissocarpha (1), Styphelia longiflora (0.6), Petrophile squamata (0.5), Oxylobium parviflorum (0.3), Astartea ambigua (0.2), Melaleuca depauperata (0.2), M. subfalacata (0.2), Baeckea corynophylla (0.1), Choretrum glomeratum (0.1), Daviesia pachyphylla (0.1), Olax benthamiana (0.1), Acacia gonophylla (+), Coleanthera myrtooides (+), Grevillea concinna (+).

Stratum 6a: Shrubs 0.0-0.5 m, CC = 14, clumping slight
 Beaufortia micrantha (4), Acacia ericifolia (2), Calothamnus gibbosus (2), Hibbertia gracilipes (2), Brachysema latifolium (0.5), Daviesia anceps (0.5), Leucopogon sp. (KRN 4083)(0.5), Melaleuca sclerophylla (0.5), Verticordia habrantha (0.5), Leucopogon tetragonus (0.4), Isopogon buxifolius (0.2), Melaleuca spathulata (0.2), A. bidentata (0.1), Cooperhooia polygalacea (0.1), Daviesia aff. colletioides (0.1), Grevillea pauciflora (0.1), Melaleuca pentagona (0.1), Spyridium oligocephalum (0.1), Acrotriche ramiflora (+), Boronia inornata (+), B. tenuis (+), Chorizema nervosum (+), Darwinia sp. (KRN 2624)(+), Goodenia concinna (+), Leptospermum

erubescens (+), *Persoonia striata* (+), *Platysace deflexa* (+),
P. effusa (+), *Stylidium repens* (+).

Stratum 6b: Misc. plants, CC = 11, clumping slight

Climbers: *Billardiera coriacea* (+), *B. sericea* (+).

Parasitic Climbers: *Cassytha glabella* (+), *C. melantha* (+).

Perennial Grasses: *Neurachne alopecuroidea* (0.2).

Sedges: *Lepidosperma* aff. *resinosum* (8), *Gahnia ancistrophylla*
 (0.5), *L. brunonianum* (0.5), *Schoenus brevifolius* (0.5),
Mesomelaena stygia ssp. *stygia* (+).

Sedge-like: *Lomandra micrantha* (0.5), *Conostylis androstemma*
 var. *argentea* (0.3), *Dianella revoluta* (+), *L. collina* (+),
Patersonia sericea var. *latifolia* (+).

No of TAXA: 74

LAST BURNT: 1957

MODIFICATION: None

LANDFORM

BEDROCK: Spongolite

GEOLOGICAL SURFACE: (Bb) Tp

UNIT: Spngolite Valley

ELEMENT: Level plain

SOIL

GROUP: Gravelly Sands

NORTHCOTE: (Not classified)

MAIN ORIGIN: In situ weathering

DRAINAGE: Good

MAIN ATTRIBUTE: Gravel content

SURFACE: Hardsetting

ROCK: Nil

STONE: Nil

PAVEMENT: 3-10% cover of material 5-12 mm across.

LITTER: Branches few; leaves broad, deposits 2 cm thick, 5-10 m apart.

SOIL PROFILE

A 0-39 cm Pale brown gravelly sand; friable; inclusions 5-15 mm
 across,

increasing from 5-10%, to 30-40 cm at 20 cm; too stony to
 auger deeper.

COMMENTS

DISTRIBUTION: Uncommon on both gentle undulating and marine plains, 2-10
 ha

PROFILE THICKNESS: ? >1 m

GENERAL: (a) *Eucalyptus falcata* is often absent.

(b) Similar vegetation occurs on gentle undulating plain.

MFS8B *Eucalyptus redunca* Open Shrub Mallee (valley)

(Not recorded as vegetation appears to have similar structure and species
 composition to the above (MFS8A). The difference is that the vegetation
 occurs on slopes of 3-12 degrees, instead of 0-2 degrees (MFS8A).)

MFS9 *Eucalyptus transcontinentalis* Open Shrub Mallee

(Two sites (MFS9a & MFS9b), burnt in 1979, are listed in Appendix III.) An
 unburnt site was not sampled, nor had one been sampled nearby.)

VERY OPEN SHRUB MALLEE (mallee up to 7 m high, 2-10 canopy cover)

MFS10 Eucalyptus annulata Very Open Shrub Mallee

LOCATION: 18 km ESE of Jerramungup (33° 56' 54"S lat., 119° 06' 40"E long.)

FAUNA SURVEYED: Yes APPROX. AREA: 40 x 85 m DATE: 9-11-1984

VEGETATION

MUIR: KSr.SBr.SCi.SDi.VLr

PROVINCE: South-west

SYSTEM: Jerramungup

Stratum 1a: Mallees 1.9-2.4 m, CC = 2.2, clumping strong
Eucalyptus annulata (1), E. conglobata (1), E. spathulata ssp. grandiflora (0.2), E. xanthonea (+).

Stratum 1b: Shrubs 2.1-2.3 m, CC = 0.1, clumping none
Hakea laurina (+), Melaleuca cucullata (+).

Stratum 2: Shrubs 1.6-2.0 m, CC = 0.1, clumping none
Dodonaea concinna (0.1).

Stratum 3: Shrubs 1.1-1.5 m, CC = 3.2, clumping strong
Allocasuarina campestris ssp. campestris (1), Hakea verrucosa (1), Melaleuca uncinata (1), Santalum acuinatum (0.2).

Stratum 4: Shrubs 0.6-1.0 m, CC = 22, clumping moderate
Hakea verrucosa (10), Melaleuca uncinata (8), Allocasuarina campestris ssp. campestris (2), Hakea lissocarpa (2), M. elliptica (0.1), M. undulata (0.1).

Stratum 5a: Shrubs 0.0-0.5 m, CC = 26, clumping slight
Spyridium sp. (KRN 5007)(6), Calytrix tetragona (4), Melaleuca lateriflora (4), Cryptandra pungens (2), M. erucaeformis (2), Acrotriche cordata (1), Halgania preissiana (1), Hybanthus floribundus ssp. adpressus (1), Oxylobium microphyllum (1), Acacia glaucoptera (0.5), Dodonaea pinifolia (0.5), Vittadinia gracilis (0.5), Leucopogon fimbriatus (0.4), Cooperhooia strophiolata (0.2), Boronia scabra (0.1), Cassia nemophila var. nemophila (0.1), Daviesia anceps (0.1), Eutaxia cuneata (0.1), Acacia ericifolia (+), Astroloma epacridis (+), Comesperma polygaloides (+), Goodenia concinna (+), Hibbertia pungens (+), Lysiosepalum involucratum (+), Microcybe albiflora (+), Opercularia vaginata (+), Pimelea imbricata (+), Stylidium repens (+).

Stratum 5b: Misc. plants, CC = 4.3, clumping slight
Annuals: Helipterum pygmaeum (+), Levenhookia pusilla (+), Millotia tenuifolia (+), Thysanotus patersonii ssp. patersonii (+), Waitzia paniculata (+).
Parasitic Climbers: Cassytha micrantha (0.2), C. glabella (+), C. melantha (+).

Perennial Grasses: Stipa variabilis (1), Amphipogon debilis var. fallax (0.2), Neurachne alopecuroidea (0.1), S. hemipogon (+).

Sedges: Gahnia ancistrophylla (1), Lepidosperma drummondii (1).

Sedge-like: Lomandra micrantha (0.5), Dianella revoluta (0.1).

No of TAXA: 58

LAST BURNT: 1957

MODIFICATION: None

LANDFORM

BEDROCK: Granite

GEOLOGICAL SURFACE: (Ne) Ahs

UNIT: Granite Valley

ELEMENT: Rocky slope

SOIL

GROUP: Shallow Calcareous Earths NORTHCOTE: (Not classified)
 MAIN ORIGIN: In situ weathering DRAINAGE: Good
 MAIN ATTRIBUTE: Calcareous SURFACE: Self-mulching
 ROCK: 20-40% cover over 2-3% of site.
 STONE: 5-35% cover of subangular greenstone 3-30 cm long, whole site.
 LITTER: Leaves broad, deposits 2 cm thick, 5-50 m apart; leaves terete,
 deposits 2 cm thick, 3-30 m apart.

SOIL PROFILE

A 0-5 cm Light red clayey sand.
 B 5-100 cm Red medium clay.

COMMENTS

DISTRIBUTION: Few areas, irregular, 2-10 ha
 PROFILE THICKNESS: 15-120 cm
 GENERAL: The bedrock is a greenstone/granite complex, and a similar
 vegetation occurs on dolerite/granite complex.

MFS11A Eucalyptus decipiens Very Open Shrub Mallee (Plain)

LOCATION: 27 km NW of West Mt. Barren (34° 05' 26"S lat., 119° 11' 55"E
 long.)

FAUNA SURVEYED: Trapline AREA: 40 X 85 m DATE: 10-11-1984

VEGETATION

MUIR: Ksr.Sr.SAi.SCi.SDc.VLr

PROVINCE: South-west

SYSTEM: Qualup

Stratum 1a: Mallees 2.1-2.7 m, CC = 2.5, clumping moderate
 Eucalyptus decipiens (2), E. tetragona (0.5).
 Stratum 1b: Shrubs 2.1-2.3 m, CC = 3, clumping none
 Lambertia inermis (2), Hakea crassifolia (1).
 Stratum 2: Shrubs 1.6-2.0 m, CC = 10.1, clumping none
 Lambertia inermis (10), Banksia baxteri (0.1).
 Stratum 3: Shrubs 1.1-1.5 m, CC = 0.2, clumping none
 Leptospermum oligandrum (0.1), Acacia subcaerulea (+), Hakea
 corymbosa (+), H. victoria (+).
 Stratum 4: Shrubs 0.6-1.0 m, CC = 22, clumping moderate
 Melaleuca striata (9), Beaufortia empetrifolia (6), Banksia
 baueri (2), Agonis spathulata (1), B. nutans var. nutans (1),
 Lysinema ciliatum (1), Adenanthos cuneatus (0.5), Isopogon
 trilobus (0.5), Chamelaucium megalopetalum (0.3), Hakea
 strumosa (0.3), Conospermum floribundum (0.1), Dryandra
 cuneata (0.1), Pultenaea adunca (0.1), Acacia gonophylla (+),
 Dampiera oligophylla ssp. juncea (+), Petrophile ericifolia
 (+).
 Stratum 5a: Shrubs 0.0-0.5 m, CC = 35, clumping moderate
 Isopogon longifolius (8), Conothamnus aureus (6), Melaleuca
 scabra (4), Oligarrhena micrantha (4), Baeckea preissiana (2),
 Banksia repens (2), Leucopogon gibbosus (2), L. sp.
 (KRN 4082)(2), Daviesia incrassata ssp. reversifolia
 (dead)(1), Jacksonia sp. (KRN 3967)(1), Stylidium preissii
 (1), Allocasuarina humilis (0.4), Dryandra obtusa (0.4),
 Frankenia fucifolia (0.4), D. nivea (0.2), Petrophile
 phyllicoides (0.2), Stirlingia tenuifolia (0.2), Darwinia
 vestita (+), Leptomeria spinosa (+), Pultenaea neurocalyx var.
 major (+).

Stratum 5b: Misc. plants, CC = 7, clumping slight
 Parasitic Climbers: *Cassytha glabella* (+).
 Perennial Grasses: *Amphipogon turbinatus* (+).
 Sedges: *Restio sphacelatus* (3), *Tricostularia neesii* (2),
Lyginia barbata (1), *Mesomelaena tetragona* (0.2), *Schoenus*
brevifolius (0.2), *Caustis dioica* (0.1), *Loxocarya cinerea*
 (0.1), *Cyathochaeta clandestina* (+).
 Sedge-like: *Conostylis vaginata* (2), *Lomandra hastilis* (0.1),
Patersonia umbrosa (+).

No of TAXA: 59

LAST BURNT: 1969

MODIFICATION: None

LANDFORM

BEDROCK: Spongolite

GEOLOGICAL SURFACE: (Bb) Czs

UNIT: Marine Plain

ELEMENT: Colluvial sand sheet

SOIL

GROUP: Deep White Sands

NORTHCOTE: Not classified

MAIN ORIGIN: Colluvial

DRAINAGE: Good

PROFILE ATTRIBUTE: Siliceous

SURFACE: Loose

ROCK: Nil

STONE: Nil

PAVEMENT: Nil

LITTER: Leaves broad, deposits 4 cm thick, 5-60 m apart.

SOIL PROFILE

A21 0-68 cm Pale grey loamy sand.

A22 68-100 cm Light yellowish brown sandy clay.

COMMENTS

DISTRIBUTION: Common, irregular on Upland Plain and Marine Plain, 2-100 ha

PROFILE THICKNESS: More than 2 m

GENERAL: See also site descriptions MFS11a, MFS11b and MFS11c in Appendix III.

MFS11B *Eucalyptus decipiens* Very Open Shrub Mallee (River)

(A similar vegetation occurs on colluvial flats along the river but has a slope of 1-4 degrees (Qc) instead of less than 2 degrees on both plains. See MFS11A for general vegetation description.)

MFS12A *Eucalyptus redunca* Very Open Shrub Mallee

LOCATION: 16 km NW of Mt. Maxwell (34° 04' 44"S lat., 119° 10' 53"E long.)

FAUNA SURVEYED: Pit traps AREA: ca 40 X 85 m DATE: 12-11-1984

VEGETATION

MUIR: Ksr.SAr.SBr.SCr.SDc.VLr

Stratum 1: Mallees 2.5-4.0 m, CC = 3.1, clumping slight

Eucalyptus uncinata (3), *E. gardneri* (+), *E. spathulata*
 ssp. *grandiflora* (+).

Stratum 2: Shrubs 2.1-2.3 m, CC = +, clumping none

Banksia media (+).

Stratum 3: Shrubs 1.6-2.0 m, CC = 7, clumping slight

Banksia media (7).

- Stratum 4: Shrubs 1.1-1.5 m, CC = 2.1, clumping none
Banksia media (1), *Hakea corymbosa* (1), *Isopogon trilobus* (+),
Phymatocarpus maxwellii (+).
- Stratum 5: Shrubs 0.6-1.0 m, CC = 6.2, clumping slight
Kunzea jucunda (5), *Hakea strumosa* (0.5), *Melaleuca*
depauperata (0.3), *Pultenaea adunca* (0.2), *Acacia ericifolia*
 (+), *Callitris roei* (+), *Coleanthera myrtooides* (+), *Daviesia*
pachyphylla (+), *Grevillea pectinata* (+), *Melaleuca*
lateriflora (+), *M. subfalcata* (+), *Petrophile seminuda* (+),
P. squamata (+).
- Stratum 6a: Shrubs 0.0-0.5 m, CC = 36, clumping slight
Melaleuca pentagona sens. lat. (20), *Beaufortia micrantha* (5),
Melaleuca aff. pentagona (2), *Verticordia habrabtha* (2),
Isopogon longifolius (1), *Melaleuca apodocephala* (1), *M.*
pentagona (1), *M. scabra* (1), *Calothamnus gibbosus* (0.8),
Daviesia lancifolia (0.6), *Isopogon buxifolius* (0.5), *Boronia*
crassifolia (0.2), *Andersonia caerulea* (0.1), *Baekea*
preissianus (0.1), *Boronia inornata* (0.1), *Hibbertia lineolata*
 (0.1), *Jacksonia sp.* (KRN 3967)(0.1), *Leucopogon tetragonus*
 (0.1), *Acacia dermatophylla* (+), *Daviesia decurrens* (+),
Drosera paleacea (+), *Grevillea huegelii* (+), *G. pauciflora*
 (+), *Leucopogon tamminensis var. australis* (+), *L. sp.*
 (KRN 4082)(+), *Lysinema ciliatum* (+), *Microcybe albiflora* (+),
Persoonia teretifolia (+), *Stachystemon polyandrus* (+),
Stylidium repens (+), *S. spathulatum var. lehmannianum* (+),
Styphelia intertexta (+).
- Stratum 6b: Misc. plants, CC = 3.9, clumping slight
 Parasitic Climbers: *Cassytha glabella* (+).
 Sedges: *Gahnia ancistrophylla* (2), *Loxocarya myrioclada* (0.5),
Tricostularia compressa (0.2), *Lepidosperma leptostachyum*
 (0.1), *L. aff. resinosum* (0.1), *L. sp.* (KRN 6488)(0.1),
Lyginia barbata (0.1), *Harperia lateriflora* (+).
 Sedge-like: *Lomandra micrantha* (0.6), *Chamaexeros serra* (0.1),
L. collina (0.1).

No of TAXA: 64
 MODIFICATION: None

LAST BURNT: 1957

LANDFORM

BEDROCK: Spongolite
 UNIT: Marine Plain

GEOLOGICAL SURFACE: (Bb) Czs
 ELEMENT: Soil specific

SOIL

GROUP: Shallow Sands
 MAIN ORIGIN: In situ weathering
 PROFILE ATTRIBUTE: Leached
 ROCK: Nil STONE: Nil

NORTHCOTE: Not classified
 DRAINAGE: Good
 SURFACE: Hardsetting
 PAVEMENT: Nil

LITTER: Leaves broad, deposits 3 cm thick, averaging 5-25 m apart.

SOIL PROFILE

A 0-38 cm Pale grey loamy sand.
 B 38-100 cm Pale yellow sandy clay.

COMMENTS

DISTRIBUTION: Common, irregular on both plains, 2-50 ha
 PROFILE THICKNESS: 70 to more than 500 cm

GENERAL: See also site descriptions MFS12Aa and MFS12Ab in Appendix III.

MFS12B Eucalyptus redunca Very Open Shrub Mallee (Valley)

(Vegetation not sampled as structure and species composition was similar to the range of MFS12A. Main site difference was slopes of up to 2 degrees (MFS12A), and 2-10 degrees (MFS12B).)

MFS13 Eucalyptus tetragona Very Open Shrub Mallee

LOCATION: 20 km NW of Mt. Maxwell (34° 05' 02"S lat., 119° 08' 15"E long.)
 FAUNA SURVEYED: Trapline AREA: ca 40 x 130 m DATE: 8-11-1984

VEGETATION

MUIR: SCr.SDc.VLi

PROVINCE: South-west

SYSTEM: Jerramungup

Stratum 1: Shrubs 2.3-2.7 m, CC = +, clumping none

Exocarpos sparteus (+).

Stratum 2: Mallees 1.8-2.3 m, CC = 0.5, clumping none

Eucalyptus uncinata (0.5), E. tetragona (+).

Stratum 3: Shrubs 1.1-1.5 m, CC = 0.5, clumping none

Callitris roei (0.3), Hakea trifurcata (0.1), Melaleuca uncinata (0.1).

Stratum 4: Shrubs 0.6-1.0 m, CC = 6.5, clumping slight

Hakea aff. falcata (5), Dryandra cirsioides (0.5), Gastrolobium spinosum (0.5), Calothamnus quadrifidus (0.1), Daviesia pachyphylla (0.1), Grevillea concinna (0.1), Hakea lissocarpa (0.1), Acacia leptoneura (+), Agonis spathulata (+), Allocasuarina campestris ssp. campestris (+), Coleanthera myrtoides (+), Hakea strumosa (+), Kunzea preissiana (+), Petrophile squamata (+).

Stratum 5a: Shrubs 0.0-0.5 m, CC = 40, clumping slight

Melaleuca cuneata (10), Hakea aff. falcata (8), Beaufortia micrantha (4), Verticordia preissii (4), Allocasuarina microstachya (2), Hibbertia gracilipes (2), Baeckea crispiflora (1), B. tetragona (1), Melaleuca pentagona (1), Mirbelia spinosa (1), Daviesia lancifolia (0.4), M. conferta (0.4), Verticordia brachypoda (0.4), Acacia ericifolia (0.2), Allocasuarina humilis (0.2), Baeckea preissiana (0.2), Calectasia cyanea var. cyanea (0.2), Cryptandra glabriflora (0.2), Kunzea micrantha (0.2), Leucopogon sp. (KRN 4082)(0.2), Lysinema ciliatum (0.2), Stylidium squamellosum (0.2), Allocasuarina thuyoides (+), Astroloma pallidum (+), Calytrix leschenaultii (+), Chamelaucium ciliatum (+), Darwinia sp. (KRN 2624)(+), Dryandra arctotidis (+), Gompholobium marginatum (+), Grevillea nudiflora (+), Hakea marginata (+), Isopogon buxifolius (+), I. teretifolius (+), Leptospermum spinescens (+), Olax benthiana (+), Petrophile seminuda (+), Platysace deflexa (+), Stylidium piliferum (+), Synaphea favosa (+).

Stratum 5b: Misc. plants, CC = 24, clumping slight

Annuals: Lobelia rarifolia (0.1).

Climbers: Billardiera sericea (+).

Parasitic Climbers: *Cassytha glabella* (+).
 Perennial Grasses: *Neurachne alopecuroidea* (1), *Amphipogon turbinatus* (0.5).
 Sedges: *Mesomelaena stygia* ssp. *stygia* (15), *Lepidosperma* sp. (KRN 6488)(1), *Schoenus subflavus* (1), *Gahnia ancistrophylla* (+), *Lepidobolus chaetocephalus* (+).
 Sedge-like: *Conostylis androstemma* ssp. *argentea* (3), *Chamaexeros serra* (2), *Patersonia juncea* (+).

No of TAXA: 71

LAST BURNT: 1969

MODIFICATION: None

LANDFORM

BEDROCK: Granite
 UNIT: River Valley

GEOLOGICAL SURFACE: (Bb) Agv
 ELEMENT: Stripped slope

SOIL

GROUP: Shallow Sands
 NORTHCOTE: Not classified
 MAIN ORIGIN: In situ weathering
 DRAINAGE: Good
 PROFILE ATTRIBUTE: Leached
 SURFACE: Hardsetting
 ROCK: Nil STONE: Nil PAVEMENT: Nil LITTER: Nil

SOIL PROFILE

A 0-32 cm Pale grey loamy sand.
 B 32-100 cm Yellow brown sandy clay.

COMMENTS

DISTRIBUTION: Frequent on middle and upper slopes of River and Granite Valleys, 1-10 ha.

PROFILE THICKNESS: 1-2 m

GENERAL: This vegetation type is often a mosaic and includes small areas of *Dryandra cirsioides* Dwarf Shrub C, *Allocasuarina campestris* ssp. *campestris* Heath A and Granite Complex (see site description MFS16 this Appendix).

TALL SHRUBLAND (shrubs >1 m high)

MFS14 *Melaleuca cuticularis* Tall Shrubland

LOCATION: 18 km ENE of Jerramungup (33° 54' 28"S lat., 119° 06' 39"E long.)

FAUNA SAMPLED: No AREA: ca 0.4 ha DATE: 25-9-1975

VEGETATION

MUIR: Si.SAi.SCr.SDr.GTr.Jr.VTr.VLr

PROVINCE: South-west

SYSTEM: Jerramungup

Stratum 1: Shrubs 3-5 m, CC = 15, clumping moderate
Melaleuca cuticularis (15).

Stratum 2: Shrubs 1.6-2.0 m, CC = 12, clumping strong
Melaleuca hamulosa (12).

Stratum 3: Shrubs 0.6-1.0 m, CC = 4, clumping moderate
Astartea fascicularis (2), *Melaleuca brevifolia* (2).

Stratum 4a: Shrubs 0.0-0.5 m, CC = 9, Clumping strong
Halosarcia halocnemoides ssp. *halocnemoides* (8), *Samolus juncea* (1).

Stratum 4b: Misc. plants, CC = 13, clumping moderate
 Annuals: *Angianthus preissianus* (2), *Triglochin minutissima*
 (0.5), *Drosera glanduligera* (0.1).
 Geophytes: *Polyphompholyx tenella* (+).
 Perennial Grasses: *Stipa juncifolia* (2).
 Sedges: *Gahnia decomposita* (6), *Juncus krausii* (2).

No of TAXA: 13 LAST BURNT: more than 40 years
 MODIFICATION: None evident or known

LANDFORM

BEDROCK: Granite GEOLOGICAL SURFACE: (Ne) Qa in Agv
 UNIT: Granite Valley ELEMENT: Saline minor drainage line

SOIL

GROUP: Saline Soils NORTHCOTE: not recorded
 MAIN ORIGIN: Alluvial DRAINAGE: Poor
 PROFILE ATTRIBUTE: Saline SURFACE: Hardsetting
 ROCK: Nil STONE: Nil PAVEMENT: Nil LITTER: Nil

SOIL PROFILE

(Not recorded)

COMMENTS

DISTRIBUTION: Single area, linear, 2 ha
 PROFILE THICKNESS: 50-200 cm
 GENERAL: (a) Strong zonation of vegetation in relation to soil salt content and water-logging.
 (b) Anticipated soil profile consists of a sandy loam A horizon 10-35 cm thick, over a B horizon of sandy clay. Profile salt content and waterlogging are low on periphery and increase to the drainage channel.

MFS15 *Melaleuca viminea* Tall Shrubland
 (Overview sample)

LOCATION: Gairdner River, near Marningerup Spring (34° 06' 05"S lat., 119°
 08' 35"E long.)

FAUNA SAMPLED: Opportunistic AREA: ca 0.6 ha DATE: 12-4-1985

VEGETATION

MUIR: Si.SAi.SDr.VLr
 PROVINCE: South-west SYSTEM: Qualup
 Stratum 1: Trees 4-6 m, CC = 0.5, clumping none
Eucalyptus occidentalis (0.5), *Allocasuarina huegeliana* (+).
 Stratum 2: Shrubs 2.1-3 m, CC = 15, clumping moderate
Melaleuca cuticularis (10), *M. hamulosa* (3), *Acacia saligna*
 (2).
 Stratum 3: Shrubs 1.6-2.0 m, CC = 26, clumping moderate
Melaleuca viminea (15), *Acacia saligna* (8), *Jacksonia*
furcellata (2), *A. cyclops* (1).
 Stratum 4a: Shrubs 0.0-0.5 m, CC = 9.5, clumping moderate
Enchylaena tomentosa var. *tomentosa* (2), *Halosarcia*
halocnemoides ssp. *halocnemoides* (2), *Sarcocornia quinqueflora*
 (2), *Threlkeldia diffusa* (2), *Frankenia tetrapetala* (1),
 **Asparagus asparagoides* (0.5), *Carpobrotus modestus* (+).

- Stratum 3: Shrubs 1.6-2.0 m, CC = 0.6, clumping moderate
Melaleuca elliptica (0.5), *M. hamulosa* (0.1), *Acacia cyclops* (+), *M. pauperiflora* (+).
- Stratum 4: Shrubs 0.6-1.0 m, CC = +, clumping none
Melaleuca brevifolia (+).
- Stratum 5a: Shrubs 0.0-0.5 m, CC = 2.5, clumping moderate
Borya nitida (2), *Astartea fascicularis* (0.1), *Lobelia alata* (0.1), *Samolus junceus* (0.1), *Sarcocornia quinqueflora* (0.1), *Astartea epacridis* (+), *Carpobrotus modestus* (+), *Disphyma clavellatum* (+), *Goodenia concinna* (+), *Kennedia prostrata* (+), *Stypandra imbricata* (+), *Xanthosia* sp. (KRN 4602)(+).
- Stratum 5b: Misc. plants, CC = 16, clumping moderate
 Annuals: *Helipterum demissum* (2), **Parientaria latifolia* (2), *Rutidotis multiflora* (2), *Actinobole uliginosum* (1), *Centrolepis polygyna* *Chrysocoryne uniflora* (1), (1), *Millotia tenuifolia* (1), *Haloragis nodulosus* (0.5), **Anagallis arvensis* (0.2), *Bulbine semibarbata* (0.2), *Angianthus preissianus* (0.1), *Calandrinia granulifera* (0.2), **Centarium minus* (0.1), *Centrolepis pilosa* (0.1), *Cotula coronopifolia* (0.1), *C. cotuloides* (0.1), *Drosera glanduligera* (0.1), *Daucus glochidiatus* (0.1), *Hydrocotyle callicarpa* (0.1), *H. scutellifera* (0.1), **Juncus bufonius* (0.1), **J. capitatus* (0.1), *Sebaea ovata* (0.1), *Triglochin centrocarpa* (0.1), **Briza minor* (+), *Brizula muelleri* (+), *Centrolepis aristata* (+), *C. humillima* (+), **Gnaphalium candidissimum* (+), *Goodenia filiformis* (+), *Levenhookia dubia* (+), *Quinetia urvillei* (+), *Schoenus cernuus* (+), *S. odontocarpus* (+), *Stylidium calcaratum* (+).
 Aquatics: *Triglochin procera* (0.1).
 Ferns: *Cheilanthes austrotenuifolia* (0.1).
 Geophytes: *Arthropodium preissii* (+), *Microtis unifolia* (+), *Polypompholyx tenella* (+), *Spiculea ciliata* (+), *Wurmbea tenella* (+).
 Perennial Grasses: *Spartochloa scirpoidea* (0.5), *Neurachne alopecuroidea* (0.1), *Stipa juncifolia* (0.2).
 Sedges: *Baumea articulata* (1), *Juncus krausii* (1), *Gahnia decomposita* (0.2), *J. pallidus* (0.2), *Lepidosperma aff. tuberculosum* (+).
 Sedge-like: *Dianella revoluta* (+), *Lomandra micrantha* (+).

No of TAXA: 72

LAST BURNT: No evidence of burning

MODIFICATION: None evident

LANDFORM

BEDROCK: Gneiss

GEOLOGICAL SURFACE: (Ne) Agv

UNIT: Granite Exposure

ELEMENT: Skeletal soil sheets

SOIL

GROUP: Granitic Soils

NORTHCOTE: Not sampled

MAIN ORIGIN: Colluvial

DRAINAGE: Variable

PROFILE ATTRIBUTE: Skeletal

SURFACE: Hardsetting

ROCK: 80% cover

STONE: 2-10% cover of flat gneiss 15-50 cm long, patchy.

PAVEMENT: 2-15% cover of material 3-12 mm long, soil surface.

LITTER: Nil

SOIL PROFILE
(Not recorded)

COMMENTS

DISTRIBUTION: Frequent on lower slopes of River and Granite Valleys, and along drainage lines of Granite Valley. Also scattered on Granite Hill.

PROFILE THICKNESS: 2-30 cm

GENERAL: Almost permanent freshwater pools with acquatics not always present.

APPENDIX II

Floristics

Taxa are listed alphabetically in the order of family, genus and species. Frequency and Cover/abundance are assessed subjectively. Number in brackets following family is their number quoted in Green (1981). * indicates an introduced species. Unnamed taxa are referenced by my collecting number (KRN) of a reference specimen lodged in the Western Australian Herbarium (PERTH). Nomenclature generally follows Green (1981).

LAi = Low Woodland

- EA = Eucalyptus astringens
- 2A = Eucalyptus occidentalis (creek)
- 2B = Eucalyptus occidentalis (swamp)

LBc = Dwarf Forest

- AC = Allocasuarina huegeliana
- EP = Eucalyptus platypus

KSr = Shrub Mallee

- EN = Eucalyptus annulata

KSi = Open Shrub Mallee

- EC = Eucalyptus conglobata (no data)
- EE = Eucalyptus eremophila
- ER = Eucalyptus redunca (combined gully & plain)
- ET = Eucalyptus transcontinentalis

KSr = Very Open Shrub Mallee

- EN = Eucalyptus annulata
- ED = Eucalyptus decipiens (combined colluvial slope & plain)
- EU = Eucalyptus redunca (combined gully & plain)
- EG = Eucalyptus tetragona

Si = Tall Shrubland

- MC = Melaleuca hamulosa
- MV = Melaleuca cuticularis (incomplete data)

Co = Complex

- GC = Granite

Frequency and Cover/abundance

Frequency	Cover/abundance
A = 1 or 2 populations	1 = 1 or 2 plants
B = Few "	2 = Few plants
C = Scattered "	3 = Few plants to 1% canopy cover
D = Frequent "	4 = 1-5% canopy cover
E = Common	5 = 6-30% " "
	6 = 31-70% " "

Species	LAI	LBC	KS	KSi			KSr	Sl	Co
	EA2A2B	AHEP	EN	E	C	E	ENEDEUEG	MHMV	GC
Schoenus aff. subfascicularis Kuekenthal (KRN 4744)	....C4	....	..	.....	..	..	..A2.....	....	..
Schoenus sp. (KRN 4138)A1.....	....	..
Schoenus sp. (KRN 4154)	A2..	..	.....	B4	..	....A5C4	....	..
Tricostularia compressa NeesD4C3..	....	..
Tricostularia neesii Lehm.D4...	....	..
DILLENACEAE (226)									
Hibbertia acerosa (R. Br. ex DC.) Benth.B2A2..	....	..
Hibbertia enervia (DC.)Hoogl.	..B2..	.....	..	..D1....	..	..	.....	....	..
Hibbertia gracilipes Benth.	B1..	..	....D2B2	..	..	..D2E3E3	....	..
Hibbertia lineata Steud.B2..	....	..
Hibbertia mucronata (Turcz.) Benth.	A2	..	..B2A2..	....	..
Hibbertia pungens Benth. complex	D2.....	....	..
Hibbertia recurvifolia (Steud.) Benth.A1	....	..
DROSERACEAE (143)									
Drosera glanduligera Lehm.C2C2..	..	..	.....	..B2	D3
Drosera macrantha Endl.	..C2..	C2..	..	....C2..	..	..	..B2..C2	....	..
Drosera menziesii R. Br.	..B1..	D2..	..	....B2..	..	..	..C2D2..	....	..
Drosera neesii Lehm. ssp. neesii	..D1..	.....	..	.....	..	..	.....B1	....	..
Drosera paleacea DC.C3B3..	....	..
Drosera parvula PlanchonA2..	..	..	....C2..	....	..
Drosera stolonifera Endl. ssp. compacta N. MarchantB1	....	..
Drosera zonaria Planch.D3..	..	..	....D2B3	....	..
EPACRIDACEAE (288)									
Acrotriche cordata (Labill.) R. Br.	D3	.....	..	..	D3.....	....	..
Acrotriche ramiflora R. Br.	D2....	..C2	..	..C1B1..	..	..	....B2..	....	..
Andersonia caerulea R. Br.D3D2	..	..	....C2..	....	..
Andersonia parvifolia R. Br.D3..	..	..	..D3D4C3	....	..
Astroloma compactum R. Br.	..C2..	B1..	..	..C1....	..	..	.....B2	....	..
Astroloma drummondii SonderB1....	..	..	..C2C2..	....	..
Astroloma epacridis (DC.)Druce	..D2..	D3..	C2	..D2....	..	..	D2.....	....	D2
Astroloma microphyllum Stschehl.B1....	..	..	.....	....	..
Astroloma pallidum R. Br.A1....	..	..	.....A1	....	..
Coleanthera myrtoides Stschehl.C1..	..	..	....B1B1	....	..
Leucopogon concinnus Benth.	C2..	..	.....	..	..	.....D3	....	..
Leucopogon fimbriatus Stschehl.	C3C3..C3	....	..
Leucopogon gibbosus Stschehl.E4..	..	..	..C3D4..	....	..
Leucopogon minutifolius W.V. Fitzg.B2..	....	..
Leucopogon polymorphus SonderB2..	..	..	.....	....	..
Leucopogon tamminensis E. Pritzel var. australis E. Pritzel	B2	..	..C2B2A2	....	..
Leucopogon tetragonus SonderC2C3B3	..	..	..B2C3C4	....	..
Leucopogon sp. (KRN 4082)C2C3..	..	..	..E3D3D3	....	..
Leucopogon sp. (KRN 9608)A1....	..	..	....A2..	....	..
Lysinema ciliatum R. Br.D3E3E3	....	..
Oligarrhena micrantha R. Br.C3B3..	....	..
Styphelia intertexta GeorgeA1....	..	..	....B2..	....	..
Styphelia tenuiflora Lindl.B1..	..	..	..A1....	....	..
Genus indet. (KRN 3191)A2.....	....	..

Species	LAi	LBc	KS	KSr	Sl	Co
	EA2A2B	AHEP	EN	EC EEEERET	ENEDEUEG	MHMV GC
EUPHORBIACEAE (185)						
<i>Euphorbia drummondii</i> Boiss. ..	..B1B1	....	..	.....	.....	..
<i>Phyllanthus calycinus</i> Labill.	..C2..	C2..	B2	.....	.....	..
<i>Poranthera ericoides</i> Klotzsch	.....	....	..	..A2....	.....	..
<i>Poranthera microphylla</i> Brongn.	..B2B2	B2..	..	.....	.....	..
<i>Stachystemon polyandrus</i> (F. Muell.)Benth.	.....	....	..	.....	..A2D2..	..
FRANKENIACEAE (236)						
<i>Frankenia tetrapetala</i> Labill.	.....	....	..	.....	.....	..D4 ..
GENTIANACEAE (303)						
* <i>Centaurium spicatum</i> (L.)Fritsch	.....	....	..	.....	.....	.. B2
<i>Sebaea ovata</i> (Labill.)R. Br.	.....	....	..	.....	.....	.. B2
GOODENIACEAE (341)						
<i>Coopernookia polygalacea</i> (De Vriese)Carolin	.....	....	D3	....D3D4	....C3..	..
<i>Coopernookia strophiolata</i> (F. Muell.)Carolin	.....	....	..	.....	D3....B2	..
<i>Dampiera lavandulacea</i> Lindl.	.....	....	..	..B1....	.....C2	..
<i>Dampiera sacculata</i> F. Muell. ex Benth.	.....	B2..	..	....C2..	..C2C2C2	..
<i>Dampiera trigona</i> De Vriese ..	.....	....	..	....A2	....A2..	..
<i>Goodenia affinis</i> De Vriese ..	..D2..	....	..	.....	....B2..	..
<i>Goodenia caerulea</i> R. Br. ..	.....	....	..	.....	....B2..	..
<i>Goodenia concinna</i> Benth. ..	.....	....	D3	..A1B3..	D2....A2	.. B2
<i>Goodenia filiformis</i> R. Br. ..	.....	....	..	.....	.....	.. A2
<i>Goodenia incana</i> R. Br. ..	.....	B1..	..	.....	....B2..	..
<i>Goodenia scapigera</i> R. Br. ..	.....	....	..	.....	..C2....	..
<i>Goodenia viscida</i> R. Br. ..	....C4	....	..	.....	.....	..
<i>Lechenaultia formosa</i> R. Br. ..	.....	....	..	....B2..	.....	..
<i>Scaevola pulvinaris</i> (E. Pritzell) Krause	.....	....	..	....B2..	.....	..
<i>Velleia trinervis</i> Labill. ..	..D2..	....	..	.....	.....	..
HAEMODORACEAE (55)						
<i>Conostylis androstemma</i> Lindl. ssp. <i>argentea</i> J.W. Green	.....	B1..	..	....B1..	..C2..C3	..
<i>Conostylis seorsiflora</i> F. Muell.	..D2..	....	..	..D3....	.....	..
<i>Conostylis setigera</i> R. Br. ..	.....	....	..	....B2..	.....	..
<i>Conostylis vaginata</i> Endl. ..	.....	....	..	.....	..C3....	..
<i>Haemodorum paniculatum</i> Lindl.	.....	....	..	.....	.....B1	..
HALORAGACEAE (276)						
<i>Glischrocaryon aureum</i> (Lindl.) Orchard var. <i>angustifolium</i> (Nees)Orchard	.....	B2..	..	..A1..A1	..C1B1..	..
<i>Gonocarpus nodulosus</i> Nees ..	..D3..	C3..	..	.....	.....	.. D3
<i>Haloragis dygna</i> Labill. ..	.....	....	A3	.....	.....	..
IRIDACEAE (60)						
<i>Patersonia juncea</i> Lindl. ..	.....	....	..	.....A1	....B2B1	..
<i>Patersonia occidentalis</i> R. Br.	..C2..	....	..	..D1....	.....	..
<i>Patersonia sericea</i> R. Br. ex Ker-Gawl var. <i>latifolia</i> (Benth. & F. Muell.)Geerinck	.....	....	..	....B1..	..B2....	..
<i>Patersonia umbrosa</i> Endl. ..	.....	....	..	.....	....B1..	..

Species	LAI	LBC	KS	KSi			KSr			S1	Co		
	EA2A2B	AHEP	EN	E	C	E	E	R	E	T	ENEDEUEG	MHMV	GC
JUNCACEAE (52)													
*Juncus bufonius L. .. ..	..B2..	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	B2
*Juncus capitatus Weig. .. ..	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	A2
Juncus krausii Hochst. .. ..	..C3..	.....	..	.....	.....	.....	.....	.....	.....	.....	E4..	.....	A3
Juncus pallidus R. Br. .. ..	.....	.....	..	.....	.....	..B3...	.....	.....	.....	.....	.....	.....	A2
JUNCAGINACEAE (26)													
Triglochin centropcarpa Hooker	..C2..	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	C2
Triglochin minutissima F. Muell.	..C2..	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	C3..	..
Triglochin mucronata R. Br. ..	..C2..	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	..
Triglochin procera R. Br. ..	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	A2
LAMIACEAE (313)													
Microcorys barbata R. Br. ..	.....	.....	..	.....	.....	.....	.....	.....	..B3....	.....	.....	.....	..
Microcorys glabra (Bartl.)Benth.	.....	.....	..	.....	.....	..B1B1	.....	.....	..B1..	.....	.....	.....	..
LAURACEAE (131)													
Cassytha flava Nees .. ..	.....	.....	..	.....	.....	.....	.....	.....	..B2....	.....	.....	.....	..
Cassytha glabella R. Br. ..	.....	.....	C1	..B1D2B1	.....	.....	.....	.....	C1..D1C1	.....	.....	.....	..
Cassytha melantha R. Br. ..	..B1..	.....	D2	..D2C2..	.....	.....	.....	.....	B2.....	.....	.....	.....	..
Cassytha micrantha Meisn. ..	.....	.....	..	.....	.....	..A1	.....	.....	A1B1A1..	.....	.....	.....	..
Cassytha racemosa Nees .. ..	.....	.....	..	.....	.....	.....	.....	.....	.....A1	.....	.....	.....	..
LEGUMINOSEA subfamily CAESALPINIOIDEAE (164)													
Cassia nemophila A. Cunn. ex Vogel var. nemophila	..B1..	.....	C2	.....	.....	.....	.....	.....	C2.....	.....	.....	.....	..
Labichea lanceolata Benth. ssp. brevifolia (Meisn.)Ross	.....	.....	..	.....	.....	..D2....	.....	.....	.....	.....	.....	.....	..
LEGUMINOSEA subfamily MIMOSOIDEAE (163)													
Acacia acellerata Maiden & Blakely	....B2	.....	..	..C2C3..	.....	.....	.....	.....	.....	.....	.....	.....	..
Acacia bidentata Benth. ..	..A1..	A1..	..	..C2..	.....	.....	.....	.....	.....A1	.....	.....	.....	..
Acacia chrysocephala Maslin ..	.....	.....	..	.....B2C1	.....	.....	.....	.....	.....A2..	.....	.....	.....	..
Acacia congesta Benth. ..	.....	.....	A3	.....	.....	.....	.....	.....	.....	.....	.....	.....	..
Acacia cyclops A. Cunn. ex G. Don	.....	.....	B2	.....	.....	.....	.....	.....	.....	.....	..D4	.....	A2
Acacia dermatophylla Benth. ..	.....	.....	..	.....	.....	.....	.....	.....	.....B1..	.....	.....	.....	..
Acacia ericifolia Benth. ..	.....	.....	..	.....	.....	..B2.	.....	.....	C3A1B2B2	.....	.....	.....	..
Acacia ferocior Maiden .. ..	.....	..A1	..	.....	.....	..C3.	.....	.....	.....	.....	.....	.....	..
Acacia glaucoptera Benth. ..	....B2	.....	D4	.....	.....	.....	.....	.....	D3....A2	.....	.....	.....	..
Acacia gonophylla Benth. ..	.....	.....	..	.....	.....	..D3D2	.....	.....	..D2D3..	.....	.....	.....	..
Acacia harveyi Benth. .. ..	..D2..	.....	C2	..C2....	.....	.....	.....	.....	.....	.....	.....	.....	..
Acacia lasiocalyx C. Andrews	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	C2
Acacia lasiocarpa Benth. var. bracteolata Maslin	..B1..	A1..	..	.....	.....	..B2..	.....	.....	.....A1	.....	.....	.....	..
Acacia leptoneura Benth. ..	.....	B2..	..	.....	.....	..B1..	.....	.....	.....C2	.....	.....	.....	..
Acacia moirii E. Pritzels ssp. moirii	.....	.....	..	.....	.....	..B2..	.....	.....	.....	.....	.....	.....	..
Acacia pulchella R. Br. var. glaberrima Meisn.	..B1..	.....	..	..B1....	.....	.....	.....	.....	.....	.....	.....	.....	..
Acacia saligna (Labill.) H.L. Wendl.	..E4..	D4..	..	..C2....	.....	.....	.....	.....	.....	.....	..E5	.....	..
Acacia squamata Lindl. .. ..	.....	.....	..	.....	.....	.....	.....	.....	.....A1..	.....	.....	.....	..
Acacia subcaerulea Lindl. ..	.....	.....	..	.....	.....	.....	.....	.....	..C2B1..	.....	.....	.....	..
Acacia tetragonocarpa Meisn.	.....	.....	..	.....	.....	.....	.....	.....	.....B2..	.....	.....	.....	..
Acacia unifissilis Court ..	.....	.....	..	.....	.....	..A1	.....	.....	..C2B2..	.....	.....	.....	..
Acacia varia Maslin var. parviflora (Benth.)Maslin	.....	.....	..	.....	.....	..C2..	.....	.....	.....D2..	.....	.....	.....	..

Species	Lai	Lbc	KS	KSi			KSr			Sl	Co
	EA2A2B	AHEP	EN	E	C	E	E	R	E	U	GC
LEGUMINOSEA subfamily MIMOSOIDEAE cont.											
Acacia aff. beauverdiana Ewart & Sharman (KRN 1295)	B4..	..	.....	.....	.....	.....	.....	.....	.....	..
Acacia aff. biflora R. Br. (KRN 4287)	A2	.....	..
Acacia aff. lineolata Benth. (KRN 3484)D3	.....	.....	.....	.....	B2B1	.....	..
Acacia sp. (KRN 384)	B1	.....	..
Acacia sp. (KRN 1296)	B3	.....	.....	.....	.....	.....	.....	.....	..
LEGUMINOSEA subfamily PAPILIONOIDEAE (165)											
Bossiaea concinna Benth.	B3	.....	..
Brachysema celsianum Lemaire	..D2	.....	.....	.....	.....	.....	.....	.....	.....	.....	..
Brachysema latifolium R. Br.D2C2	.....	.....	.....	.....	C2	.....	..
Burtonia conferta DC.B1	.....	.....	.....	.....	.....	C1	.....	..
Chorizema aciculare (DC.) C.A. GardnerB1D1	.....	.....	.....	.....	C2C2	.....	..
Chorizema cytisoides Turcz.	C2	.....	..
Chorizema glycinifolium (Sm.) Druce	C1C2	.....	..
Chorizema nervosum T. Moore	B2C2	.....	..
Daviesia abnormis F. Muell.	B2B1	.....	..
Daviesia anceps Turcz.	A2	.....	.....	.....	.....	B3	D3	.....
Daviesia benthamii Meisn. ssp. benthamiiD1	.....	.....	.....	.....	E4	.....	..
Daviesia decurrens Meisn.	B2	.....	..
Daviesia incrassata Sm.	C3C2	.....	..
Daviesia lancifolia Turcz.	D2D2	.....	..
Daviesia pachyphylla F. Muell.	B2	..	.....	.....	.....	.....	.....	D3	.....	..
Daviesia reversifolia F. Muell.	B2	.....	..
Daviesia teretifolia R. Br. ex Benth.	D3	.....	..
Daviesia aff. colletioides Meisn. (KRN 1480)	B2	.....	..
Eutaxia cuneata Meisn.	B1	.....	.....	.....	.....	D2	D3	.....
Eutaxia densifolia Turcz.B2	.....	.....	.....	.....	.....	.....	.....	.....	..
Gastrolobium hookeri Meisn.	B3	.....
Gastrolobium reticulatum (Meisn.) Benth.	B2	.....
Gastrolobium spinosum Benth.	C3C3	.....
Gompholobium aristatum Benth.	A1	.....	..
Gompholobium knightianum Lindl.	C1	.....
Gompholobium marginatum R. Br.	..C1	.....	..	.....	.....	.....	.....	.....	A1	.....	..
Gompholobium venustum R. Br.	C1	.....
Gompholobium viscidulum Meisn.	B1	.....
Goodia lotifolia Salisb.	B2	.....	..
Hovea trisperma Benth.	C2	.....	..
Jacksonia capitata Meisn.	B1	.....	..
Jacksonia furcellata (Bonpl.)DC.	..D3	.....	..	.....	.....	.....	.....	.....	.....	.....	..
Jacksonia sp. (KRN 3967)	B2B2	.....
Kennedia eximia Lindl.A2	.....	.....	.....	.....	.....	.....	.....	..
Kennedia prostrata R. Br.B2	.....	.....	.....	.....	.....	.....	.....	B2
Mirbelia spinosa Benth.	B2	.....
Oxylobium microphyllum Benth.	C3	.....	.....	.....	.....	.....	B3	D3	.....

Species	LAI EA2A2B	LBC AHEP	KS EN	KSi ECEEEERET	KSr ENEDEUEG	S1 MHMV	Co GC
<i>Oxylobium parviflorum</i> Benth.	.....	.....	..	..D2D3..	.....	.....	..
<i>Oxylobium racemosum</i> (Turcz.) C.A. Gardner	.....	.....	..	..B2....	.....	.....	..
<i>Oxylobium tetragonophyllum</i> E. Pritzel	.....	.....	..	.....	.....B2	.....	..
<i>Oxylobium tricuspdatum</i> Meisn.	..A1..	.....	..	.....	.....	.....	..
<i>Pultenaea adunca</i> Turcz. ..	.....	.....	..	..A1....	..C2B1..	.....	..
<i>Pultenaea neurocalyx</i> Turcz. var. major Benth.	.....	.....	..	.....	..A1....	.....	..
<i>Pultenaea rotundifolia</i> (Turcz.) Benth.	.....	.....	..	A2.....	.....	.....	..
<i>Pultenaea verruculosa</i> Turcz. var. <i>brachyphylla</i> Benth.	.....	.....	..	.....	.....C3B2	.....	..
<i>Sphaerolobium daviesioides</i> Turcz.	.....	.....	..	.....	.....C2..	.....	..
<i>Sphaerolobium scabriusculum</i> Meisn.	.....	.....	..	.....	.....B1..	.....	..
<i>Templetonia retusa</i> (Vent.)R. Br.	..B2..	B1..	..	..D2....	.....	.....	..
<i>Viminaria juncea</i> (Schrad. & Wendl.)Hoffmans.	..B2..	.....	..	.....	.....	.....	B2
LENTIBULARIACEAE (323)							
<i>Polyphompholyx tenella</i> (R. Br.) Lehm.	.....	.....	..	.....	.....	A1..	A2
LILIACEAE							
<i>Agrostocrinum scabrum</i> (R. Br.) Baill.	.....	B1..	..	..B1....	.....	.....	..
<i>Anthropodium preissii</i> Endl. ..	..B1..	B1..	A1	.....	.....	.....	B1
* <i>Asparagus asparagoides</i> (L.) W.F. Wright	.....	.....	..	.....	.....	..B2	..
<i>Borya nitida</i> Labill. .. ..	.....	B4..	..	.....	.....C4	.....	D4
<i>Bulbine semibarbata</i> (R. Br.)Haw.	.....	.....	..	.....	.....	.....	B2
<i>Calectasia cyanea</i> R. Br. var. cyanea	.....	.....	..	.....	..C2..C2	.....	..
<i>Chamaescilla corymbosa</i> (R. Br.) F. Muell. ex Benth.	..D2..	C2..	..	.....	.....A2	.....	..
<i>Chamaescilla spiralis</i> (Endl.) F. Muell.	..B2..	.....	..	.....B2..	.....C2C2	.....	..
<i>Chamaexeros serra</i> (Endl.)Benth.	.....	B1..	..	.....	..D2C2C3	.....	..
<i>Dianella revoluta</i> R. Br. ..	..D1..	D1..	..	..C1D1C1	D1..C1C1	.....	E1
<i>Johnsonia acaulis</i> Endl. ..	.....	.....	..	.....	.....B2..	.....	..
<i>Laxmannia brachyphylla</i> F. Muell. ex Benth.	.....	.....	..	.....	..C2....	.....	..
<i>Laxmannia squarrosa</i> Lindl. ..	.....	A1..	..	.....	.....B1B1	.....	..
<i>Lomandra collina</i> (R. Br.)Ewart	.....	.....	..	.....C1..	.....C2..	.....	..
<i>Lomandra effusa</i> (Lindl.)Ewart	....C2	B2..	..	.....	.....A1	..C3	..
<i>Lomandra hastilis</i> (R. Br.)Ewart	.....	.....	..	.....	..C2....	.....	..
<i>Lomandra micrantha</i> (Endl.)Ewart	..B1..	.....	..	.....C3D2	D2....B1	.....	B2
<i>Stypandra imbricata</i> R. Br. ..	..D2..	D2..	..	.....	.....	.....	E2
<i>Thysanotus gageoides</i> Diels ..	.....	.....	..	.....	..B1..A1	.....	..
<i>Thysanotus patersonii</i> R. Br. ssp. <i>patersonii</i>	..B1..	C1..	..	.....	C1.....	.....	..
<i>Wurmbea tenella</i> (Endl.)Benth.	.....	.....	..	.....	.....	.....	C2
<i>Xanthorrhoea preissii</i> Endl. ..	.....	.....	..	.....C1..	..C2C2..	.....	..

Species	Lai	LBc	KS	KS <i>i</i>	KSr	Sl	Co
	EA2A2B	AHEP	EN	ECEEEERET	ENEDEUEG	MHMV	GC
LOBELIACEAE (340)							
<i>Isotoma hypocrateriformis</i> (R. Br.)DruceB2	....	..
<i>Lobelia alata</i> Labill.	B2
<i>Lobelia rarifolia</i> E. WimmerB1..B1	....	..
LOGANIACEAE (302)							
<i>Logania buxifolia</i> F. Muell.D3	....A2..	....	..
<i>Logania micrantha</i> Benth.A1....	.....	....	..
<i>Logania serpyllifolia</i> R. Br.C2..	....	..
<i>Mitrasacme paradoxa</i> R. Br. ..	..C2..	.....	..	.....	.....	....	..
LORANTHACEAE (97)							
<i>Nuytsia floribunda</i> (Labill.) R. Br. ex FenzlB2B2..	....	..
MALVACEAE (221)							
<i>Alyogyne huegelii</i> (Endl.)Fryxell	C2	..C2....	.....	....	..
MYRTACEAE (273)							
<i>Agonis spathulata</i> SchauerC2....	..E4D4C2	....	..
<i>Astartea ambigua</i> F. Muell.B2C2D3	..A1B2..	....	..
<i>Astartea fascicularis</i> (Labill.) DC.	..E4..	.....	..	..E4....	.....	E4..	C3
<i>Baeckea corynophylla</i> F. Muell.B2E3D3	.....	....	..
<i>Baeckea crispiflora</i> F. Muell.	..C2..	C3..	..	.....	.....B2	....	..
<i>Baeckea fumana</i> (Schauer)F. Muell.A1C2..	....C3..	....	..
<i>Baeckea pachyphylla</i> Benth.A2	....	..
<i>Baeckea preissiana</i> (Schauer)DominE3D3D3	....	..
<i>Baeckea tetragona</i> F. Muell. ex Benth.B3	....	..
<i>Baeckea aff. latens</i> C. Andrews (KRN 6542)A1....	.....	....	..
<i>Beaufortia empetrifolia</i> (Reichb.) SchauerD4....	....	..
<i>Beaufortia micrantha</i> SchauerE4C4	..E4E4C4	....	..
<i>Beaufortia schaueri</i> Preiss ex SchauerD3..	....C4..	....	..
<i>Callistemon phoeniceus</i> Lindl.	..D3..	.....	..	..E4....	.....	....	..
<i>Calothamnus gibbosus</i> Benth.C1C3C3	.....	....	..
<i>Calothamnus gracilis</i> R. Br.E4C2..	....	..
<i>Calothamnus lateralis</i> Lindl.A1..	....	..
<i>Calothamnus quadrifidus</i> R. Br.	D3..	B1	..E4....	.....E4	....	..
<i>Calytrix asperula</i> (Schauer)Benth.D4....	....	..
<i>Calytrix leschenaultii</i> (Schauer) Benth.	..B2..	B3..	..	..A2D3..	..B2D4C2	....	..
<i>Calytrix tetragona</i> Labill. ..	..C3..	B2..	..	..B2....	B3.....	....	..
<i>Chamelaucium ciliatum</i> Desf.B1B1	....	..
<i>Chamelaucium megalopetalum</i> F. Muell. ex Benth.B2....	....	..
<i>Conothamnus aureus</i> (Turcz.)DominD3D4..	....	..
<i>Darwinia vestita</i> (Endl.)Benth.D1A1	..D1D1..	....	..
<i>Darwinia sp.</i> (KRN 2624)B1..	.....B1	....	..
<i>Eucalyptus annulata</i> Benth.	E6.....	E4.....	....	..
<i>Eucalyptus astringens</i> (Maiden) Maiden	E5....	.....	..	.....	.....	....	..
<i>Eucalyptus conglobata</i> (R. Br. ex Benth.)Maiden	A1..	E4	.....	D3....B1	....	..

Species	LAI	LBC	KS	KSi			KSr	Sl	Co
	EA2A2B	AHEP	EN	E	C	E	ENEDEUEG	MHMV	GC
MYRTACEAE cont.									
<i>Eucalyptus decipiens</i> Endl. ..	.....	.....	..	.....	..	E4B2..	.....	..
<i>Eucalyptus eremophila</i> (Diels) Maiden	.....	.....	..	..E5..C3	.....	B4..	.....	..
<i>Eucalyptus falcata</i> Turcz. ..	.....	.....	..	..B3D5..	.....	A3B4..	.....	..
<i>Eucalyptus gardneri</i> Maiden ..	.....	.....	..	.....D4	.....	C3..	.....	..
<i>Eucalyptus incrassata</i> Labill.	.....	.....	..	.....E4..	.....	B2....	.....	..
<i>Eucalyptus leptocalyx</i> Blakely	.....	.....	..	.....C3D4	.....	C4..	.....	..
<i>Eucalyptus occidentalis</i> Endl.	..E5E5	.....	..	..A1....	.....	.....	..B1	..	
<i>Eucalyptus platypus</i> Hooker ..	.....	..E6	..	.....	.....	.....	.....	..
<i>Eucalyptus redunca</i> Schauer ..	.....	.....	..	.....E5C3	.....	B2E4..	.....	..
<i>Eucalyptus spathulata</i> Hooker ssp. <i>grandiflora</i> (Benth.) L.A.S. Johnson & Blaxell	.....	.....	..	.....	.....	C3..C4..	.....	..
<i>Eucalyptus tetragona</i> (R. Br.) F. Muell.	.....	A1..	..	.....D2A1	.....	D2D4D4	.....	..
<i>Eucalyptus transcontinentalis</i> Maiden	.....	..C4	..	.....E5	.....	B3..	.....	..
<i>Eucalyptus uncinata</i> Turcz. ..	.....	.....	..	..D2E4E4	.....	C2D4C2	.....	..
<i>Eucalyptus xanthonema</i> Turcz.	.....	.....	..	..D4....	D3.....	.....	.....	..
<i>Kunzea affinis</i> S. Moore ..	.....	.....	..	..C2D3..	.....	D4	.....	..
<i>Kunzea jucunda</i> Diels ..	.....	.....	..	..B2B3..	.....	B3..	.....	..
<i>Kunzea micrantha</i> Schauer ..	.....	.....	..	.....	.....	C2D4D3	.....	..
<i>Kunzea micromera</i> Schauer ..	..D2..	.....	..	.....	.....	.....	.....	..
<i>Kunzea preissiana</i> Schauer ..	.....	.....	..	..B2....	.....	C2D3C3	.....	..
<i>Kunzea recurva</i> Schauer ..	..C2..	C2..	..	.....	.....	B2..	.....	..
<i>Leptospermum erubescens</i> Schauer	..C3..	C2..	..	..B3....	.....	C3	.....	C3	
<i>Leptospermum oligandrum</i> Turcz.	.....	B3..	..	..B2....	.....	C2....	.....	..
<i>Leptospermum spinescens</i> Endl.	.....	.....	..	....B1..	.....	C1C2B1	.....	..
<i>Melaleuca apodocephala</i> Turcz.	.....	.....	..	.....	.....	B3..	.....	..
<i>Melaleuca bracteosa</i> Turcz. ..	.....	.....	..	..D4....	.....	.....	.....	..
<i>Melaleuca brevifolia</i> Turcz. ..	.....	.....	..	..D4....	.....	.....	E5..	A2	
<i>Melaleuca calycina</i> R. Br. ..	....C4	.....	..	..C4....	.....	.....	.....	..
<i>Melaleuca conferta</i> Benth. ..	.....	.....	..	.....	.....	B1	.....	..
<i>Melaleuca cucullata</i> Turcz. ..	.....	.....	..	.....	.....	B3.....	.....	..
<i>Melaleuca cuneata</i> Turcz. ..	.....	.....	..	.....	.....	E4	.....	..
<i>Melaleuca cuticularis</i> Labill.	..D4..	.....	..	.....	.....	.....	E4E5	A1	
<i>Melaleuca densa</i> R. Br. ..	.....	.....	B2	.....	.....	A2	.....	..
<i>Melaleuca depauperata</i> Turcz.	.....	.....	..	....C3..	.....	C2..	.....	..
<i>Melaleuca elliptica</i> Labill. ..	.....	.....	..	..C2....	B2.....	.....	.....	D3	
<i>Melaleuca erucaeformis</i> Turcz.	.....	.....	..	.....	.....	D4.....	.....	..
<i>Melaleuca hamulosa</i> Turcz. ..	..B3..	.....	..	.....	.....	.....	E5E4	A1	
<i>Melaleuca lateralis</i> Turcz. ..	.....	.....	..	..B1....	.....	B3..	.....	..
<i>Melaleuca lateriflora</i> Benth.	..D3..	.....	D3	..D4..D4	E4..C4A3	.....	.....	..
<i>Melaleuca pauperiflora</i> F. Muell.	.....	.....	..	..C4....	.....	.....	.....	A1	
<i>Melaleuca pentagona</i> Labill. ..	..C2..	C2..	..	..D2D4B2	..E3..E3	.....	.....	..
<i>Melaleuca pentagona</i> Labill. var. <i>subulifolia</i> Schauer	D3....	..C2	..	..D4....	.....	.....	.....	..
<i>Melaleuca preissiana</i> Schauer	....C4	.....	..	.....	.....	.....	.....	..
<i>Melaleuca scabra</i> R. Br. ..	.....	.....	..	..B1....	.....	E4D4C4	.....	..
<i>Melaleuca sclerophylla</i> Diels	.....	.....	..	..C2D4C4	..C4D4C3	.....	.....	..
<i>Melaleuca spathulata</i> Schauer	.....	.....	..	....E4..	.....	.....	.....	..
<i>Melaleuca striata</i> Labill. ..	.....	.....	..	.....	.....	C4.....	.....	..

Species	LAI	LBC	KS	KS <i>i</i>	KS <i>r</i>	Sl	Co
	EA2A2B	AHEP	EN	ECEEEERET	ENEDEUEG	MHMV	GC
MYRTACEAE cont.							
Melaleuca suberosa (Schauer)							
C.A. Gardner	.....	.....	..	.....D3	....C1..	.....	..
Melaleuca subfalcata Turcz. ..	.....	.....	..	..C1D2D3	....D3..	.....	..
Melaleuca uncinata R. Br. ..	..D2..	D4..	C3	..D4D4..	D5....D4	.....	..
Melaleuca undulata Benth. ..	.....	.....	..	.....	C3.....	.....	..
Melaleuca viminea Lindl. ..	.....	.....	..	.....	.....	..E5	..
Melaleuca violacea Schauer ..	.....	.....	..	..C2....	....C2..	.....	..
Melaleuca pentagona Labill.							
sens. lat. (KRN 5197)	.....	.....	..	.....B2	....C4..	.....	..
Melaleuca aff. pentagona Labill.							
(KRN 10856)	.....	.....	..	..C3C3C4	....C4..	.....	..
Phymatocarpus maxwellii F. Muell.	.....	.....	..	.....	..C4C3..	.....	..
Thryptomene australis Endl. ..	.....	.....	..	.....	.....B3	.....	..
Verticordia brachypoda Turcz.	.....	.....	..	.....	.....B3	.....	..
Verticordia densiflora Lindl.	.....	.....	..	.....	..C3..C3	.....	..
Verticordia grandiflora Endl.	.....	.....	..	.....	....D3..	.....	..
Verticordia habrantha Schauer	.....	.....	..	....C3B2	..B3C3..	.....	..
Verticordia humilis Benth. ..	.....	.....	..	.....	....B2..	.....	..
Verticordia pennigera Endl. ..	.....	.....	..	.....	.....A2	.....	..
Verticordia plumosa (Desf.)Druce	.....	B2..	..	..C2....	.....	.....	..
Verticordia preissii Schauer	.....	B3..	..	.....B2	..D3E4E4	.....	..
OLACACEAE (95)							
Olax benthamiana Miq. .. ..	.....	.....	..	....B1A1	....B1C1	.....	..
ORCHIDACEAE (66)							
Caladenia deformis R. Br. ..	.....	.....	..	.....	A1.....	.....	..
Caladenia dilatata R. Br. var.							
falcata Nicholls	.....	B2..	..	.....	.....	.....	..
Caladenia doutchae O.H. Sargent	.....	B1..	..	.....	.....	.....	..
Caladenia filamentosa R. Br.							
var. tentaculata R.S. Rogers	.....	C2..	..	.....	.....	.....	..
Caladenia roei Benth. .. ..	.....	B2..	..	.....	.....	.....	..
Caladenia saccharata H. Reichenb.	.....	.....	B1	.....	.....	.....	..
Elythranthera brunonis (Endl.)							
George	..A2..	B2..	..	.....	.....A2	.....	..
Lyperanthus nigricans R. Br.	.....	.....	..	....C3..	....C2C3	.....	..
Microtis unifolia (G. Forster)							
H. Reichenb.	.....	.....	..	.....	.....	.....	B2
Spiculea ciliata Lindl. ..	.....	.....	..	.....	.....	.....	B2
Thelymitra antennifera (Lindl.)							
J.D. Hooker	..C2..	.....	..	.....	.....A1	.....	..
Thelymitra campanulata Lindl.	.....	.....	..	.....	.....B1	.....	..
Thelymitra fuscolutea R. Br.	.....	.....	..	.....	.....A1	.....	..
OXALIDACEAE (168)							
Oxalis corniculata L. .. ..	..D2..	C2..	..	..D3....	.....	.....	..
PITTOSPORACEAE (152)							
Billardiera bicolor (Putterl.)							
E.M. Bennett	.....	.....	..	....C1..	.....	.....	..
Billardiera coriacea Benth. ..	.....	.....	..	....A1..	.....	.....	..
Billardiera sericea (Turcz.)							
E.M. Bennett	.....	.....	..	....B1B1	....C1B1	.....	..
Billardiera villosa (Turcz.)							
E.M. Bennett	.....	.....	..	....C1..	.....	.....	..
Sollya heterophylla Lindl. ..	.....	.....	..	..C1....	.....	.....	..

Species	Lai	Lbc	KS	KS _i	KS _r	Sl	Co
	EA2A2B	AHEP	EN	ECEEEERET	ENEDEUEG	MHMV	GC
POACEAE (31)							
Amhipogon debilis R. Br. ..	..C3..	.....	..	.....	.....B3	.....	..
Amhipogon debilis R. Br. var. fallax Domin	.....	.....	..	.....	B2.....	.....	..
Amhipogon turbinatus R. Br.	.....	B1..	..	...D2C2	..C2E3D3	.....	..
*Briza minor L. .. ..	..A2..	.....	..	.....	.....	.....	B2
Danthonia setacea R. Br. ..	...C3	.....	..	.....	.....	.....	..
Neurachne alopecuroidea R. Br.	..E3..	E4..	D3	..D4E4D3	D3C2..E4	.....	C2
Spartochloa scirpoidea (Steud.) C.E. Hubbard	.....	.....	..	.....	.....	.....	D3
Sporobolus virginicus (L)Kunth	..B3..	.....	..	.....	.....	.....	..
Stipa hemipogon Benth. .. ..	.....	B1..	..	.....	A1..B1..	.....	..
Stipa juncifolia Hughes ..	..B4..	.....	..	.....	.....	D4..	A2
Stipa variabilis Hughes . ..	.....	.....	..	.....	B3.....	.....	..
POLYGALACEAE (183)							
Comesperma polygaloides F. Muell.	.....	.....	..	.....	A1.....	.....	..
Comesperma scoparium Steetz ..	..D2..	D2..	..	..A1....	.....C2	.....	..
Comesperma spinosum F. Muell.	.....	.....	..	.....D3	.....B3..	.....	..
Comesperma volubile Labill. ..	.....	.....	..	.....	.....B1..	.....	..
POLYGONACEAE (103)							
Muehlenbeckia adpressa (Labill.) Meisn.	..C1..	B1..	B1	..C1....	.....	.....	..
PORTULACACEAE (111)							
Calandrinia granulifera Benth.	.....	.....	..	.....	.....	.....	D3
PRIMULACEAE (293)							
*Anagallis arvense L. .. ..	..D3..	D3..	..	..C3....	.....	.....	C3
Samolus junceus R. Br. ..	..C2..	.....	..	..B2....	.....	D3..	A1
PROTEACEAE (90)							
Adenanthos cuneatus Labill. ..	.....	.....	..	.....	..D4....	.....	..
Adenanthos flavidiflorus F. Muell.	.....	.....	..	.....	..B1....	.....	..
Banksia baueri R. Br. .. ..	.....	.....	..	.....	..B4B3..	.....	..
Banksia baxteri R. Br. .. ..	.....	.....	..	.....	..B2....	.....	..
Banksia caleyi R. Br.	A1....	.....	..	...D4C3	.....B4..	.....	..
Banksia gardneri George var. hiemalis George	.....	.....	..	.....	..D3D3..	.....	..
Banksia nutans R. Br. var. nutans	.....	.....	..	.....	..D3D2..	.....	..
Banksia media R. Br. .. ..	.....	.....	..	..C2C4C2	.....B4..	.....	..
Banksia repens Labill. .. ..	.....	.....	..	.....	..D3....	.....	..
Banksia violacea C.A. Gardner	.....	.....	..	.....	..C2B1..	.....	..
Conospermum floribundum Benth.	.....	.....	..	..A1....	..B4....	.....	..
Dryandra arctotidis R. Br. ..	..B1..	B2..	..	...C2..	..D2D3C2	.....	..
Dryandra cirsioides Meisn. ..	.....	.....	..	...D3..	...D4E4	.....	..
Dryandra cuneata R. Br. ..	.....	.....	..	.....	...C3..	.....	..
Dryandra falcata R. Br. ..	.....	.....	..	.....	..C2C2..	.....	..
Dryandra nivea (Labill.)R. Br.	.....	.....	..	.....	..D3....	.....	..
Dryandra obtusa R. Br. .. ..	.....	.....	..	.....	..D4....	.....	..
Dryandra pteridifolia R. Br.	.....	.....	..	..C1E3D3	..D4D3..	.....	..
Dryandra sessilis (Knight)Domin	.....	.....	..	.....	..B3B2..	.....	..
Dryandra tenuifolia R. Br. ..	.....	.....	..	..D2D3D3	..B2....	.....	..
Franklandia fucifolia R. Br.	.....	.....	..	.....	..C1....	.....	..
Grevillea acerosa F. Muell. ..	..A2..	.....	..	.....	.....A2	.....	..

Species	LAI	LBc	KS	KS <i>i</i>	KSr	Sl	Co
	EA2A2B	AHEP	EN	ECEEEERET	ENEDEUEG	MHMV	GC
PROTEACEAE cont.							
Grevillea concinna R. Br.C1C2A2	..D2D2C1	....	..
Grevillea haplantha (F. Muell.) Benth.A2	....	..
Grevillea hookeriana Meisn.C2....	....	..
Grevillea huegelii S. MooreB3..	....	..
Grevillea nudiflora Meisn.B1..C2	....	..
Grevillea pauciflora R. Br.C2D2	....C2A1	....	..
Grevillea pectinata R. Br.B1..B2	....C2..	....	..
Hakea commutata F. Muell.	B2	.....	.....	....	..
Hakea corymbosa R. Br.C2E3A2	..D3E4..	....	..
Hakea crassifolia Meisn.E3..	..E4D4..	....	..
Hakea ferruginea SweetB4..	....	..
Hakea laurina R. Br. ..	C1....	.....	..	..C3C2C2	C2..C2..	....	..
Hakea lehmanniana Meisn.B3B2	....	..
Hakea lissocarpha R. Br. ..	..E2..	C2..	B2	..D3D3..	D4....D2	....	..
Hakea marginata R. Br.B2..C3	.....C2	....	..
Hakea nitida R. Br.D2D1B1	....C1..	....	..
Hakea obliqua R. Br.B1D3..	..D3....	....	..
Hakea prostrata R. Br.	B1..	..	.....	..B2D2..	....	..
Hakea strumosa Meisn.B1..B2	..D2C2C1	....	..
Hakea trifurcata (Sm.)R. Br.E4..	..D3D3D3	....	..
Hakea varia R. Br.B2D3C3	....B3..	....	..
Hakea verrucosa F. Muell.	D4.....	....	..
Hakea victoria Drumm.D4....	....	..
Hakea aff. falcata R. Br. (KRN 5966)B2...D5	....	..
Isopogon buxifolius R. Br.	A1..	..	..C2E4..	..D2..C2	....	..
Isopogon formosus R. Br.C2B2..	....	..
Isopogon longifolius R. Br.B1....	..D2D3..	....	..
Isopogon teretifolius R. Br.D2D2C2	....	..
Isopogon trilobus R. Br.C2C3..	....	..
Isopogon tripartitus R. Br.C2....	....	..
Lambertia inermis R. Br.C5C5..	....	..
Persoonia striata R. Br. ..	..B1..	.....	..	....C2..	.....	....	..
Persoonia teretifolia R. Br.	D1....	.....	..	..B1B1..	....C1..	....	..
Petrophile ericifolia R. Br.C4....	....	..
Petrophile phyllicoides R. Br.C2....	....	..
Petrophile seminuda Lindl.	C2..	..	..C2....	..D3..E3	....	..
Petrophile squamata R. Br.C2D3D2	..C2E3D3	....	..
Stirlingia tenuifolia (R. Br.) Steud.C2....	....	..
Synaphea favosa R. Br.	B1..	..	..A1C1..	..D2D2D2	....	..
Synaphea polymorpha R. Br.A2	....	..
RESTIONACEAE (39)							
Anarthria humilis NeesC2..	..C2C2..	....	..
Anarthria laevis R. Br.D4....	.....	....	..
Harperia lateriflora W.V. Fitzg.D4B3	..D4C4B3	....	..
Hypolaena exsulca R. Br.D3....	....B2..	....	..
Lepidobolus chaetocephalus F. Muell.C1..C1	....	..
Lepidobolus preissianus Nees	..D3..	E4..	..	.....	.....C4	....	..
Leptocarpus tenellus (Nees) F. Muell.C2..	.....	....	..

Species	LAI	LBC	KS	KSi			KSr			SI	Co		
	EA2A2B	AHEP	EN	E	C	E	E	R	E	U	EG	MHMV	GC
RESTIONACEAE cont.													
<i>Loxocarya cinerea</i> R. Br.	B3	.....	.....	A2	.....	.....	.....	.....
<i>Loxocarya fasciculata</i> (R. Br.) Benth.	D2	.....	B2C2	.....	.....	.....	.....	.....
<i>Loxocarya flexuosa</i> (R. Br.) Benth.	C4	.....	.....	.....	.....	.....	.....	.....
<i>Loxocarya myrioclada</i> Gilg	B1C2	.....	.....	.....	.....	.....
<i>Lyginia barbata</i> R. Br.	C2B2	.....	.....	.....	.....	.....
<i>Restio sphacelatus</i> R. Br.	D3C2	.....	.....	.....	.....	.....
RHAMNACEAE (215)													
<i>Cryptandra glabriflora</i> Benth.	A1	.....	C2D3	.....	.....	.....	.....	.....
<i>Cryptandra pungens</i> Steud.	C2	.....	.....	A1	D4	B2	.....	.....	.....	.....	.....
<i>Siegfriedia darwinioides</i> C.A. Gardner	..B1	..A1	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Spyridium complicatum</i> F. Muell.	..B1	B2	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Spyridium oligocephalum</i> (Turcz.) Benth.	D2D3D3	.....	D3	.....	.....	.....	.....	.....
<i>Spyridium</i> sp. (KRN 5007)	B4	.....	.....	.....	.....	.....
RUBIACEAE (331)													
<i>Opercularia apiciflora</i> Labill.	B1	.....	.....	.....	.....	.....	.....	.....
<i>Opercularia vaginata</i> Labill.	C3	B3	.....	.....	.....	.....	C2	E4D4	.....	.....	.....	.....
RUTACEAE (175)													
<i>Boronia crassifolia</i> Bartl.	B2	.....	B3C4	.....	.....	.....	.....	.....
<i>Boronia inconspicua</i> Benth.	..	D2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Boronia inornata</i> Turcz.	B2C3	.....	B2	.....	.....	.....	.....	.....
<i>Boronia scabra</i> Lindl.	C3	.....	.....	.....	C3	.....	.....	.....	.....	.....
<i>Boronia spathulata</i> Lindl.	D2B2	.....	.....	.....	.....	.....
<i>Boronia subsessilis</i> Benth.	B1	.....	.....	.....	.....	.....	.....	.....
<i>Microcybe albiflora</i> Turcz.	B3	B3	.....	.....	.....	.....
SANTALACEAE (92)													
<i>Choretrum glomeratum</i> R. Br.	B1	.....	.....	.....	.....	.....	.....	.....
<i>Exocarpos sparteus</i> R. Br.	B1	D1C1	.....	C2B1	.....	.....	.....	.....
<i>Leptomeria preissiana</i> (Miq.) A. DC.	B1	.....	.....	B2	.....	.....	.....	.....
<i>Leptomeria spinosa</i> (Lehm.) A. DC.	C2B1	.....	.....	.....	.....
<i>Santalum acuminatum</i> (R. Br.) A. DC.	B1	.....	B2	.....	.....	.....	.....	.....
SAPINDACEAE (207)													
<i>Dodonaea amblyophylla</i> Diels	..	C2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Dodonaea ceratocarpa</i> Endl.	B2	.....	.....	B1	.....
<i>Dodonaea concinna</i> Benth.	C3	.....	.....	.....	.....	.....
<i>Dodonaea pinifolia</i> Miq.	..	C2	C1	C2	.....	B1	.....	D3	.....	B1	.....	.....	.....
<i>Dodonaea ptarmicifolia</i> Turcz.	D3	.....	.....	.....	.....	.....	.....	.....	.....	.....
SCROPHULARIACEAE (316)													
* <i>Parentucella latifolia</i> (L.) Caruel	..	C3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	D3
STACKHOUSIACEAE (202)													
<i>Stackhousia brunonis</i> Benth.	C2	.....	.....	.....	.....
<i>Stackhousia huegelii</i> Endl.	..	B2	.....	.....	.....	.....	.....	B1	.....	A1	.....	.....	.....
<i>Stackhousia pubescens</i> A. Rich.	C2	.....	.....	.....	.....	.....	.....	.....	A2	.....	.....	.....
STERCULACEAE (223)													
<i>Lasiopetalum rosmarinifolium</i> (Turcz.) Benth.	B1D2C2	.....	C2	.....	.....	.....	.....	.....
<i>Lysiosepalum involucreatum</i> (Turcz.) C.A. Gardner	..	D1	.....	B1	.....	D1	.....	B1	.....	.....	.....	.....	.....

Species	Lai	LBc	KS	KSi	KSr	Sl	Co
	EA2A2B	AHEP	EN	ECEEEERET	ENEDEUEG	MHMV	GC
STERCULACEAE cont.							
<i>Thomasia angustifolia</i> Steud.	..B1B1	D2..	B1	..C2....	.....	....	..
<i>Thomasia foliosa</i> J. Gay ..	..B1..	....	C2	.....	.....	....	..
<i>Thomasia grandiflora</i> Lindl.A1..	....	..
STYLIDIACEAE (343)							
<i>Levenhookia dubia</i> Sonder	B2..	..	.....	.....	....	A2
<i>Levenhookia pusilla</i> R. Br. ..	..B3..	C3..	..	.....	A2.....	....	..
<i>Levenhookia stipitata</i> (Sonder) F. Muell.	..B2..	....	..	.....	.....B3	....	..
<i>Stylidium calcaratum</i> R. Br.A2	....	B3
<i>Stylidium caricifolium</i> Lindl.A1..	....	..
<i>Stylidium dichotomum</i> DC.	C2..	..	.....	.....B3	....	..
<i>Stylidium hirsutum</i> R. Br.A1..	....	..
<i>Stylidium perpusillum</i> J.D. HookerB2	....	..
<i>Stylidium piliferum</i> R. Br.	B1..	..	.....	..C2D3D2	....	..
<i>Stylidium preissii</i> (Sonder) F. Muell.B2....	....	..
<i>Stylidium pseudohirsutum</i> Mildbr.A1	.....	....	..
<i>Stylidium repens</i> R. Br.C1C2B1	B1E2D2B2	....	..
<i>Stylidium spathulatum</i> R. Br. var. <i>lehmanniana</i> (Sonder)Mildbr.D2....	....C3..	....	..
<i>Stylidium spinulosum</i> R. Br.A2	....	..
<i>Stylidium squamellosum</i> DC.	B1..	..	.....	.....B1	....	..
THYMELAEACEAE (263)							
<i>Pimelea argentea</i> R. Br. ..	..B2..	B2..	..	.....	.....	....	..
<i>Pimelea imbricata</i> R. Br.	B2.....	....	..
<i>Pimelea suaveolens</i> (Endl.)Meisn.A1..	....	..
<i>Pimelea sulphurea</i> Meisn.A1	....C2..	....	..
<i>Pimelea</i> sp. (KRN 1339)A2..	.....	....	..
URTICACEAE (88)							
<i>Parietaria debilis</i> G. Forster	C2..	..	.....	.....	....	..
VIOLACEAE (243)							
<i>Hybanthus floribundus</i> (Lindl.) F. Muell. ssp. <i>adpressus</i> E.M. Bennett	B2....A3	....	..

APPENDIX III

Fauna Sites not described in Appendix I

Not all fauna sites were also typical vegetation sites. Non-typical fauna sites are described below in the same format as Appendix I. Sites MFS2Aa and MFS15a only have the main plant species listed.

LOW WOODLAND

MFS2Aa Eucalyptus occidentalis Low Woodland

LOCATION: Along Gairdner River, 18 km NW of Mt. Maxwell (34° 06' 13"S lat.,
119° 08' 41"E long.)

FAUNA SAMPLED: Opportunistic AREA: ca 10 ha DATE: 18-4-1985

VEGETATION MUIR: LAi.LBr.Si.Jr
 PROVINCE: South-west SYSTEM: Qualup
 Stratum 1: Trees 10-15 m, CC = 15, clumping strong
 Eucalyptus occidentalis (15).
 Stratum 2: Trees 5-7 m, CC = 2, clumping strong
 Allocasuarina huegeliana (2).
 Stratum 3: Shrubs 2-3 m, CC = 16, clumping strong
 Acacia saligna (10), Leptospermum erubescens (3), A. microbotrya
 (2), A. cyclops (0.5), A. harvey (0.3).
 Stratum 4a: Shrubs 0.0-0.1 m, CC = 0.1, clumping strong
 Carpobrotus modestus (0.1), C. rossii (+).
 Stratum 4b: Misc. plants, CC = 8, clumping strong
 Annuals: *Arctotheca calendula (6), *Dittrichia graveolens (1).
 Sedges: Isolepis nodosa (1).

No of TAXA: 12+ LAST BURNT: >75 years
 MODIFICATION: Heavily grazed by sheep and horses ca 1930-1950.

LANDFORM

BEDROCK: Granite GEOLOGICAL SURFACE: (Bb) Qa in Czs
 UNIT: River Valley ELEMENT: Fossil river flat

SOIL

GROUP: Alluviums NORTHCOTE: Not classified
 MAIN ORIGIN: Alluvial DRAINAGE: Good
 MAIN ATTRIBUTE: Silt content SURFACE: Hardsetting
 ROCK: Nil STONE: Nil PAVEMENT: Nil
 LITTER: Branches few; leaves broad, deposits 5 cm thick, 5-30 m apart;
 leaves terete, deposits 2 cm thick, almost continuous where present.

SOIL PROFILE

(Not recorded)

GENERAL

DISTRIBUTION: Frequent along Gairdner River, 2-10 ha
 PROFILE THICKNESS: ? 2-3 m
 GENERAL: An important feature is the strong clumping of single-species
 stands of trees and tall shrubs.

OPEN SHRUB MALLEE

MFS7a Eucalyptus eremophila Open Shrub MalleeLOCATION: 2 km N of Boggy Pool Spring, Gairdner River (34° 05' 15"S lat.,
119° 10' 35"E long.)

FAUNA SAMPLED: Yes APPROX. AREA: 40 x 130 m DATE: 10-11-1984

PROVINCE: South-west SYSTEM: Qualup

VEGETATION MUIR: KSc.Sr.SAr.SBi.SDi.VLc

- Stratum 1: Mallees 3-4 m, CC = 33, clumping slight
Eucalyptus eremophila (20), E. xanthonea (10), E. falcata (2), E. uncinata (1).
- Stratum 2: Shrubs 2.1-3.0 m, CC = 3, clumping strong
Banksia media (1), Hakea laurina (1), H. nitida (1).
- Stratum 3: Shrubs 1.6-2.0 m, CC = 8.1, clumping strong
Acacia aff. lineolata (4), A. acellerata (2), Hakea corymbosa (2), Callistemon phoeniceus (0.1), Hakea obliqua (+).
- Stratum 4: Shrubs 1.1-1.5 m, CC = 20, clumping strong
Melaleuca pentagona var. subulifolia (10), M. calycina (5), M. lateralis (2), M. uncinata (2), Kunzea preissiana (0.2), Grevillea concinna (0.1), Hakea strumosa (0.1), K. affinis (0.1), M. pauperiflora (0.1), Templetonia retusa (0.1), Comesperm scoparium (+), Leptomeria preissiana (+), M. lateralis (+), Santalum acuminatum (+).
- Stratum 5: Shrubs 0.6-1.0 m, CC = 8.2, clumping slight
Melaleuca calycina (5), M. brevifolia (2), Daviesia benthamii ssp. benthamii (0.5), Astartea ambigua (0.2), Isopogon buxifolius (0.2), M. subfalcata (0.2), Petrophile squamata (0.1), Baeckea aff. latens (+).
- Stratum 6a: Shrubs 0.0-0.5 m, CC = 11, clumping none
Astartea fascicularis (2), Conostylis seorsiflora (2), Calytrix tetragona (1), Leucopogon sp. (KRN 4082)(1), Spyridium oligocephalum (1), Brachysema latifolium (0.5), Grevillea pectinata (0.5), Leucopogon tetragonus (0.5), Melaleuca aff. pentagona (0.5), Stylidium spathulatum var. lehmanniana (0.5), Verticordia plumosa (0.5), Hibbertia enervia (0.2), Melaleuca pentagona (0.2), Calothamnus gibbosus (0.1), Isopogon longifolius (0.1), M. bracteosa (0.1), Platysace deflexa (0.1), Acrotriche ramiflora (+), Astroloma drummondii (+), A. pallidum (+), Dryandra pteridifolia (+), D. tenuifolia (+), Eutaxia cuneata (+), Lasiopetalum rosmarinifolium (+), Leucopogon sp. (KRN 9608)(+), Lysinema ciliatum (+), Melaleuca scabra (+), Styphelia intertexta (+).
- Stratum 6b: Misc. plants, CC = 41, clumping slight
Climbers: Sollya heterophylla (+).
Parasitic Climbers: Cassytha glabella (+).
Perennial Grasses: Neurachne alopecuroidea (1).
Sedges: Anarthria laevis (20), Schoenus brevisetis (10), Choizandra enodis (3), Gahnia ancistrophylla (2), Hypolaena exsulca (2), Lepidosperma brunonianum (2), L. drummondii (1).
Sedge-like: Patersonia occidentalis (+).

No of TAXA: 72

LAST BURNT: 1969

MODIFICATION: None

LANDFORM

BEDROCK: Spongolite
UNIT: Marine Plain

GEOLOGICAL SURFACE: (Bb) Tp
ELEMENT: Minor drainage line

SOIL

GROUP: Alluviums NORTHCOTE: Not classified
MAIN ORIGIN: Alluvial DRAINAGE: Moderate
MAIN ATTRIBUTE: Additional water SURFACE: Hardsetting
ROCK: Nil STONE: Nil PAVEMENT: Hardsetting
LITTER: Branches few; leaves broad, deposits 3 cm thick, continuous.

SOIL PROFILE

A1 0-35 cm Grey sandy loam.
A2 35-65 cm Pale grey loamy sand.
B 65-100 cm Yellowish brown sandy clay loam.

MFS9a Eucalyptus transcontinentalis Open Shrub Mallee

LOCATION: 4 km E of Boggy Pool Spring, Gairdner River (34° 06' 20"S lat.,
119° 12' 55"E long)

FAUNA SAMPLED: Yes APPROX. AREA: 80 x 40 m DATE: 13-11-1984

VEGETATION

MUIR: SCi.SD.VLr

PROVINCE: South-west

SYSTEM: Qualup

Stratum 1: Shrubs 1.6-2.0 m, CC = +, clumping none
Exocarpos sparteus (+).

Stratum 2: Mallees (regrowth) 0.7-0.8 m, CC = 14, clumping slight
Eucalyptus uncinata (6), E. gardneri (2), E. leptocalyx (2),
E. redunca (2), E. eremophila (1), E. transcontinentalis (1).

Stratum 3a: Shrubs 0.0-0.5 m, CC = 12, clumping slight
Melaleuca pentagona sens. lat. (3), M. sclerophylla (2),
M. lateriflora (1), Beaufortia micrantha (0.5), M. suberosa
(0.5), M. aff. pentagona (0.5), Astartea ambigua (0.4),
Banksia caleyi (0.3), Acacia chrysocephala (0.2), Dampiera
trigona (0.2), Daviesia anceps (0.2), D. decurrens (0.2),
Dryandra pteridifolia (0.2), Grevillea pauciflora (0.2), G.
pectinata (0.2), Hakea marginata (0.2), Hibbertia mucronata
(0.2), Leucopogon tetragonus (0.2), Melaleuca subfalcata
(0.2), Microcorys glabra (0.2), Platysace deflexa (0.2),
Acacia gonophylla (0.1), A. unifissilis (0.1), Baeckea
corynophylla (0.1), Banksia media (0.1), Boronia crassifolia
(0.1), B. inornata (0.1), Calothamnus gibbosus (0.1),
Chorizema nervosum (0.1), Cooperhooikia polygalacea (0.1),
Daviesia lancifolia (0.1), Gompholobium aristatum (0.1),
Goodenia caerulea (0.1), Hibbertia gracilipes (0.1),
Lasiopetalum rosmarinifolium (0.1), Leucopogon tamminensis
var. australis (0.1), Melaleuca pentagona (0.1), Olax
benthamiana (0.1), Oxylobium microphyllum (0.1), Andersonia
caerulea (+), Burtonia conferta (+), Callitris roei (+),
Comesperma spinosa (+), Cryptandra glabriflora (+), Daviesia
benthamii ssp. benthamii (+), Grevillea haplantha (+), Hakea
strumosa (+), Petrophile squamata (+), Pimelea sulphurea (+),
Spyridium oligocephalum (+), Stylidium repens (+),
S. pseudohirsutum (+), Verticordia preissii (+).

Stratum 3b: Misc. plants, CC = 9, clumping slight
 Climbers: *Billardiera sericea* (0.1).
 Parasitic Climbers: *Cassytha glabella* (+), *C. micrantha* (+).
 Perennial Grasses: *Neurachne alopecuroidea* (1), *Amphipogon turbinatus* (0.5).
 Sedges: *Schoenus* sp. (KRN 4154)(6), *Lepidosperma brunonianum* (1), *Harperia lateriflora* (0.2), *S. subflavus* (0.2), *S. brevisetis* (0.1),
 Sedge-like: *Lomandra micrantha* (0.2), *Dianella revoluta* (+).

No of TAXA: 72
 MODIFICATION: None

LAST BURNT: 1979

LANDFORM

BEDROCK: Spongolite
 UNIT: Marine Plain

GEOLOGICAL SURFACE: (Bb) Tp
 ELEMENT: Level plain

SOIL

GROUP: Shallow Sands
 MAIN ORIGIN: In situ weathering
 MAIN ATTRIBUTE: Shallow A
 ROCK: Nil

NORTHCOTE: Not classified
 DRAINAGE: Moderate to good
 SURFACE: Hardsetting
 PAVEMENT: Nil
 LITTER: Nil

SOIL PROFILE

A 0-12 cm Light grey loamy sand; friable.
 B 12-43 cm Brownish yellow sandy clay loam; firm to very firm; too dry to auger deeper.

MFS9b *Eucalyptus transcontinentalis* Open Shrub Mallee

LOCATION: 4 km E of Boggy Pool Spring, Gairdner River (34° 06' 25"S lat., 119° 13' 05"E long.)

FAUNA SURVEYED: Yes APPROX. AREA: 40 x 80 m DATE: 13-11-1984

VEGETATION

PROVINCE: South-west

MUIR: SCi.SDi.VLi

SYSTEM: Qualup

Stratum 1: Shrubs 1.5 m, CC = +, clumping none
Exocarpos sparteus (+).

Stratum 2: Mallees (regrowth) 0.8-0.9 m, CC = 11, clumping moderate
Eucalyptus transcontinentalis (6), *E. leptocalyx* (2),
E. uncinata (2), *E. tetragona* (1).

Stratum 3a: Shrubs 0.0-0.5 m, CC = 17, clumping moderate
Melaleuca pentagona sens. lat. (6), *Acacia gonophylla* (1),
Astartea ambigua (1), *Beaufortia micrantha* (1), *Daviesia anceps* (1), *M. sclerophylla* (1), *M. aff. pentagona* (1),
Cooperhooikia polygalacea (0.5), *Daviesia decurrens* (0.5),
M. subfalcata (0.5), *Baekkea corynophylla* (0.4), *Banksia caleyi* (0.2),
Boronia crassifolia (0.2), *Dryandra pteridifolia* (0.2), *Acacia chrysocephala* (0.1), *Boronia inornata* (0.1),
Calothamnus gibbosus (0.1), *Darwinia vestita* (0.1), *Daviesia lancifolia* (0.1),
Dryandra tenuifolia (0.1), *Grevillea pauciflora* (0.1), *G. pectinata* (0.1),
Hakea corymbosa (0.1), *H. laurina* (0.1), *Helichrysum obtusifolium* (0.1), *Hibbertia mucronata* (0.1),
Leucopogon tetragonus (0.1), *Melaleuca*

suberosa (0.1), Microcorys glabra (0.1), Platysace deflexa (0.1), Stylidium pseudohirsutum (0.1), Verticordia habrantha (0.1), Burtonia conferta (+), Callitris roei (+), Cryptandra pungens (+), Dampiera trigona (+), Glischrocaryon aureum var. angustifolium (+), Gompholobium aristatum (+), G. marginatum (+), Goodenia caerulea (+), Hakea nitida (+), H. strumosa (+), H. varia (+), Lasiopetalum rosmarinifolium (+), Logania buxifolia (+), Pultenaea verrucosa var. brachyphylla (+), Stackhousia huegelii (+), Stylidium repens (+), Verticordia preissii (+).

Stratum 3b: Misc. plants, CC = 12, clumping slight
Parasitic Climbers: Cassytha glabella (+).
Perennial Grasses: Amphipogon turbinatus (1), Neurachne alopecuroidea (0.5),
Sedges: Schoenus sp. (KRN 4154) (6), Gahnia ancistrophylla (2), Lepidosperma brunonianum (0.5), L. aff. resinosum (0.5), Mesomelaena stygia ssp. stygia (0.5), S. brevisetis (0.2), L. carphoides (0.1), S. grammatophyllus (+).
Sedge-like: Lomandra micrantha (0.5), Dianella revoluta (+), Patersonia juncea (+).

No of TAXA: 68
MODIFICATION: None

LAST BURNT: 1979

LANDFORM

BEDROCK: Spongolite
UNIT: Marine Plain

GEOLOGICAL SURFACE: (Bb) Tp
ELEMENT: Level plain

SOIL

GROUP: Shallow Sands
MAIN ORIGIN: In situ weathering
MAIN ATTRIBUTE: Shallow A
ROCK: Nil STONE: Nil PAVEMENT: Nil LITTER: Nil
NORTHCOTE: Not classified
DRAINAGE: Moderate to good
SURFACE: Hardsetting

SOIL PROFILE

A 0-8 cm Light grey loamy sand; friable.
B 8-37 cm Brownish yellow sandy clay loam; firm to very firm; too dry to auger deeper.

VERY OPEN SHRUB MALLEE

MFS11a Eucalyptus decipiens Very Open Shrub Mallee

LOCATION: 9 km SSE of Calyerup Rock (33° 59' 30"S lat., 119° 06' 40"E long.)
FAUNA SURVEYED: Yes APPROX. AREA: 40 x 85 m DATE: 9-11-1984

VEGETATION

PROVINCE: South-west
Stratum 1: Mallees 1.8-2.8 m, CC = 3.1, clumping strong
Eucalyptus decipiens (2), E. incrassata (0.5), E. redunca (0.5), E. tetragona (+), E. uncinata (+).
MUIR: Ksr.SAr.SBr.SCr.SDc.VLi
SYSTEM: Jerramungup

- Stratum 2: Shrubs 1.6-2.0 m, CC = 5, clumping none
Hakea crassifolia (5).
- Stratum 3: Shrubs 1.1-1.5 m, CC = 5.1, clumping slight
Hakea crassifolia (2), H. trifurcata (2), H. corymbosa (1),
Dryandra falcata (+), Grevillea concinna (+).
- Stratum 4: Shrubs 0.6-1.0 m, CC = 3.2, clumping moderate
Hakea aff. falcata (2), Allocasuarina humilis (0.5),
H. obliqua (0.5), Astartea ambigua (0.1), Acacia gonophylla
(+), Daviesia pachyphylla (+), Kunzea preissiana (+).
- Stratum 5a: Shrubs 0.0-0.5 m, CC = 31, clumping slight
Melaleuca sclerophylla (6), Dryandra pteridifolia (4),
Beaufortia micrantha (3), Petrophile seminuda (3), Andersonia
parvifolia (2), Banksia repens (1), Calothamnus gracilis (2),
Leucopogon tamminensis var. australis (2), Melaleuca scabra
(2), Stylidium repens (2), Verticordia preissii (2), Drosera
paleacea (0.4), Dryandra arctotidis (0.4), Baeckea preissiana
(0.2), Hakea prostrata (0.2), Isopogon teretifolius (0.2),
Acacia ericifolia (0.1), Agonis spathulata (0.1),
Allocasuarina microstachya (0.1), Astroloma drummondii (0.1),
Banksia gardneri (0.1), B. violacea (0.1), Calectasia cyanea
var. cyanea (0.1), Conothamnus aureus (0.1), Darwinia vestita
(0.1), Hibbertia gracilipes (0.1), Jacksonia sp.
(KRN 3967)(0.1), Lysinema ciliatum (0.1), Melaleuca pentagona
(0.1), Adenanthos flavidiflora (+), Allocasuarina thuyoides
(+), Calytrix leschenaultii (+), Chorizema glycinifolium (+),
Daviesia incrassata ssp. reversifolia (+), Goodenia sacculata
(+), Grevillea nudiflora (+), Isopogon longifolius (+), Kunzea
micrantha (+), Laxmannia brachyphylla (+), Leptospermum
spinescens (+), Leucopogon sp. (KRN 4082)(+), Stachystemon
polyandrus (+), Stylidium piliferum (+), Synaphea favosa (+).
- Stratum 5b: Misc. plants, CC = 16, clumping slight
Annuals: Lobelia rarifolia (0.1), Drosera macrantha (+),
D. menziesii (+), Thysanotus patersonii ssp. patersonii (+).
Parasitic Climbers: Cassytha micrantha (+).
Perennial Grasses: Neurachne alopecuroidea (0.1), Amphipogon
turbinatus (+).
Sedges: Mesomelaena stygia ssp. stygia (10), Schoenus subflavus
(2), Harperia lateriflora (1), Lepidosperma aff. resinosum (1),
L. sp. (KRN 6488)(0.5), Lepidobolus chaetocephalus (0.1),
Tricostularia compressa (0.1), Anarthria humilis (+),
Loxocarya fasciculata (+), L. myriantha (+), Restio
sphacelatus (+).
Sedge-like: Chamaexeros serra (1), Conostylis androstemma ssp.
argentea (0.1).

No of TAXA: 82
MODIFICATION: None

LAST BURNT: 1957

LANDFORM

BEDROCK: Granite
UNIT: Gentle Undulating Plain

GEOLOGICAL SURFACE: (Ne) Czs
ELEMENT: Colluvial sand sheet

SOIL

GROUP: Deep Sands
MAIN ORIGIN: In situ weathering
MAIN ATTRIBUTE: Highly leached
ROCK: Nil STONE: Nil

NORTHCOTE: Not classified
DRAINAGE: Good
SURFACE: Hardsetting
PAVEMENT: Nil

LITTER: Leaves broad, deposits 3 cm thick, 2-50 m apart; leaves terete, deposits 2 cm thick, 2-40 m apart.

SOIL PROFILE

A21 0-20 cm Light grey loamy sand; friable.
 A22 20-48 cm Pale grey loamy sand; friable; inclusions 30-50% gravel
 5-20 mm across.
 B 48-100 cm Brownish yellow sandy clay; very firm.

MFS11b Eucalyptus decipiens Very Open Shrub Mallee

LOCATION: 14 km NW of Boggy Pool Spring, Gairdner River (33° 59' 45"S
 lat., 119° 06' 30"E long.)

FAUNA SAMPLED: Yes APPROX. AREA: 40 x 80 m DATE: 9-11-1984

VEGETATION

MUIR: Sr.SAi.SBr.SCi.SDc.VLi

PROVINCE: South-west

SYSTEM: Jerramungup

- Stratum 1: Mallees 3-4 m, CC = 1, clumping none
 Eucalyptus decipiens (1), E. tetragona (+).
- Stratum 2: Shrubs 2.1-2.3 m, CC = 3, clumping slight
 Lambertia inermis (3).
- Stratum 3: Shrubs 1.6-2.0 m, CC = 10, clumping slight
 Lambertia inermis (10), Dryandra falcata (+), D. sessilis (+).
- Stratum 4: Shrubs 1.1-1.5 m, CC = 6.1, clumping slight
 Lambertia inermis (4), Hakea corymbosa (1), H. victoria(1),
 Grevillea hookeriana (+), Styphelia longiflora (+).
- Stratum 5: Shrubs 0.6-1.0 m, CC = 16, clumping slight
 Banksia baueri (6), Isopogon ericifolia (3), Agonis spathulata
 (2), Banksia nutans var. nutans (2), Hakea trifurcata (2),
 Adenanthos cuneatus (0.5), Petrophile squamata (0.2),
 H. strumosa (+), Isopogon tripartitus (+), Pultenaea adunca
 (+).
- Stratum 6a: Shrubs 0.0-0.5 m, CC = 32, clumping slight
 Isopogon longifolius (5), Beaufortia empetrifolia (4),
 Daviesia incrassata ssp. reversifolia (dead)(4), Baeckea
 preissiana (3), Beaufortia micrantha (2), Calothamnus gracilis
 (2), Conothamnus aureus (2), Melaleuca scabra (2),
 Allocasuarina humilis (1), Calytrix asperula (1), Dryandra
 nivea (1), Hibbertia gracilipes (1), Petrophile phyllicoides
 (1), Daviesia abnormis (0.5), Hibbertia acerosa (0.5),
 Lysinema ciliatum (0.5), Stylidium repens (0.5), Leucopogon
 sp. (KRN 4082)(0.4), Banksia violacea (0.2), Allocasuarina
 thuyoides (+), Calytrix leschenaultii (+), Darwinia vestita
 (+), Isopogon formosus (+), Leucopogon fimbriatus (+),
 Stylidium piliferum (+), Synaphea favosa (+).
- Stratum 6b: Misc. plants, CC = 18, clumping slight
 Annuals: Thysanotus gageoides (+).
 Parasitic Climbers: Cassytha flava (+).
 Sedges: Restio sphacelatus (6), Tricostularia neesii (4),
 Mesomelaena stygia ssp. stygia (3), M. tetragona (2),
 T. compressa (2), Caustis dioica (1), Cyathochaeta avevacea
 (+).
 Sedge-like: Xanthorrhoea preissii (0.2), Patersonia lanata
 (+).

No of TAXA: 56
 MODIFICATION: None

LAST BURNT: 1969

LANDFORM

BEDROCK: Granite
 UNIT: Gentle Undulating Plain

GEOLOGICAL SURFACE: (Ne) Czs
 ELEMENT: Colluvial sand sheet

SOIL

GROUP: Deep Sands
 MAIN ORIGIN: In situ weathering
 MAIN ATTRIBUTE: Highly leached
 ROCK: Nil STONE: Nil
 LITTER: Leaves broad, deposits 4 cm thick, 10-60 m apart.

NORTHCOTE: Not classified
 DRAINAGE: Good
 SURFACE: Loose to hardsetting
 PAVEMENT: Nil

SOIL PROFILE

A21 0-52 cm Pale grey sand; loose.
 A22 52-62 cm Pale grey loamy sand; friable: 15-20% gravel 8-20 mm across;
 too stony to auger deeper.

MFS11c Eucalyptus decipiens Very Open Shrub Mallee

LOCATION: 3 km N of Boggy Pool Spring, Gairdner River (34^o 04' 45"S lat.,
 119^o 10' 05"E long.)

FAUNA SAMPLED: Yes APPROX. AREA: 40 x 80 m DATE: 10-11-1984

VEGETATION

MUIR: Sr.SAr.SCr.SDi.VLr

PROVINCE: South-west

SYSTEM: Qualup

Stratum 1a: Mallees 2.1-2.5 m, CC = 1, clumping strong
 Eucalyptus decipiens (0.5), E. falcata (0.5), E. tetragona (+).

Stratum 1b: Shrubs 2.1-2.3 m, CC = 2, clumping none
 Lambertia inermis (2), H. crassifolia (+).

Stratum 2: Shrubs 1.6-2.0 m, CC = 5, clumping none
 Lambertia inermis (3), Hakea crassifolia (2).

Stratum 3: Shrubs 1.1-1.5 m, CC = 0.1, clumping none
 Banksia media (0.1), Isopogon trilobus (+).

Stratum 4: Shrubs 0.6-1.0, CC = 7, clumping slight
 Beaufortia empetrifolia (4), Adenathos cuneatus (1), Agonis spathulata (1), Leptospermum oligandrum (0.6), Grevillea concinna (0.2), Hakea strumosa (0.1), Daviesia pachyphylla (+), Microcorys barbata (+), Pultenaea adunca (+).

Stratum 5a: Shrubs 0.0-0.5 m, CC = 21, clumping slight
 Isopogon longifolius (3), Melaleuca scabra (3), Calothamnus gracilis (2), Conospermum floribundum (2), Conothamnus aureus (2), Dryandra obtusa (2), D. tenuifolia (1), Daviesia incrassata ssp. reversifolia (0.7), Oligarrhena micrantha (0.7), Petrophile ericifolia (0.7), Stirlingia tenuifolia (0.7), Andersonia caerulea (0.5), Leucopogon gibbosus (0.3), L. tetragonus (0.3), Boronia crassifolia (0.2), Hibbertia gracilipes (0.2), Lysinema ciliatum (0.2), Petrophile phyllicoides (0.2), Allocasuarina humilis (+), A. thuyoides (+), Baeckea preissiana (+), Darwinia vestita (+), Franklandia fucifolia (+), Glischrocaryon aureum var. angustifolium (+), Goodenia scapigera (+), Helichrysum obtusifolium (+), Isopogon

buxifolius (+), Jacksonia sp. (KRN 3967)(+), Leptospermum spinescens (+), Leucopogon sp. (KRN 4082)(+), Verticordia habrantha (+).

Stratum 5b: Misc. plants, CC = 6.5, clumping slight
 Perennial Grasses: Amphipogon turbinatus (+).
 Sedges: Restio sphacelatus (5), Caustis dioica (0.5),
 Tricostularia neesii (0.2), T. compressa (0.1), Lepidobolus chaetocephalus (+), Schoenus curvifolius (+), S. subbarbatus (+), S. subfascicularis (+).
 Sedge-like: Conostylis vaginata (0.5), Lomandra hastilis (0.2).

No of TAXA: 59

LAST BURNT: 1969

MODIFICATION: None

LANDFORM

BEDROCK: Spongolite

GEOLOGICAL SURFACE: (Bb) Tp

UNIT: Marine Plain

ELEMENT: Slope of drainage line

SOIL

GROUP: Deep Sands

NORTHCOTE: Not classified

MAIN ORIGIN: In situ weathering

DRAINAGE: Good

MAIN ATTRIBUTE: Highly leached

SURFACE: Loose to hardsetting

ROCK: Nil STONE: Nil

PAVEMENT: Nil

LITTER: Leaves broad, deposits 3 cm thick, 10-50 m apart.

SOIL PROFILE

A 0-81 cm Pale grey loamy sand; friable.

B 81-100 cm Brownish yellow sandy clay loam; very firm.

MFS12a Eucalyptus redunca Very Open Shrub Mallee

LOCATION: 3 km S of Calyerup Rock (33° 56' 00"S lat., 119° 05' 30" long.)

FAUNA SAMPLED: Yes APPROX. AREA: 40 X 85 m DATE: 9-1-1984

VEGETATION

MUIR: Sr.SAr.SBr.SCi.SDc.LGr.LVr

PROVINCE: South-west

SYSTEM: Jerramungup

Stratum 1a: Mallees 3-4 m, CC = 1.5, clumping strong
 Eucalyptus incrassata (1), E. tetragona (0.5).

Stratum 1b: Shrubs 2.1-3.0 m, CC = 5, clumping none
 Lambertia inermis (5), Exocarpos sparteus (+), Nuytsia floribunda (+).

Stratum 2: Shrubs 1.6-2.0 m, CC = 9, clumping slight
 Hakea crassifolia (5), Hakea ferruginea (2), H. trifurcata (2).

Stratum 3: Shrubs 1.1-1.5 m, CC = 3, clumping slight
 Hakea corymbosa (2), Dryandra cuneata (1).

Stratum 4: Shrubs 0.6-1.0 m, CC = 12, clumping strong
 Dryandra cirsioides (4), Melaleuca spathulata (4), Agonis spathulata (1), Banksia nutans var. nutans (1), D. falcata (1), Beaufortia schaueri (0.5), Calothamnus lateralis (0.5), Coleanthera myrtoides (+), Daviesia pachyphylla (+), Grevillea pauciflora (+), Isopogon trilobus (+), Leptospermum spinescens (+).

Stratum 5a: Shrubs 0.0-0.5 m, CC = ??, clumping slight
Beaufortia micrantha (20), *Melaleuca sclerophylla* (5),
Dryandra tenuifolia (3), *D. pteridifolia* (2), *Petrophile squamata* (2), *Baeckea preissiana* (0.7), *Hakea lehmanniana* (0.7), *Isopogon longifolius* (0.7), *Leucopogon gibbosus* (0.7), *L. tetragonus* (0.7), *L. sp.* (KRN 4082)(0.7), *Hibbertia acerosa* (0.3), *H. gracilipes* (0.3), *Lysinema ciliatum* (0.3), *Melaleuca scabra* (0.3), *Acrotriche ramiflora* (0.2), *Allocasuarina humilis* (0.2), *Banksia gardneri* var. *hiemalis* (0.2), *Boronia crassifolia* (0.2), *Petrophile seminuda* (0.2), *Acacia gonophylla* (+), *A. varia* var. *parviflora* (+), *Astroloma dielsii* (+), *Baeckea fumana* (+), *Banksia violacea* (+), *Boronia spathulata* (+), *Calothamnus gracilis* (+), *Calytrix leschenaultii* (+), *Chorizema glycinifolium* (+), *Conothamnus aureus* (+), *Darwina vestita* (+), *Daviesia lancifolia* (+), *Gastrolobium spinosum* (+), *Isopogon buxifolius* (+), *I. formosus* (+), *Melaleuca violacea* (+), *Oligarrhena micrantha* (+), *Pultenaea verrucosa* var. *brachyphylla* (+), *Stylidium caricifolium* (+), *S. piliferum* (+), *Styphelia intertexta* (+), *Synaphea favosa* (+).

Stratum 5b: Misc. plants, CC = 11, clumping slight
 Climbers: *Billardiera sericea* (+).
 Parasitic Climbers: *Cassytha glabella* (0.1).
 Perennial Grasses: *Neurachne alopecuroidea* (3), *Amphipogon turbinatus* (+), *Stipa hemipogon* (+).
 Sedges: *Mesomelaena stygia* ssp. *stygia* (5), *Loxocarya fasciculata* (1), *Lepidosperma sp.* (KRN 6488)(0.5), *L. aff. resinosum* (0.2), *Gahnia ancistrophylla* (0.1), *Loxocarya myrioclada* (0.1), *Tricostularia compressa* (+).
 Sedge-like: *Xanthorrhoea preissii* (0.5), *Chamaexeros serra* (+), *Patersonia umbrosa* (+).

No of TAXA: 79

LAST BURNT: 1957

MODIFICATION: None

LANDFORM

BEDROCK: Granite

GEOLOGICAL SURFACE: (Ne) Czs

UNIT: Gentle Undulating Plain

ELEMENT: Plain

SOIL

GROUP: Shallow Sands

NORTHCOTE: Not classified

MAIN ORIGIN: In situ weathering

DRAINAGE: Good

MAIN ATTRIBUTE: Highly leached

SURFACE: Hardsetting

ROCK: Nil

STONE: Nil

PAVEMENT: Nil

LITTER: Leaves broad, deposits 4 cm thick, 10-60 m apart.

SOIL PROFILE

A 0-12 cm Light grey loamy sand; friable.

B 12-53 cm Brownish yellow sandy clay; firm; too dry to auger deeper.

MFS12b Eucalyptus redunca Very Open Shrub Mallee

LOCATION: 3 km E of Boggy Pool Spring, Gairdner River (34° 06' 20"S lat., 119° 12' 30"E long.)

FAUNA SURVEYED: Yes

APPROX. AREA: 40 x 85 m

DATE: 12-11-1984

VEGETATION

MUIR: Ksr.SAi.SCr.SDc.VLr

PROVINCE: South-west

SYSTEM: Qualup

- Stratum 1: Mallees 2.3-4.0 m, CC = 3, clumping moderate
Eucalyptus uncinata (2), E. falcata (0.2), E. gardneri (0.2),
E. redunca (0.2), E. spathulata ssp. grandiflora (0.2), E.
leptocalyx (0.1), E. tetragona (0.1).
- Stratum 2: Shrubs 2.1-2.3 m, CC = +, clumping none
Banksia media (+).
- Stratum 3: Shrubs 1.6-2.0 m, CC = 12, clumping none
Banksia media (12).
- Stratum 4: Shrubs 1.1-1.5 m, CC = 1.6, clumping slight
Banksia media (1), Persoonia teretifolia (0.5), Leptomeria
preissiana (0.1), Acacia aff. lineolata (+).
- Stratum 5: Shrubs 0.6-1.0 m, CC = 6.1, clumping slight
Kunzea jucunda (2), Astartea ambigua (1), Banksia caleyi (1),
Daviesia benthamii ssp. benthamii (1), Phymatocarpus maxwellii
(1), Melaleuca lateriflora (0.5), Grevillea pauciflora (0.2),
Pultenaea adunca (0.2), Daviesia pachyphylla (+), Hakea nitida
(+), H. varia (+), Melaleuca lateralis (+).
- Stratum 6a: Shrubs 0.0-0.5 m, CC = 55, clumping slight
Melaleuca pentagona sens. lat. (45), Beaufortia micrantha (5),
Calothamnus gibbosus (1), Daviesia lancifolia (1), Melaleuca
aff. pentagona (1), M. subfalcata (0.5), Isopogon buxifolius
(0.2), I. longifolius (0.2), Leucopogon tetragonus (0.2), L.
sp. (KRN 9608)(0.2), Comesperma spinosa (0.1), Daviesia
decurrens (0.1), Leucopogon opponens (0.1), Melaleuca suberosa
(0.1), Acacia dermatophylla (+), Boronia inornata (+),
Hibbertia lineolata (+), Jacksonia sp. (KRN 3967)(+).
- Stratum 6b: Misc. plants, CC = 3, clumping slight
Perennial Grasses: Amphipogon turbinatus (+).
Sedges: Gahnia ancistrophylla (2), Lepidosperma brunonianum
(0.5), Hypolaena exsulca (0.2), L. aff. resinosum (0.2), G.
australis (+).
Sedge-like: Dianella revoluta (+), Lomandra collina (+), L.
micrantha (+).

No of TAXA: 50

LAST BURNT: 1957

MODIFICATION: None

LANDFORM

BEDROCK: Spongolite

GEOLOGICAL SURFACE: (Bb) Tp

UNIT: Marine Plain

ELEMENT: Level plain

SOIL

GROUP: Shallow Sands

NORTHCOTE: Not classified

MAIN ORIGIN: In situ weathering

DRAINAGE: Good

MAIN ATTRIBUTE: Shallow A

SURFACE: Hardsetting

ROCK: Nil STONE: Nil

PAVEMENT: Nil

LITTER: Leaves broad, deposits 3 cm thick, 1-8 m apart.

SOIL PROFILE

- A 0-7 cm Light grey loamy sand; friable.
- B 7-100 cm Brownish yellow sandy clay loam; very firm.

TALL SHRUBLAND

MFS15a Melaleuca viminea Tall Shrubland (pool)LOCATION: "Sunday Pool", Gairdner River, 14.5 km NW of Mt. Maxwell
(34° 07' 14"S lat., 119° 10' 47"E long.)

FAUNA SAMPLED: Opportunistic AREA: ca 1 ha DATE: 21-4-1985

VEGETATION

MUIR: Not recorded

PROVINCE: South-west

SYSTEM: Qualup

(See Comments)

No of TAXA: Partial list

LAST BURNT: More than 40 years

MODIFICATION: None evident

BEDROCK: Gneiss

GEOLOGICAL SURFACE: (Bb) Qa in Qc

UNIT: River Valley

ELEMENT: Permanent pool and margins

SOIL

GROUP: Alluvium

NORTHCOTE: Not recorded

MAIN ORIGIN: Alluvial

DRAINAGE: Poor

PROFILE ATTRIBUTE: Saline

SURFACE: Hardsetting

ROCK: 3-5% cover in small areas

STONE: Nil

PAVEMENT: Nil

LITTER: Nil

SOIL PROFILE

(Not recorded)

COMMENTS

DISTRIBUTION: Frequent along river channel, 0.1-1.0 ha

PROFILE THICKNESS: Not recorded

GENERAL: (a) The pool is ca 300 m long, 20-25 m wide and ca 3.0 m deep when full. Sides are steep and muddy. Each end is terminated by exposed gneiss bedrock, which also is present as a few patches on the margins. One small rock protruded from the water. Two or three narrow beaches (80-100 cm wide) and 5-10 m long; otherwise the pool is over-hung with vegetation. (b) The marginal vegetation (within 2-3 m of pool edge) is dense tall shrubland (1.8-2.2 m high) of Melaleuca cuticularis, M. viminea and M. hamulosa. Scattered low shrubs of Halosarcia halocnemoides ssp. halocnemoides, Sarcocornia quinqueflora ssp. quinqueflora and Threlkeldia diffusa were present under the Melaleuca. M. cuticularis branches hung low over the water for 100-130 cm providing shade and concealment for waterfowl.
