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VEGETATION AND FLORA OF LAKE COYRECUP NATURE RESERVE NO'S 26020, 28552 AND ADJOINING UNVESTED LAND (LOC NO'S 6904, 9270)

PREPARED FOR:

DISTRICT MANAGER
KATANNING DISTRICT
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

BY:

MICHAEL N. LYONS

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ABSTRACT

The Lake Coyrecup Nature Reserve (No's 26020 and 28552) and areas of adjoining repurchased land were surveyed for vegetation and flora. The reserves lie within the Avon Botanical District, forming the southern limit of the Dumbleyung System, as mapped by Beard (1980).

Thirty-eight vegetation associations were described and mapped, including 25 types of Woodlands, 5 types of Mallees, a single Shrubland and 7 Heaths. The vegetation was regarded as being spatially assorted in response to soil type and topography, in many cases as a function of the degree of seasonal inundation.

At least 252 plant species were recorded from the study area including 19 introduced species. These species were representative of 137 genera in 46 families. Dominant among these were the Myrtaceae, Proteaceae and Asteraceae. Seven species of particular interest recorded during the current study were found to be geographically restricted, poorly collected or representative of significant range extensions.

The richness and diversity of the flora and vegetation of the Lake Coyrecup Nature Reserves reinforces their high conservation value. While other areas of wetland and associated vegetation types are being continually degraded and/or lost in the wheatbelt due to rising salinity and water levels, the reserves surveyed show only preliminary damage. The reserves are also important for comparative purposes to other similar areas. Ongoing monitoring and management to prevent further vegetation loss is considered highly worthwhile.

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VEGETATION OF LAKE COYRECUP NATURE RESERVES NO'S 26020 & 28552

KEY TO SYMBOLS

- Reserve boundary
- 1 Vegetation Association boundary
- 2 Site location
- Stream Channel
- Drainage Ditch

VEGETATION ASSOCIATIONS

Woodland Associations

1 Eucalyptus longicornis (Morrel) Tall Forest
2 Eucalyptus wandoo (Wandoo) Woodland
3 Eucalyptus wandoo (Wandoo)/Mallee Woodland
4 Eucalyptus loxophleba (York Gum) Woodland
5 Eucalyptus loxophleba (York Gum) Open Woodland
6 Eucalyptus ?annulata Woodland
7 Eucalyptus occidentalis (Yate) - E. rudis (Flooded Gum) Woodland
8 Eucalyptus occidentalis (Yate) Woodland
9 Eucalyptus occidentalis (Yate) Low Woodland
10 Eucalyptus occidentalis (Yate) Low Forest
11 Eucalyptus occidentalis (Yate) Woodland over Thicket
12 Casuarina obesa Low Forest
13 Casuarina obesa Woodland
14 Banksia attenuata Woodland
15 Banksia prionotes Low Forest
16 Banksia prionotes Woodland over Heath
17 Banksia prionotes Woodland
18 Allocasuarina huegeliana - Banksia prionotes Woodland
19 Allocasuarina huegeliana Woodland
20 Acacia acuminata (Jam) Woodland
21 Eucalyptus loxophleba - Melaleuca Woodland
22 Melaleuca Low Forest
23 Melaleuca Low Woodland
24 Melaleuca Mixed Low Forest
25 Casuarina obesa - Melaleuca Low Woodland

Mallee Associations

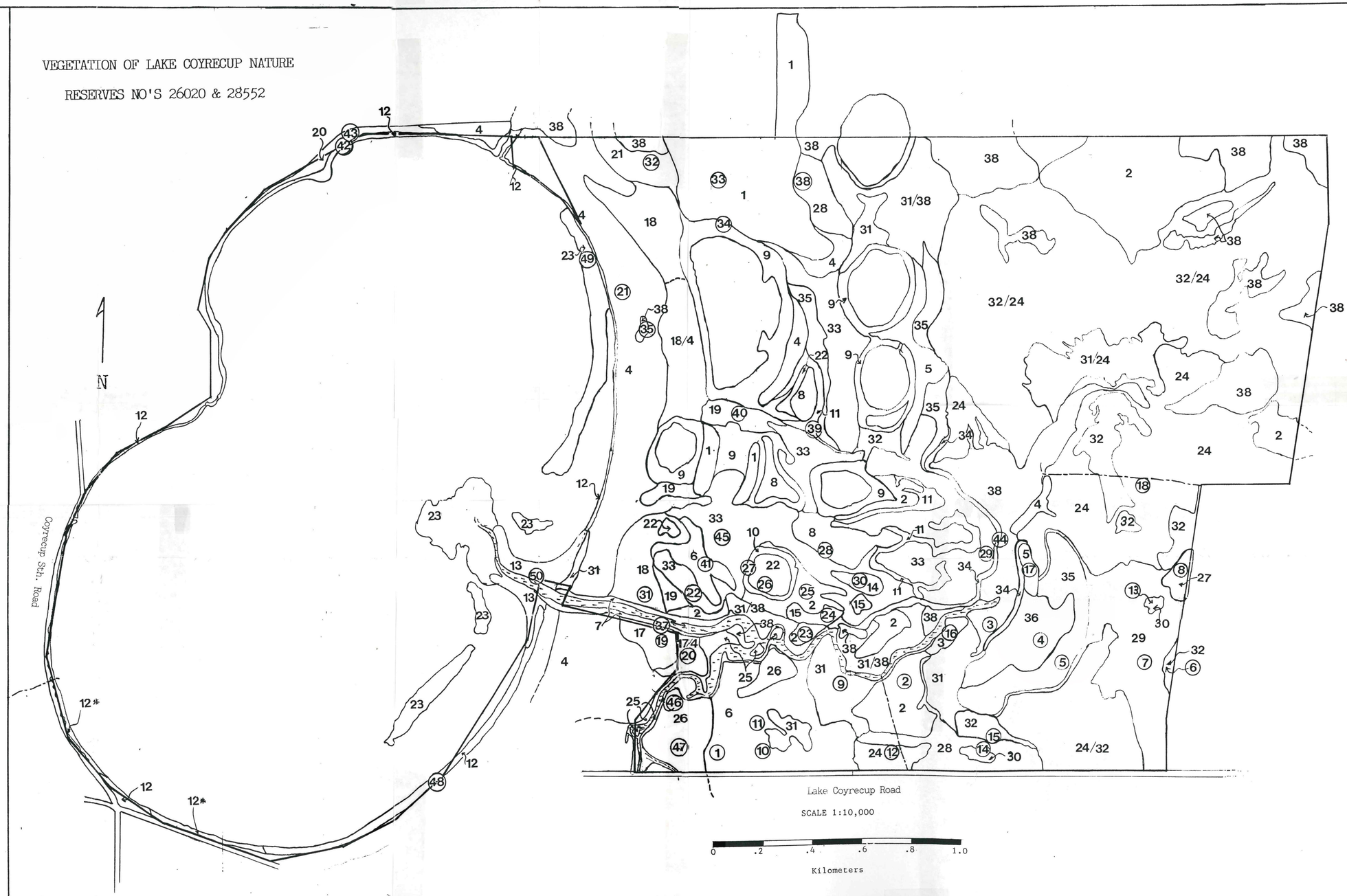
26 Eucalyptus loxophleba (York Gum) Mallee
27 Eucalyptus ?annulata Mallee
28 Mixed Mallee over Scrub
29 Eucalyptus spathulata (Swamp Mallet) Mallee over Heath
30 Eucalyptus spathulata (Swamp Mallet) - E. anceps Mallee

Shrublands

31 Melaleuca uncinatum Thicket

Heaths

32 Melaleuca Dense Heath
33 Mixed Heath
34 Mixed Melaleuca Heath (Stream Fringe)
35 Melaleuca ?pentagona Low Heath
36 Kunzea jucunda - Leptospermum erubescens Low Scrub
37 Halosarcia Dwarf Scrub
38 Halosarcia Low Heath



1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

Priorities for biological survey in the Wheatbelt Region were recently assessed by regional officers. The salt lakes ecosystems were identified as being very poorly known with respect to plants. Consequently these ecosystems were assigned a high priority for biological survey and Lake Coyrecup Nature Reserve was identified for initial work. This nature reserve was selected because:

(a) the Lake fringe, associated floodplain, and drainage lines to the east are relatively unaffected by increasing salinity, therefore the area carries a variety of wetland plant communities;

(b) vegetation communities on sand dunes associated with the Lake are, from initial inspections, floristically rich and worthy in themselves of survey;

(c) apart from a survey of Lake Dumbleyung, an area with few plant species, there is little vegetation data for wetlands in the Katanning District of CALM; and

(d) Lake Coyrecup Nature Reserve is at the confluence of an extensive drainage system extending eastwards to the Pingrup area. If farmers increase drainage of their land within the system, the Lake will be threatened by further environmental degradation. Thus a survey at this time will identify the flora conservation values at risk as well as providing data to monitor any changes which occur.

The reserves studied lie some 30km east of the Katanning townsite. This report contains the findings of vegetation and flora surveys of Lake Coyrecup Nature Reserves (Nos 26020 & 28552) and adjoining re-purchased land Loc. 6904 & 9270 and an assessment of their conservation values.

1.2 PROJECT REQUIREMENTS

The vegetation and flora survey is to address the following specific objectives:

(a) Produce a vegetation map showing the major vegetation types for Lake Coyrecup Nature Reserves (Nos 28552 & 26020) and adjoining re-purchased land (Loc. Nos 6904 & 9270) (see Figure 1).

(b) Write one or more association descriptions, based on classification systems of B. Muir, which typify the vegetation categories mapped as in (a) above. The site of each description must be accurately recorded on the vegetation map, and each description will be accompanied by a photograph.

(c) Accurately map locations of declared and other rare flora encountered during field work. An estimate of population numbers will be made and the relevant CALM form completed.

(d) Write a final report which incorporates (a), (b) and (c) above and identifies vegetation types which are found on adjoining private land but poorly represented on the nature reserves.

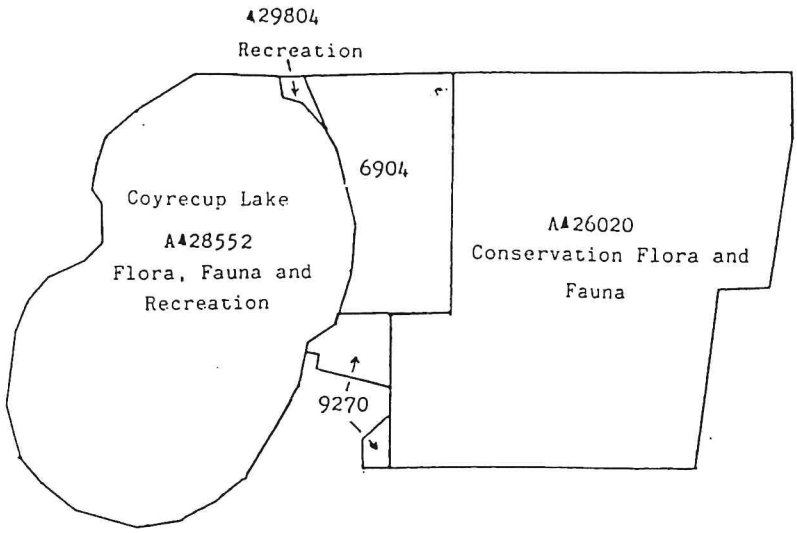
(e) Collect and identify a representative sample of the flora encountered and lodge field specimens with CALM's Katanning Office and samples of less common species with the W.A. Herbarium.

1.3 PHYSICAL ENVIRONMENT

1.3.1 GEOLOGY AND SOILS

The study area falls within the Western Gneiss Terrain (Gee, et al, 1981), forming the western part of the Yilgarn Block, an ancient formation underlain almost entirely by Archaen granite and gneiss. Contained within these are enclaves of metamorphosed mafic and ultra mafic gneiss, banded iron formation and some quartzite (Chin and Brakel, 1986).

The majority of the study area contains alluvial deposits of sands and silts. The eastern margin of Lake Coyrecup is bounded by a sand ridge of almost 290m above sea level, of predominantly aeolian origin.



Scale 1:50,000

Figure 1. Map showing the Land classifications within the study area.

A small area of reworked sandplain occurs in the north west of Loc. No. 6904, containing locally abundant limonite pebbles. The majority of the central portion of the study area consists of low undulating ridges of pale cream sands with deeper sand ridges occurring occasionally. Between ridges occur lower lying areas of sandy loams along seasonal drainage channels and winter wet depressions. The eastern portion of Reserve No. 26020 is generally low lying and shows soil types from sandy clay to clay of generally grey to light cream colouration.

3.2 CLIMATE

Meteorological data collected at Katanning reflects the typical warm mediterranean climate of the area, with hot dry summers and cool wet winters (Table 1). The area of the reserve is characterized by an average yearly rainfall of 485mm, with the majority of this being received from May to August. Winters are generally mild with the mean maximum of the coldest month (July) above 10°C. Highest mean monthly maximum temperatures (December, January) exceed 30°C, and absolute maxima above 40° occur. Following the classification of Bagnouls and Gausen, Beard (1980) describes the climate of the area as Thermomediterranean.

TABLE 1: METEOROLOGICAL DATA RECORDED AT KATANNING
(SOURCE: BUREAU OF METEOROLOGY, 1987)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN OR TOTAL
Mean Rainfall (mm)	13	18	22	31	62	80	76	63	46	37	21	16	485
No. Rainy Days	3	4	5	7	13	17	18	16	13	10	6	4	116
Mean Max. Temp °C.	30.5	29.5	27.0	22.3	18.5	15.5	14.5	15.4	17.3	21.0	24.8	28.6	22.1
Mean Min. Temp °C.	14.1	14.4	13.0	10.6	8.0	6.8	5.7	5.6	6.3	7.9	10.4	12.6	9.6
Rel. Humidity % 3pm	30	34	37	48	55	67	66	63	56	45	35	29	47

1.4 PHYSICAL FEATURES AND LAND USES

The Lake Coyrecup Nature Reserves include Lake Coyrecup (Reserve No. 28552) and to the east an area of vegetation including the main drainage system flowing into the lake.

The reserves are bounded to the west and south by the unsealed Coyrecup South and Lake Coyrecup Roads respectively. The study area is surrounded by cleared farm land, with the exception of a small area to the west and south remaining uncleared (grazed extensively).

The reserves have largely escaped significant direct human impact. The main features of human usage are listed below:

1. Two drainage ditches have been constructed upon the reserve. The first was approved to speed drainage of the margins of Lake Coyrecup Road. The second was illegally constructed several years ago and drains farmland to the east, running to the main stream channel.

2. In accordance with the recreational use of the lake, a concrete boat ramp is located upon the western shore.

3. The areas of re-purchased land lying between the two reserves (Loc. No's 6904 and 9270) reveal the effects of past grazing. In addition, areas of Acacia acuminata show signs of timber removal. While this is known to have occurred immediately prior to the purchase being completed, some areas appear to have been cut prior to this.

4. A track runs along the main ridge from the recreation reserve in the north eastern portion of the lake fringe, to the main stream channel.

Despite these human impacts, the vast majority of the study area is undisturbed. In particular, Reserve No. 26020 is in almost pristine condition.

1.5 HISTORY OF THE RESERVE

Lake Coyrecup Reserve (No. 28552) was created in 1967, being vested in the Western Australian Wildlife Authority for the purpose of "Conservation of Flora and Fauna and Recreation", (Class A).

Originally set aside in 1961, Coyrecup Reserve (Reserve No. 26020) was vested in the Western Australian Wildlife Authority as an "A" class reserve for the purpose "Conservation of Flora". In 1969 this was amended to include the Conservation of Fauna once it was realized that the reserve contained the headwaters of the largest of the lakes drainage systems, in addition to extensive breeding and feeding areas for waterfowl. Both reserves are also game reserves, being classified as Shooting or Hunting Areas in 1971. Current vesting is with the National Parks and Nature Conservation Authority.

Following recommendations by the Department of Agriculture to the landholder, the privately held land between the two reserves was considered unsuitable for clearing due to the potential for salinisation. Subsequently, proposals were made to purchase the land and include it in the above reserves. After extensive negotiations over some seven years, the land was finally purchased in 1987 and is likely to be incorporated into Reserve No. 26020.

2.0 METHODS

Ground surveys of flora and vegetation were carried out during the months of August and September. After initial inspection general vegetation types were delineated by toposcanic viewing of black and white 1:50 000 aerial photographs. Sites for typification of vegetation types were selected and examined by foot traverses. Given access restrictions, some areas could not be visited directly and mapping was carried out by extrapolation from known vegetation types of similar shading and texture on the aerial photographs.

Descriptions of vegetation structure and floristic association follow the work of Muir (1977), (Table 2). In those associations demonstrating poor stratification such as some Heath and Low Scrub types, the vegetation was "forced" into the most appropriate strata. Soil descriptions follow the classification of McDonald et al (1984). Unless extensive in area, ecotonal regions are generally not mapped but may be described as comments for each association.

TABLE 2: CLASSIFICATION OF STRUCTURAL VEGETATION TYPES USED IN CURRENT SURVEY. (From Muir et al, 1977)

LIFE FORM/HEIGHT CLASS	CANOPY COVER			
	DENSE 70-100%	MID-DENSE 30-70%	SPARSE 10-30%	VERY SPARSE 2-10%
Trees >30m	Dense Tall Forest	Tall Forest	Tall Woodland	Open Tall Woodland
Trees 15-30m	Dense Forest	Forest	Woodland	Open Woodland
Trees 5-15m	Dense Low Forest A	Low Forest A	Low Woodland A	Open Low Woodland A
Trees <5m	Dense Low Forest B	Low Forest B	Low Woodland B	Open Low Woodland B
Mallee tree form	Dense Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Mallee shrub form	Dense Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs >2m	Dense Thicket	Thicket	Scrub	Open Scrub
Shrubs 1.5-2.0m	Dense Heath A	Heath A	Low Scrub A	Open Low Scrub A
Shrubs 1.0-1.5m	Dense Heath B	Heath B	Low Scrub B	Open Low Scrub B
Shrubs 0.5-1.0m	Dense Low Heath C	Low Heath C	Dwarf Scrub C	Open Dwarf Scrub C
Shrubs 0.0-0.5m	Dense Low Heath D	Low Heath D	Dwarf Scrub D	Open Dwarf Scrub D
Mat plants	Dense Mat Plants	Mat Plants	Open Mat Plants	Very Open Mat Plants
Hummock Grass	Dense Hummock Grass	Mid-Dense Hummock Grass	Hummock Grass	Open Hummock Grass
Bunch grass >0.5m	Dense Tall Grass	Tall Grass	Open Tall Grass	Very Open Tall Grass
Bunch grass <0.5m	Dense Low Grass	Low Grass	Open Low Grass	Very Open Low Grass
Herbaceous spp.	Dense Herbs	Herbs	Open Herbs	Very Open Herbs
Sedges >0.5m	Dense Tall Sedges	Tall Sedges	Open Tall Sedges	Very Open Tall Sedges
Sedges <0.5m	Dense Low Sedges	Low Sedges	Open Low Sedges	Very Open Low Sedges
Ferns	Dense Ferns	Ferns	Open Ferns	Very Open Ferns
Mosses, liverwort	Dense Mosses	Mosses	Open Mosses	Very Open Mosses

The final vegetation map was produced using a 1:10 000 black and white aerial photograph. This provided both accurate association boundaries and the appropriate scale. Accompanying each site description, a site species list was compiled based on a 10 x 40m quadrat, centred about the site location.

Flora collections were made during all field trips, with specimens being taken at every opportunity. In excess of 400 collections were made. These were identified using keys, comparison to specimens in the Katanning District Herbarium, and finally by comparison with named specimens held at the Western Australian Herbarium. Herbarium staff with expertise in particular groups were consulted to ensure accuracy of determination.

.0 RESULTS

.1 VEGETATION SURVEY

PREVIOUS WORK

The Coyrecup Reserves lie within the Dumbleyung grid square mapped by Beard (1980) at a scale of 1:250 000. The reserves form the southern extremity of the Dumbleyung System, within the Avon Botanical District. The reserves lie within the boundaries of Beard's general formation classes of Eucalyptus occidentalis Open Woodland with Melaleuca thickets and samphires, and Mallee (Eucalyptus redunca, E. eremophila). Beard (1980) defines the Dumbleyung system as being gently undulating with scattered residual laterite cappings. Saltflats and lakes occupy principal valleys often associated with low level sand deposits. The general catena of the system is one of Dryandra heaths on laterite residuals, Woodlands and Low Woodlands on laterites and laterite wash, Woodland of Eucalyptus loxophleba, E. longicornis, E. salmonophloia, and E. wandoo on undulating areas associated with small patches of mallee, teatree and samphire, with scrub-heath and Low Woodland on low level sand-plains.

Detailed surveys of the Dongolocking group of reserves (Muir, 1978) provide examples of all principal formations of the system except those of salt flats and low level sandplains. Beard (1980) sampled various sites in the system and reported additional mallee formations of Eucalyptus calycogona, E. celastroides and E. spathulata. In Reserve No. 24282 samphire flats of Halosarcia lepidosperma surrounded by Melaleuca acuminata, M. uncinata and M. spp. were noted. Eucalyptus rudis lines creek channels if fresh, but is replaced by Casuarina obesa as they become salt. Low level sandplains show dominance of Calothamnus, Gastrolobium and Leptospermum species. Deeper sands support small trees of Banksia prionotes and Allocasuarina huegeliana (Beard, 1980).

CURRENT SURVEY

The basic vegetation analysis of Beard (1980) is confirmed with greater detail in the current survey. The vegetation of the reserves fell into initial groupings of Woodlands, Mallee, Shrublands, and Heaths, subdivided within these groupings by floristic association and finer structural aspects. Table 3 lists the vegetation associations described and mapped in the current study. While many of the vegetation associations of the reserve demonstrate distinct boundaries, some form mosaic patterns. This is particularly relevant for mallee and thicket areas of the reserve where blending over broad ecotonal regions occurs. Woodlands also blend over broad interzones into heath types, particularly with respect to Eucalyptus wandoo Woodlands. Furthermore much of the fringing vegetation of the stream channels changes very rapidly upslope. Such associations are described as a block from open water to the distinct upland vegetation type. Adjoining areas of Halosarcia species were not included in these assemblages but mapped separately, as they provide an indication of the extent of salinisation.

Mallee (Eucalyptus sp.) were often difficult to identify in the field due to the absence of fertile material. Dominants are noted where possible. Melaleuca thickets and shrublands occur extensively over the reserve in largely inundated areas hampering rigorous ground truthing. For several Melaleuca species absence of flowering specimens and current taxonomic revision of the genus restricted delineation of some floristic associations. In addition, areas of Halosarcia heath may be underestimated due to extensive flooding. Important species not determined at the time of report preparation are quoted as collection numbers to permit incorporation at a later date (see Appendix 2 and association descriptions).

Distribution of vegetation types was regarded as a response to soil type, and topography (in lower areas largely a function of the degree and duration of seasonal inundation). Heaths occurred on low sand ridges grading into Banksia, Allocasuarina, and some Eucalypt Woodlands on deeper sand ridges. Low lying areas with soils tending towards clay were associated with Mallee and Melaleuca Shrublands, Woodlands and Heaths within areas experiencing greater inundation during winter in the central part of the study area.

Areas of freshwater seepage were associated with Eucalypt Woodlands with dense shrub understoreys. Stream and lake fringing vegetation types are thought to be assorted according to water permanence and possibly salinity. Extensive areas of Halosarcia Heaths occur in low lying saline areas of the upper stream channels and drainage basin.

TABLE 3: VEGETATION ASSOCIATIONS IDENTIFIED FOR THE LAKE COYRECUP NATURE RESERVES

VEGETATION ASSOCIATIONS

Woodland Associations

1 Eucalyptus longicornis (Morrel) Tall Forest
2 Eucalyptus wandoo (Wandoo) Woodland
3 Eucalyptus wandoo (Wandoo)/Mallee Woodland
4 Eucalyptus loxophleba (York Gum) Woodland
5 Eucalyptus loxophleba (York Gum) Open Woodland
6 Eucalyptus ?annulata Woodland
7 Eucalyptus occidentalis (Yate) - E. rudis (Flooded Gum) Woodland
8 Eucalyptus occidentalis (Yate) Woodland
9 Eucalyptus occidentalis (Yate) Low Woodland
10 Eucalyptus occidentalis (Yate) Low Forest
11 Eucalyptus occidentalis (Yate) Woodland over Thicket
12 Casuarina obesa Low Forest
13 Casuarina obesa Woodland
14 Banksia attenuata Woodland
15 Banksia prionotes Low Forest
16 Banksia prionotes Woodland over Heath
17 Banksia prionotes Woodland
18 Allocasuarina huegeliana - Banksia prionotes Woodland
19 Allocasuarina huegeliana Woodland
20 Acacia acuminata (Jam) Woodland
21 Eucalyptus loxophleba - Melaleuca Woodland
22 Melaleuca Low Forest
23 Melaleuca Low Woodland
24 Melaleuca Mixed Low Forest
25 Casuarina obesa - Melaleuca Low Woodland

TABLE 3: cont.

Mallee Associations

26 Eucalyptus loxophleba (York Gum) Mallee
27 Eucalyptus ?annulata Mallee
28 Mixed Mallee over Scrub
29 Eucalyptus spathulata (Swamp Mallet) Mallee over Heath
30 Eucalyptus spathulata (Swamp Mallet) - E. anceps Mallee

Shrublands

31 Melaleuca uncinata Thicket

Heaths

32 Melaleuca Dense Heath
33 Mixed Heath
34 Mixed Melaleuca Heath (Stream Fringe)
35 Melaleuca ?pentagona Low Heath
36 Kunzea jucunda - Leptospermum erubescens Low Scrub
37 Halosarcia Dwarf Scrub
38 Halosarcia Low Heath

1. Eucalyptus longicornis Tall Forest Site # 33

Key Description - Tall forest over Open Woodland over low Woodland B over dense herbs on Medium brown sandy clay loam with laterite pebbles.

Soil Type - Medium brown sandy clay loam with laterite pebbles.

Stratum 1 - Eucalyptus longicornis > 30m with Eucalyptus wandoo occasionally to this height. 30-45% cover.

Stratum 2 - Eucalyptus wandoo dominant from 15-20m with occasional E. longicornis at 10-15% cover.

Stratum 3 - Acacia acuminata intermixed with occasional E. wandoo between 3 and 5m occasionally to 7m. 10-15% cover.

Stratum 4 - Herbaceous species including Ursinia anthemoides, Podotheca graphilicides as dominants. Additional species include Anagallis arvensis, Podotheca pygmaea, Trachymene pilosa and Waitzia acuminata. (70-90% cover).

Comments - This formation contains the tallest trees of the entire survey area. It is restricted to a small area in the north of the reserve containing lateritic remnants. Emergent from the herbaceous stratum are several shrub species including Rhagodia preissii, Pimelea argenta, Bossiaea sp, and Hakea lissocarpha.

Plate 1

Wandoo Woodland. Site # 2, 23, 25.

y Description - Woodland over Low Heath C/Low Woodland B/Open Scrub over Low dges/Open Dwarf Scrub D/Dense Low Sedges over Open Herbs/Very Open Low Sedges/ ry Open Herbs over Open Herbs on light brown sandy loam.

ratum 1 - Eucalyptus wandoo from 15 to 20m and 10-30% cover.

ratum 2 - A variable layer composed of either Acacia acuminata with occasional llocasuarina huegeliana (3-5m, 10-30% cover) or Melaleuca acuminata, M. uncinata 2-3m, 2-10%) or low shrubs to 1.0m including Calytrix lechenaultii, Melaleuca entagona and Oxylobium parviflorum and 30-40% cover.

ratum 3 - A variety of Sedge dominated strata including Lomandra effusa, Gahnia ifida (10-30% cover) or Baumea juncea (70-90% cover).

ratum 4 - Herbaceous species with cover values largely inversely related to the nsity of overtopping sedges. Includes many species such as Ursinia anthemoides, achycome pusilla, Drosera subhirtella, Drosera glanduligera and many others th cover from 10-30%.

mments - A composite association diagnosed by the presence of Eucalyptus wandoo. e understorey is very variable and may include either Acacia acuminata, laleuca spp or a low scrub of Calytrix lechenaultii and Melaleuca ?pentagona th Leptospermum erubescens often emergent to 2m. The associations occur on ightly elevated areas close to the stream channel or alternatively (Site 25) in pressions with dense sedge strata. Scattered Eucalyptus wandoo occurs along the rthern bank of the main stream chennel, with some individuals showing crown ath adjacent to the fringing vegetation (Formation 34).

Plate 2a - Eucalyptus wandoo Woodland (Site 2) with Low Shrubs (Calytrix lechenaultii, Oxylobium parviflorum) and sedges Lomandra effusa and Gahnia trifida.

Plate 2b - Eucalyptus wandoo Woodland (Site 23) with Acacia acuminata and dense herbs (Waitzia citrina, W. acuminata). Note Melaleuca uncinata fringing the stream channel in the background.

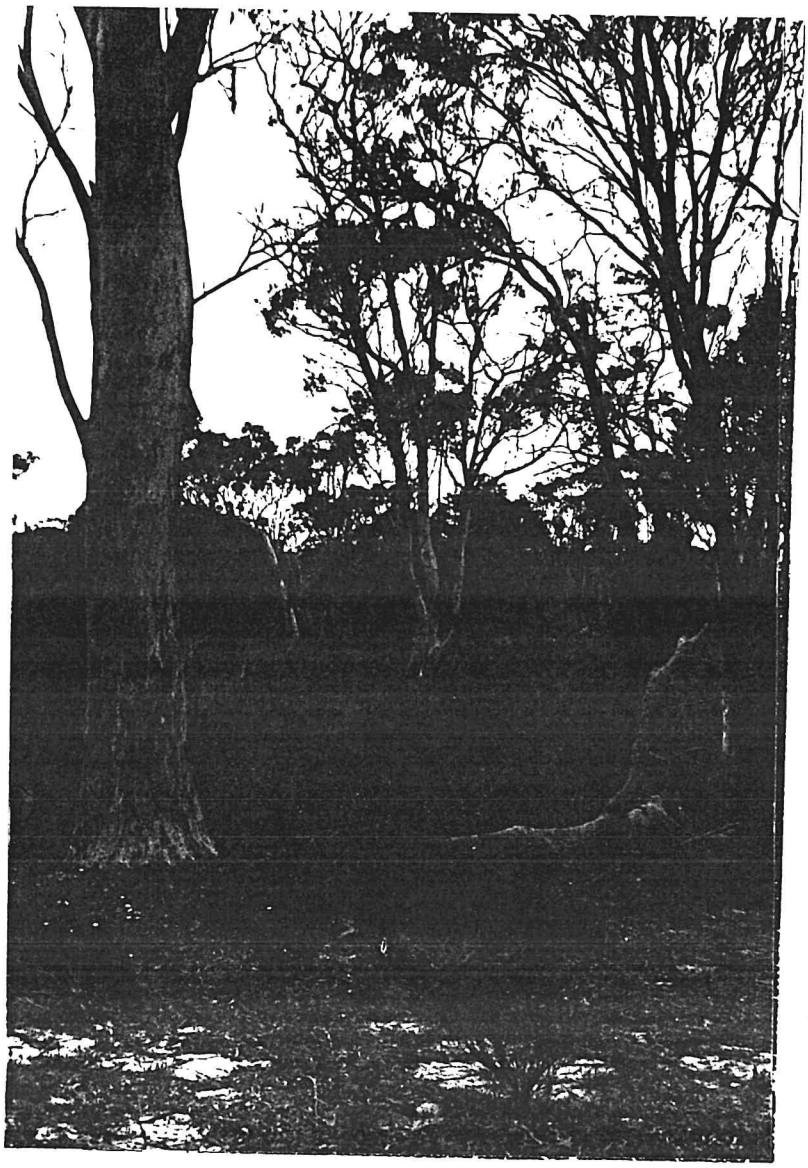


Plate 2c - Eucalyptus wandoo Woodland with Melaleuca acuminata with dense sedges with scattered herbs (Site 25).

Eucalyptus wandoo (Wandoo)/Mallee Woodland Site # 16

y Description - Open low woodland A over Open Shrub Mallee over low scrub A over en herbs on Grey clayey sand.

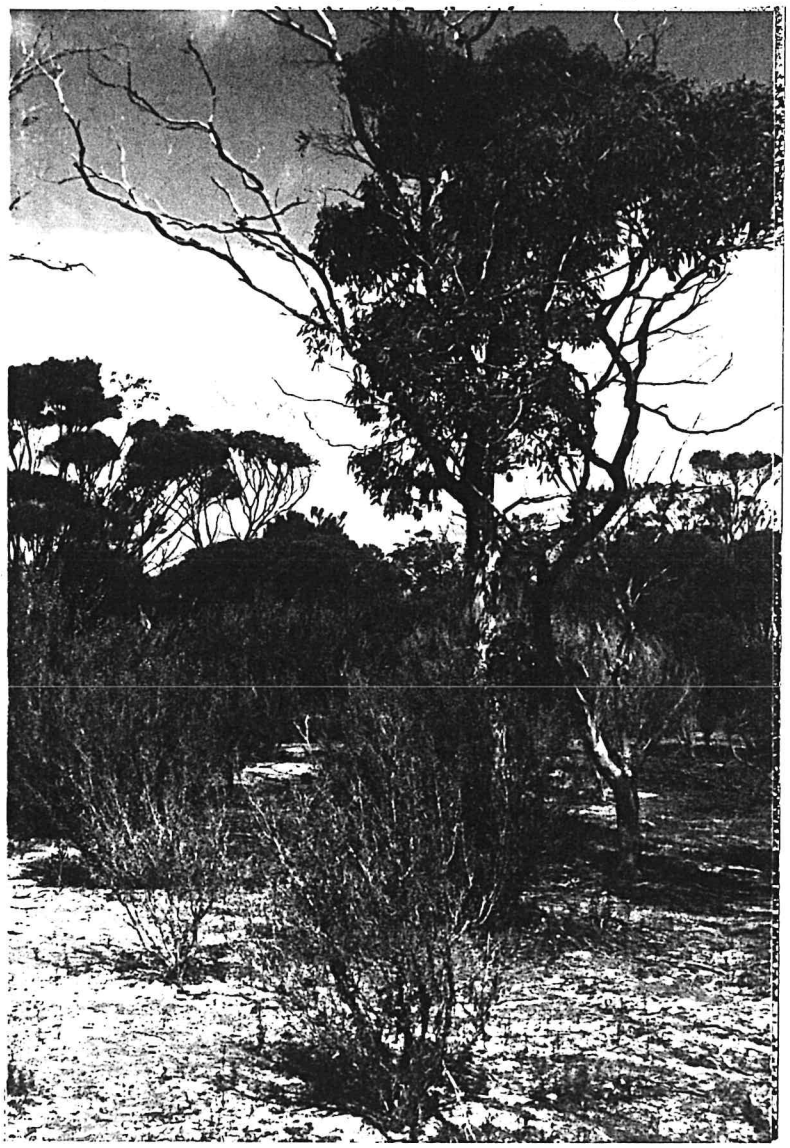
ratum 1 - Eucalyptus wandoo 10-15m and 2-10% cover.

ratum 2 - Eucalyptus spathulata shrub mallee to 6m and 10-15% cover.

ratum 3 - Leptospermum erubescens, Melaleuca uncinata to 2.0m and 30-70% cover.

ratum 4 - Mixed herbs including Ursinia anthemoides and Brachycome pusilla. 10-30% ver.

mments - An association covering a small area forming a zone between Eucalyptus ndco woodland and areas of Mallee. The herb layer shows emergent low sedges.



te 3 - Eucalyptus wandoo/Mallee woodland with Leptospermum erubsecens in the foreground.

4. Eucalyptus loxophleba (York Gum) Woodland Site # 21

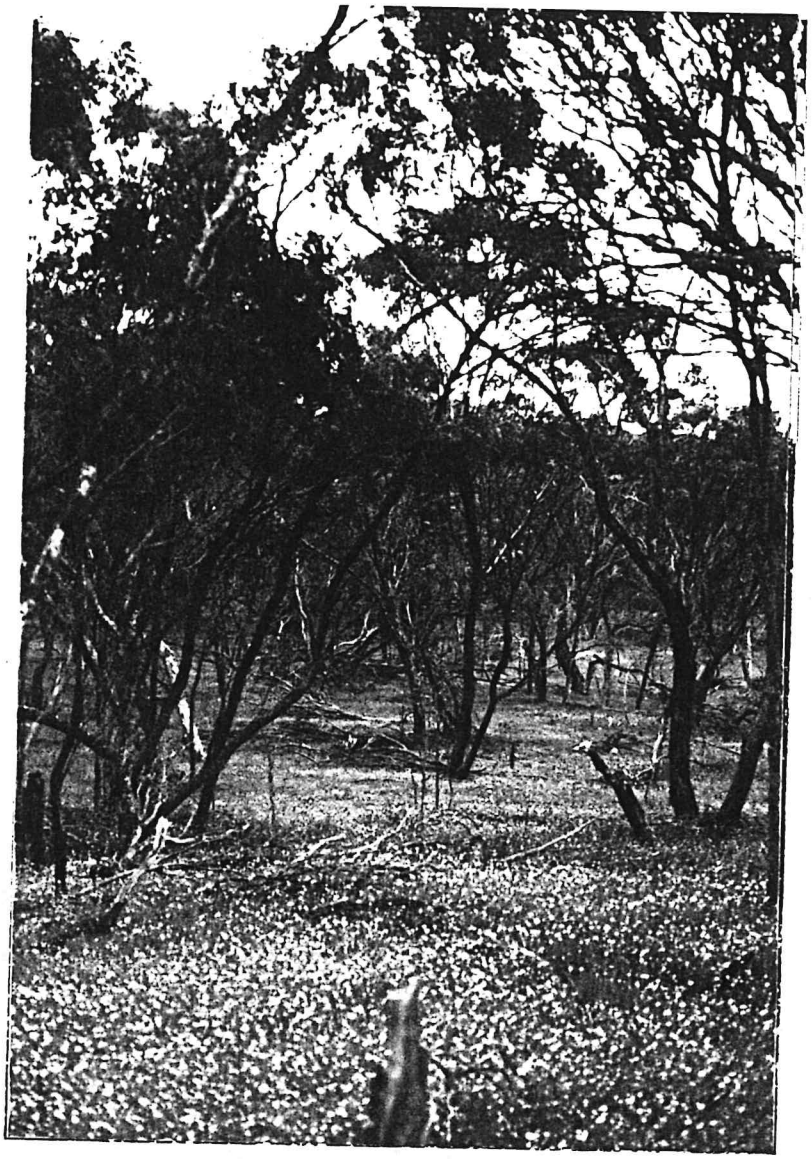
Key Description - Low Woodland A over Low Woodland A/B over Herbs/Dense Herbs on light brown/creamy loamy sand.

Stratum 1 - Eucalyptus loxophleba from 10-20m occasionally >20m with 10-30% cover.

Stratum 2 - Acacia acuminata 3-6m and 5-40% cover may occasionally include Allocasuarina huegeliana at < 2% cover.

Stratum 3 - Herbaceous species dominated by Asteraceae species. Including Podotheca gnaphalioides, Ursinia anthemoides, Waitzia spp and Caladenia spp. Cover values range between 50-100%.

Comments - This formation dominates almost the entire sand ridge along the eastern lake margin. The density of the lower strata (2) is quite variable with Acacia acuminata being in dense stands to almost absent. The herbaceous layer supports the richest Asteraceae stands of the reserve in addition to many Caladenia spp. The formation grades into Allocasuarina huegeliana/Banksia prionotes Woodlands to the east and extends to within 4 metres of the lake shore. Young jam trees may occur as emergents from the herbaceous layer. Jam tree removal has occurred and past grazing is an obvious feature of this formation.



ate 4 - Eucalyptus loxophleba (York Gum) woodland. Note dense herb layer inly of Podotheca gnaphilioides.

Eucalyptus loxophleba open woodland. Site #17

y Description - Open Low Woodland A over Open low scrub B over Open Dwarf Scrub over Open Low sedges/herbs on deep pale brown creamy sand.

rratum 1 - Eucalyptus loxophleba from 6-8m and at 2-10% cover. Some individuals tree mallee life form.

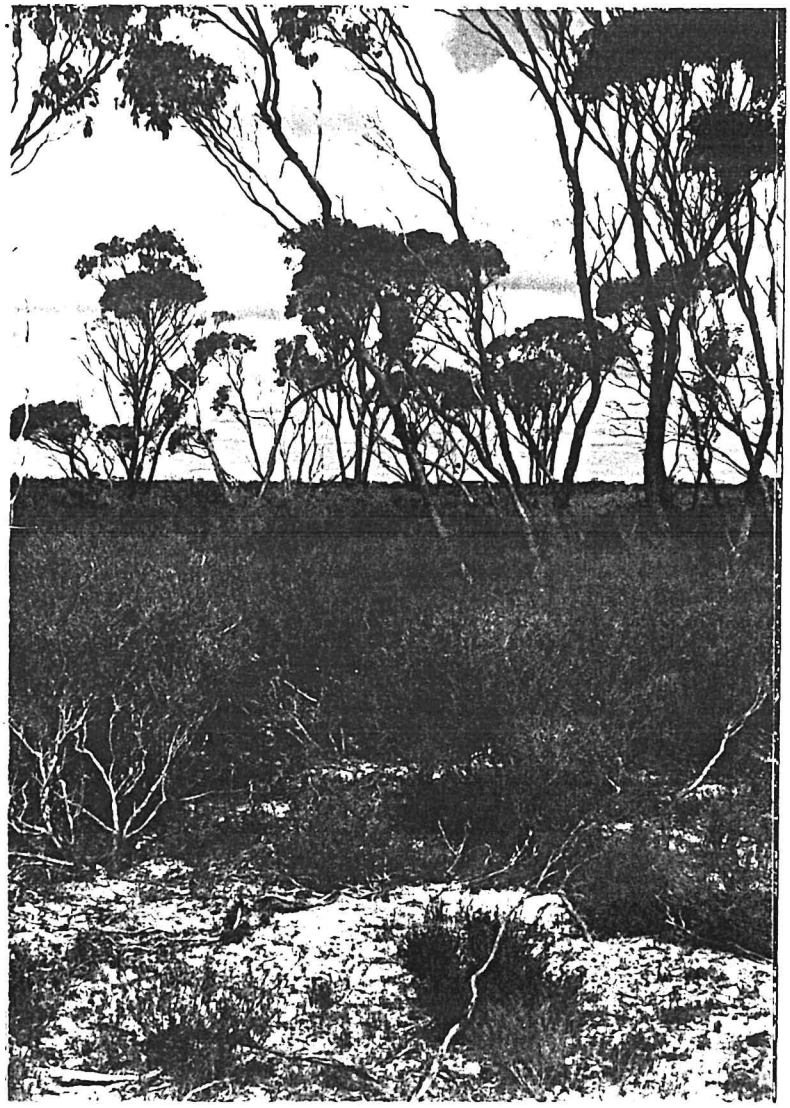
rratum 2 - Shrubs from 0.5 to 1.0m in height and 70-80% cover. Includes Melaleuca f pentagona, Grevillea biternata, Leptospermum erubescens.

rratum 3 - Shrubs to 0.5m and 2-10% cover dominated by Calytrix lechenaultii.

rratum 4 - Mixed sedge community Lepidospermum pubesquameum and Loxocarya anerea. cludes assorted herbaceous species, Brachycome pusilla, Waitzia citrina and osera glanduligera to 0.2m and 10-30% cover.

mments - This association is restricted to a small area of the reserve north east Site 4. In other adjacent areas Eucalyptus loxophleba may be considered an ccasional emergent from the heath.

ate 5 - Eucalyptus loxophleba ork Gum) Open Woodland, with sociations 35 and 36 in the stance.



Eucalyptus ?annulata Open Woodland. Site # 1, 10, 11.

y Description - Open Low Woodland A/ Low Woodland A over Open Scrub/Scrub over nse herbs on grey sandy clay.

ratum 1 - Eucalyptus ?annulata to 10m with cover from 2-20%.

ratum 2 - Melaleuca lateriflora to 4m and 2-30% cover.

ratum 3 - Dense herbaceous layer including numerous introduced and Asteraceous ecies. These include: Homeria miniata, Helipterum gracile, Podolepis tepperi, lessonii, Helipterum mangelsii. Cover varies from 70-100%.

mments - A heterogenous association restricted to clay soils. The presence of ratum 2 is variable particularly to the west where it is totally absent. Large en areas consisting of herbs only occur. This formation shows obvious effects past grazing. May include occasional Eucalyptus platypus.

te 6a - Eucalyptus ?annulata open woodland with dense herb layer.

Plate 6t - Open herb covered area within E. ?annulata Open Woodland.
Note large [illegible] lateriflora to the left.

Eucalyptus occidentalis (Yate) Eucalyptus rudis (Flooded Gum) Woodland. Site # 37

y Description - Woodland over low Woodland A/Low Forest A over Low Woodland over Low Sedges on pale sand.

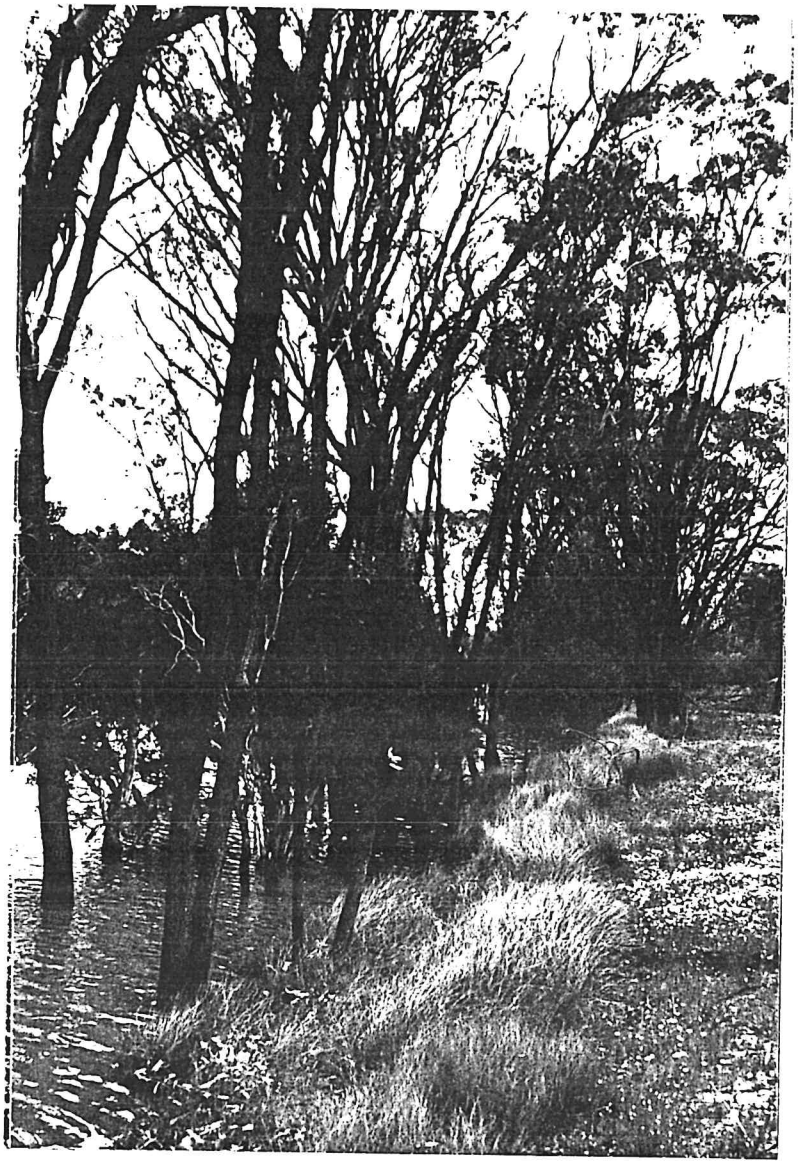
ratum 1 - Eucalyptus occidentalis with less common Eucalyptus rudis from -25m and 10-30% cover.

ratum 2 - Casuarina obesa from 5-8m occasionally 3-10m with 10-50% cover. May clude Melaleuca uncinata to 5m.

ratum 3 - Mixed Melaleuca layer including Melaleuca spp (#350, 349) and M. minata from 2-4m and 10-30% cover.

ratum 4 - Sedges dominated by Baumea juncea and including Leptocarpus canus C.5m and 30-40% cover.

mments - This vegetation type is restricted to the lower main stream fringe d forms a narrow vegetation strip (approximately 5m) characteristic of the eeper sided banks. Occasional very old Eucalyptus rudis are located on the uthern shore within private property. The density of the Casuarina obesa ratum is quite variable. Small patches of Melaleuca sp (350) extend into the ir. channel.



late 7 - Fringing vegetation of the main stream channel. Eucalyptus occidentalis, rudis Woodland. Note bands of Melaleuca spp, sedges, and Casuarina obesa in ne background.

8. Eucalyptus occidentalis Woodland. Site # 28

Key Description - Woodland over Low Woodland B over open scrub over dense low sedges on creamy sand over clay.

Stratum 1 - Eucalyptus occidentalis from 15-25m and 10-15% cover including occasional E. wandoo to 25m.

Stratum 2 - Eucalyptus occidentalis from 5-8m, 10-30% cover.

Stratum 3 - Mixed Melaleuca shrubs to 2.5m and 2-5% cover. Includes M. acuminata, M. sp (349).

Stratum 4 - Dense layer of Baumea juncea ≃80% cover.

Comments - Occupies winter wet depressions in the centre of the reserves. May cover extensive areas or form a more dense fringing band to areas of higher elevation. Inundated to 30cm during the current study.

Plate 8 - Eucalyptus occidentalis Woodland taken from adjacent sand ridge. Note occasional E. wandoo and layers of Melaleuca spp and sedges.

9. Eucalyptus occidentalis Low Woodland. Site # 34

Key Description - Open Low Woodland A over Low Forest A over Thicket over Very Open Low Sedges on shallow clayey sand over clay.

Stratum 1 - Eucalyptus occidentalis to 15m and 2-10% cover.

Stratum 2 - Casuarina obesa to 6-7m and 60-70% cover. Includes occasional emergent Melaleuca sp. (324) to 8m.

Stratum 3 - Mixed Melaleuca shrub layer from 2 to 3m high and 30-50% cover.

Stratum 4 - Sedges of 0.5m and 2-5% cover. Baumea juncea totally dominant.

Comments - This formation is restricted to the margins of the central winter lakes of the reserves. In lakes with gentle gradients to the shore the vegetation extends up to 30m into the lake.

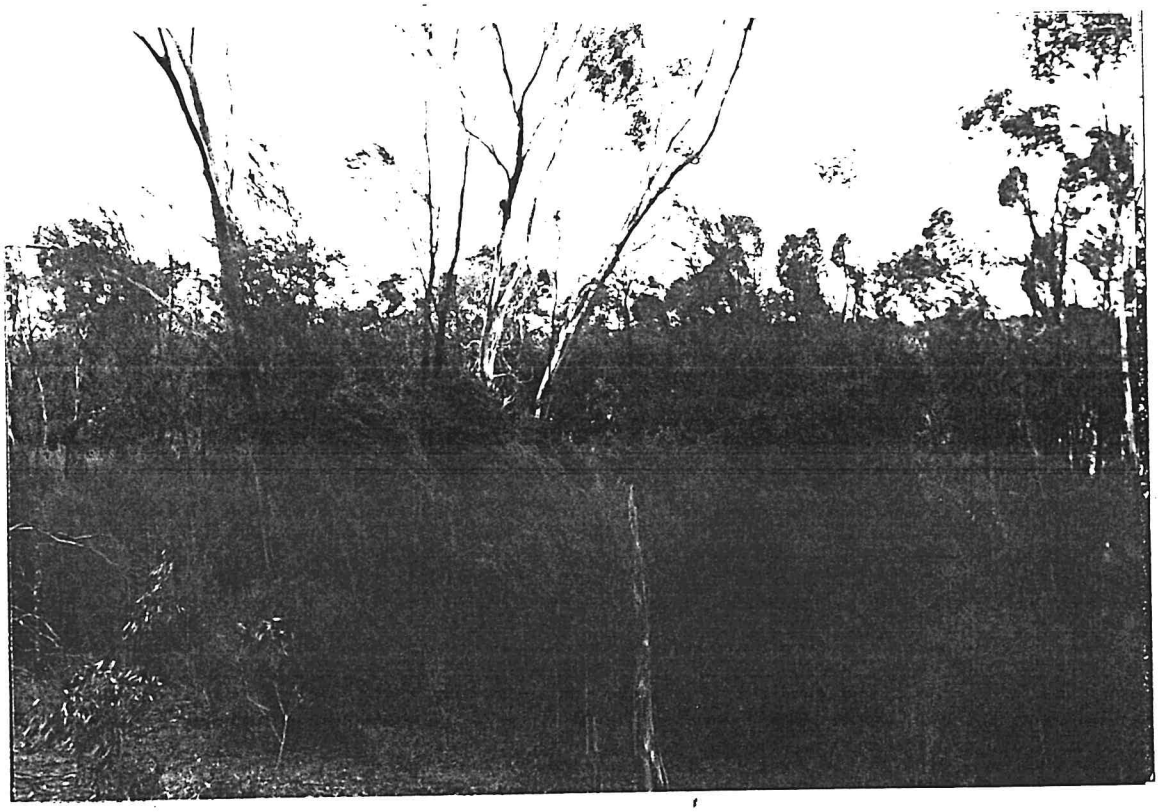


Plate 9 - Eucalyptus occidentalis Low Woodland, with Casuarina obesa and Melaleuca species.

Eucalyptus occidentalis Low Forest. Site # 27.

Description - Low Forest A over Open Low Scrub B over Open Low Sedges over bs on light brown sand over clay.

ratum 1 - *Eucalyptus occidentalis* from 5-10m at 35-55% cover.

ratum 2 - *Melaleuca* sp (324) to 1.5 metres and 2-10% cover with occasional *M. cirata* and *Callistemon phoeniceus*.

ratum 3 - Sedge layer to 0.4m and 10-20% cover. Occasionally absent in small eas. Dominated by *Baumea juncea*.

ratum 4 - Mixed herbaceous species from 30-70% cover including *Ursinia themoides*, *Waitzia citrina*, *Brachycome pusilla* and *Hypochaeris glabra*.

ments - This association forms a narrow fringing band (5-20m) around one of the ntral seepage areas (see *Melaleuca* Woodland Site 26). *Eucalyptus wandoo* may be attered along the upslope margin of the association, as may more typically heath ecies. It can be distinguished from other *E. occidentalis* formations by canopy nsity and the paucity of the second stratum.

ate 10 - Eucalyptus occidentalis Low Forest with Callistemon phoeniceus, and Melaleuca uncinata forming a dense fringing band.

Eucalyptus occidentalis Woodland. Site # 39

Description - Open/Low Woodland A over Thicket over Open Low Sedges.

Stratum 1 - Eucalyptus occidentalis 5-12m and 5-25% cover with occasional E. wandoo.

Stratum 2 - Melaleuca sp. (350) shrubs to 2.5m intermixed with M. uncinata, M. sp 24 and Callistemon phoeniceus with cover from 70-80%.

Stratum 3 - Sedge layer dominated by Baumea juncea to 0.5m and 10-30% cover, greater small patches.

Comments - This association dominates freshwater drainage lines throughout the central area of Reserve No. 26020. Eucalyptus wandoo may be associated, particularly on the upper margins of the drainage lines and source areas. Although commonly following drainage lines it may cover larger areas of freshwater seepage. In some areas the upper stratum may not be present and lower strata follow drainage channels.

Plate 11a - Eucalyptus occidentalis Woodland extending along drainage channel.

ate 11b - Eucalyptus occidentalis Woodland with Melaleuca spp, Callistemon peniceus and Sedges.

2. Casuarina obesa Low Forest. Site # 42, 48.

y Description - Low Forest A over Low Woodland B over Dense Low Heath D/Low eath D on brown loamy sand over clay.

tratum 1 - Casuarina obesa trees to 14m and 30-70% cover.

tratum 2 - Melaleuca sp. (13, 14) from 2-4m and 10-30% cover.

tratum 3 - Halosarcia pergranulata and H. lepidosperma shrubs to 0.4m and -80% cover.

mments - This association occurs around the majority of the margin of Lake Coyrecup, a band approximately 15m wide. Eucalyptus occidentalis occurs uniformly as an ergent to 20m. Less commonly Eucalyptus rudis occurs, particularly in the north stern and south eastern quarters of the lake shore. Along the eastern shore the wer stratum is absent, with the Casuarina obesa of greater stature yet similar wer. Areas of significant tree death are mapped as 12*.

te 12 - Casuarina obesa Low Forest, with band of Melaleuca towards the water underlain by samphires.

13. Casuarina obesa Low Woodland. Site # 36

Key Description - Open Low Woodland B/Low Woodland B over Dwarf Scrub on grey/black sandy clay.

Stratum 1 - Casuarina obesa to 5m and 10-40% cover and occasional Melaleuca uncinata.

Stratum 2 - Halosarcia pergranulata, H. lepidosperma and Sarcocornia ?quinquefolia to 0.4m and 30% cover.

Comments - This association occurs at the mouth of the main stream channel and the associated depositional flats. The area shows extreme tree death particularly in areas of lower elevation. A narrow dense stand of trees occurs on the edge of the stream channel.

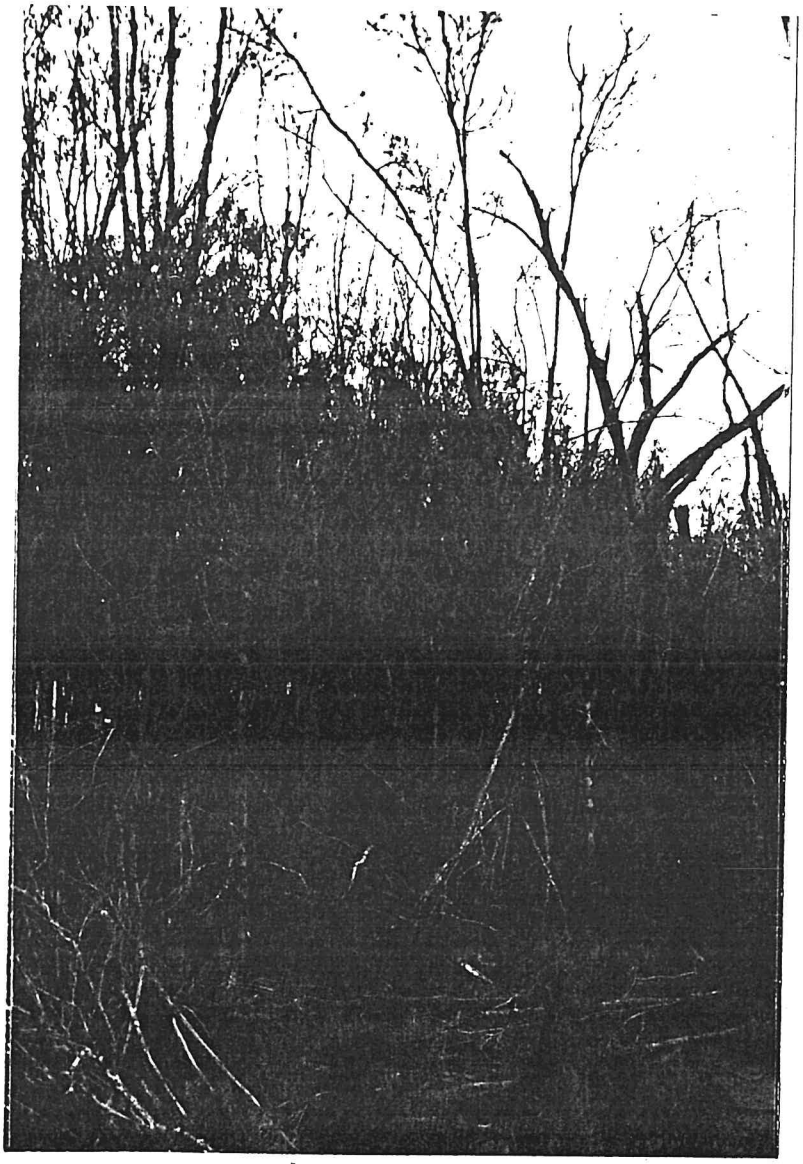


Plate 13 - Casuarina obesa Low Woodland showing tree death and Halosarcia layer.

Banksia attenuata Woodland. Site # 30.

escription - Low Woodland B over Heath B over Dwarf Scrub C over Open Low s/Herbs on deep pale sand.

um 1 - Banksia attenuata from 4-6m with 10-30% cover.

um 2 - Eremaea pauciflora, Leptospermum erubescens, Hakea corymbosa from 1.0 to with 30-40% cover.

um 3 - Mixed dwarf scrub including Conospermum stoechadis, Calytrix flavescens, spermum erubescens (young plants), Kunzea vestita, and Hibbertia rupicola, from .8m with 10-30% cover.

um 4 - Mixed sedge herb layer including Lomandra effusa, Schoenus curvifolius, anthos humilis, and the ephemerals Waitzia citrina, W. acuminata and ycome spp.

nts - This formation does not occur extensively within the reserves but is icted to a few sand ridges north of the main stream channel. The Banksia attenuata y is quite variable and the formation gives way to mixed heath. The formation was bly more extensive in the past since numerous examples of Banksia death, probably o senescence were observed within the heath areas occupying the highest sand ridges.

14 - Banksia attenuata Woodland occupying a sand ridge with Eremaea pauciflora in the foreground.

15. Banksia prionotes Low Forest. Site # 24.

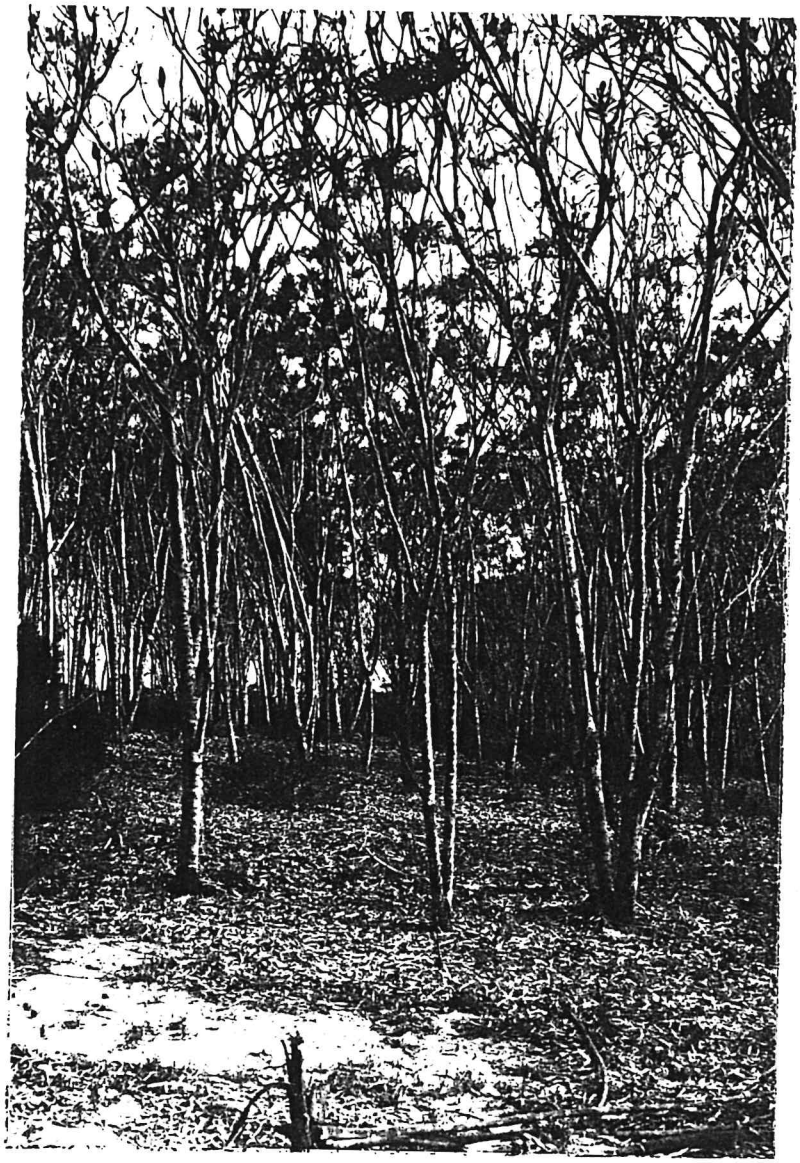
Key Description - Low Forest B over Open Dwarf Scrub D over Open Herbs on creamy white sand with <10% clay.

Stratum 1 - Banksia prionotes at 4-5m varying from 50-65% cover.

Stratum 2 - Scattered shrubs of Hibbertia rupicola, Calytrix lechenaultii and Gastrolobium pedunculare from 0.3 to 0.5m at 2-10% cover.

Stratum 3 - Mixed herbaceous species with some sedges, including Ursinia anthemoides, Waitzia citrina, Trachymene pilosa, Conostylis aculeata, Caladenia flava, Caladenia discoidea, and the sedges Lepidobolus chaetocephalus and Alexgeorgia nitens, from 5-20cm with 10-30% cover.

Comments - This formation occurs on higher sand ridges immediately north of the main east west drainage channel, grading into areas of Allocasuarina huegeliana, scrub heath and E. wandoo Woodland. The second stratum may contain emergent Hakea recurva and Leptospermum erubescens. It is similar to Banksia prionotes Woodland over Heath (Association 16), but for the density of the 2nd stratum and the degree of maturity of the Banksias which appear as post fire regeneration given the even age of the stands.



te 15 - Banksia prionotes Low Forest, with scattered shrubs and herb layer.

6. Banksia prionotes Woodland. Site # 41.

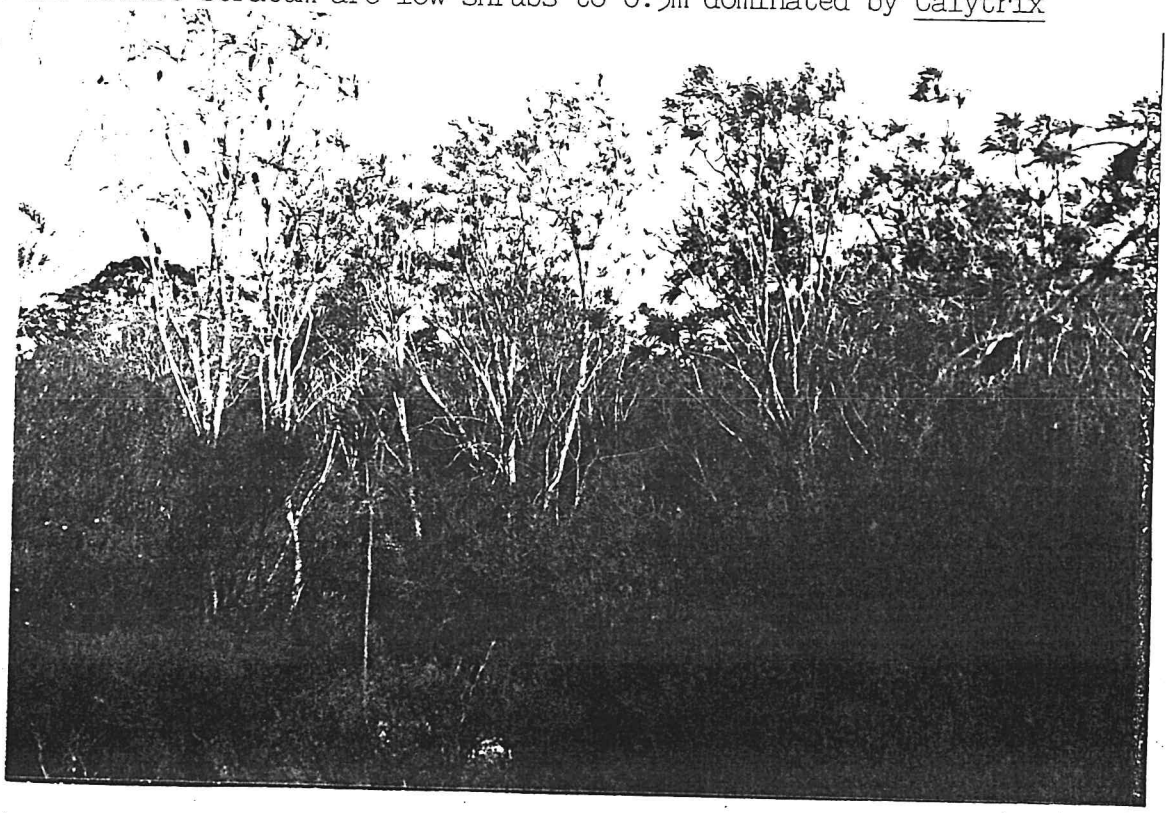
ey Description - Low Woodland B over Heath B over Open Herbs. on light brown ver creamy white sand.

ratum 1 - Banksia prionotes 4-5m at 15-30% cover.

ratum 2 - Mixed scrub layer from 1.0 to 1.5m but occasional to 2m at 50-65% ver. Dominated entirely by Petrophile ericifolia, Leptospermum erubescens and remaea pauciflora.

ratum 3 - Mixed herbaceous restionaceous layer dominated including Trachymene lcsa, Brachycome pusilla, Ursinia anthemoides, Anigozanthos humilis and ustis dioica.

mments - This formation is common in the south western corner of Reserve No. 02?, north of the stream channel, being confined to the deeper sands of the ridges proximately 100m north of the stream. The formation grades into Allocasuarina egeliana/Banksia prionotes Woodland. To the east, Wandoo Woodlands in the swales major sand ridges, and heaths to the north, where the B. prionotes stratum is sent. The formation very rarely includes B. attenuata and Allocasuarina huegeliana. e density of stratum 2 varies and grades into Banksia prionotes low forest. ergent from the lowest stratum are low shrubs to 0.5m dominated by Calytrix chenaultii.



e 16 - Banksia prionotes Woodland with Eremaea pauciflora and Petrophile ericifolia

7. Banksia prionotes Woodland. Site # 19, 20.

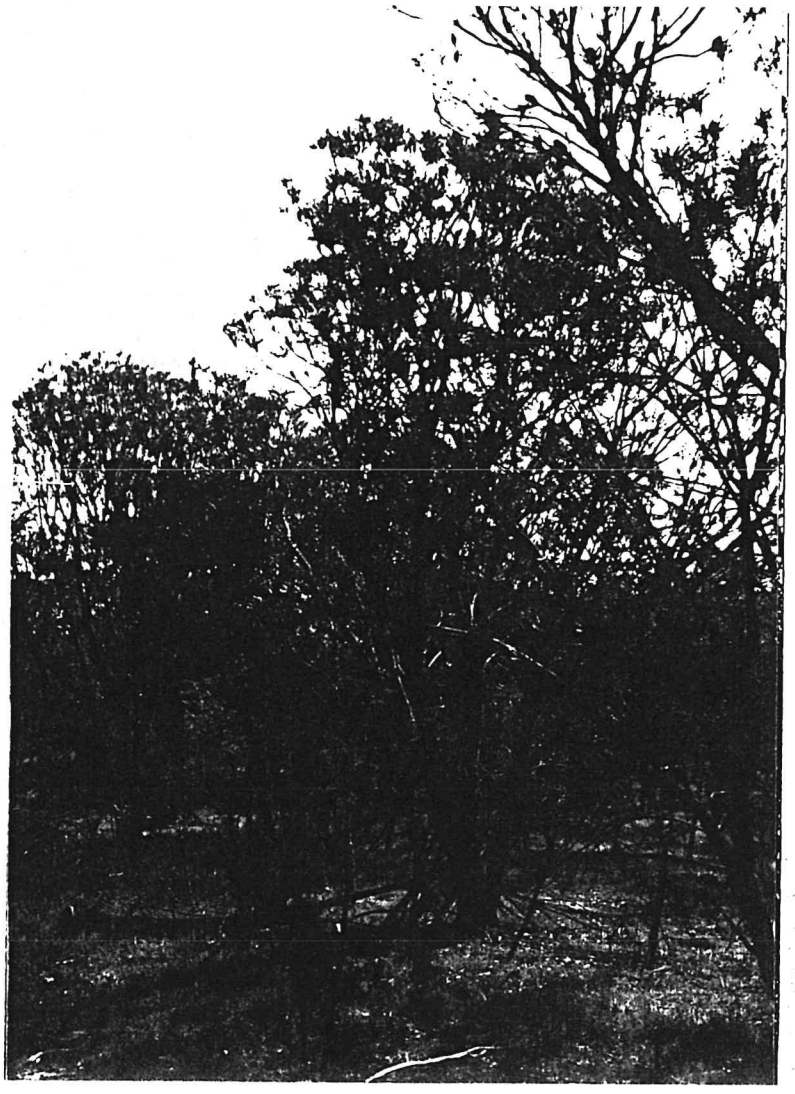
y Description – Low Forest A over Open Scrub over Open Herbs on pale cream to ite sand.

ratum 1 – Banksia prionotes from 6–10m at 30–55% cover including occasional/rare nksia attenuata.

ratum 2 – Scattered scrubs from 2.0–2.5m at 2–10% dominated by Jacksonia rcellata, but including Hakea prostrata and Acacia saligna.

ratum 3 – Mixed herb layer from 0–20cm at 10% dominated by Ursinia anthemoides, pochaeris glabra and including isolated clumps of Alexgeorgia nitens and sorted grasses.

mments – This formation occupies the eastern edge of a high sand ridge and shows igns of past grazing. Occasional Allocasuarina huegeliana and Eucalyptus loxophleba e emergent from the Banksias to >10m. The formation is bounded by the stream inge and E. loxophleba woodland to the west. Considerable Banksia prionotes ath is evident, probably due to senescence.



ate 17 – Banksia prionotes odland with Jacksonia rcellata and Sedge/Herb yer.

Allocasuarina huegeliana/Banksia prionotes Low Forest. Site # 31.

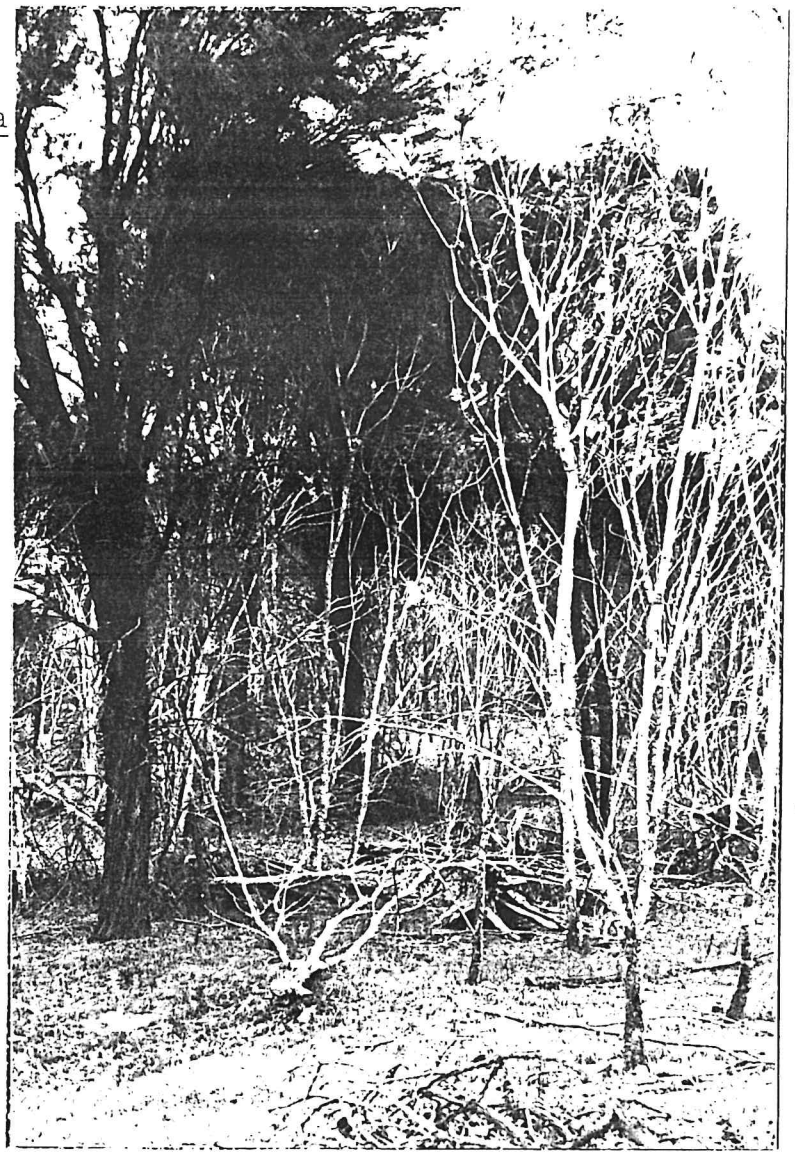
Description - Low Forest A over Herbs/Open Herbs on light brown to creamy ite loamy sand.

Stratum 1 - Allocasuarina huegeliana 6-13m, 25-50% cover.

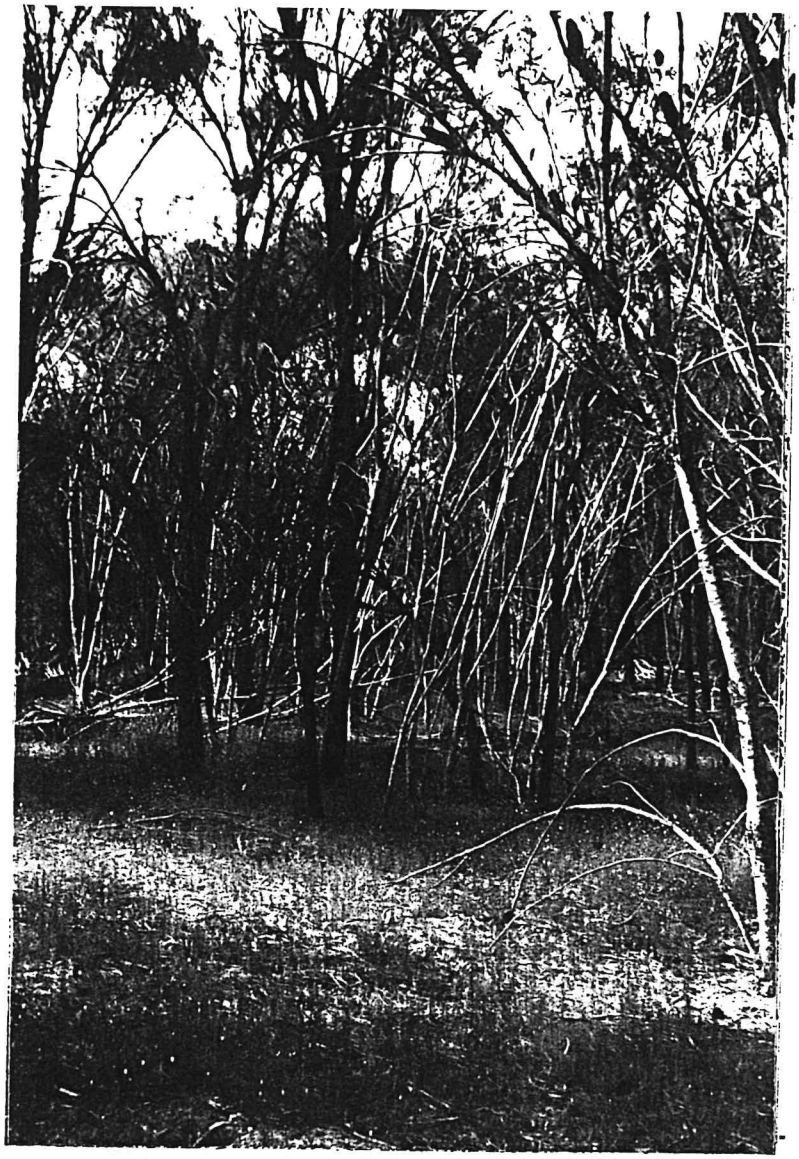
Stratum 2 - Banksia prionotes from 4-6m and 30-65% cover.

Stratum 3 - Herbaceous species including Waitzia citrina, Millotia tenuifolia, achymene pilosa, Anigozanthos humilis and Ursinia anthemoides, very variable in ver from 10-80%.

ments - This formation extends along the eastern slopes of the main ridge of the stern lake margin. In some parts of the formation, Allocasuarina huegeliana and nksia prionotes form a more or less mixed upper stratum, while in southern parts the formation the Sheoaks form a readily discernible monospecific upper stratum. thin the formation small single species stands are found.



te 18a - Allocasuarina huegeliana Banksia prionotes Low Forest with per stratum of A. huegeliana.



18b - Allocasuarina huegeliana and Banksia prionotes forming a more even upper stratum.

Allocasuarina huegeliana Woodland. Site # 40.

Description - Low Woodland A over Open Dwarf Scrub C over Open Herbs on light ge brown clayey sand.

atum 1 - Allocasuarina huegeliana trees to 8m and 10-20% cover, occasionally > 10m.

atum 2 - Leptospermum erubescens and Calytrix lechenaultii with 2-10% cover, from -1.0m high.

atum 3 - Herbaceous species to 0.2m and 10-30% cover commonly including Ursinia hemcides, Waitzia spp, Caladenia flava and Trachymene pilosa.

ments - This formation is found only is small areas of the reserve to the east of main sand ridge on the eastern shore of the lake. It commonly grades into locasuarina huegeliana/Banksia prionotes woodland and heath vegetation.

e 19 - Allocasuarina huegeliana Woodland along low sand ridge with scattered bs, Calytrix lechenaultii, and herbs.

Acacia acuminata (Jam) Woodland. Site # 43.

Description - Open Low Woodland B over Dense Low Grass on dark brown loamy with occasional laterite pebbles.

tum 1 - *Acacia acuminata* from 2-5m and 2-10% cover.

tum 2 - Dense bunch grass with herbs dominated by introduced weed species luding *Arctotheca calendula*, *Lolium perenne*, *Hordeum glaucum*, *H. leporinum*, rra *longifolia*, *Avena fatua*, very dense to 95% cover.

ents - Occurs around the north eastern perimeter of the lake adjacent to cleared d. May contain occasional *Eucalyptus loxophleba* to the east.

e 20 - *Acacia acuminata* (Jam) with dense layer of introduced herbs and grasses. Note lake fringe to the left.

21. Eucalyptus loxophleba Melaleuca Woodland. Site # 32.

Key Description - Open Low Woodland A over Open Low Woodland B over Open Scrub over Low Sedges over Herbs on light loam brown creamy sandy clay.

Stratum 1 - Eucalyptus loxophleba 2-5% cover from 6-10m, denser towards margins.

Stratum 2 - Melaleuca sp (324) to 4m and 2-10% cover including occasional Casuarina obesa.

Stratum 3 - Melaleuca shrub layer including M. sp (324, 340) to 2.5m and 2-10% cover.

Stratum 4 - Sedges to 0.5m dominated by Gahnia trifida with 50-60% cover. Includes Halosarcia lepidosperma.

Stratum 5 - Dense layer of herbs including Anagallis arvensis and Cotula bipinnata to 70% cover.

Comments - Occurs in seepage areas in the north of the reserve. Some Eucalyptus tree death evident. Subject to extensive flooding.

Plate 21 - Eucalyptus loxophleba-Melaleuca Woodland with Sedges and Halosarcia lepidosperma.

Melaleuca Low Forest. Site # 26.

Description - Low Forest B over Dwarf Scrub D over Dense Herbs. on grey clay with some sand grains.

Stratum 1 - Melaleuca sp (324) trees from 2.5-4m with very occasional Casuarina sp and Melaleuca uncinata 30-35% cover.

Stratum 2 - Chenopod shrubs to 0.5m including Halosarcia lepidosperma, H. pergranulata and occasional Atriplex semibaccata 10-20% cover.

Stratum 3 - Mixed herbaceous species with some grasses. Dominants include Cotula bipinnata, Anagallis arvensis, Hypochaeris glabra and Disphyma crassifolia at 0.2m and 80-90% cover.

Comments - This formation occurs in seepage areas, immediately east of the main ridge along the east lake margin. It also forms occasional components of other wetland areas of the central reserve (No. 26020). The area sampled was covered in approximately 5cm of water, probably only occurring in high rainfall winters.

Plate 22 - Melaleuca Low Forest with dense M. sp (324), Halosarcia app and dense Herb layer (Cotula bipinnata dominant).

Melaleuca Low Woodland. Site # 49.

Description - Low Woodland B on sandy clay.

Stratum 1 - *Melaleuca* sp (13) to 4m with 10-20% cover. Cover variable according to degree of canopy death.

Comments - Previously covering extensive areas of the lake this association shows severe reductions due to rising water levels and salinity.

Plate 23 - *Melaleuca* sp (13) Low Woodland adjacent to the lake shore.

. Melaleuca mixed Low Forest. Site # 18.

y Description - Low Forest B over Open Low Scrub over Dwarf Scrub D on grey own sandy clay.

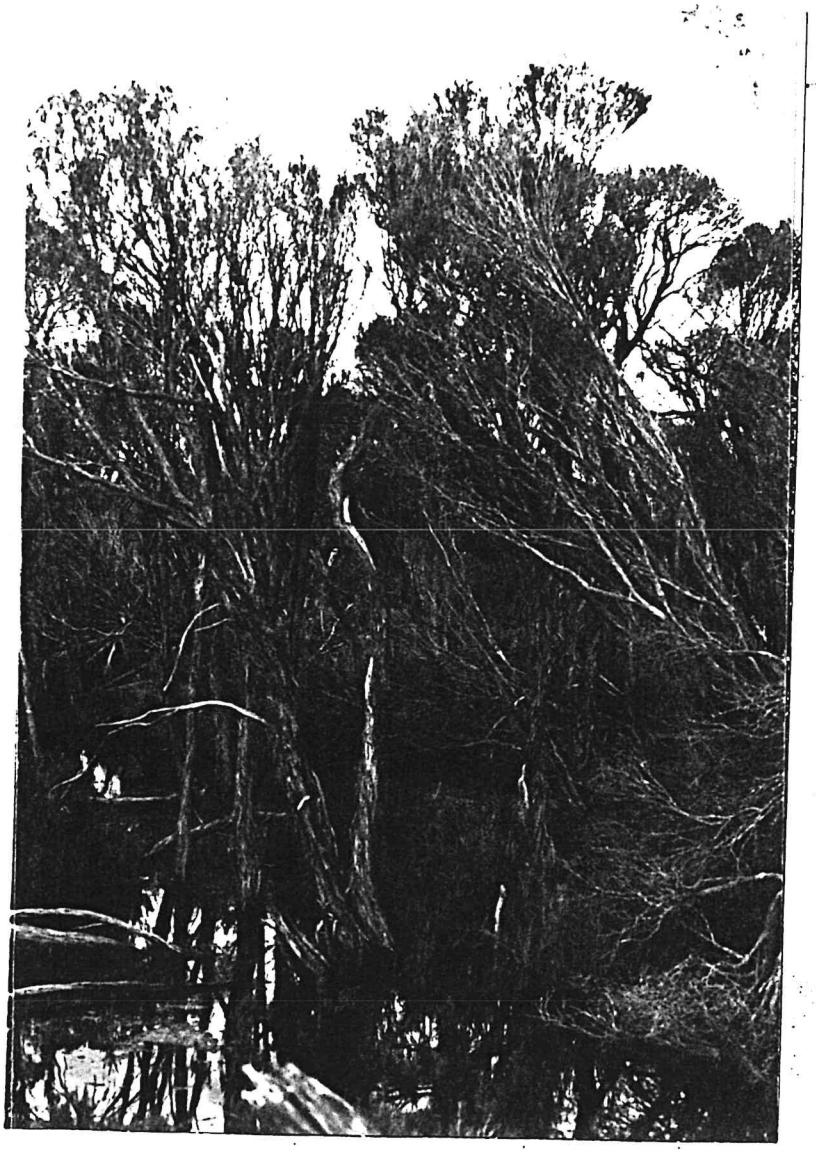
ratum 1 - Melaleuca sp (297) dominant with Melaleuca lateriflora to 4m and 45% cover.

ratum 2 - Melaleuca lateriflora, M. acuminata, shrubs to 2m with 5-10% cover.

ratum 3 - Chenopod species including Halosarcia lepidosperma, H. indica to m and 10-30% cover.

ments - This formation occurs in sections of the north east and central southern rts of Reserve No. 26020, where the soil is clayey and totally inundated in winter. ttle tree death is evident, although the Chenopodiaceae spp suggest some inisation. It is similar to Melaleuca thicket but for species composition and tree life form of the dominant stratum.

te 24 - Melaleuca mixed Low est showing high inundation r Halosarcia species.



Casuarina obesa Low Woodland/Melaleuca Low Forest Site # 46

Description - Open Low Woodland over Low Forest B over Dwarf Scrub D/Open
f Scrub D on grey clayey sand.

tum 1 - Casuarina obesa to 7m and 2-20% cover.

tum 2 - Melaleuca uncinata, M. acuminata and M. sp (269), 2-4m and 30-70% cover.

tum 3 - Scattered Halosarcia lepidosperma, H. pergranulata to 0.3m and 2-30%
r.

ents - Association of mid to lower stream channel and areas of deposition within
stream channel. The lower parts of the southern stream channel dominated by
leuca species. Eucalyptus occidentalis occurs occasionally.

e 25 - Casuarina obesa Low Woodland/Melaleuca Low Forest. Note zonation from shore to stream channel.

Eucalyptus loxophleba Tree Mallee. Site # 47

Description - Tree Mallee over Low Sedges over Herbs on light brown sandy clay

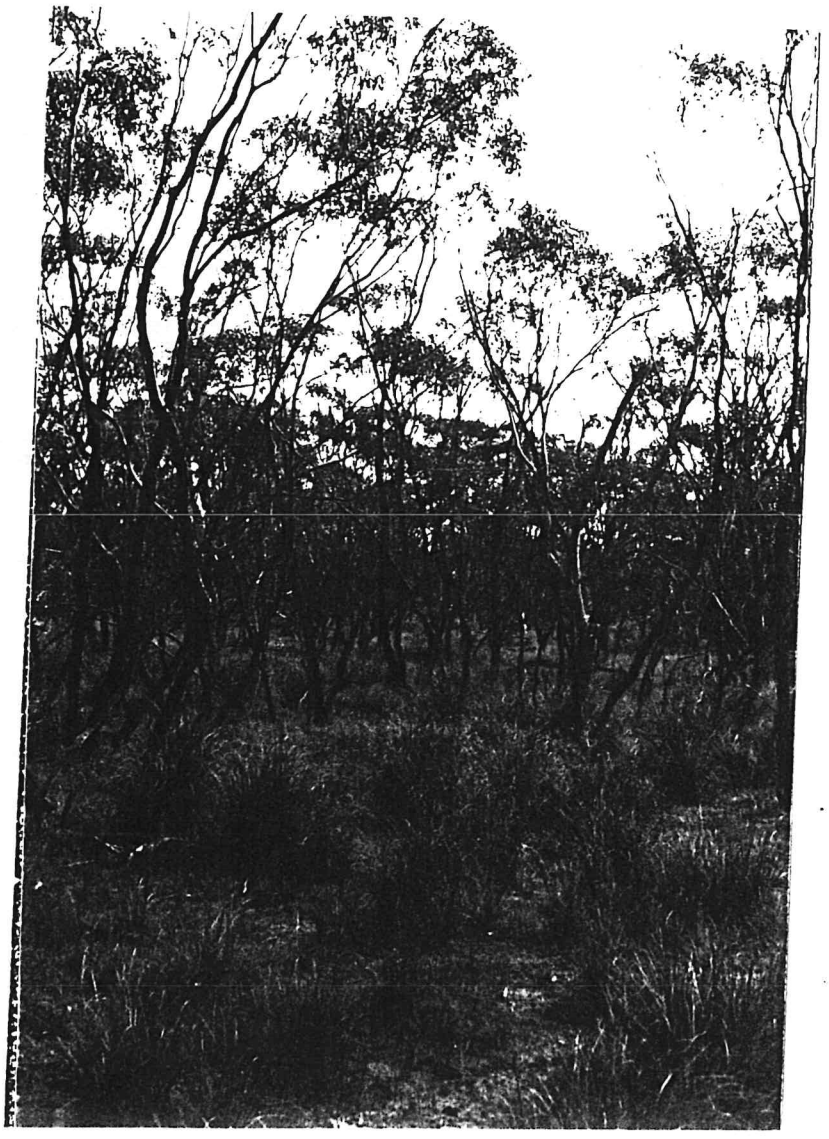
tum 1 - Eucalyptus loxophleba Tree Mallee from 8-12m at 30-60% cover mixed with form 2-10% at same height.

tum 2 - Mixed sedge community to 0.5m at 30-70% cover dominated entirely by ia trifida and Lomandra effusa.

tum 3 - Mid dense to dense herbaceous spp including Ursinia anthemoides, alis arvensis, Caladenia spp, Podolepis capillaris, and other annuals.

ents - This formation occurs to within 10 metres of the stream fringe. The upper tum may include occasional emergent Eucalyptus wandoo. Grades into fringing tation of stream channel to the east. Emergent Melaleuca spp occur to the phery of the formation. The upper stratum, while containing trees, is dominated he tree mallee life form.

e 26 - Eucalyptus loxophleba Mallee with occasional E. oo and sedges (Gahnia ida).



Eucalyptus ?annulata Tree Mallee Woodland. Site # 8.

Description - Tree Mallee over Open Scrub over Open Dwarf Scrub]) on pale y clay with some sand.

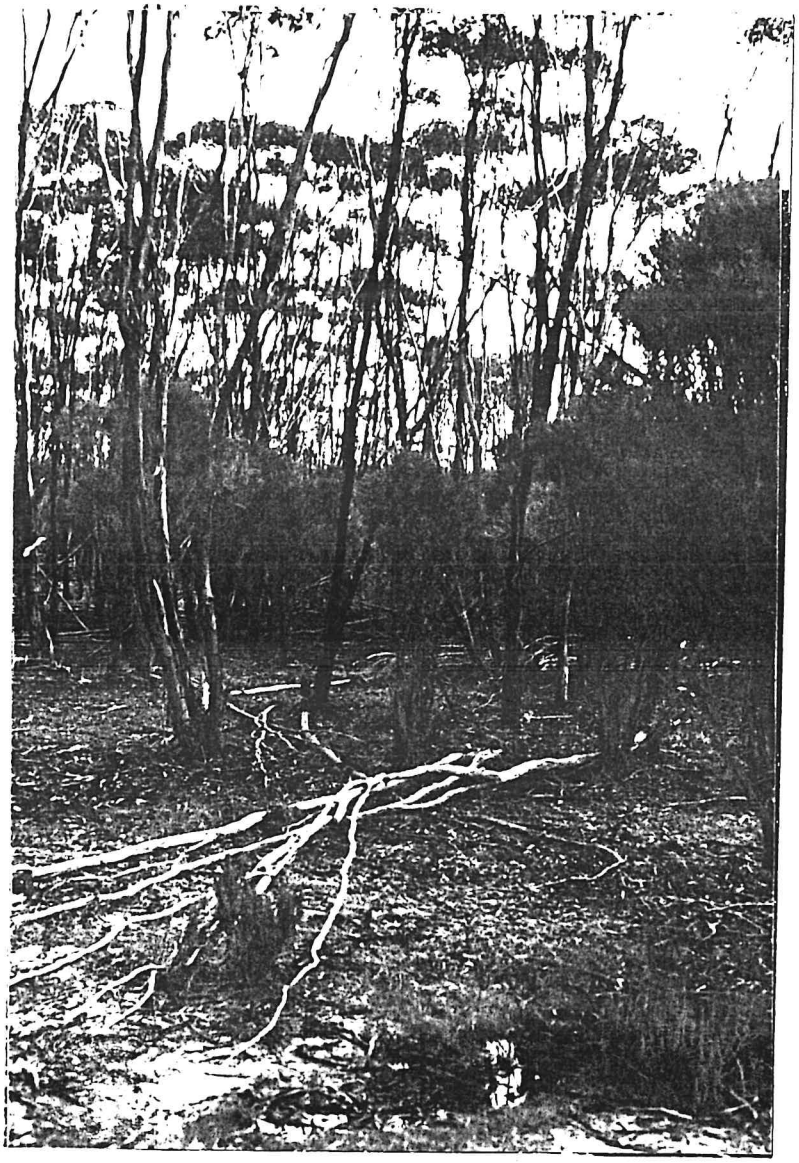
atum 1 - Eucalyptus ?annulata tree mallee to 15m and 40-60% cover.

atum 2 - Shrubs from 2m to 3m composed of Melaleuca lateriflora and M. minata from 10-15% cover.

atum 3 - Chenopods dominated by Halosarcia indica and Halosarcia lepidosperma. % cover to 0.5m.

ments - This is a small isolated association on the eastern boundary of the erve surrounded by Mallee and Melaleuca thicket and Heath.

te 27 - Eucalyptus ?annulata e Mallee Woodland with laleuca acuminata, M. eriflora and Halosarcia .



Mixed Mallee over Scrub. Site # 38.

Description - Open Shrub Mallee over Scrub over Open Low Sedges over Herbs on brown/grey sandy clay.

um 1 - Eucalyptus spathulata with E. xanthonema and E. phaenophylla shrub es from 3.5m and 10-20% cover.

um 2 - Melaleuca uncinata, M. acuminata from 2 to 4m and 20-30% cover.

um 3 - Mixed sedges and herbaceous species. Gahnia trifida, Lepidosperma squameum, 20-30% cover.

um 4 - Mixed herbs from 30-70% cover.

nts - An extensive association, very distinct from Eucalyptus spathulata over ket. The stature of Melaleuca species is variable, commonly equalling and sionally exceeding that of the mallees.

23 - Mixed Mallee over Scrub with Eucalyptus spathulata and E. xanthonema, Melaleuca spp and sedges.

Eucalyptus spathulata Mallee over Heath. Site # 7.

Description - Open Shrub Mallee/Shrub Mallee over Dense Heath A over Open f Scrub C over Herbs on grey sandy clay loam.

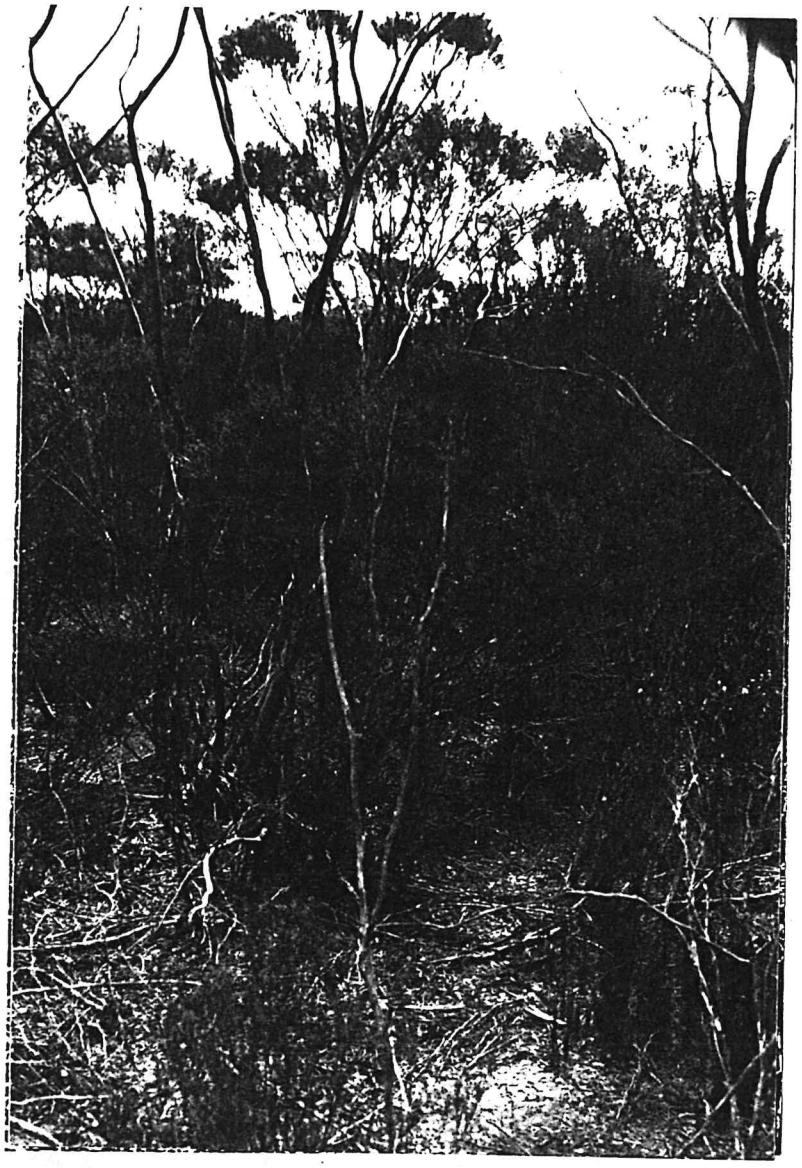
atum 1 - Shrub Mallee from 3-4m high and cover from 10-40%. Dominated by alyptus spathulata and including E. celastroides and E. calycogona occasionally.

atum 2 - Shrubs from 1.5 to > 2m and 70-80% cover. Domonated by Melaleuca inata.

atum 3 - Mixed shrubs including Oxylobium parviflorum, Melaleuca spicigera, cia sp nov (89), Prostanthera serpyllifolia and Exocarpus aphyllus. From 0.5 to m and 2-10% cover.

atum 4 - Herbaceous layer including Ursinia anthemoides, Drosera macrantha, adenia saccharata, Pterostylis recurva and Arctotheca calendula. 30-50% cover.

ments - This association dominates the south east portion of the study area. re the elevation falls the Mallee overstorey becomes less dense. In such ndated areas limited death of Mallee species is evident. The formation also tains areas where the Melaleuca understorey is very open.



29 - Eucalyptus spathulata Mallee over Heath.

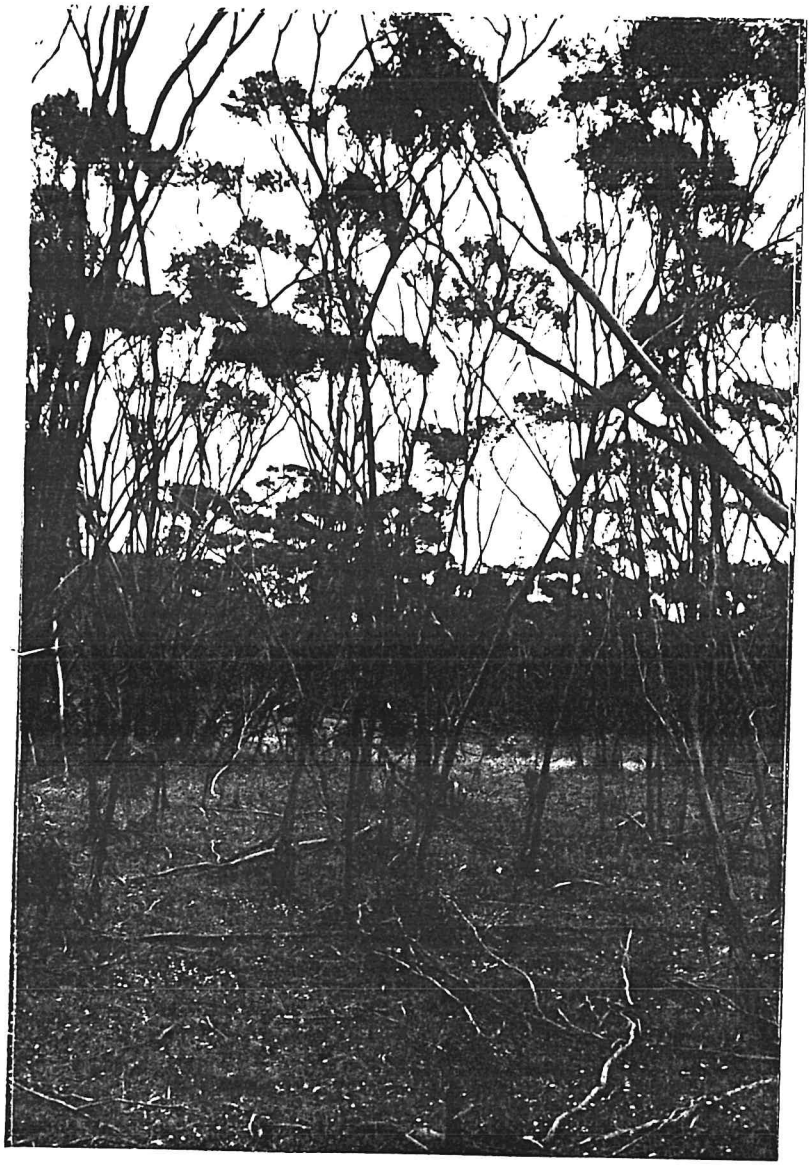
Eucalyptus anceps/E. spathulata mallee. Site # 13, 14.

Description – Shrub Mallee over Dense Herbs/Herbs.

tum 1 – Eucalyptus anceps, E. spathulata. Scrub Mallee from 5 – 7m and 30–50% r.

tum 2 – Herbaceous species including Ursinia anthemoides, Caladenia flava, ostylis recurva and Waitzia citrina. 60–100% cover.

ents – Association occurring within other mallee vegetation types in the south of the reserve on more elevated areas.



30 – Eucalyptus anceps/E. spathulata Mallee (Site 14).

Melaleuca uncinata thicket. Site # 9.

Description - Thicket over Open Low Scrub A over Open Herbs on grey clay with sand.

Type - Light grey clay with some sand grains.

Stratum 1 - Totally dominated by Melaleuca uncinata to 4m but may include occasional Melaleuca lateriflora, 40-70% cover.

Stratum 2 - Melaleuca sp (282) and M. lateriflora between 2 and 2.5m. 2-10% cover.

Stratum 3 - Assorted herbaceous species including Cotula bipinnata, Hypochaeris glabra, Senecio sp and Disphyma crassifolium. 10-30% cover.

Comments - This formation demonstrates a heterogenous structure, with frequent small clearings where the uppermost stratum is absent. These areas contain Halosarcia lepidosperma emergent from the herbaceous stratum, in addition to a more dense secondary stratum of Melaleuca sp (282). Melaleuca thickets occur extensively throughout the reserve on inundated areas, adjacent to the stream channel and in low lying areas in the north eastern corner. While approaching the tree life form the Melaleuca uncinata of the uppermost stratum are better described as shrubs given the multiple stems arising from a short trunk. cf. Melaleuca Woodland.

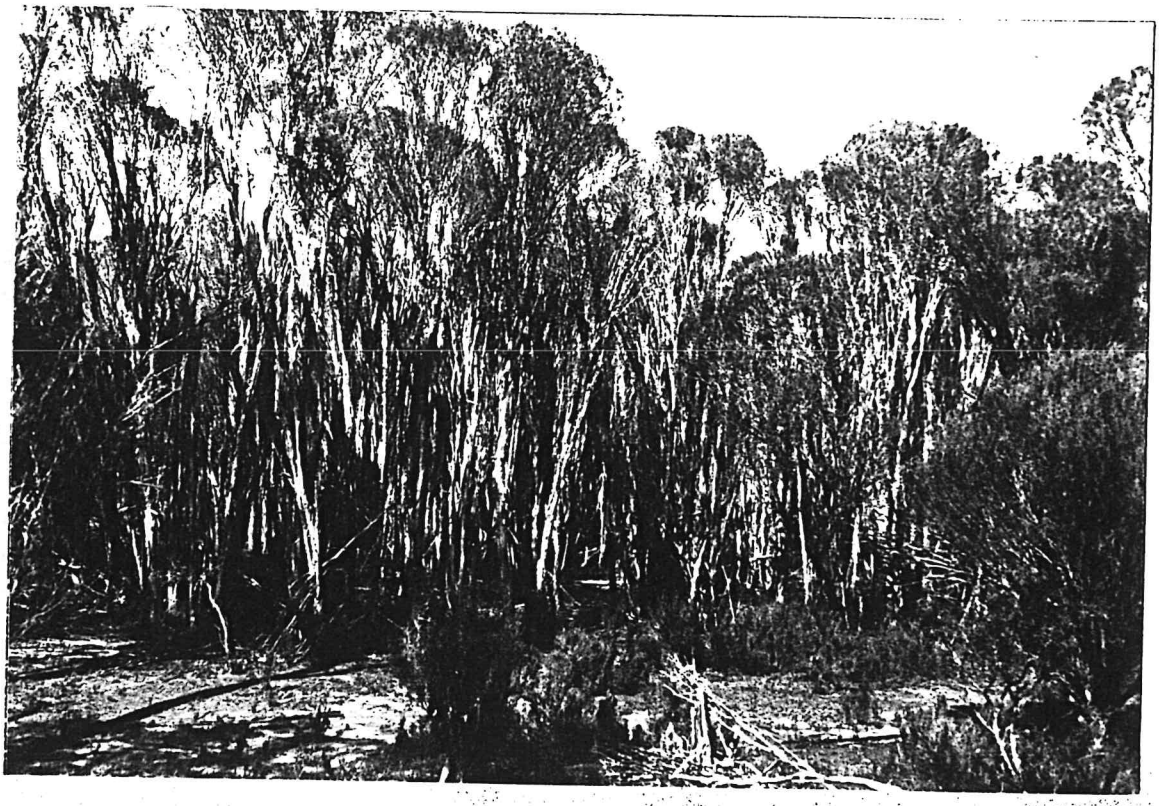


Plate 31: Melaleuca uncinata Thicket with open areas supporting herbs and Halosarcia lepidosperma.

Melaleuca Dense Heath. Site # 6, 15.

Description - Dense Heath A/Heath A over Open Dwarf Scrub D/Dwarf Scrub D over Open Herbs/Open Herbs/Herbs on light brown to grey sandy clay/clay.

Stratum 1 - Melaleuca lateriflora, Melaleuca sp, Melaleuca acuminata 1.5 to 2.0m 30-80% cover. May include Melaleuca uncinata.

Stratum 2 - Halosarcia indica from 2-30% to 0.4m.

Stratum 3 - Herbaceous species including introduced weeds Romulea rosea, Anagalis arvensis, and native herbs Bulbine semibarbata, Helipterum gracile and Blennospora drummondii. Cover values vary from 5-60%.

Notes - A structurally simple yet very variable formation occupying large areas of Reserve, often being totally flooded. While Melaleuca lateriflora is most often the dominant other species contribute variably to the primary stratum. The formation occurs in areas subject to flooding in the north east and southern sections of Reserve R0020, grading into other Melaleuca dominated formations and Mallees. In south-eastern parts small open areas may occur within associations dominated by Halosarcia species.

Fig. 22 - Melaleuca Dense Heath. Note degree of inundation.

3. Mixed Heath. Site # 29, 45, 22.

ey Description - Heath B over Low Heath D over Open Low Sedges over Very Open erbs on creamy white sand to loamy sand.

tratum 1 - Leptospermum erubescens, Petrophile ericifolia and Eremaea pauciflora m 1.0 to 1.5m occasionally to 2m with 40-60% cover.

tratum 2 - Mixed dwarf shrub layer including Eremaea pauciflora, Melaleuca sp, ssiaea peduncularis, Leptospermum erubescens, Brachyloma concolor, Dryandra nivea, ttertia ?inclusa from 0.3 to 0.5m and commonly up to 0.7m at 30-50% cover.

tratum 3 - Sedges to 0.3m including Loxocarya flexuosa, Lepidosperma pubesquameum, stis dioica, Dianella revoluta and Lomandra rupestris at 10-30% cover.

tratum 4 - Herbaceous species including Waitzia citrina, Trachymene pilosa, Waitzia minata, Ursinia anthemoides with 2-15% cover.

ments - This formation covers much of the gently undulating sand ridges in the tral part of Reserve No. 26020. The heath may also contain emergent Banksia enuata, B. prionotes, Hakea obliqua and Santalum acuminatum, and grades into B. ionotes or B. attenuata Woodland where an upper stratum is established. Where lar depressions are sufficiently deep the formation gives way to Eucalyptus dentalis or E. wandoo Woodlands.

3 - Mixed Heath with Petrophile ericifolia, Eremaea pauciflora and Leptospermum erubescens. Note Banksia prionotes and Eucalyptus occidentalis Woodlands in background.

Mixed Melaleuca Heath (Stream Fringe) Site # 44.

Description - Dense Heath A over Dwarf Scrub D over Very Open Herbs on Shallow sand over grey sandy clay.

Stratum 1 - Melaleuca uncinata, M. lateriflora, M. sp nov (42), M. sp (337) and Callistemon phoeniceus. 1-2m and 70-90% cover.

Stratum 2 - Halosarcia lepidosperma and H. pergranulata, 2-10% cover and to 0.5m.

Stratum 3 - Herbaceous species including Cotula bipinnata and Helipterum gracile and Trachine semibarbata to 10% cover.

Comments - This association occupies the fringes of the stream channel in the centre of the reserve. Towards the channel Halosarcia species invade the lower margin of the formation for approximately 3m shoreward. Eucalyptus occidentalis or E. wandoo may occur if only occasionally. Crown death of these is evident. Melaleuca uncinata often forms an upslope band delineating the upper edge of this association.

Plate 34 - Mixed Melaleuca Heath forming a fringe to the stream channel. Some crown death of trees on the upper margin is shown. Halosarcia pergranulata in foreground.

5. Melaleuca Low Heath. Site # 5.

Description - Low Heath D over Very Open Low Sedges over Open Herbs on pale brown sand with some clay.

Stratum 1 - Melaleuca ?pentagona dominates this stratum which is between 0.4 and 0.5m high 70-80% cover. Also includes Calytrix lechenaultii and occasional Kunzea preissii.

Stratum 2 - Herbaceous stratum composed of Ursinia anthemoides, Borya laciniata and Drosera zonaria with 10-30% cover.

Comments - This formation is distinguished from other heath type formations by its uniform low stature, and the dominance of Melaleuca ?pentagona of the upper stratum. It occurs downslope from Kunzea, Leptospermum Low Scrub and forms an ecotonal region towards the Mallee, thicket and Eucalyptus occidentalis formations of low lying areas. The formation only occurs where the slope from ridge to depression is gradual and exceeds approximatley 60m from ridge to swale. Occasional emergent shrubs occur over the downslope gradient including Kunzea jucunda and Leptospermum flavescens.

Fig 35 - Melaleuca Low Heath. Dominated by Melaleuca ?pentagona.

Kunzea, Leptospermum Low Scrub. Site # 4.

Description - Open Low Scrub A over Dwarf Scrub C over Low Heath D over Very Herb/Low Sedges on light brown clayey sand over pale brown/cream sand.

Stratum 1 - Leptospermum erubescens & Kunzea jucunda from 1.5-2.0m from 2-10% cover.

Stratum 2 - Mixed low heath containing numerous species including Isopogon buxifolius, Melaleuca ?pentagona, Kunzea preissii and Leptospermum erubescens at 1.0m and 10-15% cover.

Stratum 3 - Mixed dwarf shrubs to 0.4m including Verticordia acerosa, Calytrix brenaultii, Cryptandra pungens, Brachyloma concolor, with cover between 30 and 50%.

Stratum 4 - Very open sedges and assorted herbaceous species including Stylidium uliferum, Drosera zonaria, Loxocarya cinerea.

Comments - While similar at initial inspection to the other shrub formation of the reserve this vegetation type can be distinguished by species composition, and the density of the uppermost stratum. The formation is restricted to a single low sandy ridge south of the main stream channel, being bounded to the south and west by low lying areas of mallee and thicket and to the north by the stream channel.

36 - Kunzea jucunda/Leptospermum erubescens Low Scrub with prominent K. jucunda (pink) and Isopogon buxifolius.

7. Halosarcia Dwarf/Scrub. Site # 35.

/Description - Dwarf Scrub over Herbs on grey/brown sandy clay.

Stratum 1 - Halosarcia pergranulata and H. lepidosperma to 0.5m and 60-70% cover.

Stratum 2 - Herbaceous species including Cotula bipinnata, Ursinia anthemoides, Arctotheca calendula, and Anagalis arvensis to 70% cover.

Comments - Located in a single winter wet depression east of the main sand ridge. Contains emergent (< 2% cover) Melaleuca sp (350).

Site 37 - Halosarcia Dwarf Scrub with Herbs and Melaleuca sp (350). York Gum Woodland in the background.

Halosarcia Low Heath. Site # 3.

Description - Low Heath D on grey sandy saline clay.

Stratum 1 - Halosarcia pergranulata to 0.4m with 30-60% cover.

Comments - This simple association occurs extensively on the open flats of the upper stream channel and associated floodplain. Where the stream fringe rises distinctly from a bank, this formation grades into fringing vegetation as at Site 44 (Association 34). Where the floodplain is large the formation is gradually overtopped by Melaleuca uncinata Thicket. Extensive tree death is evident within the formation, implying widespread Melaleuca death within the stream floodplain. Also includes occasional Halosarcia lepidosperma.

Plate 3a - Halosarcia Low Heath. Note dead Melaleuca stems and E. wandoo woodland in the background.

ate 38b - Upstream location showing more recent Melaleuca death.

A total of 252 species is recorded for the Lake Coyrecup Nature Reserves, being representative of 46 families and 137 genera (see Appendix 1). Past Departmental collections provided a further 3 taxa not recorded in the current study.

Included in the taxa were 19 introduced species dominated by members of the Poaceae (10 species) and Asteraceae (4 species) families. The collecting period covered late winter and early spring, consequently most of the flora was represented by good flowering specimens.

All dominant species are considered to be represented as well as the vast majority of perennial species. Although collections of annual species are extensive (18 species of Orchidaceae and 31 species of Asteraceae for example), some of the later flowering species may have been omitted. Furthermore due to extensive flooding of low lying areas of the reserve, some submerged areas supporting populations of Chenopodiaceae species could not be effectively sampled. Although exhaustive sampling was not feasible, the total of 252 species is regarded as high. Additional specimens with only provisional identifications not included in the current species list and will increase the list following incorporation at a later date ($\simeq$ 15 specimens).

Of the total number of families recorded, the Myrtaceae and Asteraceae were dominant, with the Proteaceae and Orchidaceae also significant. The following table provides an analysis of the major families and their contribution to the reserves' flora. (This analysis excludes introduced species.)

FAMILY	NO. OF SPECIES	% OF TOTAL
MYRTACEAE	9	16.7
ASTERACEAE	27	11.6
PROTEACEAE	19	8.2
ORCHIDACEAE	18	7.7
PAPILIONACEAE	11	4.7
MIMOSACEAE	10	4.3
TOTAL	124	53.2

While the relative contribution of different vegetation types to the total area of the reserve will influence its overall floristic diversity, some relative measure can be gained by computing the number of species per km^2.

Excluding those areas of Lake Coyrecup lacking any vegetation (i.e. open water), the area surveyed is estimated to be 7.5km^2 ± 0.5km^2. This gives a relative floristic diversity of approximately 31.1 spp per km^2. While no floristic diversity figure is available for Lake Dumbleyung, a much larger area, only 104 species were recorded from this wetland. The Lake Coyrecup reserves compare favourably with other non-wetland reserves such as Tutanning Reserve (22 species/km^2) and Corrigin Water Reserves (22.2 species/km^2). It is also much higher than the more easterly Tarin Rock (8.7 species/km^2) and Bendering (5.9 species/km^2) (Muir, 1977). Future data for reserves close to and similar to Lake Coyrecup will provide for more valuable comparisons.

The flora of the reserve is dominated by Myrtaceous species, testament to the large areas of Melaleuca thickets and Eucalypt woodlands and mallees. The high number of species of Asteraceae is a function of the "open" nature of the secondary strata within many of the woodland formations, and the timing of the survey.

1 SPECIES OF INTEREST

Calothamnus preissii was collected from a single location (Site 22) from a population of 2 plants. This species is regarded as possibly rare and poorly collected (Category D). Leigh et al, (1984) describes the species as endangered (Code 3EC) with only 2 populations secured in Tutanning and Yornarning Nature Reserves. Additional collections in the Western Australian Herbarium represent un-reserved roadside populations at Cranbrook, Tambellup and Kojonup. The population represents the only reserved population on the southern part of the species' known range.

Dryandra calophylla was recorded from 3 populations within the reserve, each constituting approximately 20-30 plants. Marchant and Keighery (1979), regard the species as being geographically restricted (less than 100km) and potentially rare (Category E). Some taxonomic confusion between D. preissii and D. calophylla makes the status of this species uncertain.

Leigh et al (1984) reports Eucalyptus xanthonema as having a very restricted distribution, with a maximum geographic range of less than 100km. This represents one of the most northerly populations. Acacia glaucoptera is also treated by Leigh et al (1981) and is reported as having a geographical range greater than 100km but occurring on only small populations, restricted to high habitats. This species is in the south western corner of Reserve No. 26020 and Loc. 9270, with Eucalyptus loxophleba mallee and E. ?incrassata woodlands on low lying clay soils.

Kunzea jucunda is listed by Marchant & Keighery (1979) as being partially or more or less restricted with populations being known only from locations collections less than 160km apart. This occurs at site 4 only.

Amyema miraculosum subsp. miraculosum was ubiquitous throughout the reserve growing on Santalum acuminatum. Along with previous collections from "Peringillup" nature reserve the current record reinforces the significant southerly range extension established by the former collection. Furthermore the taxon is poorly represented in both the National and Western Australian Herbaria.

While Cassytha melantha is reported by Marchant & Keighery (1979) as being poorly known, subsequent collections have been extensive. The species occurs in significant numbers in the south east of Reserve No. 26020, particularly on Eucalyptus spathulata.

Finally, Prasophyllum macrostachyum var. macrostachyum has previously been restricted to regions on or adjacent to the coastal plain between Dongara and Esperance (Hoffman and Brown, 1984). Collections made in the current survey extend this distribution inland by 75-100 kilometres. This orchid was recorded in the central southern portion of Reserve No. 26020 under Mallee adjacent to the southern drainage ditch.

SUMMARY AND RECOMMENDATIONS

IMPORTANCE OF THE VEGETATION AND FLORA

Areas of uncleared land in the wheatbelt region are uncommon and for this reason alone the Lake Coyrecup Nature Reserves are of some importance. The current study identifies the reserves as supporting a wide range of wheatbelt vegetation formations showing a particularly diverse array of woodland associations. In addition the reserves support several riparian vegetation associations. These vegetation associations support a flora of significant diversity comparing favourably with other reserves. Included in the flora are several species of limited geographical distribution and/or have been poorly collected. A population of Calothamnus preissii represents the third known reserved population of this species regarded by Leigh et al (1984) as possibly endangered.

The vegetation of the reserves is also of high value due to the loss of similar areas to rising salinity and water levels associated with surrounding agricultural clearing. While several associations demonstrate initial degradation due to these factors, many areas remain relatively unaffected. These associations are not only important in themselves in preserving vegetation types being continually lost in other parts of the wheatbelt, but also in providing suitable habitats for the breeding and feeding of native waterfowl.

To gain some indication of the magnitude of salinity values, water samples were taken on 20/9/88 and 30/9/88. For the outflow of water on the western side of the lake values ranged from 1.5ppt - 1.6ppt on 20/9, and 1.7ppt on 30/9. Inflowing water (adjacent to site 44) salinity is likely to be at a minimum at this time due to dilution. Sampling at the commencement of winter rains would be particularly valuable to detect the peak in salt input.

MANAGEMENT CONSIDERATIONS

The conservation values of the reserves are considered to be high and it is deemed appropriate that some degree of continued monitoring is undertaken to detect any changes that may indicate that these are being lost. Permanent monitoring sites should be established in conjunction with regular water depth and quality measurements, to detect any further vegetation loss due to increasing salinity and/or catchment discharge.

To limit any accelerated deterioration in these factors, preventing any increased drainage directly onto the reserve is crucial. This includes the construction of firebreaks, which are likely to lead to the pooling of water likely to be significantly salt affected. Establishing liaison with neighbouring landholders aimed at supporting any revegetation of adjacent salt affected farmland would also be highly desirable.

The reserves have not been burnt for possibly greater than 25 years. While extensive burning of the reserve is not recommended, the limited burning of some areas of heath, showing areas of senescent shrubs should be evaluated further. These areas occur centrally within the reserves and as such burning is unlikely to lead to significant weed invasion.

In general human activity on the reserves is minimal although some rubbish dumping and tree removal probably occurs. Restricting vehicle access, particularly along the east lake shore and sand ridge may prevent weed invasion and tree removal. Adjacent areas of uncleared, though grazed farmland are probably not suitable for incorporation into the reserve. Being low lying and likely to suffer extensive inundation they are unlikely to be cleared. Encouraging landholders to leave these areas uncleared would be worthwhile.

Finally, it is hoped the current survey will provide the basis for comparison to other, as yet poorly known, wetlands within the surrounding wheatbelt.

ACKNOWLEDGEMENTS

Appreciation is extended to the staff of the Western Australian Herbarium including Dr P.G. Wilson for identification of Chenopodiaceae and Asteraceae species, Bruce Maslin and Richard Cowan for identification of Acacia species, Dr S.D. Hopper and M.I.H. Brooker for identification of Eucalyptus species, and Mrs. S. Patrick for her general assistance. The efforts of Mrs. J. Vann in typing and general preparation of this report are greatly appreciated.

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APPENDIX 1

SPECIES LIST

KEY

(150) Collection number.

* Introduced species.

(KW, MG) Recorded in previous work. Collected Ken Wallace, Malcolm Graham.

MONOCOTYLEDONAE

ANTHERICACEAE

Borya laciniata D.M. Churchill
Borya sphaerocephalas R. Br. (25)
Chamaescilla corymbosa (R. Br.) F. Muell. ex Benth. (226, 355)
Laxmannia palaecea F. Muell. (403)
Sowerbaea laxiflora Lindley (404)
Thysanotus patersonii R. Br. (90)

ASPHODELACEAE

Bulbine semibarbata (R. Br.) Haw. (212)

COLCHICACEAE

Wurmbea dioica (R. Br.) F. Muell. var. alba

CYPERACEAE

Baumea juncea (R. Br.) Palla
Caustis dioica R. Br.
Gahnia ancistrophylla Benth.
Gahnia trifida Labill.
Lepidosperma brunonianum Nees
Lepidosperma drummondii Benth.
Lepidosperma pubisquameum Stuedel
Lepidosperma viscidum R. Br.
Schoenus curvifolius (R. Br.) Benth.
Tetraria capillaris (R. Muell.) J. Black

DASYPOGONACEAE

Lomandra effusa (Lindley) Ewart
Lomandra rupestris (Endl.) Ewart (121)

HAEMODORACEAE

Anigozanthos humilis Lindley
Conostylis aculeata R. Br.
Conostylis seorsiflora F. Muell. var. seorsiflora Hopper (318)
Conostylis setigera R. Br.

IRIDACEAE

Homeria miniata (Andrews) Sweet
Orthrosanthus laxus (Endl.) Benth. var. laxus (405)
Patersonia occidentalis R. Br.
Romulea rosea (L.) Ecklon (17)

JUNCAGINACEAE

Triglochin ?procera R. Br. (406)

ORCHIDACEAE

Caladenia deformis R. Br.
Caladenia denticulata Lindl. subsp. polychrama Hopper (367)
Caladenia dilatata R. Br. var. falcata W.H. Nicholls
Caladenia discoidea Lindley (366)
Caladenia doutche O. Sarg. (237)
Caladenia filamentosa R. Br. subsp. denticulata (368)
Caladenia flava R. Br.
Caladenia hirta Lindley
Caladenia latifolia R. Br. (400)
Caladenia menziesii R. Br. (399)
Caladenia roei Benth. (365)
Caladenia saccharata H.G. Reichb.
Diuris longifolia R. Br.
Elythranthera burnonis (Endl.) A.S. George
Orchidaceae sp. (93)
Prasophyllum macrostachyum R. Br. var. macrostachyum (392)
Pterostylis nana R. Br.
Pterostylis recurva Benth.

PHORMIACEAE

Dianella revoluta R. Br.
Stypandra glauca R. Br.

POACEAE

* Aira cupaniana Guss.
* Avena fatua L.
* Briza maxima L.
* Briza minor L.
* Ehrharta longiflora Sm.
* Hordeum glaucum Stued.
* Hordeum leporinum Link
* Lolium perenne L.
Neurachne alopecuroidea R. Br.
* Pentaschistis airoides (Nees) Stapf
* Polypogon monspelliensis (L.) Desf.
Stipa sp.
Stipa elegantissima Labill.
Stipa ?trichophylla Benth.

RESTIONACEAE

Alexgeorgea nitens (Nees) L. Johnson & B. Briggs
Lepidobolus chaetocephalus F. Muell.
Leptocarpus canus Lindley & Nees.
Loxocarya fasciculata (R. Br.) Benth.
Loxocarya flexuosa (R. Br.) Benth.
Loxocarya myrioclada Gilg.
Restio sphacelatus R. Br.

DICOTYLEDONAE

AIZOACEAE

Carpobrotus aequilaterus (Haw.) N.E. Br.
Disphyma crassifolium (L.) L. Bolus

APIACEAE

Trachymene pilosa Smith

ASTERACEAE

Actinobole uliginosum (A. Gray) H. Sichler (217)
Angianthus tomentosus Wendl. (223)
Arctotheca calendula (L.) Levyns
Blennospora drummondii A. Gray (241)
Brachycome bellidioides Steetz (358)
Brachycome billardierei Benth.
Brachycome ciliaris (Labill.) Less. (16)
Brachycome pusilla Steetz (101,134,311)
Cotula bipinnata Thunb. (4,204)
Cotula coronipifolia L. (395)
Craspedia glauca
Helichrysum lingleyi H. Eichler (100)
Helipterum corymbosum (A. Gray) Benth.
Helipterum gracile (A. Gray) Benth. (274,394)
Helipterum manglesii
Helipterum pygmaeum (DC.) Benth.
Hyalochlamys globifer A. Gray (204)
Hypochaeris glabra L.
Millotia tenuifolia Cass. (312)
Podolepis capillaris (Steetz) Diels (76)
Podolepis lessonii (Cass.) Benth. (271,344)
Podolepis tepperi (F. Muell.) D.A. Cooke (272)
Podotheca angustifolia (Labill.) Less. (393)
Podotheca gnaphalioides R.A. Graham (209,357)
Pogonolepis stricta Steetz (385)
Senecio sp. (137)
Senecio glossanthus (Sonder) Belcher (138)
Sonchus asper Hill subsp. nymanii
Sonchus tenerrimus L. (342)
Ursinia anthemoides (L.) Poiret
Waitzia acuminata Steetz (320)
Waitzia citrina (Benth.) Steetz

BORAGINACEAE

Halgania sp. (302A)

BRASSICACEAE

Brassica aff. tournefortii Gouan (193)
Lepidium rotundum (Desv.) DC. (199)

CASUARINACEAE

Allocasuarina huegeliana (Miq.) L. Johnson
Allocasuarina lehmanniana (Miq.) L. Johnson
Casuarina obesa Miq.

CHENOPODIACEAE

Atriplex acutibractea R. Anderson (5)
Atriplex exilifolia F. Muell.
Atriplex ?semibaccata R. Br.
Atriplex semibaccata R. Br. (83,136)
Enchylaena lanata Paul G. Wilson
Halosarcia indica (Willd.) Paul G. Wilson subsp. lutens Paul G. Wilson
Halosarcia ?lepidosperma Paul G. Wilson (139)
Halosarcia lepidosperma Paul G. Wilson
Halosarcia pergranulata (J. Black) Paul G. Wilson (8)
Rhagodia preissii subsp. preissii Moq. (164)
Sarcocornia ?quinqueflora (Bunge Ex Ung.-Sternb.) A.J. Scott (10,11)
Sclerolaena diacantha (Nees.) Benth. (172)

DILLENIACEAE

Hibbertia aff. inclusa Benth. (56 ,380)
Hibbertia rupicola (S. Moore) C. Gard.

DROSERACEAE

Drosera bulbosa Hook.
Drosera glanduligera Lehm.
Drosera macrantha Endl. subsp. macrantha Endl.
Drosera subhirtella Planchon
Drosera zonaria Planchon

EPACRIDACEAE

Astroloma aff. prostratum R. Br. (381)
Brachyloma concolor (F. Muell.) C. Gardner
Leucopogon ?oxycedrus Sonder (99)
Lysinema ciliatum R. Br.

GERANIACEAE

Erodium cygnorum Nees.
Pelargonium ?havlasae Domin.

GOODENIACEAE

Anthotium humile R. Br. (85)
Dampiera lavandulacea Lindley
Goodenia affinis Vriese (373)
Goodenia ?concinna Benth.
Goodenia tennella R. Br. (396)
Scaevola sp. (398)
Scaevola pulvinaris (E. Pritzel) Krause in Engl. (397)

GYROSTEMONACEAE

Gyrostemon subnudus (Nees.) Baillon.

LAMIACEAE

Prostanthera serpyllifolia (R. Br.) Briq.

LAURACEAE

Cassytha melantha R. Br.

LORANTHACACEAE

Amyema miraculosum (Miq.) Tieghem subsp. miraculosum Barlow.

MIMOSACEAE
Acacia sp. nov. (89)
Acacia acanthoclada F. Muell.
Acacia acuminata Benth.
Acacia erinacea Benth.
Acacia glaucoptera Benth.
Acacia heteroclita Meissner
Acacia lasiocarpa Benth. in Endl. var. bracteolata
Acacia lasiocarpa Benth. in Endl. var. sedifolia
Acacia pulchella R. Br. var. subsessilis
Acacia saligna (Labill.) H.L. Wendl.

MYOPORACEAE

Eremophila aff. kochii

MYRTACEAE

Astartea fascicularis (Labill.) DC.
Baeckea preissiana (Schauer) Domin.
Callistemon phoeniceus Lindley
Calothamnus preissii Schauer. (361)
Calytrix flavescens Cunn.
Calytrix lechenaultii (Schauer) Benth.
Calytrix tetragona Labill.
Darwinia diosmoides (DC.) Benth.
Eremaea pauciflora (Endl.) Druce
Eucalyptus anceps (R. Br. ex Maiden) Blakely
Eucalyptus annulata Benth.
Eucalyptus celastroides Turcz.
Eucalyptus ?incrassata Labill.
Eucalyptus longicornis (F. Muell.) F. Muell. ex Maiden
Eucalyptus loxophleba Benth.
Eucalyptus occidentalis Endl.
Eucalyptus platypus Hook.
Eucalyptus redunca (KW)
Eucalyptus rudis Endl.
Eucalyptus spathulata Hook.
Eucalyptus wandoo Blakely
Eucalyptus xanthonema Turcz.
Kunzea ericirolia (Smith) Heynh.
Kunzea jucunda Diels
Kunzea preissiana Schauer
Leptospermum erubescens Schauer
Melaleuca sp. nov. (124)
Melaleuca sp. nov. (42,167)
Melaleuca acuminata
Melaleuca lateriflora
Melaleuca laxiflora

MYRTACEAE (cont)

Melaleuca ?pentagona (407)
Melaleuca spicigera
Melaleuca uncinata
Verticordia sp. (250)
Verticordia acerosa
Verticordia insignis
Verticordia plumosa (Desf.) Bruce var. brevifolia

OXALIDACEAE

Oxalis corniculata L.

PAPILLIONACEAE

Bossiaea aff. peduncularis Turcz. "Yellow flowered form"
Bossiaea peduncularis Turcz.
Daviesia brevifolia
Dillwynia uncinata (Turcz.) J. Black
Gastrolobium crassifolium Domin.
Isotropis ?cuneifolia (Smith) Benth. (370)
Jacksonia furcellata (Bonpl.) DC.
Lupinus albus L.
Oxylobium parviflorum Benth.
Templetonia sulcata
Trifolium campestre Schreber

PITTOSPORACEAE

Billardiera ?bicolor (Putterl.) E.M. Bennett
Pittosporum phylliraeoides DC.

POLYGALACEAE

Comesperma scoparium Steetz.
Comesperma volubile Labill. (221)

PORTULACACEAE

Caladrinia eremaea Ewart (103)

PRIMULACEAE

Anagallis arvensis L. var. caerulea

PROTEACEAE

Banksia attenuata R. Br.
Banksia prionotes Lindley
Conospermum bracteosum Meissner (54)
Conospermum floribundum (402)
Conospermum stoechadis Endl.
Conospermum triplinervium R. Br.
Cryandra calophylla R. Br. (378)
Cryandra nivea (Labill.) R. Br.
Grevillea tridentifera (Endl.) Meissner (94)
Grevillea sparsiflora F. Muell. (240)
Hakea lissocarpha R. Br.
Hakea obliqua R. Br.
Hakea preissii Meissner
Hakea prostrata R. Br.
Hakea varia R. Br. (MG)

PROTEACEAE (cont)

Isopogon buxifolius R. Br.
Petrophile ericifolia R. Br.
Petrophile longifolia R. Br.
Petrophile squamata R. Br.
Synaphea sp. (40)

RHAMNACEAE

Cryptandra pungens Stuedel

RUBIACEAE

Opercularia vaginata Labill (359)

RUTACEAE

Boronia ramosa (58)

SANTALACEAE

Exocarpus aphyllus R. Br.
Santalum acuminatum (R. Br.) A. DC.

SAPINDACEAE

Dodonaea viscosa Jacq. (245)

SOLANACEAE

Solanum nigrum L. (MG)

STACKHOUSIACEAE

Stackhousia monogyna Labill.

STERCULIACEAE

Lasiopetalum rosmarinifolium (Turcz.) Benth.
Thomasia aff. rugosa Turcz. (289)

STYLIDACEAE

Stylidium bulbiferum Benth.
Stylidium petiolare Sonder
Stylidium piliferum subsp. minor R. Br.

THYMELAEACEAE

Pimelea brachyphylla Benth.
Pimelea argenta Meissner

APPENDIX 2

SPECIES LISTINGS BY SITE

SITE 1

Anagallis arvensis
Arctotheca calendula
Atriplex ?semibaccata
Carpobrotus aequilaterus
Chaemascilla corymbosa
Disphyma crassifolium
Erodium cygnorum
Eucalyptus ?annulata
Isodenia concinna
Helipterum gracile
Helipterum pygmaeum
* Hordeum glaucum
* Hypochaeris glabra
Melaleuca sp (142)
Melaleuca lateriflora
Podolepis lessonii
* Romulea rosea
* Ursinia anthemoides

SITE 2

Brachycome pusilla
Caladenia flava
Caladenia hirta
Calytrix lechenaultii
Calytrix tetragona
Chaemascilla corymbosa
Disphyma crassifolium
Drosera glanduligera
Drosera subhirtella
Eucalyptus wandoo
Lahnia trifida
* Geranium ?havlasae
Leptospermum erubescens
Lomandra effusa
Loxocarya myrioclada
Melaleuca pentagona
Neurachne alopecuroides
Oxylobium parviflorum
* Ursinia anthemoides
Waitzia citrina

SITE 3

Halosarcia lepidosperma
Halosarcia pergranulata

SITE 4

Brachyloma concolor
Calytrix lechenaultii
Cryptandra pungens
Drosera subhirtella
Drosera zonaria
Eremaea pauciflora
Hakea obliqua
Kunzea jucunda
Kunzea preissii
Lepidobolus chaetocephalus
Lepidosperma pubisquameum
Leptospermum erubescens
Loxocarya cinerea
Leucopogon ?oxycedrus
Melaleuca ?pentagona
Petrophile ericifolia
Stylidium bulbiferum
Tetraria capillaris
Verticordia acerosa

SITE 5

Acrya laciniata
Calytrix lechenaultii
Drosera zonaria
Hibbertia trifida
Hypochaeris glabra
Kunzea preissii
Lepidobolus chaetocephalus
Loxocarya myrioclada
Melaleuca ?pentagona
Thysanotus patersonii
* Ursinia anthemoides

SITE 6

Calothamnia sp
Melaleuca sp
Melaleuca lateriflora

SITE 7

Acacia sp nov (89)
Anthocercis miraculosum subsp miraculosum
Caladenia saccharata
Drosera glanduligera
Drosera macrantha
Eucalyptus calycogona
Eucalyptus spathulata
Hypochaeris glabra
Lepidosperma brunonianum
Lepidosperma viscidum
Lomandra effusa
Melaleuca lateriflora
Melaleuca uncinata
Oxylobium parviflorum
Prostanthera serpyllifolia
Pterostylis recurva
Santalum acuminatum
* Ursinia anthemoides

SITE 8

Eucalyptus ?annulata
Halosarcia indica
Halosarcia lepidosperma
Melaleuca acuminata
Melaleuca lateriflora

SITE 9

Cotula coronopifolia
Halosarcia indica
Halosarcia lepidosperma
Melaleuca sp
Melaleuca lateriflora
Melaleuca aff vimenea/hamulosa

SITE 10

Anagallis arvensis
Arctotheca calendula
Atriplex ?semibaccata
Chaemascilla corymbosa
Eucalyptus ?annulata
Goodenia concinna
* Homeria miniata
* Hypochaeris glabra
Melaleuca lateriflora
Podolepis manglesii
* Ursinia anthemoides

SITE 11

Anagallis arvensis
Chaemascilla corymbosa
Disphyma crassifolium
Goodenia concinna
Homeria miniata
* Hypochaeris glabra
Melaleuca lateriflora
Podolepis capillaris
* Romulea rosea
Stackhousia monogyna

SITE 12

Bulbine semibarbata
Disphyma crassifolium
Halosarcia lepidosperma
Melaleuca lepidosperma
Melaleuca lateriflora
Pterostylis nana
Trifolium campestre

SITE 13

Brachycome pusilla
Eucalyptus stathulata
Halosarcia indica
Melaleuca acuminata
Melaleuca lateriflora
* Ursinia anthemoides

SITE 14

Caladenia flava
Eucalyptus anceps
Eucalyptus spathulata
Lepidosperma brunonianum
Lepisosperma viscidum
Melaleuca acuminata
Melaleuca uncinata
Prostanthera recurva
Pterostylis recurva
* Ursinia anthemoides
Waitzia acuminata
Waitzia citrina

SITE 15

* Anagallis arvensis
Blennospora drummondii
Bulbine semibarbata
Melaleuca acuminata
Melaleuca lateriflora
* Romulea rosea

SITE 16

* Arctotheca calendula
Brachycome pusilla
Erodium cygnorum
Eucalyptus phaenophylla
Eucalyptus spathulata
Eucalyptus wandoo
* Hypochaeris glabra
Leptospermum erubescens
Lomandra effusa
Loxocarya cinerea
Melaleuca uncinata
* Ursinia anthemoides

SITE 17

Acacia sp (89)
* Anagallis arvensis
Brachycome pusilla
Calytrix lechenaultii
Drosera glanduligera
Drosera zonaria
Eucalyptus loxophleba
Grevillea biternata
Hibbertia rupicola
Lepidobolus chaetocephalus
Lepidosperma pubisquameum
Leptospermum erubescens
Loxocarya cinerea
Melaleuca ?pentagona
Neurachne alopecuroidea
Santalum acuminatum
* Ursinia anthemoides
Waitzia citrina

SITE 18

Arctotheca calendula
Cotula bipinnata
Disphyma crassifolium
Halosarcia lepidosperma
Melaleuca sp (282)
Melaleuca lateriflora
Melaleuca uncinata

SITE 19

Alexgeorgea nitens
Allocasuarina huegeliana
Banksia attenuata
Banksia prionotes
Briza maxima
Caladenia flava
Conostylis aculeata
Conostylis soersiflora
Hakea prostrata
Hibbertia rupicola
* Hypochaeris glabra
Jacksonia furcellata
* Ursinia anthemoides
Waitzia acuminata
Waitzia citrina

SITE 20

Alexgeorgea nitens
Allocasuarina huegeliana
Banksia attenuata
Banksia prionotes
Blennospora drummondii
Caladenia flava
Drosera zonaria
Eucalyptus loxophleba
Jacksonia furcellata
Podolepis manglesii
Santalum acuminatum
* Ursinia anthemoides
Waitzia acuminata
Waitzia citrina

SITE 21

Acacia acuminata
Allocasuarina huegeliana
Brachycome pusilla
Caladenia flava
Caladenia hirta
Caladenia latifolia
Eucalyptus loxophleba
Podolepis capillaris
Podotheca angustifolia
Podotheca gnaphalioides
* Ursinia anthemoides
Waitzia acuminata
Waitzia citrina

SITE 22

Allocasuarina huegeliana
Anagallis arvensis
Blennospora drummondii
Brachycome pusilla
Conospermum bracteosum
Conostylis aculeata
Eremaea pauciflora
Hakea prostrata
Hypochaeris glabra
Kunzea vestita
Lepidobolus chaetocephalus
Leptospermum erubescens
Lomandra rupestris
Loxocarya cinerea
Loxocarya fasciculata
Millotia tenuifolia
Waitzia acuminata
Waitzia citrina

SITE 23

Acacia acuminata
Allocasuarina huegeliana
Caladenia flava
Caladenia roei
Calytrix lechenaultii
Carpobrotus aequilaterus
Conostylis seorsiflora var seorsiflora
Erodium cygnorum
Eucalyptus wandoo
Grevillea tridentifera
* Hypochaeris glabra
Lepodobolus chaetocephalus
Lomandra effusa
Loxocarya cinerea
Neurachne alopecuroides
Trachymene pilosa
Waitzia acuminata
Waitzia citrina

SITE 24

Alexgeorgea nitens
Banksia prionotes
Bossiaea ?peduncularis (yellow flowered)
Caladenia doutche
Caladenia flava
Calytrix lechenaultii
Conospermum stoechadis
Conostylis seorsiflora
Hibbertia rupicola
* Hypochaeris glabra
Lepidobolus chaetocephalus
Trachymene pilosa
* Ursinia anthemoides
Waitzia acuminata
Waitzia citrina

SITE 25

Acacia acuminata
Anagallis arvensis
Baumea juncea
Brachycome pusilla
Callistemon phoeniceus
Chamaescilla corymbosa
Conostylis aculeata
Erodium cygnorum
Eucalyptus wandoo
* Hypochaeris glabra
Melaleuca sp (324)
Melaleuca uncinata
Neurachne alopecuroidea
Trifolium campestre
* Ursinia anthemoides
Waitzia citrina

SITE 26

Arctotheca calendula
Atriplex semibaccata
Bulbine semibarbata
Casuarina obesa
Calandrinia eremaea
Cotula bipinnata
Disphyma crassifolium
Halosarcia lepidosperma
Halosarcia pergranulata
Hordeum glaucum
* Hypochaeris glabra
Melaleuca sp (324)
Melaleuca uncinata

SITE 27

Baumea juncea
Brachycome pusilla
Callistemon phoeniceus
Eucalyptus occidentalis
Hypochaeris glabra
Melaleuca sp (324)
Melaleuca uncinata
Senecio glossanthus
* Ursinia anthemoides
Waitzia citrina

SITE 28

Baumea juncea
Callistemon phoeniceus
Eucalyptus occidentalis
Eucalyptus wandoo
Melaleuca sp (324)
Melaleuca sp (327)
Melaleuca sp (338)

SITE 29

Anagallis arvensis
Baeckea preissiana
Banksia attenuata
Brachycome pusilla
Brachyloma concolor
Conospermum stoechadis
Eremaea pauciflora
Hakea corymbosa
Hibbertia ?indica
Hypochaeris glabra
Kunzea jucunda
Lepidospermum pubesquameum
Leptospermum erubescens
Loxocarya flexuosa
Neurachne alopecuroidea
Petrophile ericifolia
Podotheca gnaphalioides
Pterostylis recurva
Santalum acuminatum
* Ursinia anthemoides
Waitzia citrina

SITE 30

Anigozanthos humilis
Astroloma aff prostratum
Banksia attenuata
Brachycome pusilla
Caladenia discoidea
Caladenia flava
Calandrinia eremaea
Calytrix flavescens
Calytrix lechenaultii
Conospermum stoechadis
Conostylis aculeata
Drosera zonaria
Eremaea pauciflora
Gastrolobium peduncularis
Hakea corymbosa
Hibbertia rapicola
Lepidosperma pubesquameum
Leptospermum erubescens
Lomandra rupestris
Meleleuca sp (338)
Neurachne alopecuroidea
Podotheca gnapialioides
Schoenus curvifolius
Waitzia citrina

SITE 31

Alexgeorgea arenicola
Allocasuarina huegeliana
Anigozanthos humilis
Banksia prionotes
Brachycome pusilla
Caladenia flava
Millotia tenuifolia
Trachymene pilosa
* Ursinia anthemoides
Waitzia citrina

SITE 32

* Anagallis arvensis
* Arctotheca calendula
* Briza minor
* Bulbine semibarbata
* Cotula bipinnata
Eucalyptus loxophleba
Gahnia trifida
Halosarcia lepidosperma
* Homeria miniata
Melaleuca sp (324)
Melaleuca sp (340)

SITE 33

Acacia acuminata
Acacia erinaceae
* Anagallis arvensis
Blennospora drummondii
Caladenia filamentosa var denticulata
Chamaescilla corymbosa
Dampiera lavendulaceae
Eucalyptus longicornis
Eucalyptus wandoo
* Hypochaeris glabra
Lomandra effusa
Neurachne alopecuroides
Pimelea argenta
Podolepis capillaris
Podotheca gnaphalioides
Podotheca pygmaea
Rhagodia preissii
Sowerbaea laxiflora
Trachymene pilosa
* Ursinia anthemoides
Waitzia acuminata

SITE 34

Baumea juncea
Casuarina obesa
Eucalyptus occidentalis
Melaleuca sp (350)
Melaleuca sp (374)
Melaleuca lateriflora
Melaleuca uncinata

SITE 35

* Anagallis arvensis
* Arctotheca calendula
* Cotula bipinnata
Halosarcia lepidosperma
Halosarcia pergranulata
Helipterum gracile
Melaleuca sp (350)
Rhagodia preissii
* Ursinia anthemoides

SITE 36

Casuarina obesa
Halosarcia lepidosperma
Halosarcia pergranulata
Melaleuca uncinata
Sarcocornia ?quinqueflora

SITE 37

Baumea juncea
Casuarina obesa
Eucalyptus occidentalis
Eucalyptus rudis
Leptocarpus canus
Melaleuca sp (349)
Melaleuca sp (350)
Melaleuca acuminata
Melaleuca uncinata

SITE 38

Arctotheca calendula
Brachycome pusilla
Eucalyptus phaenophylla
Eucalyptus spathulata
Eucalyptus xanthonema
Gahnia trifida
Hyalochlamys globifer
Lepidosperma pubesquameum
Melaleuca sp (351)
Melaleuca acuminata
Melaleuca uncinata
* Ursinia anthemoides

SITE 39

Baumea juncea
Callistemon phoeniceus
Eucalyptus occidentalis
Eucalyptus wandoo
Melaleuca sp (324)
Melaleuca sp (350)
Melaleuca uncinata

SITE 40

Anigozanthos humilis
Brachycome pusilla
Caladenia flava
Calytrix lechenaultii
* Hypochaeris glabra
Leptospermum erubescens
Loxocarya flexuosa
Neurachne alopecuroidea
Trachymene pilosa
* Ursinia anthemoides
Waitzia citrina

SITE 41

Banksia prionotes
Brachycome pusilla
Calytrix lechenaultii
Caustis dioica
Conostylis aculeata
Eremaea pauciflora
Gastrolobium peduncularis
Leptospermum erubescens
Lomandra rupestris
Melaleuca sp
Neurachne alopecuroidea
Petrophile ericifolia
* Ursinia anthemoides

SITE 42

Casuarina obesa
Eucalyptus occidentalis
Halosarcia indica
Halosarcia pergranulata
Melaleuca sp (324)

SITE 43

Acacia acuminata
* Arctotheca calendula
* Avena fatua
* Erharta longifolia
Erodium cygnorum
* Hordeum glaucum
* Hordeum leporinum
* Lolium perenne

SITE 44

Callistemon phoeniceus
* Cotula bipinnata
Gahnia trifida
Halosarcia pergranulata
Helipterum gracile
Melaleuca sp
Melaleuca sp (147)
Melaleuca lateriflora
Melaleuca uncinata

SITE 45

Anigozanthos humilis
Banksia prionotes
Brachycome pusilla
Calytrix lechenaultii
Caustis dioica
Dianella revoluta
Dryandra nivea
Eremaea pauciflora
Hakea obliqua
Kunzea preissii
Leptospermum erubescens
Lomandra rupestris
Melaleuca pentagona
Neurachne alopecuroidea
Petrophile ericifolia
Trachymene pilosa
* Ursinia anthemoides
Waitzia acuminata
Waitzia citrina

SITE 46

Casuarina obesa
Cotula coronopifolia
Eucalyptus occidentalis
Gahnia trifida
Halosarcia lepidosperma
Halosarcia pergranulata
Melaleuca sp (269)
Melaleuca acuminata
Melaleuca uncinata

SITE 47

* Anagallis arvensis
Atriplex ?semibaccata
* Briza maxima
* Briza minor
Calandrinia eremaea
* Cotula bipinnata
Erodium cygnorum
Eucalyptus loxophleba
Gahnia trifida
Helipterum gracile
* Hypochaeris glabra
Lepidium ?rotundum
Lomandra effusa
Neurachne alopecuroidea
Sclerolaena diacantha
Senecio tenneremus
Stipa ?trichophylla
Thysanotus patersonii
* Ursinia anthemoides

SITE 48

Casuarina obesa
Eucalyptus occidentalis
Halosarcia lepidosperma
Halosarcia pergranulata
Melaleuca sp (13, 14)
Sarcocornia ?quinqueflora

SITE 49

Melaleuca sp (13)

VEGETATION & FLORA OF RESERVE NO'S 26020, 28552 & ADJOINING UNVESTED LAND LOC NOS 6904, 9270 BY MN LYONS, 1988.

SPECIES FROM ABOVE REPORT IN KATANNING HERBARIUM

Acacia acanthoclada (F)	1898
Acacia glaucoptera	1657
Acacia heteroclita	1812
Acacia lasiocarpa	1698, 1700
Acacia lineolata (F)	1811
Acacia microbotrya	1697
Acacia pulchella (F)	1699
Actinobole uliginosum (F)	1711
Aira cupaniana	1621
Allocasuarina huegeliana (F)	1774, 1654
Allocasuarina lehmanniana	1636
Amyema miraculosum ssp *miraculosum*	1627
Anagallis arvensis	1772
Angianthus tomentosus	1714
Anigozanthos ?humilis	1765
Anigozanthos humilis (F)	1706
Anigozanthos humilis forma lutea (F)	1893
Astartea fascicularis (F)	1901
Atriplex sp	1719
Atriplex acutibractea	1771
Atriplex exilifolia	1905
Atriplex ?semibaccata	1907
Baeckea leptophylla (F)	1666
Baeckea preissiana (F)	1640
Billardiera ?bicolor	1749
Blennospora drummondii (F)	1709
Boronia ramosa (S)	1661
Borya laciniata (F)	1777
Borya sphaerocephala (F)	1685
Bossiaea peduncularis (F)	1743
Brachycome aff *bellidioides* (F)	1649
Brachycome billardierei (F)	1801
Brachycome ciliaris (F)	1798
Brachycome pusilla (F)	1800, 1731
Brachyloma concolor (F)	1693, 1705
Brassica tournefortii (F)	1668
Bulbine semibarbata (F)	1646
Caladenia deformis (F)	1736
Caladenia denticulata (F)	1828
Caladenia denticulata ssp *polychroma* (F)	1786
Caladenia dilatata var *falcata* (F)	1791
Caladenia discoidea (F)	1785
Caladenia doutchae (F)	1816
Caladenia filamentosa ssp *denticulata* (F)	1789
Caladenia flava (F)	1656
Caladenia hirta (F)	1686
Caladenia latifolia (F)	1790
Caladenia menziesii (F)	1782
Caladenia roei (F)	1788
Caladenia saccharata (F)	1754
Calandrinia eremaea (F)	1669
Calothamnus preissii (S)	1810

Calytrix flavescens (F)
Calytrix lechenaultii
Calytrix lechenaultii (F)
Calytrix tetragona (F)
Cassytha melantha 1739, 1768
Casuarina obesa 1766
Caustis dioica 1724
Conospermum bracteatum (F) 1659
Conospermum floribundum (F) 1628
Conospermum scoparium 1704
Conospermum triplinervium 1623
Conostylis aculeata (F) 1875, 1718
Conostylis soersiflora subsp *soersiflora* (F) 1715
* *Cotula bipinnata* (F) 1792
* *Cotula coronopifolia* (F) 1629
Craspedia sp nov 1647
Cryptandra pungens (F) 1683
Dampiera lavandulacea (F) 1680
Darwinia diosmoides (F) 1634
Dicrastylis velutina (F) 1864
Dillwynia uncinata (F) 1897
Diuris longifolia (F) 1784
Dodonaea viscosa 1663
Drosera bulbosa (F) 1689
Drosera glanduligera (F) 1691
Drosera micrantha (F) 1687
Drosera subhirtella (F) 1690
Dryandra calophylla 1681
Dryandra nivea 1763
Elythranthera brunonis (F) 1783
Enchylaena lanata 1902
Eremaea pauciflora (S) 1755
Eremophila kochii 1641
Erodium cygnorum (F) 1672
Eucalyptus anceps (S) 1911
Eucalyptus loxophleba 1684
Eucalyptus ?pheanophylla (S) 1912
Eucalyptus pheanophylla 1814
Exocarpos aphyllus 1658
Gahnia trifida 1752
Goodenia affinis (F) 1716
Goodenia calogynoides (F) 1679
Goodenia pulchella (F) 1869
Goodenia tenella 1622
Grevillea sparsiflora 1676
Grevillea tridentifera (F) 1735
Gyrostemon subnudus 1748
Hakea obliqua (F) 1756
Hakea prostrata (F) 1762
Halosarcia indica subsp *lutens* 1900
Helichrysum leucopsideum (F) 1867
Helichrysum lindleyi (F) 1778, 1732
Helipterum corymbosum (F) 1637
Helipterum cotula (F) 1861
Helipterum gracile (F) 1624
Helipterum manglesii (F) 1707, 1688
Helipterum pygmaeum (F) 1793
Hibbertia inclusa (F) 1692

Hibbertia rupicola (F)	1908
Hordeum glaucum	1695
Hyalochlamys globifer (F)	1909
Isopogon buxifolius (F)	1677
Isotoma hypercratiformis (F)	1863
Isotoma scapigera (F)	1901
Isotropis cuneifolia (F)	1899
Jacksonia furcellata	1747
Kunzea jucunda (F)	1807,1744,1639
Kunzea preissiana (F)	1757
Kunzea vestita	1775
Lasiopetalum rosmarinifolium (F)	1653
Laxmannia paleacea	1635
Lepidium sp (F)	1737
Lepidium rotundum (F)	1667
Lepidobolus chaetocephalus	1734
Lepidosperma brunonianum	1758
Lepidosperma aff *pubisquameum*	1738
Lepidosperma viscidum	1723
Leptocarpus canus	1729
Leptospermum erubescens (F)	1652
Leucopogon ?oxycedrus	1904
Leucopogon aff *prostratum*	1906
Lobelia alata (F)	1868
Lobelia heterophylla (F)	1862
Lomandra effusa (F)	1760, 1776
Lomandra rupestris	1742, 1741
Loxocarya cinerea	1722
Loxocarya fasciculata (F)	1662
Loxocarya myrioclada	1721
Lysinema ciliatum (F)	1660
Melaleuca aff *pentagona* (F)	1620
Millotia tenuifolia (F)	1712
Opercularia vaginata (F)	1795
Oxylobium parviflorum (F)	1673
Patersonia occidentalis	1733
Pelargonium ?havlasae	1643
Petrophile ericifolia (S)	1764
Petrophile squamata (F)	1682
Pimelea argentea (F)	1702
Pimelea brachyphylla (F)	1678
Podolepis capillaris (F)	1780
Podolepis lessonii (F)	1708
Podotheca angustifolia (F)	1630
Podotheca gnaphalioides	1648
Podotheca gnaphalioides (F)	1794
Pogonolepis stricta (F)	1710
Prasophyllum macrostachyum var *macrostachyum* (F)	1827
Prostanthera serpyllifolia subsp *microphylla*	1903
Pterostylis nana (F)	1750
Pterostylis recurva (F)	1753, 1787
Restio sphacelatus (F)	1720
Rhagodia preissii ssp *preissii* (F)	1642
Scaevola sp	1619
Scaevola pulvinaris	1638
Schoenus curvifolius	1725
Sclerolaena diacantha (F)	1730
Senecio ?glomeratus (F)	1674

Senecio glossanthus (F) 1675
Senecio ?quadridentatus (F) 1865
Sonchus tenerrimus (F) 1802
Sowerbaea laxiflora (F) 1631
Stackhousia monogyna 1703
Stackhousia monogyna (F) 1664
Stipa elegantissima 1696
Stipa trichophylla 1625
Stylidium bulbiferum 1671
Stylidium petiolare (F) 1717
Stylidium piliferum 1670
Stylidium piliferum (F) 1632
Stypandra glauca (F) 1726
Synaphea polymorpha (F) 1633
Thomasia rugosa (F) 1665
Thysanotus patersonii (F) 1803
Ursinia anthemoides 1767
Verticordia acerosa (F) 1808, 1701
Verticordia insignis (F) 1804
Verticordia plumosa (F) 1626
Verticordia plumosa var *brevifolia* (F) 1805
Verticordia sp 1770
Waitzia acuminata (F) 1713
Waitzia citrina (F) 1779, 1769
Waitzia paniculata (F) 1866