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Flora and vegetation of the Byenup-Muir reserve system, south-west Western Australia

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ABSTRACT

This study documents the high conservation values of Byenup-Muir reserve system in terms of both flora and diversity of plant communities recorded. A total of 976 taxa were recorded in 13 reserves; this included three species of Declared Rare Flora and 33 taxa on CALM's priority flora list. Structural vegetation mapping carried out in nine reserves showed a complex mosaic of more than 30 vegetation types. Comparison with oblique aerial photography taken in 1980 allowed qualitative changes in vegetation cover over 19 years to be described.

Eryngium sp. Lake Muir (*E. Wittwer* 2293) and *Tribonanthes* sp. Lake Muir (*GJK & NG* 2387) appear to be endemic taxa to the Byenup-Muir area. The Lake Muir Nature Reserve contains the only known populations of *Euphrasia scabra* and *Lilaeopsis polyantha* in WA. The Byenup-Muir wetland reserve system fulfils at least four criteria for listing as a wetland of international importance under the Ramsar Convention.

The major threats to conservation values of the reserve system identified were (1) increases in salinity resulting from drainage schemes and rising water table and (2) spread of dieback. Major changes in plant communities in many of the wetlands have occurred since 1980. These changes were not just confined to lake margins but also occurred in sumplands and damplands.

INTRODUCTION

The Byenup-Muir wetland complex covers a sequence of basin wetlands, swamps, seasonally wet flats and low sandy and occasionally lateritic rises in the south-west of Western Australia (WA). It is unusual in that this wetland complex is largely undisturbed and contains peat-based wetlands, which are very rare in WA (ANCA 1996; CALM 1998). The wetland complex is reserved in 13 separate nature reserves (Bokarup, Cobertup, Cowerup, Galamup, Kodjinup, Kulunilup, Lake Muir, Noobijup, Pindicup, Pinticup, Quindinup, Unicup and Yarnup) (Fig. 1; Gibson and Keighery 1999).

The broad plain on which most of the wetlands occur has had a complex geological history. The area was subject to several marine incursions while most of the soils are of Tertiary and Quaternary age and represent infilling of blocked paleodrainage systems (Wilde and Walker 1984; Chakravartula and Street 1999). Churchward *et al.* (1988) mapped landforms and soils south of Byenup Lagoon. The wetlands fell into their swampy terrain landform with Cambellup (plains with drainage floors, swamps and low rises) and Morande (lunettes, dunes, hummocks and intervening swamps) being the most common units. Chakravartula and Street (1999) have recently produced a more detailed soil interpretation from airborne radiometric data for the entire Muir and Unicup catchments.

Regional vegetation mapping at 1:250 000 scale was undertaken by Smith (1972) and at 1:1 000 000 scale by Beard (1981). The reserves fall mainly into Beard's Kwornicup vegetation system with the upland areas around Unicup Nature Reserve in the Jingalup vegetation system. The Jingalup uplands have extensive areas of lateritic capping and deeply dissected watercourses. Most of this system is dominated by eucalypt woodland with the creek lines dominated by *Eucalyptus rudis, Melaleuca cuticularis* and *M. viminea*. The more extensive Kwornicup system is characterized by a poorly-drained swampy plain between the headwaters of the Kent, Hay and Gordon Rivers. The vegetation is a mosaic of jarrah (*Eucalyptus marginata*)-marri (*E. calophylla*) forests, paperbark (*Melaleuca* spp.) low forest and reed swamps, with *E. decipiens* occurring on sandy swampy sites as the dominant or understorey species. Clay swamps usually contain stands of yate (*E. cornuta*) with an understorey of *Melaleuca cuticularis* and *M. violacea* while sandy swamps may have dense stands of *Melaleuca cuticularis* grading into reed swamps (Beard 1981).

The broad scale vegetation mapping gives little indication of the degree of patterning or the array of plant communities found in the area. More detailed information is available for three of the nature reserves: Kulunilup, Unicup and Yarnup (Griffin 1984). In his report Griffin described 24 vegetation associations ranging from upland lateritic jarrah communities to shrublands and sedgelands of the wet flats, and commented on the gradational nature of the vegetation with the complex mosaic apparently related to soil type, moisture status and salinity.

The aim of the present work was to compile species lists for all 13 reserves, to map the nine wetland reserves for which detailed vegetation information is lacking, and to provide a qualitative assessment of vegetation change over 19 years using oblique aerial photography taken in 1980.

METHODS

Vegetation and Flora

Structural vegetation mapping was undertaken for Bokarup, Cobertup, Cowerup, Galamup, Kodjinup, Lake Muir, Noobijup, Pindicup, Pinticup Nature Reserves using 1:25 000 stereo colour aerial photographs (WA3619 – 23.x.95) (Fig. 1). Structural units were mapped then field-checked by traverses of external boundaries and internal tracks. The Lake Muir Reserve is over 11 000 ha and much is inaccessible by vehicle: mapping units in this reserve were checked by air. Vegetation units were found to occur in complex mosaics, and broad units similar to those used by Griffin (1984) were adopted.

For each reserve detailed flora lists were compiled. The lists for Lake Muir and Cowerup Nature Reserves are considered preliminary because of the large size in the case of Lake Muir and lack of sampling of annuals in Cowerup. The mapping and flora survey was undertaken during five field trips in spring, summer and autumn from 1997 to 1999. Over 800 voucher collections have been lodged in the Western Australian Herbarium. Nomenclature generally follows Green (1985) and current usage at the Western Australian Herbarium (ms indicates manuscript name, * indicates an introduced taxon).

Current vegetation patterns and aerial photographs were compared with oblique aerial photography of many of the reserves taken by J.A.K. Lane in 1980. This allowed a qualitative assessment of vegetation change within the reserves over the last 19 years.

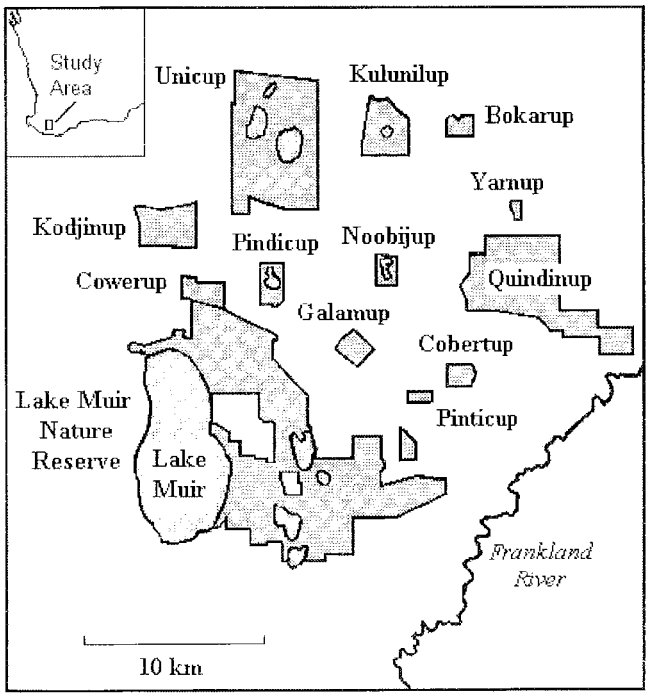

Figure 1. Location map showing the 13 reserves that make up the Byenup-Muir reserve system.

RESULTS AND DISCUSSION

Flora

Reserve summaries, new vegetation mapping and flora lists for the 13 reserves of the Byenup-Muir wetland system are given in Appendix 1. A total of 976 taxa were recorded from the 13 reserves (Appendix 2), of these 862 were native and 114 were introduced. The most species-rich native families were the Orchidaceae (70 taxa), Cyperaceae (65 taxa), Myrtaceae (60 taxa), Proteaceae and Papilionaceae (52 taxa), Asteraceae (50 taxa) and Stylidiaceae (36 taxa). The families with the most introduced taxa were Poaceae (22 taxa), Asteraceae (18 taxa) and the Papilionaceae (12 taxa).

During the survey three taxa listed as Declared Rare Flora (DRF) were recorded from the area, as were 33 taxa listed on CALM's priority flora list (Atkins 1998; Table 1). This is a considerable increase in the number of priority flora previously reported (three DRF and four priority species–CALM 1998).

This is a rich flora for such a small area: it is more than 10 per cent of that recorded for the south-west, about half that recorded for Fitzgerald River National Park (Newbey and McQuoid 1997) and more than that known for Lesueur National Park (Griffin *et al.* 1990). Both the latter areas are major centres of biodiversity in south-west WA (Table 2). The reasons for such diversity in the Byenup-Muir area probably relate to complexes of soil types and hydrological patterns (both local and regional) found over short distances relating to the blockage of major drainage patterns during the Tertiary and subsequent infilling of the plain (Chakravartula and Street 1999). The complex of vegetation patterning is also related to these patterns (particularly period of inundation, and quality of ground water) as well as fire history, although much detailed work would be required to demonstrate these correlations.

TABLE 1

Rare and priority flora recorded from the Byenup-Muir wetland reserves (DRF = Declared Rare Flora, 1–4 = priority flora listing—after Atkins 1998)

TAXON	PRIORITY LISTING
Amphibromus vickeryae	1
Anthotium junciforme	4
Apodasmia ceramophila ms	2
Caladenia christineae ms	DRF
Caladenia harringtoniae ms	DRF
Caladenia starteorum ms	2
Caustis sp. Boyanup (*G.S. McCutcheon* 1706)	1
Diuris drummondii	DRF
Dryandra porrecta	4
Eryngium sp. Lake Muir (*E. Wittwer* 2293)	1
Eucalyptus aspersa	4
Eucalyptus latens	4
Euchiton gymnocephalus	3
Euphrasia scabra	2
Gratiola pedunculata	2
Hibbertia silvestris	4
Hydatella australis	1
Jacksonia sparsa ms	3
Leucopogon lasiophyllus	2
Leucopogon tamariscinus	2
Lilaeopsis polyantha	2
Melaleuca pritzelii	2
Opercularia rubioides	2
Phyllangium palustre	2
Pithocarpa corymbulosa	2
Pterostylis turfosa	1
Rhodanthe pyrethrum	3
Schoenus benthamii	3
Schoenus capillifolius	2
Schoenus loliaceus	2
Schoenus natans	4
Stylidium lepidum	3
Stylidium mimeticum	3
Stylidium rhipidium	1
Synaphea decumbens	1
Tribonanthes sp. Lake Muir (*GJK & NG* 2387)	Recommended P4
Villarsia submersa	4

TABLE 2

Comparison of species richness of the Byenup-Muir wetland reserves with Fitzgerald River National Park and Lesueur National Park.

	AREA (ha)	NUMBER OF TAXA RECORDED
13 Byenup-Muir wetland reserves	19 888	976
Fitzgerald River National Park	329 000	1883
Lesueur National Park	26 978	821

The area was remarkable for the number of threatened or poorly known taxa recorded (Table 1). Of particular note were *Euphrasia scabra, Lilaeopsis polyantha, Schoenus natans, Eryngium* sp. Lake Muir (*E Wittwer* 2293), and *Tribonanthes* sp. Lake Muir (*GJK & NG* 2387).

Euphrasia scabra and *Lilaeopsis polyantha* are known in WA only from the Byenup-Lake Muir area. *E. scabra* was widespread in the eastern States but is now considered extinct in New South Wales and South Australia, many populations in Victoria and Tasmania have disappeared and the remaining ones are declining badly (Thompson 1992; Gilfedder and Kirkpartick 1995; Gilfedder and Kirkpatrick 1997). Two large populations of this taxon were located during the course of this work, both appear in good health.

Schoenus natans is an aquatic sedge that was believed to be extinct until it was rediscovered on the Swan Coastal Plain in the early 1990s when it was listed as Declared Rare Flora (Keighery and Keighery 1996). It was subsequently found in a number of clay-based wetlands on the plain and the adjacent Darling Scarp. During the present survey large populations of this taxon were found in five of the nature reserves. This taxon was subsequently taken off the DRF list.

Two taxa appear to be endemic to the Byenup-Muir wetland reserves: *Eryngium* sp. Lake Muir (*E. Wittwer* 2293), and *Tribonanthes* sp. Lake Muir (*GJK & NG* 2387). Both taxa occur on winter-wet clay flats. While the *Eryngium* has been recognized for some time the *Tribonanthes* appears to be a previously unrecognized taxon. It is recommended that it be listed on CALM's priority flora list as a Priority 4 taxon, given its widespread occurrence in clay wetlands within the reserve system.

Vegetation

More than 30 different structural vegetation units were used to map nine nature reserves. The general pattern found was that of complex mosaics and gradational change as previously reported by Griffin (1984). Initially mapping was undertaken using the same map units as earlier mapping of Unicup, Kulunilup and Yarnup Nature Reserves (Griffin 1984). It was found that some of these units were too heterogenous to map reliably. Final map units chosen are generally comparable with the earlier work and correlations are made in relevant sections of Appendix 1.

Major vegetation patterning appears to be related to soil type, period of inundation, quality and type of ground water, and fire history. The complex hydrology of the area is evident in reserves such as Unicup where saline and freshwater plant communities occur on the same wetland. The occurrence of a patch of *Baumea articulata* on the eastern side of Little Unicup in an otherwise saline lake implies the occurrence of a freshwater spring (Froend and McComb 1991). Similar patterning is seen in other lakes in Unicup and Pindicup Nature Reserves. In both these reserves saline wetlands (presumably in contact with saline ground water) and freshwater wetlands (presumably fed by perched aquifers) can occur within very short distances of each other.

Considerable change in vegetation communities can be noted since J.A.K. Lane took a series of oblique aerial photographs of many of the reserves in 1980. These changes have not been restricted to the margins of the basin wetlands but also affect damplands and sumplands (primarily wet heath communities).

Of the 10 basin wetlands dominated by *Baumea* sedgeland photographed in 1980 five (Cobertup, Kulunilup, Pindicup, Pinticup and Yarnup) show no obvious change when compared with recent aerial photographs. In three wetlands (Galamup, Kodjinup, and Noobijup) the density of the *Baumea* appears to have dropped but the area of open water shows little change. At Bokarup Swamp the cover of *Baumea* sedgeland has decreased by about 50 per cent. Associated with this dramatic change is the almost complete replacement of a *Melaleuca lateritia* wet heath in the eastern wetland by open water. The 1980 photographs show the wet heath beginning to die from the centre of the wetland suggesting that a rise in water table rather than fire has precipitated this change (Fig. 2).

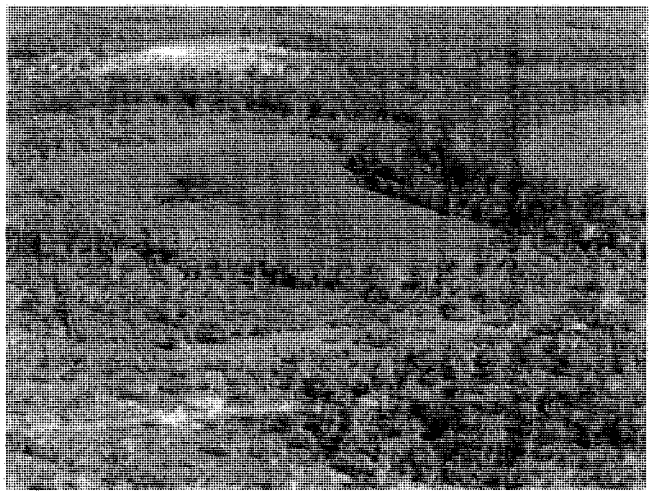

Figure 2. A view looking south across the eastern wetland in Bokarup Nature Reserve taken in 1980. Note the death of the wet heath in the centre of the wetland. By 1999 the wet heath had been relaced by open water except for a narrow band on the eastern boundary. (Photo JAK Lane).

Lane's 1980 photography of Byenup Lagoon shows extensive areas of *Baumea* sedgeland in good condition interspersed by small patches of open water and clumps of *Melaleuca* forming small 'islands'. The October 1995 aerial photography appears to show most of the *Baumea* on the western and north-eastern side to be an orange colour, which is indicative of stress. None of the other *Baumea* sedgelands in the Byenup-Muir wetlands shows this pattern on this series of air photographs. Recent aerial inspections of the wetland (January 1999) indicate the *Baumea* no longer appears stressed but does appear to be less dense in some areas. Salinity levels reached an 8-year peak (and water levels an 8-year low) in Byenup Lagoon in 1995 (J.A.K. Lane[1] personal communication). It would be instructive to compile a time sequence of photographs covering the period 1985–1999 to determine whether the health of the *Baumea* sedgeland of Byenup Lagoon is correlated with salinity levels.

The seasonally inundated clay flats (sumplands) on the west side of Noobijup Nature Reserve also show severe impacts of a rising saline water table dating from 1980. In the 1980 photographs much of the private property on the eastern side of Noobijup had just been cleared and the wet clay flats were in excellent condition. Subsequent hydrological changes have resulted in significant death of both the tree and understorey layers over an extensive area in the reserve. Urgent remedial action is required to stop these impacts in the highly diverse Noobijup clay flats communities.

A salt scald has also developed on the west side of Yarnup Nature Reserve since 1980. Halse *et al.* (1993) report that this was first observed about 1988. Surprisingly, the October 1995 aerial photography shows no obvious change since 1980 in the density of the *Baumea* sedgeland in this reserve.

The observed changes seen in the *Baumea* sedgelands and wet heath communities are consistent with increases in salinity and/or water table depth (Froend and McComb 1991). The comparison of aerial photography is imprecise and subtle changes may not be apparent from these comparisons. What is clear is that there has been significant change to a number of the wetlands since 1980 and in all cases this change has been toward wetland degradation.

Significant degradation has also occurred on the *Banksia ilicifolia* woodlands (damplands) in Kodjinup Nature Reserve since 1993 as the result of installation of an approved drain (CALM 1998; Appendix 2). The drain, constructed through the central part of the reserve, has caused massive deaths of *Banksia ilicifolia* woodland and associated heath species as a result of *Phytophthora* (dieback) spread. This impact is being monitored by a series of photopoints (22 March 1997) laid along a 50-m transect perpendicular to the drain. Changes in inundation owing to drain construction have also resulted in death to small areas of jarrah woodland. The northern (upslope) section of the drain was constructed through what appear to be areas of old dieback infections.

[1] J.A.K.Lane, CALM, Busselton.

The nature conservation values of Kodjinup Nature Reserve have been severely compromised by the construction of this drain. It is clear that detailed biological and dieback assessments should be made in the appropriate season before consideration is given to granting any approval to establish drains into any conservation reserve of the Byenup-Muir system. The dieback hazard of the low-lying areas of the Byenup-Muir reserves system should be considered moderate-to-high. Extensive areas of dead *Banksia ilicifolia* woodland were also observed along the Muir Highway and on the southern boundary of Kodjinup Nature Reserve.

Some degraded vegetation was mapped at the southern end of Lake Muir (Map 5). This was investigated during the aerial survey of the Lake Muir vegetation and appears to be an *Armillaria* infection. This needs to be investigated further.

CONCLUSIONS

The wetlands of the Byenup-Muir reserve system have very high conservation values in terms of total flora diversity, diversity of rare and priority taxa, and diversity of plant communities and their complex mosaic and gradational patterning. This study has shown that the flora of the area is not well known and with further survey work more species will be recorded, especially in Lake Muir Nature Reserve.

The Byenup-Muir wetland system is listed in the Directory of Important Wetlands in Australia (ANCA 1996) under Byenup Lagoon system (including 11 nature reserves) and Lake Muir listings. The flora and vegetation of the Byenup-Muir wetland system would meet at least four Ramsar Convention criteria for listing as Wetlands of International Importance (ANCA 1996). (*Criteria 1a* – it is a particularly good representative example of natural or near natural wetland, characteristic of the appropriate biogeographical region; *Criteria 1d* – it is an example of a specific type of wetland, rare or unusual in the appropriate biogeographical region; *Criteria 2a* – it supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more of these species; *Criteria 2d* – it is of special value for one or more endemic plant or animal species or communities.)

There has been significant degradation of some of the wetland areas in the Byenup-Muir system since 1980. The degradation has generally resulted from changes in the hydrological regime or as a result of dieback. Changes in the hydrological regime have resulted from a rising water table, presumably as a consequence of land clearance, or of drainage works. The spread of dieback is correlated with drainage and road works.

The impacts of dieback spread in Kodjinup Nature Reserve since 1993 clearly show how drainage works can have a serious impact on the nature conservation values of a reserve in a short time. Detailed biological survey and dieback mapping are essential before consideration is given to granting approval for any new drainage works in conservation reserves of the Byenup-Muir system.

The designation of the Muir-Unicup catchments as a recovery catchment under the Salinity Action Plan (Government of Western Australia 1996) should provide resources to protect and manage the very significant biodiversity values of this area into the future.

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APPENDIX 1

Descriptions of 13 reserves of the Byenup-Muir reserve system.
(* indicates an introduced taxon, ms indicates a manuscript name)

BOKARUP NATURE RESERVE

Reserve number 14739 **Class** A
Location 34 20 09S 116 49 52E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 146 ha

Biological values

Flora 371 species have been recorded from the reserve (see flora list below). These include four priority taxa (*Jacksonia sparsa* ms (Priority 3), *Schoenus benthamii* (Priority 3), *Schoenus natans* (Priority 4), *Villarsia submersa* (Priority 4)).

Vegetation description Twelve vegetation units have been mapped on the reserve (Map 1).

1. **Jarrah (*Eucalyptus marginata*)-marri (*E. calophylla*) forest and woodlands** on laterites and lateritic gravels cover most of the reserve. The understorey is diverse in shrubs, herbs and grasses. Typical understorey shrubs include *Hibbertia* spp., *Leucopogon* spp. and peas such as *Bossiaea* spp., *Daviesia* spp. and *Gompholobium* spp.

2. **Jarrah-marri open woodlands** occupy the sand dune between the large wetlands. Typical understorey species include *Phyllanthus calycinus* and *Hakea ruscifolia* with *Centrolepis* spp. and *Johnsonia* spp. being the common herbs.

3. ***Melaleuca preissiana-Banksia littoralis* woodland** occurred along the drainage lines on the western side of the reserve. *Pericalymma ellipticum* and *Lepidosperma longitudinale* were the dominant understorey species.

4. ***Melaleuca preissiana-Eucalyptus rudis* woodland** occurred on seasonally wet flats on the transition zones between the drainage lines and wetlands, and the jarrah-marri woodlands on the laterites. Again *Lepidosperma longitudinale* was the common understorey species.

5. ***Melaleuca rhaphiophylla* low forest** surrounds the major wetland on the eastern side of the reserve, at the western end of Bokarup Swamp and a small swamp on the northern boundary. These areas are inundated for long periods in winter and spring and the dense overstorey precludes development of any significant understorey layer.

6. ***Melaleuca rhaphiophylla* open woodland** was found on less inundated areas than the previous unit. *Eucalyptus rudis* was also recorded from this community, while the understorey was generally dominated by *Lepidosperma longitudinale* and/or *Pericalymma ellipticum*.

7. **Wet heath** along the south-western shore of the eastern wetland. This unit was dominated by *Melaleuca lateritia* and once dominated this wetland. A visit in late summer showed the remains of an old post and rail fence line crossing the lake and extending into the upland vegetation on the eastern side of the lake.

8. ***Baumea* sedgeland** covered about half of Bokarup Swamp. This community was very species-poor, with *Baumea articulata* dominating in deeper water and *Baumea vaginalis, B. juncea* and *Villarsia albiflora* co-dominating in shallows near shore.

9. ***Acacia dealbata* thicket** occurs near the northern boundary of Bokarup Swamp on the edge of the cleared area. This introduced species appears to be the result of early rehabilitation efforts. There was little understorey under the dense canopy.

10. **Revegetation** of mostly planted eucalypt occurs in the north-west corner of the reserve.

11. **Cleared area** largely dominated by annual grasses occur in the same area as units 9 and 10. The northern end of the dune between the two major wetlands has also been cleared.

12. **Open water** dominates all of the eastern wetland and approximately half the Bokarup Swamp.

Vegetation change Oblique aerial photographs from April 1980 show the eastern wetland almost totally covered by a *Melaleuca lateritia* wet heath community, this is currently open water (Map 1). The heath appears to be dying from the centre in the 1980 photography. The same series of photographs show Bokarup Swamp itself was fully covered with *Baumea* sedgeland approximately half of which is now open water. The only revegetation work obvious on the 1980 photography was the *Acacia dealbata* thicket.

Disturbance or threats The cause of the major change in the wetland vegetation in this reserve is not clear but appears to have resulted from a rising water table. The occurrence of the *Acacia dealbata* thicket represents a significant potential weed threat and should be removed as soon as possible.

Bokarup Nature Reserve flora list.

Aizoaceae
- Carpobrotus modestus

Amaranthaceae
- Alternanthera nodiflora
- Ptilotus manglesii

Amaryllidaceae
- * Amaryllis belladonna

Anthericaceae
- Agrostocrinum scabrum
- Arthropodium capillipes
- Arthropodium preissii
- Borya scirpoidea
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Chamaescilla spiralis
- Johnsonia acaulis
- Johnsonia lupulina
- Laxmannia sessiliflora
- Sowerbaea laxiflora
- Thysanotus patersonii
- Thysanotus tenellus
- Thysanotus thyrsoideus
- Thysanotus triandrus
- Tricoryne elatior
- *Tricoryne humilis*

Apiaceae
- Daucus glochidiatus
- Eryngium pinnatifidum
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Hydrocotyle diantha
- Hydrocotyle pilifera
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Asteraceae
- Angianthus tomentosus
- * Arctotheca calendula
- * Aster subulatus
- Blennospora drummondii
- Brachyscome iberidifolia
- * Carduus pycnocephalus
- * Cirsium vulgare
- * Conyza albida
- Cotula coronopifolia
- Cotula cotuloides
- Craspedia variabilis
- Euchiton gymnocephalus
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia myosotidifolia
- Podolepis gracilis
- Podotheca angustifolia
- Pterochaeta paniculata
- Quinetia urvillei
- Senecio glomeratus
- Senecio minimus
- Senecio picridioides
- Siloxerus humifusus
- * Sonchus hydrophilus
- * Sonchus oleraceus
- * Tolpis barbata
- * Vellereophyton dealbatum
- Waitzia nitida

Brassicaceae
- * Sisymbrium officinale

Campanulaceae
- Wahlenbergia multicaulis
- Wahlenbergia preissii

Caryophyllaceae
- * Cerastium glomeratum
- * Petrorhagia velutina

Casuarinaceae
- Allocasuarina humilis

Centrolepidaceae
- Aphelia cyperoides
- Brizula drummondii
- Centrolepis aristata
- Centrolepis glabra
- Centrolepis pilosa
- Centrolepis polygyna

Colchicaceae
- Burchardia congesta
- Burchardia monantha
- Wurmbea dioica ssp. alba

Convolvulaceae
- Dichondra repens

Crassulaceae
- Crassula colorata
- Crassula exserta
- * Crassula natans

Cyperaceae
- Baumea articulata
- Baumea juncea
- Baumea vaginalis
- Chorizandra enodis
- Cyathochaeta avenacea
- * Cyperus eragrostis
- * Cyperus tenellus
- Isolepis cernua
- * Isolepis marginata
- Isolepis nodosa
- Isolepis oldfieldiana
- * Isolepis prolifera
- Isolepis stellata
- Lepidosperma aff. angustatum
- Lepidosperma longitudinale
- Lepidosperma squamatum
- Lepidosperma tenue
- Mesomelaena tetragona
- Schoenus benthamii
- Schoenus curvifolius
- Schoenus elegans
- Schoenus natans
- Schoenus tenellus
- Tetraria capillaris
- Tetraria octandra

Dasypogonaceae
- Chamaexeros serra
- Dasypogon bromeliifolius
- Lomandra caespitosa
- Lomandra nigricans
- Lomandra purpurea
- Lomandra sericea
- Lomandra suaveolens

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia acerosa
- Hibbertia commutata
- Hibbertia cunninghamii
- Hibbertia racemosa
- Hibbertia stellaris
- Hibbertia vaginata

Droseraceae
- Drosera erythrorhiza
- Drosera glanduligera
- Drosera macrantha
- Drosera menziesii
- Drosera rosulata
- Drosera stolonifera

Epacridaceae
- Astroloma baxteri
- Astroloma ciliatum
- Astroloma pallidum

- Leucopogon australis
- Leucopogon capitellatus
- Leucopogon conostephioides

Euphorbiaceae
- Monotaxis occidentalis
- Phyllanthus calycinus
- Poranthera microphylla

Gentianaceae
- * Cicendia filiformis

Geraniaceae
- Geranium solanderi
- Pelargonium littorale

Goodeniaceae
- Anthotium humile
- Dampiera alata
- Dampiera cuneata
- Dampiera linearis
- Goodenia micrantha
- Goodenia pulchella
- Scaevola phlebopetala
- Velleia trinervis

Haemodoraceae
- Anigozanthos flavidus
- Anigozanthos manglesii
- Conostylis aculeata
- Conostylis laxiflora
- Conostylis setigera
- Haemodorum laxum
- Haemodorum simplex
- Haemodorum sparsiflorum
- Haemodorum spicatum
- Tribonanthes violacea

Haloragaceae
- Gonocarpus cordiger

Hydatellaceae
- Trithuria bibracteata

Hypoxidaceae
- Hypoxis occidentalis

Iridaceae
- * Iris germanica
- Patersonia juncea
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)
- * Romulea rosea
- * Watsonia bulbillifera

Juncaceae
- * Juncus bufonius
- * Juncus capitatus
- Juncus holoschoenus
- Juncus pallidus

Juncaginaceae
- Triglochin centrocarpum
- Triglochin huegelii
- Triglochin lineare
- Triglochin mucronatum

Lamiaceae
- Hemiandra pungens

Lauraceae
- Cassytha glabella
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida
- Utricularia inaequalis

Linaceae
- Linum marginale

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Isotoma hypocrateriformis
- Lobelia alata
- Lobelia tenuior

Loganiaceae
- Logania campanulata
- Logania serpyllifolia
- Phyllangium paradoxum

Lycopodiaceae
- Phylloglossum drummondii

Lythraceae
- * Lythrum hyssopifolia

Menyanthaceae
- Villarsia albiflora
- Villarsia submersa
- Villarsia ?violifolia

Mimosaceae
- * Acacia dealbata
- Acacia extensa
- Acacia huegelii
- Acacia incurva
- Acacia myrtifolia
- Acacia pulchella
- Acacia saligna

Myoporaceae
- Myoporum caprarioides

Myrtaceae
- Agonis parviceps
- Astartea fascicularis
- Astartea sp.
- Baeckea camphorosmae
- Calothamnus lateralis
- Eucalyptus calophylla
- Eucalyptus decipiens
- Eucalyptus marginata
- Eucalyptus occidentalis
- Eucalyptus rudis
- Eucalyptus wandoo
- Kunzea micrantha
- Kunzea recurva
- Melaleuca lateritia
- Melaleuca leptoclada
- Melaleuca preissiana
- Melaleuca rhaphiophylla
- Melaleuca viminea
- Pericalymma ellipticum

Olacaceae
- Olax benthamiana

Onagraceae
- Epilobium billardierianum

Orchidaceae
- Caladenia flava
- Caladenia longicauda
- Caladenia marginata
- Caladenia radiata
- Caladenia reptans
- Caladenia varians
- Cryptostylis ovata
- Cyrtostylis robusta
- Diuris laxiflora
- Diuris longifolia
- Drakonorchis barbarossa ms
- Elythranthera brunonis
- Elythranthera emarginata
- Leporella fimbriata
- Leptoceras menziesii
- Microtis atrata
- Microtis orbicularis
- * Monadenia bracteata
- Pterostylis barbata
- Pterostylis nana
- Pterostylis recurva
- Pterostylis vittata
- Pyrorchis nigricans
- Thelymitra crinita
- Thelymitra flexuosa
- Thelymitra pauciflora

Orobanchaceae
- * Orobanche minor

Papilionaceae
- Aotus intermedia
- Bossiaea eriocarpa
- Bossiaea ornata
- Bossiaea praetermissa

Brachysema melanopetalum
Callistachys lanceolata
Daviesia cordata
Daviesia physodes
Daviesia preissii
Eutaxia virgata
Gompholobium marginatum
Gompholobium polymorphum
Gompholobium preissii
Gompholobium tomentosum
Hovea chorizemifolia
Hovea trisperma var. grandiflora
Isotropis cuneifolia
Jacksonia sparsa ms
Kennedia coccinea
Kennedia prostrata
* Lotus angustissimus
Oxylobium lineare
Pultenaea ochreata
Sphaerolobium medium
* Trifolium campestre
* Trifolium dubium
* Trifolium repens
* Trifolium subterraneum

Philydraceae
Philydrella pygmaea

Phormiaceae
Dianella brevicaulis
Dianella revoluta
Stypandra glauca

Pittosporaceae
Billardiera variifolia
Marianthus candidus
Sollya heterophylla

Plantaginaceae
Plantago debilis

Poaceae
Agrostis avenacea
* Aira caryophyllea
Amphipogon turbinatus
* Anthoxanthum odoratum
Austrodanthonia occidentalis
Austrostipa pycnostachya
Austrostipa ?trichophylla
* Briza maxima
* Briza minor
* Cynodon dactylon
Deyeuxia quadriseta
Eragrostis elongata
Hemarthria uncinata
* Holcus lanatus
* Hordeum leporinum
* Lolium multiflorum
Microlaena stipoides
Poa poiformis
* Stenotaphrum secundatum
Tetrarrhena laevis
* Vulpia myuros

Polygalaceae
Comesperma calymega
Comesperma flavum
Comesperma virgatum
Comesperma volubile

Polygonaceae
Muehlenbeckia adpressa
Persicaria prostrata
* Rumex acetosella

Primulaceae
* Anagallis arvensis

Proteaceae
Banksia grandis
Banksia littoralis
Dryandra lindleyana
Grevillea fasciculata
Hakea ceratophylla
Hakea lissocarpha
Hakea prostrata
Hakea ruscifolia
Hakea sulcata
Hakea trifurcata
Hakea varia
Persoonia longifolia
Petrophile media
Petrophile serruriae
Synaphea petiolaris

Ranunculaceae
Ranunculus colonorum

Restionaceae
Anarthria laevis
Anarthria prolifera
Harperia lateriflora
Hypolaena exsulca
Lepyrodia muirii
Lyginia barbata
Meeboldina cana ms
Meeboldina tephrina ms

Rhamnaceae
Trymalium ledifolium

Rosaceae
* Acaena echinata

Rubiaceae
* Galium murale
Opercularia apiciflora
Opercularia hispidula

Rutaceae
Boronia megastigma
Boronia ramosa
Boronia spathulata

Santalaceae
Leptomeria squarrulosa

Scrophulariaceae
* Bartsia trixago
* Parentucellia latifolia
* Parentucellia viscosa

Selaginellaceae
Selaginella gracillima

Solanaceae
* Solanum nigrum

Stackhousiaceae
Stackhousia monogyna
Tripterococcus brunonis

Stylidiaceae
Levenhookia pusilla
Levenhookia stipitata
Stylidium affine
Stylidium assimile
Stylidium brunonianum ssp. minor
Stylidium calcaratum
Stylidium ecorne
Stylidium guttatum
Stylidium hispidum
Stylidium junceum
Stylidium repens
Stylidium schoenoides
Stylidium spathulatum

Thymelaeaceae
Pimelea angustifolia
Pimelea argentea
Pimelea sylvestris

Tremandraceae
Platytheca galioides

Typhaceae
* Typha orientalis

Xanthorrhoeaceae
Xanthorrhoea preissii

Zamiaceae
Macrozamia riedlei

COBERTUP NATURE RESERVE

Reserve number 26681 **Class** A
Location 34 27 23S 116 49 50E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 151 ha

Biological values

Flora 370 taxa were recorded from the reserve (see flora list below). These include two priority taxa (*Apodasmia ceramophila* ms (Priority 2) and *Rhodanthe pyrethrum* (Priority 3)).

Vegetation description Ten vegetation units have been mapped on the reserve (Map 2).

1. **Jarrah-marri forest and woodland** on laterite occupies the higher ground in the north-west, north-east and south-west corners of the reserve. The understorey is diverse in shrubs, herbs and grasses. Typical understorey shrubs include *Hibbertia* spp., *Leucopogon* spp. and peas such as *Bossiaea* spp., *Daviesia* spp. and *Gompholobium* spp.

2. **Jarrah-marri open woodland** occupies the dune areas around the major swamps. The understorey is dominated by species such as *Phyllanthus calycinus, Allocasuarina humilis, Desmocladus flexuosus, Hypolaena exsulca,* and *Lyginia barbata,* taxa typical of sandy substrates. Yate (*Eucalyptus occidentalis)* was common on ecotone between this unit and the clay flats (vegetation unit 8).

3. ***Melaleuca preissiana* woodland** occurs in the south-eastern corner of the reserve. In the wettest areas *Banksia littoralis* is a co-dominant. Common understorey species include *Hakea varia, Gonocarpus paniculatus,* and *Hemarthria uncinata.* This area was recently burnt in a hot fire.

4. ***Eucalyptus decipiens* woodland** occurs on the northern boundary of the reserve, common elements in the understorey include *Xanthorrhoea preissii, Hypocalymma angustifolium,* and the sedges *Mesomelaena tetragona* and *Tetraria octandra*

5. ***Melaleuca rhaphiophylla* woodland** occurs as a band around the major *Baumea* swamps and intergrades into *Melaleuca preissiana* woodland in the south-east corner of the reserve. The dominant understorey species is *Lepidosperma longitudinale.*

6. ***Melaleuca rhaphiophylla* woodland over wet heath** has also recently been burnt but appears similar in species composition to vegetation unit 8 (heathland on clay flats) with an open overstorey of *Melaleuca rhaphiophylla.*

7. ***Melaleuca lateritia-Hakea varia* heath** has been recently burnt in a hot fire. Most shrubs were killed and are regenerating from seed. *Lepidosperma longitudinale* has resprouted and is the dominant species at this time.

8. **Heathland** on clay flats are variously dominated by *Melaleuca viminea, Melaleuca densa, Kunzea micrantha* and *Astartea* sp. over a very rich and diverse herb layer including taxa such as *Rhodanthe pyrethrum, Hyalosperma simplex, Caesia micrantha, Burchardia congesta, Wurmbea dioica, Goodenia mimuloides,* and *Tribonanthes* sp. Lake Muir, rushes and annual sedges are also prolific in the understorey.

9. **Open *Baumea* sedgeland** occupies the western swamp, this community is very species-poor being dominated by *Baumea articulata.* Other sedges occurring in this sedgeland include *Baumea arthrophylla* and *B. juncea.*

10. **Closed *Baumea* sedgeland** occupies the eastern swamp with essentially the same species composition as vegetation unit 9, however, *Baumea* spp. cover is denser.

Vegetation change Oblique aerial photographs from April 1980 show that although there has been considerable vegetation clearance in the area around Cobertup Nature Reserve there are no obvious large scale changes to the vegetation.

Disturbance or threats On the northern boundary where run off from a dam is providing extra nutrients on the clay flat there has been considerable weed invasion. Management of this run-off is urgently needed. Further monitoring of the reserve is needed to determine whether vegetation communities are stable given the recent nature clearance of the adjoining lands.

Cobertup Nature Reserve flora list.

Amaranthaceae
- Ptilotus drummondii
- Ptilotus manglesii

Anthericaceae
- Agrostocrinum scabrum
- Arthropodium preissii
- Borya sphaerocephala
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Chamaescilla ?spiralis
- Johnsonia lupulina
- Laxmannia sessiliflora
- Sowerbaea laxiflora
- Thysanotus manglesianus
- Thysanotus sparteus
- Thysanotus tenellus
- Tricoryne elatior
- Tricoryne humilis

Apiaceae
- Daucus glochidiatus
- Eryngium pinnatifidum
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Hydrocotyle diantha
- Hydrocotyle pilifera var. glabrata
- Hydrocotyle sp.
- Platysace juncea
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Asteraceae
- * Arctotheca calendula
- Asteridea athrixioides
- * Cirsium vulgare
- Cotula coronopifolia
- Craspedia variabilis
- Hyalosperma simplex
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia myosotidifolia
- Podolepis gracilis
- Quinetia urvillei
- Rhodanthe pyrethrum
- Rutidosis multiflora
- Senecio glomeratus
- Senecio minimus
- Siloxerus humifusus
- * Sonchus asper
- * Sonchus oleraceus
- Trichocline spathulata
- * Ursinia anthemoides
- * Vellereophyton dealbatum
- Waitzia nitida
- Waitzia suaveolens

Campanulaceae
- Wahlenbergia gracilenta
- Wahlenbergia preissii

Caryophyllaceae
- * Petrorhagia velutina

Casuarinaceae
- Allocasuarina humilis
- Allocasuarina lehmanniana

Centrolepidaceae
- Aphelia cyperoides
- Brizula drummondii
- Centrolepis aristata
- Centrolepis drummondiana
- Centrolepis glabra

Colchicaceae
- Burchardia congesta
- Burchardia monantha
- Burchardia multiflora
- Wurmbea dioica

Crassulaceae
- Crassula colorata
- * Crassula decumbens
- Crassula peduncularis

Cyperaceae
- Baumea arthrophylla
- Baumea articulata
- Baumea juncea
- Chorizandra enodis
- Cyathochaeta avenacea
- * Cyperus tenellus
- Gahnia aristata
- Gahnia trifida
- Isolepis cernua
- * Isolepis marginata
- Isolepis nodosa
- Isolepis oldfieldiana
- Isolepis producta
- Lepidosperma angustatum
- Lepidosperma sp.
- Lepidosperma tenue
- Mesomelaena stygia
- Mesomelaena tetragona
- Schoenus bifidus
- Schoenus curvifolius
- Schoenus laevigatus
- Schoenus obtusifolius
- Schoenus sculptus
- Schoenus sp.
- Schoenus ?tenellus
- Tetraria capillaris
- Tetraria octandra
- Tricostularia neesii var. neesii

Dasypogonaceae
- Chamaexeros serra
- Dasypogon bromeliifolius
- Lomandra caespitosa
- Lomandra hermaphrodita
- Lomandra micrantha
- Lomandra purpurea
- Lomandra sericea
- Lomandra suaveolens

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia ?acerosa
- Hibbertia ?commutata
- Hibbertia cunninghamii
- Hibbertia gracilipes
- Hibbertia racemosa
- Hibbertia stellaris

Droseraceae
- Drosera bulbosa
- Drosera erythrorhiza
- Drosera gigantea
- Drosera glanduligera
- Drosera macrantha
- Drosera menziesii
- Drosera stolonifera

Epacridaceae
- Astroloma ciliatum
- Astroloma pallidum
- Leucopogon capitellatus
- Leucopogon conostephioides
- Leucopogon propinquus

Euphorbiaceae
- Monotaxis occidentalis
- Phyllanthus calycinus
- Poranthera microphylla

Gentianaceae
- * Centaurium erythraea
- * Cicendia filiformis

Geraniaceae
- Geranium solanderi
- Pelargonium littorale

Goodeniaceae
- Anthotium humile
- Dampiera alata
- Dampiera linearis
- Dampiera trigona
- Goodenia micrantha
- Goodenia mimuloides
- Goodenia pulchella
- Lechenaultia formosa
- Scaevola phlebopetala
- Velleia trinervis

Haemodoraceae
- Anigozanthos bicolor
- Anigozanthos flavidus
- Anigozanthos manglesii
- Conostylis aculeata
- Conostylis setigera
- Haemodorum laxum
- Haemodorum simplex
- Haemodorum sparsiflorum
- Haemodorum spicatum
- Tribonanthes australis
- Tribonanthes longipetala
- Tribonanthes sp. Lake Muir
- Tribonanthes violacea

Haloragaceae
- Glischrocaryon aureum
- Gonocarpus paniculatus
- Haloragis brownii
- Myriophyllum crispatum
- Myriophyllum limnophilum

Hydatellaceae
- Hydatella sp
- Trithuria submersa

Hypoxidaceae
- Hypoxis occidentalis

Iridaceae
- Patersonia juncea
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)

Isoetaceae
- Isoetes drummondii

Juncaceae
- * Juncus articulatus
- * Juncus bufonius
- * Juncus capitatus
- Juncus pallidus
- Juncus planifolius

Juncaginaceae
- Triglochin huegelii
- Triglochin sp.

Lauraceae
- Cassytha glabella
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida
- Utricularia hookeri

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Grammatotheca bergiana
- Isotoma hypocrateriformis
- Lobelia alata
- Lobelia heterophylla
- Lobelia rhombifolia

Loganiaceae
- Logania campanulata
- Logania serpyllifolia
- Phyllangium paradoxum

Lythraceae
- * Lythrum hyssopifolia

Menyanthaceae
- Villarsia albiflora
- Villarsia parnassifolia

Mimosaceae
- Acacia alata
- Acacia extensa
- Acacia huegelii
- Acacia incurva
- Acacia myrtifolia
- Acacia nervosa
- Acacia pulchella
- Acacia saligna
- Acacia stenoptera

Myoporaceae
- Myoporum caprarioides

Myrtaceae
- Astartea fascicularis
- Astartea sp. (pink weeping)
- Baeckea camphorosmae
- Calothamnus lateralis
- Calytrix angulata
- Eucalyptus calophylla
- Eucalyptus decipiens
- Eucalyptus marginata
- Eucalyptus occidentalis
- Eucalyptus patens
- Eucalyptus rudis
- Hypocalymma angustifolium
- Kunzea ericifolia
- Kunzea micrantha
- Melaleuca densa
- Melaleuca lateritia
- Melaleuca leptoclada
- Melaleuca preissiana
- Melaleuca rhaphiophylla
- Melaleuca spathulata
- Melaleuca viminea
- Pericalymma ellipticum
- Verticordia densiflora
- Verticordia habrantha

Olacaceae
- Olax benthamiana

Onagraceae
- Epilobium billardierianum
- Epilobium hirtigerum

Orchidaceae
- Caladenia flava
- Caladenia longicauda
- Caladenia radiata
- Caladenia reptans
- Diuris laxiflora
- Diuris longifolia
- Elythranthera brunonis
- Elythranthera emarginata
- Eriochilus dilatatus
- Microtis atrata
- Microtis media
- Microtis orbicularis
- * Monadenia bracteata
- Prasophyllum macrostachyum
- Pterostylis nana
- Pterostylis recurva
- Pterostylis vittata
- Thelymitra crinita
- Thelymitra flexuosa

Orobanchaceae
- * Orobanche minor

Oxalidaceae
- Oxalis perennans

Papilionaceae
- Bossiaea eriocarpa
- Bossiaea linophylla
- Bossiaea ornata
- Brachysema praemorsum
- Callistachys lanceolata
- Chorizema nanum
- Daviesia ?incrassata
- Daviesia preissii

- Eutaxia virgata
- Gompholobium knightianum
- Gompholobium marginatum
- Gompholobium polymorphum
- Gompholobium preissii
- Gompholobium tomentosum
- Goodia lotifolia
- Hovea chorizemifolia
- Hovea trisperma
- Isotropis cuneifolia
- Jacksonia furcellata
- Kennedia coccinea
- Kennedia prostrata
- * Lotus angustissimus
- Oxylobium lineare
- Sphaerolobium linophyllum
- Sphaerolobium medium
- Sphaerolobium ?vimineum
- Viminaria juncea

Philydraceae
- Philydrella drummondii
- Philydrella pygmaea

Phormiaceae
- Dianella brevicaulis
- Dianella revoluta
- Stypandra glauca

Pittosporaceae
- Sollya heterophylla

Poaceae
- Agrostis avenacea
- Amphibromus nervosus
- Amphipogon ?debilis
- Amphipogon turbinatus
- Austrodanthonia caespitosa
- Austrostipa compressa
- Austrostipa ?pycnostachya
- Austrostipa trichophylla
- * Briza minor
- Deyeuxia quadriseta
- Eragrostis ?brownii
- Hemarthria uncinata
- * Lolium multiflorum
- Microlaena stipoides
- Neurachne alopecuroidea
- * Poa annua
- Poa drummondiana
- Poa poiformis
- * Polypogon monspeliensis
- Tetrarrhena laevis
- * Vulpia myuros

Polygalaceae
- Comesperma calymega
- Comesperma virgatum
- Comesperma volubile

Polygonaceae
- Muehlenbeckia adpressa
- Persicaria prostrata

Portulacaceae
- Calandrinia ?composita
- Calandrinia granulifera

Primulaceae
- * Anagallis arvensis
- Samolus junceus

Proteaceae
- Banksia littoralis
- Dryandra armata
- Dryandra lindleyana
- Grevillea fasciculata
- Hakea ceratophylla
- Hakea lissocarpha
- Hakea prostrata
- Hakea sulcata
- Hakea varia
- Persoonia longifolia
- Synaphea petiolaris

Ranunculaceae
- Clematis pubescens
- Ranunculus colonorum

Restionaceae
- Anarthria prolifera
- Apodasmia ceramophila ms
- Chordifex sp.
- Desmocladus fasciculatus ms
- Desmocladus flexuosus ms
- Harperia lateriflora
- Hypolaena exsulca
- Lyginia barbata
- Meeboldina cana ms

Rhamnaceae
- Trymalium ledifolium

Rosaceae
- * Acaena echinata

Rubiaceae
- * Galium divaricatum
- Opercularia hispidula
- Opercularia vaginata

Rutaceae
- Boronia juncea ssp. ?laniflora
- Boronia megastigma
- Boronia spathulata

Santalaceae
- Leptomeria squarrulosa

Scrophulariaceae
- Gratiola peruviana
- Gratiola pedunculata
- * Parentucellia latifolia
- * Parentucellia viscosa

Selaginellaceae
- Selaginella gracillima

Solanaceae
- * Solanum nigrum

Stackhousiaceae
- Stackhousia monogyna
- Tripterococcus brunonis

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium brunonianum ssp. minor
- Stylidium caespitosum
- Stylidium calcaratum
- Stylidium crassifolium
- Stylidium guttatum
- Stylidium inundatum
- Stylidium perpusillum
- Stylidium pulchellum
- Stylidium sp.
- Stylidium spathulatum

Thymelaeaceae
- Pimelea angustifolia
- Pimelea ?rosea
- Pimelea suaveolens

Tremandraceae
- Platytheca galioides
- Tetratheca sp.

Typhaceae
- * Typha orientalis

Violaceae
- Hybanthus floribundus

Xanthorrhoeaceae
- Xanthorrhoea gracilis
- Xanthorrhoea preissii

Zamiaceae
- Macrozamia riedlei

COWERUP NATURE RESERVE

Reserve number 33455 **Class** C
Location 34 25 48S 116 25 00E
Land tenure Nature Reserve
Purpose Conservation of flora and fauna
Area 270 ha

Biological values

Flora 185 taxa have been recorded for the reserve (see flora list below). This is likely to seriously underestimate the total flora since only minimal sampling was undertaken when the annuals were conspicuous. Four priority taxa were found (*Rhodanthe pyrethrum* (Priority 3), *Schoenus benthamii* (Priority 3), *Schoenus natans* (Priority 4), and *Villarsia submersa* (Priority 4)).

Vegetation description Cowerup Nature Reserve adjoins the northern boundary of the Lake Muir Nature Reserve. Consequently both reserves were mapped using the same vegetation units. Of the 30 units that occurred in Lake Muir Nature Reserve, eight were found in Cowerup Nature Reserve, one unit was too small to map (Map 5).

1. **Jarrah-marri forest and woodland** on laterite and lateritic gravels occurred as small flat ridges in the sandy jarrah-marri woodlands and could not be distinguished from them on aerial photography. They occurred predominantly on the eastern boundary of the reserve. The understorey is typically diverse in shrubs, herbs and grasses. Typical understorey shrubs include *Hibbertia* spp., *Leucopogon* spp. and peas such as *Bossiaea* spp., *Daviesia* spp. and *Gompholobium* spp.

2. **Jarrah-marri open woodland** on sandy soils occurs widely in the eastern half of the reserve, common understorey species include *Hibbertia racemosa, Astroloma baxteri, Leucopogon* spp., *Phyllanthus calycinus, Acacia pulchella, Jacksonia furcellata.* On wetter sites this community is replaced by jarrah-marri woodland over *Agonis* scrub (unit 3).

3. **Jarrah-marri woodland over *Agonis* scrub** occurs on seasonally wet flats; on slight sandy rises *Banksia ilicifolia* often becomes the dominant canopy species. Understorey development depends on density of the *Agonis* layer.

12. ***Melaleuca cuticularis* woodland over wet heath** forms a distinct unit in the south-western corner of the reserve. The substrate is generally clayey and this unit has a very rich and diverse annual herb layer. The Asteraceae, Centrolepidaceae, Cyperaceae, Orchidaceae, Stylidiaceae are well represented. Common perennial taxa include *Melaleuca* spp., *Kunzea micrantha* and the rushes *Apodasmia ceramophila, Meeboldina coangustata,* and *Meeboldina cana.*

14. ***Melaleuca preissiana* woodland over wet heath** occurs extensively along the wet drainage lines. The understorey is variable in the wettest sites and is generally dominated by *Pericalymma ellipticum.* On drier sites understorey is diverse with peas and Myrtaceae dominating. On the western side of the reserve *Banksia littoralis* takes over as the canopy dominant.

15. ***Melaleuca rhaphiophylla* forest** forms dense stands around the deepest wetland and in the wettest parts of the flats. The understorey is generally dominated by *Lepidosperma* spp. and *Baumea* spp. but where the canopy is more open a variety of shrubs such as *Hypocalymma angustifolium, Pericalymma ellipticum, Callistachys lanceolata, Banksia littoralis, Hakea sulcata* become common.

17. ***Melaleuca densa-M. viminea* heath** occupies drainage lines with sandy clay substrates. These areas are winter-wet and dry slowly in late spring and early summer. In the Lake Muir reserve this type of flat was characterized by aquatic taxa such as *Schoenus natans* and *Villarsia* spp. early in spring giving way to diverse herblands as the wetlands dry.

24. **Closed *Baumea* sedgeland** occupies basin wetlands; *Baumea articulata* is the dominant sedge over most of the wetland, while toward the edge *B. juncea* and *B. vaginalis* co-dominate.

Vegetation change No photographs were taken of this reserve in 1980.

Disturbance or threats The land to the west of the reserve has been cleared for some time. Aerial photography indicates this may have resulted in increased inundation in the wetlands on the western boundary. Recently a new fence and bund has been constructed along this property line. There has been some recent clearance on the south-eastern boundary.

Cowerup Nature Reserve flora list.

Anthericaceae
- Johnsonia acaulis

Apiaceae
- Actinotus omnifertilis
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia huegelii

Asteraceae
- Craspedia sp.
- * Hypochaeris glabra
- Podolepis gracilis
- Rhodanthe pyrethrum
- Senecio glomeratus
- Siloxerus humifusus
- Waitzia suaveolens

Casuarinaceae
- Allocasuarina humilis

Centrolepidaceae
- Brizula drummondii
- Centrolepis aristata
- Centrolepis drummondiana
- Centrolepis glabra

Colchicaceae
- Burchardia congesta
- Burchardia monantha
- Wurmbea dioica

Cupressaceae
- Actinostrobus pyramidalis

Cyperaceae
- Baumea articulata
- Baumea juncea
- Baumea vaginalis
- Cyathochaeta avenacea
- Gahnia trifida
- Isolepis cernua
- Isolepis stellata
- Lepidosperma angustatum
- Lepidosperma longitudinale
- Mesomelaena tetragona
- Schoenus benthamii
- Schoenus efoliatus
- Schoenus maschalinus
- Schoenus natans
- Schoenus tenellus
- Tetraria octandra
- Tricostularia neesii var. elatior

Dasypogonaceae
- Dasypogon bromeliifolius
- Lomandra purpurea
- Lomandra sericea

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia commutata
- Hibbertia cunninghamii
- Hibbertia racemosa
- Hibbertia stellaris

Epacridaceae
- Astroloma baxteri
- Astroloma ciliatum
- Leucopogon australis
- Leucopogon glabellus
- Leucopogon pendulus
- Leucopogon propinquus
- Lysinema ciliatum

Euphorbiaceae
- Amperea volubilis
- Monotaxis occidentalis

Gentianaceae
- Centaurium spicatum

Goodeniaceae
- Dampiera linearis
- Goodenia claytoniacea
- Goodenia pulchella
- Scaevola phlebopetala

Haemodoraceae
- Conostylis aculeata

Haloragaceae
- Gonocarpus hexandrus ssp.
- Gonocarpus paniculatus
- Myriophyllum ?limnophilum

Iridaceae
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)

Juncaginaceae
- Triglochin huegelii

Lamiaceae
- Hemiandra pungens

Lauraceae
- Cassytha glabella
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida
- Utricularia hookeri
- Utricularia violacea

Lobeliaceae
- Lobelia alata

Loganiaceae
- Phyllangium paradoxum

Loranthaceae
- Nuytsia floribunda

Menyanthaceae
- Villarsia albiflora
- Villarsia submersa

Mimosaceae
- Acacia extensa
- Acacia myrtifolia
- Acacia saligna
- Acacia stenoptera

Myrtaceae
- Actinodium cunninghamii
- Agonis parviceps
- Astartea sp. (pink weeping)
- Astartea sp. (white erect)
- Baeckea camphorosmae
- Calothamnus hirsutus
- Calothamnus lateralis
- Calytrix angulata
- Eucalyptus calophylla
- Eucalyptus decipiens
- Eucalyptus marginata
- Eucalyptus rudis
- Hypocalymma angustifolium
- Kunzea ericifolia
- Kunzea micrantha
- Melaleuca cordata
- Melaleuca cuticularis
- Melaleuca densa
- Melaleuca lateritia
- Melaleuca preissiana
- Melaleuca rhaphiophylla
- Melaleuca spathulata
- Melaleuca thymoides
- Melaleuca viminea
- Melaleuca violacea
- Pericalymma ellipticum
- Verticordia densiflora

Olacaceae
- Olax phyllanthi

Orchidaceae
- Caladenia flava
- Caladenia reptans
- Elythranthera brunonis
- Microtis atrata
- Microtis orbicularis
- Pterostylis nana
- Pterostylis vittata
- Thelymitra pauciflora

Papilionaceae
- Aotus intermedia
- Bossiaea linophylla
- Bossiaea rufa
- Brachysema melanopetalum
- Callistachys lanceolata
- Daviesia physodes
- Gompholobium capitatum
- Jacksonia furcellata
- Kennedia prostrata
- Pultenaea ochreata
- Pultenaea reticulata
- Viminaria juncea

Phormiaceae
- Dianella revoluta

Pittosporaceae
- Marianthus candidus
- Sollya heterophylla

Poaceae
- * Aira caryophyllea
- Amphipogon laguroides
- Austrodanthonia occidentalis
- Austrodanthonia sp.
- Austrostipa compressa
- Austrostipa pycnostachya
- * Vulpia myuros

Polygalaceae
- Comesperma calymega
- Comesperma flavum
- Comesperma volubile

Primulaceae
- Samolus caespitosus

Proteaceae
- Adenanthos obovatus
- Banksia grandis
- Banksia ilicifolia
- Banksia littoralis
- Dryandra lindleyana
- Hakea ceratophylla
- Hakea lissocarpha
- Hakea prostrata
- Hakea ruscifolia
- Hakea sulcata
- Hakea trifurcata
- Hakea undulata
- Hakea varia
- Persoonia longifolia
- Synaphea petiolaris

Restionaceae
- Anarthria laevis
- Anarthria prolifera
- Anarthria scabra
- Desmocladus fasciculatus ms
- Hypolaena exsulca
- Lepyrodia muirii
- Lyginia barbata
- Meeboldina cana ms
- Meeboldina coangustata ms
- Meeboldina denmarkica
- Meeboldina scariosa ms
- Tremulina tremula ms

Rubiaceae
- Opercularia hispidula

Rutaceae
- Boronia juncea ssp. laniflora ms
- Boronia megastigma
- Boronia spathulata

Santalaceae
- Leptomeria spinosa
- Leptomeria squarrulosa

Selaginellaceae
- Selaginella gracillima

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium repens
- Stylidium scandens

Tremandraceae
- Platytheca galioides

Xanthorrhoeaceae
- Xanthorrhoea preissii

Zamiaceae
- Macrozamia riedlei

GALAMUP NATURE RESERVE

Reserve number 6549 **Class** A
Location 34 26 35S 116 46 10E
Land tenure Nature Reserve
Purpose Conservation of flora and fauna
Area 222 ha

Biological values

Flora 291 taxa and one hybrid have been recorded for the reserve (see flora list below). Eight priority taxa were found (*Caladenia starteorum* ms (Priority 2), *Cryptandra arbutiflora* ssp. *minor* (Priority 1), *Leucopogon lasiophyllus* (Priority 2), *Leucopogon tamariscinus* (Priority 2), *Pterostylis turfosa* (Priority 1), *Schoenus benthamii* (Priority 3), *Schoenus loliaceus* (Priority 2), *Stylidium mimeticum* (Priority 3)). While the hybrid *Caladenia starteorum* x *splendens* was recorded only one of the presumed parents was seen.

Vegetation description Fourteen vegetation units were mapped on the reserve (Map 3).

1. **Jarrah-marri forest and woodland** is the dominant vegetation unit of the reserve, on a mixture of both sandy and lateritic substrates. The gentle topography did not allow different substrates to be mapped. The understorey was diverse and predominantly shrubby.

2. **Jarrah-marri open woodland** on sandy soils in the central part of the reserve had understorey species typical of damplands. The most common of these included *Hypocalymma angustifolium, Kunzea micrantha, Pericalymma ellipticum, Viminaria juncea,* sedge and rushes were also common.

3. **Jarrah-marri open woodland over wet heath** occurred along a drainage line on the north-eastern side of the reserve, with an understorey of scattered *Melaleuca preissiana* and a dense ground layer of *Pericalymma ellipticum* and/or *Agonis parviceps* and sedges such as *Lyginia barbata.* It also occurs in the centre of the reserve where the *Agonis* forms a dense thicket.

4. ***Eucalyptus decipiens* woodland** occurs in the south-eastern corner of the reserve and grades into vegetation unit 11 (heathland on clay flats). The woodland is extremely species-rich with high diversity in shrubs and herbs. Seven species of *Stylidium* were recorded.

5. ***Melaleuca rhaphiophylla-Banksia littoralis* woodland** occurs around the edge of Galamup Swamp. This unit is inundated during the winter and early spring.

6. ***Melaleuca lateritia* heath** occurs in a small basin wetland in the centre of the reserve. Taxa such as *Baumea articulata* and *Lepidosperma longitudinale* co-occur with *M. lateritia* and as the wetland dries diverse annual herbland develops.

7. ***Pericalymma elliptica-Lepidosperma longitudinale* heath** dominates another small basin wetland in the centre of the reserve. This wetland has much lower species richness than vegetation unit 6. *Schoenus loliaceus* was recorded from this wetland. A few scattered *Banksia littoralis* were also found but most have been killed by fire.

8. ***Hakea prostrata* heath** occurs as a series of narrow bands within the jarrah-marri woodland (vegetation unit 1) and appears to represent minor drainage features. Shrubs associated with damplands, as well as sedges and annual herbs, are typical of this unit.

9. ***Baumea* sedgeland** dominates most of Galamup Swamp. *Baumea articulata* is dominant while toward the edge of the wetland *B. juncea* and *B. vaginalis* also occur. In the narrow transition zone between the swamp vegetation and the *Melaleuca rhaphiophylla-Banksia littoralis* woodland an unusual herb-sedgeland dominated by *Drosera glanduligera, Poranthera microphylla, B. juncea* and *Villarsia albiflora* was found.

10. ***Agonis* heath and scrub** occurred along a sandy drainage line in the northern part of the reserve. *Melaleuca thymoides* is a common element of this community.

11. **Wet heath** on clay flats occurs in the southern corner of the reserve. In terms of species composition it is very similar to vegetation unit 4 (*Eucalyptus decipiens* woodland) without the overstorey element.

12. **Wet heath** on sandy substrate occurs in the very centre of the reserve. This heath had a similar species composition to vegetation unit 3 (jarrah-marri woodland over wet heath) without the overstorey element.

13. **Disturbed areas** on the south-western and north-western sides have been used for gravel extraction while the area on the north-eastern boundary is a wet flat degrading as a result of nutrient-rich run-off from a dam across the fence line.

14. **Open water** occurs in the centre of Galamup Swamp.

Vegetation change Oblique aerial photographs from February and April 1980 show a denser *Baumea* sedgeland in Galamup Swamp. No obvious cause is apparent for this change.

Disturbance or threats The changes to Galamup Swamp are of concern, as is the wet heath degradation on the north-eastern boundary which is becoming badly weed-invaded as a result of nutrient-rich run-off from a dam on private property. Further degradation of the wet heath can be expected unless this nutrient run-off is controlled.

Galamup Nature Reserve flora list.

Amaranthaceae
- Ptilotus manglesii

Anthericaceae
- Agrostocrinum scabrum
- Borya scirpoidea
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Johnsonia acaulis
- Johnsonia lupulina
- Sowerbaea laxiflora
- Thysanotus manglesianus
- Thysanotus tenellus
- Tricoryne humilis
- Tricoryne tenella

Apiaceae
- Centella cordifolia
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Hydrocotyle pilifera var. glabrata
- Platysace ?juncea
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Asteraceae
- Brachyscome iberidifolia
- Craspedia variabilis
- Euchiton gymnocephalus
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia tenuifolia
- Podolepis gracilis
- Pterochaeta paniculata
- Quinetia urvillei
- Senecio glomeratus
- Senecio minimus
- Siloxerus humifusus
- * Sonchus asper
- * Sonchus oleraceus
- Waitzia suaveolens

Campanulaceae
- Wahlenbergia multicaulis
- Wahlenbergia preissii

Casuarinaceae
- Allocasuarina humilis
- Allocasuarina microstachya

Centrolepidaceae
- Aphelia cyperoides
- Centrolepis aristata
- Centrolepis glabra

Colchicaceae
- Burchardia congesta
- Burchardia monantha
- Burchardia multiflora

Cyperaceae
- Baumea arthrophylla
- Baumea articulata
- Baumea juncea
- Baumea vaginalis
- Cyathochaeta avenacea
- * Cyperus tenellus
- Lepidosperma ?gracile
- Lepidosperma longitudinale
- Lepidosperma squamatum
- Lepidosperma tenue
- Mesomelaena stygia
- Mesomelaena tetragona
- Schoenus benthamii
- Schoenus bifidus
- Schoenus curvifolius
- Schoenus ?humilis
- Schoenus ?loliaceus
- Schoenus odontocarpus
- Schoenus sp.
- Schoenus subbulbosus
- Schoenus unispiculatus
- Tetraria capillaris
- Tetraria octandra

Dasypogonaceae
- Chamaexeros serra
- Dasypogon bromeliifolius
- Lomandra collina
- Lomandra sericea
- Lomandra suaveolens

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia acerosa
- Hibbertia ?amplexicaulis
- Hibbertia commutata
- Hibbertia microphylla
- Hibbertia racemosa
- Hibbertia stellaris

Droseraceae
- Drosera bulbosa
- Drosera erythrorhiza
- Drosera gigantea
- Drosera glanduligera
- Drosera heterophylla
- Drosera menziesii
- Drosera pallida
- Drosera rosulata
- Drosera stolonifera

Epacridaceae
- Andersonia ?caerulea
- Astroloma microcalyx
- Astroloma pallidum
- Leucopogon australis
- Leucopogon capitellatus
- Leucopogon lasiophyllus
- Leucopogon parviflorus
- Leucopogon ?pendulus
- Leucopogon propinquus
- Leucopogon tamariscinus
- Leucopogon verticillatus
- Lysinema ciliatum
- Sphenotoma gracile

Euphorbiaceae
- Monotaxis occidentalis
- Phyllanthus calycinus
- Poranthera microphylla

Geraniaceae
- Pelargonium littorale

Goodeniaceae
- Dampiera linearis
- Dampiera trigona
- Velleia trinervis

Haemodoraceae
- Anigozanthos bicolor
- Anigozanthos manglesii
- Conostylis aculeata
- Conostylis laxiflora
- Conostylis setigera
- Haemodorum simplex
- Haemodorum sparsiflorum
- Haemodorum spicatum
- Phlebocarya ciliata
- Tribonanthes australis
- Tribonanthes longipetala

Haloragaceae
- Glischrocaryon aureum
- Gonocarpus pithyoides

Iridaceae
- Patersonia juncea
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)

Juncaceae
- Luzula meridionalis

Juncaginaceae
- Triglochin huegelii

Lamiaceae
- Hemiandra pungens

Linaceae
- Linum marginale

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Isotoma hypocrateriformis
- Lobelia alata
- Lobelia gibbosa
- Lobelia rhombifolia
- Lobelia tenuior

Loganiaceae
- Logania serpyllifolia
- Phyllangium paradoxum

Lycopodiaceae
- Phylloglossum drummondii

Menyanthaceae
- Villarsia albiflora

Mimosaceae
- Acacia extensa
- Acacia huegelii
- * Acacia longifolia ssp. longifolia
- Acacia myrtifolia
- Acacia nervosa
- Acacia pulchella
- Acacia saligna
- Acacia stenoptera

Myrtaceae
- Agonis parviceps
- Astartea sp. (pink weeping)
- Calytrix angulata
- Calytrix leschenaultii
- Darwinia vestita
- Eucalyptus calophylla
- Eucalyptus cornuta
- Eucalyptus decipiens
- Eucalyptus marginata
- Eucalyptus occidentalis
- Hypocalymma angustifolium
- Kunzea micrantha
- Melaleuca lateritia
- Melaleuca preissiana
- Melaleuca spathulata
- Melaleuca thymoides
- Melaleuca viminea
- Pericalymma ellipticum

Orchidaceae
- Caladenia flava
- Caladenia starteorum ms
- Caladenia starteorum x splendens
- Cryptostylis ovata
- Elythranthera brunonis
- Elythranthera emarginata
- Microtis atrata
- Microtis media
- * Monadenia bracteata
- Prasophyllum drummondii
- Prasophyllum elatum
- Prasophyllum macrostachyum
- Pterostylis recurva
- Pterostylis turfosa
- Pterostylis vittata
- Pyrorchis nigricans
- Thelymitra flexuosa
- Thelymitra macrophylla
- Thelymitra pauciflora

Oxalidaceae
- Oxalis perennans

Papilionaceae
- Aotus intermedia
- Bossiaea linophylla
- Bossiaea ornata
- Brachysema praemorsum
- Daviesia sp.
- Gastrolobium bilobum
- Gompholobium capitatum
- Gompholobium confertum
- Gompholobium marginatum
- Gompholobium polymorphum
- Gompholobium preissii
- Gompholobium tomentosum
- Hovea trisperma var. grandiflora
- Isotropis cuneifolia
- Jacksonia ?furcellata
- Kennedia coccinea
- Oxylobium lineare
- Sphaerolobium vimineum
- Viminaria juncea

Philydraceae
- Philydrella pygmaea

Phormiaceae
- Dianella brevicaulis
- Dianella revoluta
- Stypandra glauca

Pittosporaceae
- Sollya heterophylla

Poaceae
- * Aira caryophyllea
- Austrodanthonia caespitosa
- Austrodanthonia setacea
- Austrostipa compressa
- Austrostipa ?pycnostachya
- * Briza maxima
- * Briza minor
- Deyeuxia quadriseta
- Neurachne alopecuroidea
- Tetrarrhena laevis
- * Vulpia myuros

Polygalaceae
- Comesperma volubile

Proteaceae
- Adenanthos obovatus
- Banksia grandis
- Banksia littoralis
- Dryandra lindleyana
- Franklandia fucifolia
- Hakea lissocarpha
- Hakea prostrata
- Hakea sulcata
- Hakea varia
- Petrophile acicularis

- Synaphea petiolaris
- Synaphea sp.

Ranunculaceae
- Clematis pubescens

Restionaceae
- Anarthria laevis
- Anarthria prolifera
- Anarthria scabra
- Chordifex sp.
- Cytogonidium leptocarpoides ms
- Desmocladus fasciculatus ms
- Desmocladus flexuosus ms
- Harperia lateriflora
- Hypolaena exsulca
- Lyginia barbata
- Meeboldina kraussii ms

Rhamnaceae
- Cryptandra arbutiflora ssp. minor
- Trymalium ledifolium

Rubiaceae
- Opercularia hispidula
- Opercularia vaginata

Rutaceae
- Boronia crenulata
- Boronia spathulata

Santalaceae
- Leptomeria cunninghamii
- Leptomeria scrobiculata
- Leptomeria squarrulosa

Schizaeaceae
- Schizaea dichotoma

Scrophulariaceae
- Gratiola peruviana
- * Parentucellia viscosa

Selaginellaceae
- Selaginella gracillima

Stackhousiaceae
- Stackhousia monogyna
- Tripterococcus brunonis

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium ?assimile
- Stylidium brunonianum ssp. minor
- Stylidium calcaratum
- Stylidium corymbosum
- Stylidium guttatum
- Stylidium inundatum
- Stylidium mimeticum
- Stylidium perisceliantum
- Stylidium perpusillum
- Stylidium petiolare
- Stylidium pulchellum
- Stylidium repens
- Stylidium roseonanum
- Stylidium schoenoides
- Stylidium spathulatum

Thymelaeaceae
- Pimelea angustifolia
- Pimelea imbricata
- Pimelea rosea
- Pimelea sulphurea
- Pimelea sylvestris

Tremandraceae
- Tetratheca affinis
- Tetratheca setigera
- Tetratheca virgata

Violaceae
- Hybanthus floribundus

Xanthorrhoeaceae
- Xanthorrhoea gracilis
- Xanthorrhoea preissii

Zamiaceae
- Macrozamia riedlei

KODJINUP NATURE RESERVE

Reserve number 26678 **Class** A
Location 34 23 07S 116 39 30E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 626 ha

Biological values

Flora 341 taxa and one hybrid have been recorded from the reserve (see flora list below). This includes four priority taxa (*Jacksonia sparsa* ms (Priority 3), *Leucopogon tamariscinus* (Priority 2), *Schoenus benthamii* (Priority 3), *Stylidium mimeticum* (Priority 3)). A hybrid swarm of *Kunzea recurva* x *sulphurea* and backcrosses to both parents can be seen in several places along the southern boundary of the reserve.

Vegetation description Thirteen vegetation units were mapped in the reserve (Map 4).

1. **Jarrah-marri forest and woodland** occur on laterites and lateritic gravels on the western side of the reserve. The understorey is diverse in shrubs, herbs and grasses. Typical understorey shrubs include *Hibbertia* spp., *Leucopogon* spp. and peas such as *Bossiaea* spp., *Daviesia* spp. and *Gompholobium* spp.

2. **Jarrah-marri open woodland** on sandy low-lying soils is widespread in the northern and eastern parts of the reserve. The understorey is variable but includes species such as *Hibbertia racemosa, Andersonia caerulea, Astroloma baxteri, Leucopogon propinquus, Calytrix angulata* and *Melaleuca thymoides.* Where it is wettest, *Agonis parviceps* dominates. The herb layer is similarly diverse.

3. ***Banksia ilicifolia*-jarrah woodland** occurs commonly in the southern and western part of the reserve. This vegetation unit is a dampland with dominant understorey species including *Melaleuca thymoides, Kunzea recurva, Aotus intermedia, Pultenaea ochreata* and *Adenanthos obovatus.* In the wettest areas jarrah disappears. This community grades into vegetation unit 6 (*Melaleuca preissiana-Banksia littoralis* woodland) which occupies somewhat wetter sites.

4. **Dieback affected *Banksia ilicifolia*-jarrah woodland** A significant area of *Banksia ilicifolia* woodland has been destroyed by dieback in the south-western corner of the reserve. Some trees are still standing dead, the understorey is dominated by *Pultenaea ochreata.*

5. ***Melaleuca cuticularis* woodland** occurs in the north-eastern corner of the reserve. A well developed but variable herb and sedge layer develops under the *Melaleuca.* Obvious species include *Lepyrodia muirii, Gahnia trifida, Lepidosperma longitudinale, Cotula coronopifolia, Triglochin* spp., *Juncus* spp., *Tribonanthes* spp. and *Burchardia monantha.* Variability in understorey species appears to be correlated with variation in sand and clay content of the soil.

6. ***Melaleuca preissiana-Banksia littoralis* woodland** is a common vegetation unit on low-lying sandy areas, the understorey is quite variable depending on period of inundation. In the wettest areas *Pericalymma ellipticum* and *Lepidosperma longitudinale* form a dense understorey. In slightly drier sites this is replaced by an understorey dominated by *Melaleuca* spp. (often *M. densa, M. spathulata,* and *M. viminea*), *Kunzea recurva*, and *Viminaria juncea.*

7. ***Melaleuca preissiana* woodland over *Agonis* scrub** is a species-poor unit where the understorey is dominated by dense stands of *Agonis parviceps.*

8. ***Melaleuca rhaphiophylla* low forest** occurs around the basin wetlands and drainage lines. This unit is generally species-poor owing to the dense canopy, and the understorey is usually dominated by sedges (*Lepidosperma longitudinale, Baumea* spp.).

9. **Open *Melaleuca rhaphiophylla* low forest** has a more species-rich understorey with sedges, shrubs (such as *Agonis linearifolia,* and *Aotus intermedia*) and herbs (such as *Villarsia albiflora*, *Samolus junceus*, and *Opercularia hispidula*).

10. **Open *Baumea* sedgeland** occurs over Kodjinup Swamp itself, *Baumea articulata* is the dominant sedge, while toward the edge *B. juncea* and *B. vaginalis* co-dominate.

11. **Closed *Baumea* sedgeland** occurs in the western basin wetland, and has an identical species composition to vegetation unit 10 but has a higher cover of the *Baumea* spp.

12. **Disturbed areas** associated with an old mill occur on the eastern side.

13. **Open water** occurs in small areas but may dry to herbland later in summer.

Vegetation change Oblique aerial photographs from April 1980 show that the *Baumea* in Kodjinup Swamp appears to have become less dense although expanses of open water are not yet apparent.

Disturbance or threats A drain constructed through the central part of the reserve in 1993 (CALM 1998[1]) has caused massive deaths of *Banksia ilicifolia* woodland and associated heath species as a result of dieback (*Phytophthora* sp.) spread. This impact is being monitored by a series of photopoints (22 March 1997) laid along a 50-m transect perpendicular to the drain. At 10-m intervals a photograph has been taken toward the east parallel to the drain. All photopoints were marked with a fence dropper. Changes in inundation owing to drain construction have resulted in death in small areas of jarrah woodland (Map 4). The northern (upslope) section of the drain was constructed through what appear to be areas of old dieback infections. The nature conservation values of this reserve have been severely compromised by the construction of this drain.

A much smaller drain directs water in wetland vegetation on the southern boundary of the reserve, there are no impacts to the vegetation at this time.

Kodjinup Nature Reserve flora list.

Anthericaceae
- Agrostocrinum scabrum
- Chamaescilla corymbosa
- Johnsonia lupulina
- Laxmannia minor
- Laxmannia sessiliflora
- Thysanotus manglesianus
- Thysanotus multiflorus
- Thysanotus patersonii
- Thysanotus tenellus
- Tricoryne elatior
- Tricoryne humilis

Apiaceae
- Actinotus glomeratus
- Centella cordifolia
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia atkinsoniana
- Xanthosia candida
- Xanthosia ciliata
- Xanthosia huegelii

Asteraceae
- Angianthus preissianus
- * Arctotheca calendula
- * Aster subulatus
- * Cirsium vulgare
- Cotula coronopifolia
- Cotula cotuloides
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia myosotidifolia
- Olearia elaeophila
- Pithocarpa pulchella
- Pogonolepis stricta
- * Pseudognaphalium luteoalbum
- Rhodanthe citrina
- Senecio minimus
- Siloxerus humifusus
- * Sonchus asper
- * Sonchus hydrophilus

Campanulaceae
- Wahlenbergia multicaulis
- Wahlenbergia preissii
- Wahlenbergia stricta

Casuarinaceae
- Allocasuarina humilis

Centrolepidaceae
- Aphelia cyperoides
- Brizula drummondii
- Centrolepis aristata
- Centrolepis drummondiana
- Centrolepis glabra
- Centrolepis polygyna

Colchicaceae
- Burchardia congesta
- Burchardia monantha
- Burchardia multiflora

Crassulaceae
- Crassula colorata

Cyperaceae
- Baumea articulata
- Baumea juncea
- Baumea vaginalis
- Cyathochaeta avenacea
- * Cyperus tenellus
- Gahnia trifida
- Isolepis cernua
- Isolepis congrua
- Isolepis ?cyperoides
- * Isolepis marginata
- Isolepis oldfieldiana
- Isolepis stellata
- Lepidosperma angustatum
- Lepidosperma longitudinale
- Lepidosperma squamatum
- Lepidosperma tenue
- Mesomelaena graciliceps
- Mesomelaena tetragona
- Schoenus asperocarpus
- Schoenus benthamii
- Schoenus efoliatus
- Schoenus humilis
- Schoenus odontocarpus
- Schoenus plumosus
- Schoenus submicrostachyus
- Tetraria capillaris
- Tetraria octandra
- Tricostularia neesii var. neesii

Dasypogonaceae
- Dasypogon bromeliifolius
- Lomandra hermaphrodita
- Lomandra micrantha
- Lomandra sericea

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia ?amplexicaulis
- Hibbertia commutata
- Hibbertia pulchra
- Hibbertia racemosa
- Hibbertia stellaris
- Hibbertia vaginata

Droseraceae
- Drosera erythrorhiza
- Drosera gigantea
- Drosera glanduligera
- Drosera menziesii
- Drosera pallida
- Drosera stolonifera

[1] CALM (1998). Draft management plan, Perup Forest and Lake Muir/Unicup Nature Reserves. Department of Conservation and Land Management, Perth.

Epacridaceae
- Andersonia caerulea
- Astroloma baxteri
- Astroloma ciliatum
- Astroloma pallidum
- Leucopogon australis
- Leucopogon capitellatus
- Leucopogon glabellus
- Leucopogon oxycedrus
- Leucopogon ?polymorphus
- Leucopogon propinquus
- Leucopogon tamariscinus
- Leucopogon unilateralis
- Leucopogon verticillatus
- Lysinema ciliatum
- Styphelia tenuiflora

Euphorbiaceae
- Monotaxis occidentalis
- Poranthera microphylla

Goodeniaceae
- Anthotium humile
- Dampiera alata
- Dampiera cuneata
- Dampiera ?juncea
- Dampiera linearis
- Dampiera ?pedunculata
- Dampiera aff. triloba
- Goodenia claytoniacea
- Goodenia micrantha
- Goodenia pulchella
- Velleia trinervis

Haemodoraceae
- Anigozanthos bicolor
- Anigozanthos flavidus
- Conostylis aculeata
- Conostylis laxiflora
- Conostylis setigera
- Haemodorum laxum
- Haemodorum spicatum
- Tribonanthes australis
- Tribonanthes violacea

Haloragaceae
- Glischrocaryon aureum
- Gonocarpus hexandrus ssp. integrifolius
- Gonocarpus paniculatus

Hydatellaceae
- Trithuria bibracteata
- Trithuria submersa

Iridaceae
- * Gladiolus undulatus
- Patersonia juncea
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)

Juncaceae
- * Juncus bufonius
- * Juncus capitatus
- Juncus kraussii
- Juncus pallidus

Juncaginaceae
- Triglochin calcitrapum
- Triglochin centrocarpum
- Triglochin huegelii
- Triglochin striatum

Lamiaceae
- Hemiandra pungens

Lauraceae
- Cassytha glabella
- Cassytha micrantha
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Lobelia alata

Loganiaceae
- Logania serpyllifolia
- Phyllangium paradoxum

Loranthaceae
- Nuytsia floribunda

Lythraceae
- * Lythrum hyssopifolia

Menyanthaceae
- Villarsia albiflora
- Villarsia parnassifolia

Mimosaceae
- Acacia extensa
- Acacia incurva
- Acacia myrtifolia
- Acacia pulchella
- Acacia stenoptera

Myrtaceae
- Agonis linearifolia
- Agonis parviceps
- Astartea sp. (pink weeping)
- Astartea sp. (tall white)
- Baeckea camphorosmae
- Baeckea aff. preissiana
- Calothamnus lateralis
- Calytrix angulata
- Eucalyptus calophylla
- Eucalyptus decipiens
- Eucalyptus marginata
- Hypocalymma angustifolium
- Hypocalymma strictum
- Kunzea recurva
- Kunzea recurva x sulphurea hybrid
- Kunzea sulphurea
- Melaleuca cuticularis
- Melaleuca densa
- Melaleuca lateritia
- Melaleuca leptoclada
- Melaleuca preissiana
- Melaleuca rhaphiophylla
- Melaleuca spathulata
- Melaleuca thymoides
- Melaleuca viminea
- Melaleuca violacea
- Pericalymma ellipticum

Onagraceae
- Epilobium billardierianum

Orchidaceae
- Caladenia flava
- Caladenia longicauda
- Caladenia radialis
- Caladenia radiata
- Elythranthera brunonis
- Elythranthera emarginata
- Eriochilus dilatatus
- Leporella fimbriata
- * Monadenia bracteata
- Praecoxanthus aphyllus ms
- Prasophyllum drummondii
- Prasophyllum ?elatum
- Pterostylis barbata
- Pterostylis nana
- Pterostylis vittata
- Pyrorchis nigricans
- Thelymitra crinita
- Thelymitra flexuosa
- Thelymitra ?macrophylla

Orobanchaceae
- * Orobanche minor

Papilionaceae
- Aotus intermedia
- Bossiaea eriocarpa
- Bossiaea linophylla
- Bossiaea ornata
- Bossiaea sp.
- Brachysema melanopetalum

- Brachysema praemorsum
- Chorizema ilicifolium
- Daviesia physodes
- Gompholobium capitatum
- Gompholobium confertum
- Gompholobium knightianum
- Gompholobium polymorphum
- Gompholobium preissii
- Gompholobium tomentosum
- Hovea chorizemifolia
- Hovea trisperma var. grandiflora
- Jacksonia furcellata
- Jacksonia sparsa ms
- Kennedia coccinea
- * Lotus angustissimus
- * Lotus suaveolens
- * Ornithopus compressus
- Oxylobium lineare
- Pultenaea ochreata
- Pultenaea reticulata
- Sphaerolobium macranthum
- Sphaerolobium medium
- Sphaerolobium vimineum
- Viminaria juncea

Philydraceae
- Philydrella pygmaea

Phormiaceae
- Dianella revoluta

Pittosporaceae
- Billardiera variifolia
- Marianthus candidus

Poaceae
- * Aira caryophyllea
- Amphipogon debilis
- Amphipogon turbinatus
- Austrostipa compressa
- Austrostipa juncifolia
- Deyeuxia quadriseta
- Hemarthria uncinata
- * Holcus lanatus
- Neurachne alopecuroidea
- Poa poiformis
- Tetrarrhena laevis
- * Vulpia myuros

Podocarpaceae
- Podocarpus drouynianus

Polygalaceae
- Comesperma calymega
- Comesperma flavum
- Comesperma virgatum
- Comesperma volubile

Polygonaceae
- * Rumex acetosella
- * Rumex crispus
- * Rumex pulcher

Primulaceae
- Samolus junceus

Proteaceae
- Adenanthos obovatus
- Banksia grandis
- Banksia ilicifolia
- Banksia littoralis
- Conospermum flexuosum
- Dryandra armata
- Dryandra lindleyana
- Franklandia fucifolia
- Hakea ceratophylla
- Hakea lissocarpha
- Hakea prostrata
- Hakea ruscifolia
- Hakea sp.
- Hakea sulcata
- Hakea trifurcata
- Hakea varia
- Isopogon sp.
- Persoonia longifolia
- Petrophile media
- Petrophile rigida
- Petrophile serruriae
- Stirlingia anethifolia
- Synaphea sp.

Ranunculaceae
- Clematis pubescens

Restionaceae
- Anarthria laevis
- Anarthria prolifera
- Desmocladus fasciculatus ms
- Desmocladus flexuosus ms
- Hypolaena exsulca
- Leptocarpus tenax
- Lepyrodia muirii
- Lyginia barbata
- Meeboldina tephrina ms
- Sporadanthus strictus ms
- Stenopa ramosissima ms
- Tremulina tremula ms

Rhamnaceae
- Trymalium ledifolium

Rubiaceae
- Opercularia hispidula

Rutaceae
- Boronia nematophylla
- Boronia spathulata
- Eriostemon nodiflorus ssp. lasiocalyx

Santalaceae
- Leptomeria pauciflora
- Leptomeria scrobiculata
- Leptomeria squarrulosa

Scrophulariaceae
- Gratiola peruviana

Stackhousiaceae
- Stackhousia monogyna

Sterculiaceae
- Thomasia ?pauciflora

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium calcaratum
- Stylidium guttatum
- Stylidium luteum
- Stylidium mimeticum
- Stylidium perpusillum
- Stylidium repens
- Stylidium scandens
- Stylidium schoenoides
- Stylidium spathulatum
- Stylidium violaceum

Thymelaeaceae
- Pimelea angustifolia
- Pimelea ciliata ssp. ciliata
- Pimelea imbricata var. major
- Pimelea rosea
- Pimelea sulphurea

Tremandraceae
- Tetratheca sp.
- Tremandra diffusa

Xanthorrhoeaceae
- Xanthorrhoea gracilis
- Xanthorrhoea preissii

Zamiaceae
- Macrozamia riedlei

KULUNILUP NATURE RESERVE

Reserve number 26677 **Class** A
Location 34 20 05S 116 47 16E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 612 ha

Biological values

Flora Using Griffin[2] (1984) data as a basis, a flora list of 432 taxa was compiled from the reserve (see flora list below). This included seven priority taxa (*Amphibromus vickeryae* (Priority 1), *Apodasmia ceramophila* ms (Priority 2), *Euchiton gymnocephalus* (Priority 3), *Phyllangium palustre* (Priority 2), *Rhodanthe pyrethrum* (Priority 3), *Schoenus natans* (Priority 4), *Villarsia submersa* (Priority 4)).

Vegetation description Griffin (1984) mapped the reserve and described 11 vegetation units. Brief descriptions of these units are given below.

3(I). ***Eucalyptus marginata* (jarrah) forest (Type 2)** [bottom of lateritic ridges]. Jarrah-marri forest at the base of lateritic ridges, essentially similar to Kodjinup vegetation unit 1.

3/9. ***Eucalyptus marginata* (jarrah) forest (Type 2)/*Agonis parviceps* thicket** Variable unit similar to Kodjinup vegetation unit 2, common on low-lying sandy substrates.

4/6. ***Eucalyptus marginata* (jarrah)-*E. wandoo* forest/*Hakea prostrata* Low Scrub A** A variable unit dominated by jarrah and/or wandoo, occasionally marri, over a *Hakea prostrata-Hypocalymma angustifolia* heath with sedges *Mesomelaena tetragona* and *M. stygia*. This unit occupies old sandy drainage lines.

6. ***Hakea prostrata* low scrub A** Similar to unit 4/6 without the overstorey. Essentially the same as Galamup vegetation unit 8.

10. ***Melaleuca preissiana-Banksia littoralis* open low woodland A** A complex unit essentially similar to Kodjinup vegetation unit 6.

12. ***Melaleuca lateritia* dense low heath** Essentially similar to Galamup vegetation unit 6, these are small basin wetlands on loamy clays.

13. ***Melaleuca rhaphiophylla* dense low forest B** Occurs as circular or ring shaped areas in the centre of some basin wetlands. This unit is equivalent to Muir vegetation unit 15.

19. ***Baumea* sedges** Occupying basin wetlands, essentially the same as Kodjinup vegetation units 10 and 11.

22. ***Melaleuca viminea* heath** Occurring on grey clayey soils, with a variable understorey of *Baumea* sp. and *Leptocarpus aristatus.*

23. ***Melaleuca spathulata* complex** Very variable unit of poorly drained flats. Its composition depends on drainage conditions; in the wettest areas *M. spathulata* forms a dense heath, in the drier peripheral zones it is more similar to vegetation unit 10.

24. ***Leptocarpus* sedges** Clay flats dominated by *Apodasmia ceramophila* ms. Griffin (1984) states that there are few herbs, however, these winter-wet flats have a diverse annual herb flora in spring and early summer as these seasonally inundated wetlands dry.

Disturbed areas Not mapped by Griffin (1984) but used in compiling species lists.

Vegetation change Oblique aerial photographs from April 1980 show little change to the central wetland.

Disturbance or threats Recent aerial photography and on-the-ground inspections show several major drains entering the reserve. Of particular concern is the impact on the *Melaleuca spathulata* heath in the north-eastern corner of the reserve. Presently the community is very open with large areas of bare ground. This may be the result of salinity, and needs to be investigated using a time series of aerial photography to determine whether this is the case and, if so, the rate of spread of this impact.

Other major drains enter the reserve from the west and south. No obvious impacts from these drains are apparent at this time.

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[2] Griffin, E.A. (1984). Vegetation survey of three nature reserves in the Lake Unicup complex (Lake Unicup, Kulunilup Lake and Yarnup Lake). A report for Department of Fisheries and Wildlife, Perth.

Kulunilup Nature Reserve flora list.

Aizoaceae
* Carpobrotus edulis
Carpobrotus modestus
Amaranthaceae
Alternanthera nodiflora
Anthericaceae
Agrostocrinum scabrum
Arthropodium preissii
Borya scirpoidea
Borya sphaerocephala
Caesia micrantha
Caesia occidentalis
Chamaescilla corymbosa
Chamaescilla spiralis
Johnsonia lupulina
Laxmannia minor
Sowerbaea laxiflora
Thysanotus manglesianus
Thysanotus tenellus
Tricoryne elatior
Tricoryne humilis
Apiaceae
Centella cordifolia
Daucus glochidiatus
Eryngium pinnatifidum
Homalosciadium homalocarpum
Hydrocotyle alata
Hydrocotyle diantha
Hydrocotyle pilifera
Schoenolaena tenuior
Trachymene pilosa
Xanthosia candida
Xanthosia huegelii
Asteraceae
Angianthus preissianus
Angianthus tomentosus
* Arctotheca calendula
Asteridea athrixioides
Blennospora drummondii
Brachyscome iberidifolia
* Carduus pycnocephalus
Cotula coronopifolia
Craspedia variabilis
* Dittrichia graveolens
Euchiton gymnocephalus
Euchiton sphaericus
Gnephosis tenuissima
Hyalosperma simplex
* Hypochaeris glabra
Lagenifera huegelii
Millotia myosotidifolia
Olearia paucidentata
Podolepis gracilis
Podotheca angustifolia
* Pseudognaphalium luteoalbum
Pterochaeta paniculata
Quinetia urvillei
Rhodanthe citrina
Rhodanthe pyrethrum
Rutidosis multiflora
Senecio minimus
Siloxerus humifusus
* Sonchus asper
* Sonchus hydrophilus
* Sonchus oleraceus
Trichocline sp.
* Vellereophyton dealbatum
Campanulaceae
Wahlenbergia multicaulis
Wahlenbergia preissii
Caryophyllaceae
* Cerastium glomeratum
Casuarinaceae
Allocasuarina humilis
Allocasuarina lehmanniana
Allocasuarina thuyoides
Centrolepidaceae
Aphelia cyperoides
Brizula drummondii
Centrolepis aristata
Centrolepis drummondiana
Centrolepis glabra
Centrolepis pilosa
Centrolepis polygyna
Colchicaceae
Burchardia congesta
Burchardia monantha
Burchardia multiflora
Wurmbea dioica
Crassulaceae
Crassula colorata
Crassula decumbens var. decumbens
* Crassula natans
Crassula pedicellosa
Crassula peduncularis
Cupressaceae
Actinostrobus pyramidalis
Cyperaceae
Baumea articulata
Baumea juncea
Baumea rubiginosa
Baumea ?vaginalis
Chorizandra enodis
Cyathochaeta avenacea
* Cyperus tenellus
Eleocharis sphacelata
Gahnia ancistrophylla
Gahnia trifida
Isolepis cernua
* Isolepis marginata
Isolepis oldfieldiana
Isolepis sp.
Isolepis stellata
Lepidosperma angustatum
Lepidosperma longitudinale
Lepidosperma sp.
Lepidosperma squamatum
Lepidosperma tenue
Mesomelaena stygia
Mesomelaena tetragona
Schoenus bifidus
Schoenus efoliatus
Schoenus elegans
Schoenus natans
Schoenus sp.
Schoenus subbulbosus
Schoenus tenellus
Tetraria capillaris
Tetraria octandra
Dasypogonaceae
Chamaexeros serra
Dasypogon bromeliifolius
Lomandra caespitosa
Lomandra collina
Lomandra micrantha
Lomandra nigricans
Lomandra purpurea
Lomandra sonderi
Lomandra suaveolens
Dennstaedtiaceae
Pteridium esculentum
Dilleniaceae
Hibbertia ?commutata
Hibbertia cunninghamii
Hibbertia gracilipes
Hibbertia racemosa
Hibbertia spicata ssp. spicata

Hibbertia stellaris
Hibbertia subvaginata
Droseraceae
Drosera erythrorhiza
Drosera gigantea
Drosera glanduligera
Drosera macrantha
Drosera menziesii
Drosera neesii
Drosera rosulata
Epacridaceae
Andersonia caerulea
Astroloma baxteri
Astroloma ciliatum
Astroloma pallidum
Leucopogon australis
Leucopogon capitellatus
Leucopogon conostephioides
Leucopogon parviflorus
Leucopogon pendulus
Leucopogon verticillatus
Lysinema ciliatum
Sphenotoma capitatum
Euphorbiaceae
Poranthera microphylla
Gentianaceae
* Centaurium erythraea
* Cicendia filiformis
Geraniaceae
* Erodium cicutarium
Geranium solanderi
Goodeniaceae
Anthotium humile
Dampiera alata
Dampiera linearis
Dampiera pedunculata
Goodenia mimuloides
Goodenia pulchella
Lechenaultia formosa
Scaevola phlebopetala
Velleia trinervis
Haemodoraceae
Anigozanthos bicolor
Anigozanthos manglesii
Conostylis aculeata
Conostylis aurea
Conostylis laxiflora
Conostylis setigera
Haemodorum laxum
Haemodorum simplex
Haemodorum sparsiflorum
Haemodorum spicatum
Tribonanthes australis
Tribonanthes longipetala
Tribonanthes sp Lake Muir
Tribonanthes violacea
Haloragaceae
Glischrocaryon aureum
Myriophyllum crispatum
Myriophyllum limnophilum
Hydatellaceae
Trithuria bibracteata
Trithuria submersa
Hypoxidaceae
Hypoxis occidentalis
Iridaceae
Patersonia juncea
Patersonia occidentalis
* Romulea rosea
Isoetaceae
Isoetes drummondii
Juncaceae
* Juncus articulatus
* Juncus bufonius
* Juncus capitatus
Juncus pallidus
Juncus radula
Juncus sp.
Juncaginaceae
Triglochin centrocarpum
Triglochin huegelii
Triglochin lineare
Lamiaceae
Hemiandra pungens
* Mentha pulegium
Lauraceae
Cassytha racemosa
Lentibulariaceae
Polypompholyx multifida
Polypompholyx tenella
Utricularia inaequalis
Linaceae
Linum marginale
Lindsaeaceae
Lindsaea linearis
Lobeliaceae
Grammatotheca bergiana
Lobelia alata
Lobelia gibbosa
Loganiaceae
Logania campanulata
Logania serpyllifolia
Phyllangium palustre
Phyllangium paradoxum
Loranthaceae
Nuytsia floribunda
Lythraceae
* Lythrum hyssopifolia
Menyanthaceae
Villarsia albiflora
Villarsia submersa
Mimosaceae
Acacia alata
Acacia cyclops
Acacia extensa
Acacia huegelii
Acacia incurva
Acacia laricina var. laricina
Acacia nervosa
Acacia pulchella
Acacia saligna
Acacia stenoptera
Myrtaceae
Actinodium cunninghamii
Agonis juniperina
Astartea sp. (pink weeping)
Astartea sp. (white erect)
Calothamnus lateralis
Calothamnus sanguineus
Calothamnus schaueri
Calytrix flavescens
Eremaea pauciflora
Eucalyptus calophylla
Eucalyptus decipiens
Eucalyptus marginata
Eucalyptus occidentalis
Eucalyptus rudis
Eucalyptus wandoo
Hypocalymma angustifolium
Kunzea micrantha
Melaleuca cuticularis
Melaleuca densa
Melaleuca lateriflora
Melaleuca lateritia
Melaleuca leptoclada
Melaleuca preissiana
Melaleuca rhaphiophylla
Melaleuca spathulata
Melaleuca thymoides
Melaleuca viminea
Pericalymma ellipticum
Verticordia densiflora

Onagraceae
- Epilobium billardierianum
- Epilobium hirtigerum

Orchidaceae
- Caladenia flava
- Caladenia longicauda
- Caladenia marginata
- Caladenia radiata
- Caladenia splendens ms
- Corybas dilatatus
- Cyrtostylis robusta
- Diuris laxiflora
- Diuris longifolia
- Drakonorchis barbarossa ms
- Elythranthera brunonis
- Elythranthera emarginata
- Leporella fimbriata
- Microtis atrata
- Microtis media
- Microtis orbicularis
- * Monadenia bracteata
- Prasophyllum drummondii
- Prasophyllum macrostachyum
- Pterostylis nana
- Pterostylis pyramidalis
- Pterostylis recurva
- Pterostylis vittata
- Pyrorchis nigricans
- Thelymitra crinita
- Thelymitra pauciflora

Orobanchaceae
- * Orobanche minor

Papilionaceae
- Bossiaea eriocarpa
- Bossiaea linophylla
- Bossiaea ornata
- Bossiaea praetermissa
- Brachysema melanopetalum
- Brachysema praemorsum
- Chorizema aciculare
- Daviesia cordata
- Daviesia incrassata
- Daviesia preissii
- Eutaxia virgata
- Gompholobium capitatum
- Gompholobium knightianum
- Gompholobium marginatum
- Gompholobium ovatum
- Gompholobium polymorphum
- Gompholobium preissii
- Gompholobium scabrum
- Gompholobium tomentosum
- Hovea chorizemifolia
- Hovea trisperma var. grandiflora
- Isotropis cuneifolia
- Jacksonia furcellata
- Kennedia coccinea
- Kennedia prostrata
- * Lotus angustissimus
- * Lotus uliginosus
- Oxylobium lineare
- Pultenaea ericifolia
- Sphaerolobium medium
- Sphaerolobium vimineum
- * Trifolium campestre
- * Trifolium dubium
- * Trifolium subterraneum
- Viminaria juncea

Philydraceae
- Philydrella drummondii
- Philydrella pygmaea

Phormiaceae
- Dianella brevicaulis
- Dianella revoluta
- Stypandra glauca

Pittosporaceae
- Billardiera sp.
- Marianthus candidus
- Sollya heterophylla

Poaceae
- Agrostis avenacea
- * Aira caryophyllea
- Amphibromus nervosus
- Amphibromus vickeryae
- Amphipogon debilis
- Austrodanthonia occidentalis
- Austrodanthonia setacea
- Austrostipa compressa
- Austrostipa pycnostachya
- * Briza maxima
- * Briza minor
- Deyeuxia quadriseta
- Hemarthria uncinata
- * Holcus lanatus
- Neurachne alopecuroidea
- Poa drummondiana
- * Polypogon monspeliensis
- Tetrarrhena laevis
- * Vulpia bromoides
- * Vulpia myuros

Polygalaceae
- Comesperma calymega
- Comesperma ciliatum
- Comesperma flavum
- Comesperma virgatum

Polygonaceae
- Persicaria prostrata
- * Polygonum arenastrum
- * Rumex conglomeratus
- * Rumex pulcher

Primulaceae
- Samolus junceus

Proteaceae
- Banksia grandis
- Banksia littoralis
- Dryandra armata
- Dryandra lindleyana
- Grevillea brownii
- Hakea lissocarpha
- Hakea prostrata
- Hakea ruscifolia
- Hakea sulcata
- Hakea varia
- Isopogon polycephalus
- Isopogon teretifolius
- Persoonia longifolia
- Petrophile media
- Petrophile serruriae
- Petrophile squamata
- Synaphea favosa
- Synaphea petiolaris

Ranunculaceae
- Clematis pubescens

Restionaceae
- Anarthria laevis
- Anarthria prolifera
- Apodasmia ceramophila ms
- Desmocladus fasciculatus ms
- Harperia lateriflora
- Hypolaena exsulca
- Leptocarpus tenax
- Lepyrodia muirii
- Lyginia barbata
- Meeboldina cana ms
- Meeboldina coangustata ms
- Meeboldina scariosa ms
- Tremulina tremula ms

Rhamnaceae
- Trymalium ledifolium

Rubiaceae
- Opercularia hispidula
- Opercularia vaginata

Rutaceae
- Boronia ?juncea
- Boronia megastigma
- Boronia ramosa
- Boronia spathulata

Santalaceae
- Santalum acuminatum

Scrophulariaceae
- Gratiola peruviana
- Limosella australis
- * Parentucellia latifolia
- * Parentucellia viscosa

Selaginellaceae
- Selaginella gracillima

Stackhousiaceae
- Stackhousia monogyna
- Tripterococcus brunonis

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium assimile
- Stylidium brunonianum ssp. minor
- Stylidium calcaratum
- Stylidium carnosum
- Stylidium crassifolium
- Stylidium emarginatum
- Stylidium guttatum
- Stylidium inundatum
- Stylidium miniatum
- Stylidium perpusillum
- Stylidium petiolare
- Stylidium pulchellum
- Stylidium repens
- Stylidium roseonanum
- Stylidium schoenoides
- Stylidium spathulatum

Thymelaeaceae
- Pimelea angustifolia
- Pimelea ?ciliata
- Pimelea sulphurea

Tremandraceae
- Platytheca galioides
- Tetratheca setigera

Violaceae
- Hybanthus floribundus

Xanthorrhoeaceae
- Xanthorrhoea gracilis
- Xanthorrhoea preissii

Zamiaceae
- Macrozamia riedlei

LAKE MUIR RESERVE

Reserve number 31880 **Class** A
Location 34 29 08S 116 43 24E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 11 311 ha

Biological values

Flora 737 taxa and one hybrid were recorded from the reserve (see flora list below). This list included three Declared Rare Flora (*Caladenia christineae* ms, *Caladenia harringtoniae, Diuris drummondii*) and 19 priority taxa (*Amphibromus vickeryae* (Priority 1), *Anthotium junciforme* (Priority 4), *Apodasmia ceramophila* ms (Priority 2), *Caladenia starteorum* ms (Priority 2), *Eryngium* sp. Lake Muir (E Wittwer 2293) (Priority 1), *Euchiton gymnocephalus* (Priority 3), *Euphrasia scabra* (Priority 2), *Jacksonia sparsa* ms (Priority 3), *Leucopogon tamariscinus* (Priority 2), *Lilaeopsis polyantha* (Priority 2), *Melaleuca pritzelii* (Priority 2), *Phyllangium palustre* (Priority 2), *Rhodanthe pyrethrum* (Priority 3), *Schoenus capillifolius* (Priority 2), *Schoenus natans* (Priority 4), *Stylidium lepidum* (Priority 3), *Stylidium rhipidium* (Priority 1), *Synaphea decumbens* (Priority 1), *Villarsia submersa* (Priority 4)).

Of these taxa *Eryngium* sp. Lake Muir (*E. Wittwer* 2293) appears to be endemic to the Lake Muir area. The two large populations of *Euphrasia scabra* are the only extant locations known for this taxon in WA, it has been recommended for listing as nationally critical based on population declines in the eastern States. The shrublands and forests surrounding Lake Muir contain the only known populations of *Lilaeopsis polyantha* in WA. The aquatic sedge *Schoenus natans* has recently been delisted as Declared Rare Flora based on the large population of this taxon in Lake Muir Nature Reserve and several other nature reserves in the area. It was previously believed to be restricted to the Swan Coastal Plain (Keighery and Keighery 1996).

Vegetation description 31 vegetation units have been mapped in the reserve, wet heaths and scrubs predominate in the northern section of the reserve while eucalypt woodlands are more common in the south (Map 5).

1. **Jarrah-marri forest and woodland** on laterite and lateritic gravels cover a small area in the south-eastern corner of the reserve. The understorey is typically diverse in shrubs, herbs and grasses. Typical understorey shrubs include *Hibbertia* spp., *Leucopogon* spp. and peas such as *Bossiaea* spp., *Daviesia* spp. and *Gompholobium* spp.

2. **Jarrah-marri open woodland** on sandy soils occurs widely in the southern half of the reserve, common understorey species include *Hibbertia racemosa, Hibbertia subvaginata, Astroloma baxteri, Leucopogon* spp., *Phyllanthus calycinus, Acacia pulchella, Jacksonia furcellata.* There is generally a very rich and diverse herb layer and orchids are numerous early in the spring. Toward the northern part of the reserve, this vegetation unit is replaced by jarrah-yate woodlands (unit 4).

3. **Jarrah-marri woodland over *Agonis* scrub** occurs along seasonally-wet drainage lines and in the swales between the dunes to the east of Lake Muir. Typically the *Agonis* scrub is very dense with little or no other understorey.

4. **Jarrah-yate woodland** occurs on the large dune bordering the eastern side of Lake Muir and sandy flats in the northern part of the reserve. Elsewhere on the reserve it is replaced by vegetation unit 3 (jarrah-marri woodlands on sand). Both units have very similar understorey composition. Where the jarrah-yate community has been grazed weed diversity is high.

5. **Jarrah woodland over *Hakea oleifolia* heath** occurs on the red dunes to the east of Poorginup Swamp. This soil unit was not seen elsewhere in the reserve.

6. ***Eucalyptus decipiens* woodland**, similar to those occurring in Galamup and Cobertup Nature Reserves, is found in a small area on the wet clayey flats north of the Muir Highway. *Allocasuarina lehmanniana, Allocasuarina microstachya, Leucopogon australis, Darwinia vestita,* and *Aotus intermedia* are common components of the understorey. There is also a rich and diverse herb and sedge layer.

7. ***Eucalyptus rudis* woodland** occurs in small patches on wet flats and small rises. The understorey is typical of seasonally-inundated situations and includes *Anigozanthos flavidus, Agonis parviceps, Kunzea ericifolia, Viminaria juncea, Hakea ceratophylla,* and *Hakea varia.* Orchids were common in this unit in early spring.

8. ***Eucalyptus rudis* woodland on sand dunes** occurs on the eastern side of most of the basin wetlands. These woodlands tended to be quite weedy reflecting a history of past grazing. *E. rudis* woodland is replaced by yate woodland (vegetation unit 31) on the fringing dunes of Lake Muir, understorey composition is essentially similar.

9. ***Banksia ilicifolia* woodland** occurs in small patches along and to the north of the Muir Highway. Extensive areas of dieback are apparent. In dieback-free areas a diverse understorey of peas, epacrids, and Myrtaceae is present. *Schoenus* spp. and *Mesomelaena tetragona* are also common.

10. ***Melaleuca cuticularis* complex** The wet flats in the northern half of the reserve are mostly covered by *Melaleuca* shrublands and/or woodlands in a complex mosaic. One of the most variable is the *Melaleuca cuticularis* complex, which ranges from woodland to very open woodland to wet heath with occasional *M. cuticularis* trees. Understorey is also variable, apparently related to period of inundation, but generally includes *Astartea* spp., *Melaleuca densa, Hypocalymma angustifolium, Hakea varia, Harperia lateriflora* and *Meeboldina cana.* The Lake Muir endemic *Eryngium* sp. Lake Muir is also found in this unit.

11. ***Melaleuca cuticularis* woodland over *Gahnia* sedgeland** is a distinct unit occurring on the flats along the edge of Lake Muir. This unit is quite species poor.

12. ***Melaleuca cuticularis* woodland over wet heath** forms a distinct unit in the south-eastern part of the reserve. The substrate is generally clayey and this unit has a very rich and diverse annual herb layer. The Asteraceae, Centrolepidaceae, Cyperaceae, Orchidaceae, Stylidiaceae are well represented. Common perennial taxa include *Melaleuca* spp., *Kunzea micrantha* and the rushes *Apodasmia ceramophila, Meeboldina coangustata,* and *Meeboldina cana.*

13. ***Melaleuca preissiana-Kunzea sulphurea* woodland** occurs as a small unit on drainage lines on the southern boundary of the reserve.

14. ***Melaleuca preissiana* woodland over wet heath** occurs extensively north of the Muir Highway. The understorey is variable and in the wettest sites is generally dominated by *Pericalymma ellipticum.* On drier sites the understorey is diverse with peas and Myrtaceae dominating.

15. ***Melaleuca rhaphiophylla* forest** forms dense stands around basin wetland and in the wettest parts of the flats. The understorey is generally dominated by *Lepidosperma* spp. and *Baumea* spp. but where the canopy is more open a variety of shrubs such as *Hypocalymma angustifolium, Pericalymma ellipticum, Callistachys lanceolata, Banksia littoralis, Hakea sulcata* become common.

16. ***Melaleuca-Kunzea* scrub** occurs on the clay flats near Wimbalup Swamp, dominant *Melaleuca* spp. include *M. viminalis, M. densa, M. ?spathulata.* The annual herb layer is again very diverse with an aquatic flora (e.g. *Schoenus natans, Villarsia submersa*) giving way to a sequence of annual Asteraceae, Centrolepidaceae, Cyperaceae and Stylidiaceae as the wetlands dry.

17. ***Melaleuca densa-M. viminea* heath** was a widespread unit in the northern area of the reserve occupying both sandy and sandy clay substrates. These areas are winter-wet and dry slowly in late spring and early summer. Aquatic taxa such as *Schoenus natans* and *Villarsia* spp. are widespread in early spring giving way to herbs as the wetlands dry. It was in this community that *Euphrasia scabra* was found. Two large populations were located and more populations may occur.

18. ***Melaleuca densa-M. viminea* thicket** can develop on long-inundated sites, where diversity drops as the canopy closes over.

19. **Mixed *Melaleuca* heath** occurs in low lying flats in the southern half of the reserve. Composition is variable: *Sphaerolobium vimineum, Eutaxia virgata, Hakea ceratophylla, Aotus intermedia,* and *Calothamnus lateralis* are common. On small rises this unit intergrades with the sandy jarrah unit (unit 2). In the wettest areas it gives way to the wet heath unit (unit 21) often dominated by *Pericalymma ellipticum.* Units 17, 18 and 19 occupy similar positions in the landscape and may reflect differences in fire age and/or period of winter inundation.

20. ***Hakea prostrata* heath** is a very small unit in Lake Muir but has essentially the same species composition to that of the same unit in Galamup Nature Reserve.

21. **Wet heath** occupies very wet sandy sites and is generally dominated by *Pericalymma ellipticum* and *Lepidosperma longitudinale.* On more clayey substrates this community grades into the *Melaleuca* shrublands (units 16–19). This unit is most common in the northern part of the reserve.

22. ***Gahnia* sedgeland** occurs in the shallow swales along the edge of Lake Muir. This community is very species-poor, being dominated by *Gahnia trifida.* This unit grades into unit 11.

23. **Open *Baumea* sedgeland** occupies basin wetlands. In the deeper water *Baumea articulata* is the sole dominant, closer to the shore *B. juncea* and *B. arthrophylla* occur. Around the edge of these wetlands taxa such as *Utricularia australis, Cotula coronopifolia, Centrolepis polygyna, Juncus bufonius, Villarsia albiflora* and *Microtis atrata* can also be found.

24. **Closed *Baumea* sedgeland** occupies basin wetlands and is essentially similar to unit 23, however, the *Baumea articulata* tends to be denser.

25. **Dying *Baumea* sedgeland** The *Baumea articulata* in Byenup Lagoon appears to be dying on the aerial photography taken on the 23rd October1995 (WA3619–5051). This photo shows most of the sedgeland to be bright orange in colour, generally indicative of stress. Recent aerial inspection found a recovery of the sedgeland but that the sedgeland now appears more open than in 1995. It is not clear as to the cause of this apparent decline but it does coincide with an 8-year peak in salinity levels in the lagoon (J.A.K. Lane, personal communication).

26. **Riparian vegetation** (not mapped) Incised creek lines had a narrow but distinctive vegetation unit associated with them: this unit was too small to map. The overstorey was *Agonis* or *Callistachys* with a dense shrub layer of *Brachysema melanopetalum*. The poorly collected orchid *Gastrodia lacista* was found in these habitats.

27. **Samphire flats** occur along the shore of Lake Muir between the shore and the *Gahnia* sedgeland. Common species include *Halosarcia indica, Halosarcia leptoclada, Sarcocornia quinqueflora, Suaeda australis* and *Wilsonia backhousei.*

28. **Cleared land** occurs on a portion of the reserve north-west of Byenup Lagoon. This area is largely covered by pasture grasses and weeds, although some revegetation of the shrub and tree layer is occurring. A block of private land west of Poorginup Swamp has previously been cleared, but is also slowly revegetating.

29. ***Armillaria*-affected shrubland** Part of the *Melaleuca preissiana-Kunzea sulphurea* woodland north of Poorginup Swamp appears to be affected by canker, possibly *Armillaria*. This needs further investigation.

30. **Open water** occurs on most of the larger basin wetlands.

31. **Yate woodland** on sand dunes replaces the more widespread fringing *E. rudis* woodland (vegetation unit 8) on the eastern shore of Lake Muir.

Vegetation change Photographs of three wetlands to the east of Lake Muir from April show little change with recent aerial photography. The photo of Byenup shows healthy *Baumea* sedgeland, dense around open water and more interspersed with clumps of *Melaleuca* and small patches of open water away from the major water body. As outlined above (vegetation unit 25) 1995 aerial photography appears to show the *Baumea* in a very stressed condition. Recent aerial survey indicates the *Baumea* sedgeland is in good condition but appears to have become more open.

Disturbance or threats **(1)** Drainage patterns and salinity levels in Byenup Lagoon should be investigated as a matter of priority in an attempt to identify the cause of the apparent collapse of the *Baumea* sedgeland in this wetland. A series of aerial photos over time should be assembled to confirm whether the health of the *Baumea* sedgeland is correlated with salinity levels. If this proves to be the case then management of salt loads in the lagoon would need to be kept well below the 1995 levels. **(2)** A series of illegal drains have been constructed into the eastern side reserve during the course of this study. Significant impacts owing to salinity and changes to inundation period could be expected. **(3)** The block of private land west of Poorginup Swamp should be acquired to protect Tordit-Gurrup Lagoon and Poorginup Swamp. These are two of the wetland systems in the best condition within the Lake Muir reserve. Any attempt to farm this land could put them at serious risk. **(4)** Vegetation unit 29 needs investigation to determine whether it is a result of fungal canker.

Lake Muir Nature Reserve flora list.

Aizoaceae
- Carpobrotus modestus

Amaranthaceae
- Alternanthera nodiflora
- Hemichroa diandra
- Ptilotus drummondii
- Ptilotus manglesii

Anthericaceae
- Agrostocrinum scabrum
- Arthropodium capillipes
- Arthropodium preissii
- Borya scirpoidea
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Chamaescilla spiralis
- Johnsonia acaulis
- Johnsonia lupulina
- Laxmannia minor
- Laxmannia sessiliflora
- Sowerbaea laxiflora
- Thysanotus multiflorus
- Thysanotus patersonii
- Thysanotus tenellus
- Thysanotus thyrsoideus
- Tricoryne elatior
- Tricoryne humilis
- Tricoryne tenella

Apiaceae
- Actinotus glomeratus
- Actinotus omnifertilis
- Apium annuum
- Apium prostratum
- Centella cordifolia
- Daucus glochidiatus
- Eryngium pinnatifidum
- Eryngium sp. Lake Muir (*E. Wittwer* 1193)
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Hydrocotyle diantha
- Hydrocotyle pilifera
- Lilaeopsis polyantha
- Platysace haplosciadia
- Platysace filiformis
- Schoenolaena juncea
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Asteraceae
- Angianthus preissianus
- Angianthus sp.

* Arctotheca calendula
* Aster subulatus
Asteridea pulverulenta
Blennospora drummondii
Blennospora sp.
Brachyscome bellidioides
Brachyscome iberidifolia
Calotis erinacea
* Carduus pycnocephalus
* Centaurea melitensis
* Cirsium vulgare
* Conyza albida
Cotula australis
Cotula coronopifolia
Cotula cotuloides
* Cotula turbinata
Craspedia variabilis
* Dittrichia graveolens
Euchiton gymnocephalus
Euchiton sphaericus
Gnephosis sp.
* Hedypnois rhagadioloides
Hyalosperma cotula
* Hypochaeris glabra
Ixiolaena viscosa
* Lactuca serriola
Lagenifera huegelii
Millotia myosotidifolia
Millotia tenuifolia
Olearia axillaris
Olearia elaeophila
Podolepis gracilis
Podolepis lessonii
Podotheca angustifolia
Pogonolepis stricta
* Pseudognaphalium luteoalbum
Pterochaeta paniculata
Quinetia urvillei
Rhodanthe pyrethrum
Rutidosis multiflora
Senecio glomeratus
Senecio lautus
Senecio minimus
Senecio picridioides
Senecio quadridentatus
Siloxerus humifusus
* Sonchus asper
* Sonchus hydrophilus
* Sonchus oleraceus
Trichocline sp.
Trichocline spathulata
* Ursinia anthemoides
* Vellereophyton dealbatum
Vittadinia australasica var. australasica
Waitzia nitida
Waitzia suaveolens

Brassicaceae
* Cardamine paucijuga
* Lepidium africanum

Callitrichaceae
* Callitriche stagnalis

Campanulaceae
Wahlenbergia multicaulis
Wahlenbergia preissii

Caryophyllaceae
* Cerastium glomeratum
* Corrigiola litoralis
* Petrorhagia velutina
* Spergularia salina

Casuarinaceae
Allocasuarina humilis
Allocasuarina lehmanniana
Allocasuarina microstachya

Centrolepidaceae
Aphelia cyperoides
Brizula drummondii
Centrolepis aristata
Centrolepis drummondiana
Centrolepis glabra
Centrolepis humillima
Centrolepis mutica
Centrolepis pilosa
Centrolepis polygyna

Chenopodiaceae
* Atriplex prostrata
* Chenopodium murale
Halosarcia indica
Halosarcia leptoclada
Rhagodia baccata
Sarcocornia quinqueflora
Suaeda australis

Clusiaceae
Hypericum gramineum

Colchicaceae
Burchardia congesta
Burchardia monantha
Burchardia multiflora
Wurmbea dioica

Convolvulaceae
Dichondra repens
Wilsonia backhousei

Crassulaceae
Crassula colorata
* Crassula natans
Crassula pedicellosa
Crassula peduncularis

Cupressaceae
Actinostrobus acuminatus
Actinostrobus pyramidalis

Cyperaceae
Baumea arthrophylla
Baumea articulata
Baumea juncea
Baumea vaginalis
Carex appressa
Carex preissii
Chorizandra enodis
Cyathochaeta avenacea
Cyathochaeta clandestina
* Cyperus tenellus
Gahnia ancistrophylla
Gahnia trifida
Isolepis cernua
Isolepis cyperoides
Isolepis fluitans
* Isolepis marginata
Isolepis nodosa
Isolepis oldfieldiana
Isolepis producta
* Isolepis prolifera
Isolepis stellata
Lepidosperma angustatum
Lepidosperma gladiatum
Lepidosperma longitudinale
Lepidosperma squamatum
Lepidosperma tenue
Mesomelaena stygia
Mesomelaena tetragona
Schoenus bifidus
Schoenus capillifolius
Schoenus curvifolius
Schoenus efoliatus
Schoenus humilis
Schoenus laevigatus
Schoenus maschalinus
Schoenus nanus
Schoenus natans
Schoenus plumosus
Schoenus rigens
Schoenus sp.
Schoenus subbulbosus
Schoenus submicrostachyus

- Schoenus tenellus
- Tetraria capillaris
- Tetraria octandra
- Tricostularia neesii var. elatior

Dasypogonaceae
- Dasypogon bromeliifolius
- Lomandra caespitosa
- Lomandra nigricans
- Lomandra purpurea
- Lomandra sericea
- Lomandra sonderi
- Lomandra suaveolens

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia acerosa
- Hibbertia amplexicaulis
- Hibbertia commutata
- Hibbertia cunninghamii
- Hibbertia racemosa
- Hibbertia spicata
- Hibbertia stellaris
- Hibbertia subvaginata
- Hibbertia vaginata

Droseraceae
- Drosera bulbosa
- Drosera erythrorhiza
- Drosera gigantea
- Drosera glanduligera
- Drosera macrantha
- Drosera menziesii
- Drosera neesii
- Drosera pallida
- Drosera pulchella
- Drosera stolonifera

Epacridaceae
- Andersonia caerulea
- Astroloma baxteri
- Astroloma ciliatum
- Astroloma pallidum
- Leucopogon australis
- Leucopogon capitellatus
- Leucopogon conostephioides
- Leucopogon glabellus
- Leucopogon parviflorus
- Leucopogon pendulus
- Leucopogon propinquus
- Leucopogon pulchellus
- Leucopogon sprengelioides
- Leucopogon tamariscinus
- Leucopogon unilateralis
- Leucopogon verticillatus
- Lysinema ciliatum
- Needhamiella pumilio
- Sphenotoma gracile
- Styphelia tenuiflora

Euphorbiaceae
- Amperea simulans
- Monotaxis occidentalis
- Phyllanthus calycinus
- Poranthera huegelii
- Poranthera microphylla

Fumariaceae
- * Fumaria capreolata

Gentianaceae
- * Centaurium erythraea
- Centaurium spicatum
- * Cicendia filiformis

Geraniaceae
- * Erodium botrys
- * Erodium cicutarium
- * Erodium moschatum
- Geranium solanderi
- Pelargonium littorale

Goodeniaceae
- Anthotium humile
- Anthotium junciforme
- Dampiera alata
- Dampiera linearis
- Dampiera pedunculata
- Dampiera trigona
- Goodenia claytoniacea
- Goodenia micrantha
- Goodenia mimuloides
- Goodenia pulchella
- Lechenaultia expansa
- Scaevola globulifera
- Scaevola lanceolata
- Scaevola phlebopetala
- Velleia trinervis

Haemodoraceae
- Anigozanthos bicolor
- Anigozanthos flavidus
- Anigozanthos manglesii
- Anigozanthos viridis
- Anigozanthos bicolor x manglesii
- Conostylis aculeata
- Conostylis laxiflora
- Conostylis setigera
- Haemodorum laxum
- Haemodorum simplex
- Haemodorum sparsiflorum
- Haemodorum spicatum
- Tribonanthes australis
- Tribonanthes brachypetala
- Tribonanthes longipetala
- Tribonanthes violacea

Haloragaceae
- Glischrocaryon aureum
- Gonocarpus cordiger
- Gonocarpus paniculatus
- Haloragis brownii
- Myriophyllum crispatum
- Myriophyllum drummondii
- Myriophyllum tillaeoides

Hydatellaceae
- Trithuria bibracteata
- Trithuria submersa

Hypoxidaceae
- Hypoxis occidentalis

Iridaceae
- * Homeria flaccida
- Patersonia juncea
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)
- Patersonia umbrosa
- * Romulea rosea

Isoetaceae
- Isoetes drummondii

Juncaceae
- * Juncus bufonius
- * Juncus capitatus
- Juncus kraussii
- Juncus pallidus
- Luzula meridionalis

Juncaginaceae
- Triglochin calcitrapum
- Triglochin centrocarpum
- Triglochin huegelii
- Triglochin lineare
- Triglochin minutissimum
- Triglochin mucronatum
- Triglochin striatum

Lamiaceae
- Hemiandra pungens

Lauraceae
- Cassytha flava
- Cassytha glabella
- Cassytha micrantha
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida
- Polypompholyx tenella
- Utricularia australis
- Utricularia inaequalis
- Utricularia simplex
- Utricularia sp.
- Utricularia violacea
- Utricularia volubilis

Linaceae
- Linum marginale

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Isotoma hypocrateriformis
- Isotoma scapigera
- Lobelia alata
- Lobelia gibbosa
- Lobelia rhombifolia

Loganiaceae
- Logania campanulata
- Logania serpyllifolia
- Phyllangium palustre
- Phyllangium paradoxum

Loranthaceae
- Amyema miquelii
- Nuytsia floribunda

Lycopodiaceae
- Phylloglossum drummondii

Lythraceae
- * Lythrum hyssopifolia

Malvaceae
- Lawrencia spicata
- * Malva parviflora
- Sida hookeriana

Marsileaceae
- Pilularia novae-hollandiae

Menyanthaceae
- Villarsia albiflora
- Villarsia capitata
- Villarsia parnassifolia
- Villarsia submersa
- Villarsia violifolia

Mimosaceae
- Acacia alata
- Acacia cochlearis
- Acacia cyclops
- Acacia extensa
- Acacia huegelii
- Acacia incurva
- Acacia latipes ssp. latipes ms
- Acacia myrtifolia
- Acacia nervosa
- Acacia pentadenia
- Acacia pulchella
- Acacia pulchella var. goadbyi
- Acacia saligna
- Acacia stenoptera
- Acacia urophylla
- Acacia willdenowiana

Molluginaceae
- Macarthuria apetala

Myoporaceae
- Myoporum caprarioides

Myrtaceae
- Actinodium cunninghamii
- Agonis hypericifolia
- Agonis linearifolia
- Agonis parviceps
- Astartea fascicularis
- Astartea sp. (pink weeping)
- Astartea sp. (white erect)
- Baeckea camphorosmae
- Baeckea pygmaea
- Calothamnus lateralis
- Calothamnus lehmannii
- Calytrix angulata
- Calytrix flavescens
- Calytrix leschenaultii
- Darwinia oederoides
- Darwinia vestita
- Eucalyptus calophylla
- Eucalyptus cornuta
- Eucalyptus decipiens
- Eucalyptus marginata
- Eucalyptus megacarpa
- Eucalyptus occidentalis
- Eucalyptus patens
- Eucalyptus rudis
- Hypocalymma angustifolium
- Kunzea ericifolia
- Kunzea micrantha
- Kunzea recurva
- Kunzea sulphurea
- Melaleuca cordata
- Melaleuca cuticularis
- Melaleuca densa
- Melaleuca lateriflora
- Melaleuca lateritia
- Melaleuca leptoclada
- Melaleuca preissiana
- Melaleuca pritzelii
- Melaleuca rhaphiophylla
- Melaleuca spathulata
- Melaleuca thymoides
- Melaleuca viminea
- Melaleuca violacea
- Pericalymma ellipticum
- Verticordia densiflora
- Verticordia densiflora ssp. caespitosa
- Verticordia habrantha
- Verticordia plumosa

Olacaceae
- Olax phyllanthi

Onagraceae
- Epilobium billardierianum

Ophioglossaceae
- Ophioglossum lusitanicum

Orchidaceae
- Caladenia caesarea
- Caladenia caesarea ssp. caesarea ms
- Caladenia christineae ms
- Caladenia drummondii
- Caladenia ferruginea
- Caladenia flava
- Caladenia harringtoniae
- Caladenia latifolia
- Caladenia longicauda
- Caladenia longiclavata
- Caladenia macrostylis
- Caladenia marginata
- Caladenia nana
- Caladenia radiata
- Caladenia reptans
- Caladenia starteorum ms
- Caladenia varians ssp. varians ms
- Corybas recurvus
- Cryptostylis ovata
- Cyanicula deformis ms
- Cyanicula gemmata ms
- Cyrtostylis huegelii
- Diuris drummondii
- Diuris laxiflora
- Diuris longifolia
- Drakaea glyptodon
- Drakaea livida
- Drakonorchis barbarossa ms
- Elythranthera brunonis
- Elythranthera emarginata
- Eriochilus dilatatus
- Eriochilus dilatatus ssp. undulatus ms
- Gastrodia lacista

Leporella fimbriata
Leptoceras menziesii
Microtis atrata
Microtis media
Microtis orbicularis
* Monadenia bracteata
Paracaleana nigrita
Praecoxanthus aphyllus ms
Prasophyllum drummondii
Prasophyllum elatum
Prasophyllum fimbria
Prasophyllum macrostachyum
Prasophyllum plumiforme
Pterostylis barbata
Pterostylis nana
Pterostylis pyramidalis
Pterostylis recurva
Pterostylis vittata
Pyrorchis nigricans
Thelymitra antennifera
Thelymitra benthamiana
Thelymitra crinita
Thelymitra cucullata
Thelymitra flexuosa
Thelymitra fuscolutea
Thelymitra nuda
Thelymitra pauciflora

Orobanchaceae
* Orobanche minor

Oxalidaceae
Oxalis perennans

Papilionaceae
Aotus intermedia
Bossiaea aquifolium
Bossiaea eriocarpa
Bossiaea linophylla
Bossiaea ornata
Bossiaea rufa
Brachysema melanopetalum
Brachysema praemorsum
Callistachys lanceolata
Chorizema nanum
Daviesia cordata
Daviesia hakeoides
Daviesia physodes
Daviesia preissii
Eutaxia virgata
Gastrolobium bilobum
Gompholobium capitatum
Gompholobium confertum
Gompholobium knightianum
Gompholobium marginatum
Gompholobium ovatum
Gompholobium polymorphum
Gompholobium preissii
Gompholobium scabrum
Gompholobium tomentosum
Hardenbergia comptoniana
Hovea chorizemifolia
Hovea elliptica
Hovea trisperma
Hovea trisperma var. grandiflora
Isotropis cuneifolia
Jacksonia furcellata
Jacksonia sparsa ms
Kennedia coccinea
Kennedia prostrata
Latrobea tenella
* Lotus angustissimus
* Ornithopus compressus
Oxylobium lineare
Pultenaea ericifolia
Pultenaea ochreata
Pultenaea reticulata
Sphaerolobium linophyllum
Sphaerolobium medium
Sphaerolobium vimineum
* Trifolium arvense
* Trifolium campestre
* Trifolium dubium
* Trifolium fragiferum
* Trifolium glomeratum
* Trifolium repens
* Trifolium subterraneum
Viminaria juncea

Philydraceae
Philydrella drummondii
Philydrella pygmaea

Phormiaceae
Dianella brevicaulis
Dianella revoluta
Stypandra glauca

Pinaceae
* Pinus pinaster

Pittosporaceae
Billardiera variifolia
Marianthus candidus
Sollya heterophylla

Plantaginaceae
Plantago exilis

Poaceae
Agrostis avenacea
* Aira caryophyllea
Amphibromus vickeryae
Amphipogon debilis
Amphipogon laguroides
Amphipogon turbinatus
* Anthoxanthum odoratum
* Avena fatua
* Briza maxima
* Briza minor
* Bromus diandrus
Austrodanthonia occidentalis
Austrodanthonia sp.
Austrostipa compressa
Austrostipa juncifolia
Austrostipa pycnostachya
Austrostipa trichophylla
* Cynodon dactylon
* Cynosurus echinatus
Deyeuxia quadriseta
Eragrostis brownii
Eragrostis elongata
Hemarthria uncinata
* Holcus lanatus
* Holcus setiger
* Hordeum geniculatum
* Hordeum leporinum
* Lolium multiflorum
* Lolium rigidum
Microlaena stipoides
Neurachne alopecuroidea
* Parapholis incurva
Poa drummondiana
Poa poiformis
* Polypogon monspeliensis
Sporobolus virginicus
Tetrarrhena laevis
* Vulpia myuros

Podocarpaceae
Podocarpus drouynianus

Polygalaceae
Comesperma calymega
Comesperma ciliatum
Comesperma drummondii
Comesperma flavum
Comesperma virgatum

Polygonaceae
Muehlenbeckia adpressa
Persicaria prostrata
* Rumex acetosella
* Rumex brownii

* Rumex crispus
* Rumex pulcher

Portulacaceae
- Calandrinia composita
- Montia australasica

Potamogetonaceae
- Potamogeton tricarinatus
- Ruppia megacarpa

Primulaceae
* Anagallis arvensis var. arvensis
* Anagallis arvensis var. caerulea
- Samolus caespitosus
- Samolus junceus

Proteaceae
- Adenanthos obovatus
- Banksia grandis
- Banksia ilicifolia
- Banksia littoralis
- Conospermum flexuosum
- Dryandra armata
- Dryandra bipinnatifida
- Dryandra lindleyana
- Franklandia fucifolia
- Grevillea brownii
- Hakea ceratophylla
- Hakea lissocarpha
- Hakea oleifolia
- Hakea prostrata
- Hakea ruscifolia
- Hakea sulcata
- Hakea trifurcata
- Hakea undulata
- Hakea varia
- Isopogon polycephalus
- Isopogon teretifolius
- Persoonia longifolia
- Petrophile media
- Petrophile serruriae
- Petrophile squamata
- Stirlingia tenuifolia
- Synaphea decumbens
- Synaphea petiolaris

Ranunculaceae
- Clematis pubescens
- Ranunculus colonorum
* Ranunculus muricatus

Restionaceae
- Anarthria laevis
- Anarthria prolifera
- Anarthria scabra
- Apodasmia ceramophila ms
- Desmocladus fasciculatus ms
- Harperia lateriflora
- Hypolaena exsulca
- Hypolaena humilis ms
- Lepyrodia macra
- Lepyrodia muirii
- Lyginia barbata
- Meeboldina cana ms
- Meeboldina coangustata ms
- Meeboldina denmarkica
- Meeboldina kraussii ms
- Meeboldina sp.
- Meeboldina tephrina ms
- Stenopa ramosissima ms
- Tremulina tremula ms

Rhamnaceae
- Cryptandra sp.
- Trymalium floribundum
- Trymalium ledifolium

Rosaceae
* Acaena echinata

Rubiaceae
* Galium divaricatum
* Galium murale
- Opercularia apiciflora
- Opercularia hispidula
- Opercularia vaginata
* Sherardia arvensis

Rutaceae
- Boronia capitata
- Boronia crenulata
- Boronia juncea
- Boronia megastigma
- Boronia ramosa
- Boronia sp.
- Boronia spathulata

Santalaceae
- Leptomeria lehmannii
- Leptomeria scrobiculata
- Leptomeria spinosa
- Leptomeria squarrulosa

Schizaeaceae
- Schizaea dichotoma

Scrophulariaceae
* Bartsia trixago
- Euphrasia scabra
- Glossostigma diandrum
- Glossostigma drummondii
- Gratiola peruviana
* Parentucellia latifolia
* Parentucellia viscosa

Selaginellaceae
- Selaginella gracillima

Solanaceae
* Solanum americanum
* Solanum nigrum

Stackhousiaceae
- Stackhousia monogyna
- Tripterococcus brunonis

Sterculiaceae
- Guichenotia sp.
- Rulingia corylifolia
- Thomasia foliosa
- Thomasia paniculata
- Thomasia pauciflora

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium adnatum
- Stylidium amoenum
- Stylidium assimile
- Stylidium brunonianum ssp. minor
- Stylidium calcaratum
- Stylidium corymbosum
- Stylidium crassifolium
- Stylidium ecorne
- Stylidium emarginatum
- Stylidium guttatum
- Stylidium hispidum
- Stylidium inundatum
- Stylidium junceum
- Stylidium lepidum
- Stylidium periscelianthum
- Stylidium perpusillum
- Stylidium petiolare
- Stylidium pulchellum
- Stylidium repens
- Stylidium rhipidium
- Stylidium scandens
- Stylidium schoenoides
- Stylidium sp.
- Stylidium spathulatum
- Stylidium spinulosum

Thymelaeaceae
- Pimelea angustifolia
- Pimelea argentea
- Pimelea ciliata
- Pimelea cracens ssp. cracens
- Pimelea imbricata var. gracillima
- Pimelea imbricata var. piligera
- Pimelea rosea

Pimelea suaveolens
Pimelea sylvestris
Tremandraceae
Platytheca galioides
Tetratheca hirsuta
Tetratheca nuda
Tetratheca setigera
Tremandra diffusa
Tremandra hirsuta
Typhaceae
Typha domingensis
* Typha orientalis
Urticaceae
Parietaria debilis
Violaceae
Hybanthus debilissimus
Hybanthus floribundus
Xanthorrhoeaceae
Xanthorrhoea gracilis
Xanthorrhoea preissii
Zamiaceae
Macrozamia riedlei
Zannichelliaceae
Lepilaena australis

NOOBIJUP NATURE RESERVE

Reserve number 26680 **Class** A
Location 34 24 18S 116 47 11E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 183 ha

Biological values

Flora 348 taxa have been recorded from the reserve (see flora list below) including four priority taxa (*Anthotium junciforme* (Priority 4), *Leucopogon tamariscinus* (Priority 2), *Rhodanthe pyrethrum* (Priority 3), and *Villarsia submersa* (Priority 4)).

Vegetation description Nine vegetation units have been mapped in the reserve. These include one clearly resulting from salinity and raised water tables (Map 6). More detailed vegetation mapping has recently been undertaken (D. Gardner[3], personal communication).

1. **Jarrah-marri forest and woodland** on laterite occur in the south-west and along the eastern boundary of the reserve. Species composition is similar to that described previously on this surface with a diverse understorey of shrubs, herbs and grasses. Typical understorey shrubs include *Astroloma* spp., *Leucopogon* spp. and peas such as *Bossiaea* spp. and *Gompholobium* spp. *Xanthorrhoea gracilis. Thysanotus* spp. and *Dryandra armata* are also typical of this community.

2. **Jarrah-marri open woodland** on sand occurs on the flats around the lake. Within this unit some minor lateritic ridges occur on the eastern side of the lake. Typical understorey elements include *Hakea ruscifolia, Hakea prostrata, Dryandra lindleyana, Hibbertia* spp., *Astroloma ciliatum, Mesomelaena tetragona, Lepidosperma* spp. and *Mesomelaena tetragona* and a diverse array of annual Asteraceae and Anthericaceae. Close to the lake edge *Agonis juniperina, Hypocalymma angustifolium, Pericalymma ellipticum* and *Lepidosperma longitudinale* become more common.

3. ***Eucalyptus decipiens* open woodland** occurs on the clayey soils in the north-west corner of the reserve. This unit is essentially similar to that described for Lake Muir and Galamup Nature Reserves. The understorey is diverse in both shrubs and herbs and the dominants include *Calothamnus lateralis, Kunzea micrantha, Hakea varia* and *Daviesia incrassata.* The unit grades into the wet heath on clay flats (unit 6) which occupies the more water logged sites.

4. ***Melaleuca rhaphiophylla-Eucalyptus rudis* open woodland** occurs on a small wet flat near the eastern boundary of the reserve. The understorey is dominated by a pink weeping species of *Astartea* and by *Calothamnus lateralis.*

5. ***Melaleuca rhaphiophylla* low forest** occurs as a narrow band on the eastern margin of the lake with *Lepidosperma longitudinale* being the dominant element in the understorey.

6. **Wet heath** on clay flats is floristically diverse in terms of both the shrub and herb layers. This unit is dominated by *Melaleuca densa, M. lateritica,* and *M. rhaphiophylla* and becomes inundated in winter. As the wetland dries aquatic species such as *Villarsia submersa,* and *Schoenus natans* dominate to be replace by a diverse herbland which includes *Rhodanthe pyrethrum, Anthotium junciforme, Tribonanthes violacea, Trithuria bibracteata, Trithuria submersa, Polypompholyx multifida,* and *Utricularia inaequalis.* Perennial rushes are also an obvious component of this wetland (primarily *Leptocarpus tenax, Lepyrodia muirii* and *Meeboldina cana*). Three of the four priority taxa recorded for the reserve are found in this area. Rising water table and salt intrusion from the private property to the east are having significant impacts on this vegetation.

7. **Open *Baumea* sedgeland** occurs in the northern portion of Lake Noobijup and is dominated by *Baumea articulata* in deeper water, closer to the shore *Triglochin huegelii* and *Villarsia albiflora* are also found. This vegetation unit is very species-poor.

8. **Closed *Baumea* sedgeland** is essentially similar to unit 7, however, the *Baumea articulata* tends to be denser.

9. **Salt-affected vegetation** occurs on the western and southern edges of the reserve and is caused by a rising watertable and increasing salinity coming from private property. Initially the herbaceous layer is killed followed by death of the shrub layer and finally the tree cover. The area of impact appears to be spreading north through the wet heath on the western side of the reserve.

Vegetation change Oblique aerial photographs from April 1980 show the firebreak along the western boundary had recently been cleared as had an area of bushland on the private property that has now been inundated by rising ground water. The area of wet heath that has subsequently been destroyed by the rise in ground water (and increases in salinity) appeared in good condition in the 1980 photography. Further clearance along the western boundary has taken place since 1980. The *Baumea* sedgeland in Lake Noobijup appears to be denser in the 1980 photography. Permanent long-term

[3] D. Gardner, CALM, Manjimup.

monitoring sites (as part of the Salinity Action Plan wetland monitoring program) have been established in the Lake Noobijup Nature Reserve (Odgen and Froend 1998[4]).

Disturbance or threats Rising ground water on the western side of the reserve since clearance in 1980 has resulted in destruction of high diversity seasonal clay pan communities. The area impacted is continuing to increase. The vegetation in the Lake itself appears to be becoming less dense. It appears that saline water is entering the lake from the south, the north (at times of high flow) and perhaps from the west via ground water.

Noobijup Nature Reserve flora list.

Amaranthaceae
- Ptilotus manglesii

Anthericaceae
- Agrostocrinum scabrum
- Arthropodium preissii
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Johnsonia acaulis
- Johnsonia lupulina
- Sowerbaea laxiflora
- Thysanotus patersonii
- Thysanotus tenellus
- Thysanotus thyrsoideus
- Thysanotus triandrus
- Tricoryne elatior
- Tricoryne humilis
- Tricoryne tenella

Apiaceae
- Daucus glochidiatus
- Eryngium ?pinnatifidum
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Hydrocotyle callicarpa
- Platysace filiformis
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Asteraceae
- Angianthus preissianus
- Asteridea athrixioides
- Blennospora drummondii
- Brachyscome iberidifolia
- Cotula coronopifolia
- Craspedia variabilis
- Euchiton sphaericus
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia tenuifolia
- Podolepis gracilis
- Podotheca angustifolia
- Quinetia urvillei
- Rhodanthe citrina
- Rhodanthe pyrethrum
- Senecio glomeratus
- Senecio minimus
- Siloxerus humifusus
- * Sonchus asper
- * Sonchus oleraceus
- Trichocline spathulata
- * Vellereophyton dealbatum

Campanulaceae
- Wahlenbergia multicaulis
- Wahlenbergia preissii

Caryophyllaceae
- * Cerastium glomeratum
- * Petrorhagia velutina
- * Spergularia salina

Casuarinaceae
- Allocasuarina humilis
- Allocasuarina lehmanniana

Centrolepidaceae
- Aphelia cyperoides
- Brizula drummondii
- Centrolepis aristata
- Centrolepis drummondiana
- Centrolepis glabra
- Centrolepis polygyna

Chenopodiaceae
- Halosarcia indica

Colchicaceae
- Burchardia congesta
- Burchardia monantha
- Burchardia multiflora

Crassulaceae
- Crassula colorata
- * Crassula natans
- Crassula peduncularis

Cupressaceae
- Actinostrobus pyramidalis

Cyperaceae
- Baumea articulata
- Baumea juncea
- Chorizandra enodis
- Cyathochaeta avenacea
- * Cyperus tenellus
- Gahnia trifida
- Isolepis cernua
- * Isolepis marginata
- Isolepis nodosa
- Isolepis oldfieldiana
- Lepidosperma angustatum
- Lepidosperma longitudinale
- Lepidosperma squamatum
- Lepidosperma ?tenue
- Mesomelaena stygia
- Mesomelaena tetragona
- Schoenus bifidus
- Schoenus ?efoliatus
- Schoenus elegans
- Schoenus sp.
- Schoenus tenellus
- Tetraria capillaris
- Tetraria octandra
- Tricostularia compressa

Dasypogonaceae
- Chamaexeros serra
- Dasypogon bromeliifolius
- Lomandra caespitosa
- Lomandra collina
- Lomandra micrantha
- Lomandra sericea
- Lomandra sonderi

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia amplexicaulis
- Hibbertia commutata
- Hibbertia cunninghamii
- Hibbertia racemosa
- Hibbertia spicata
- Hibbertia stellaris

[4] Odgen, G. and Froend, R.H. (1998). Salinity Action Plan. Wetland vegetation monitoring 1997/98. Unpublished report. Centre for Ecosystem Management, Edith Cowan University, Perth.

Droseraceae
- Drosera bulbosa
- Drosera erythrorhiza
- Drosera gigantea
- Drosera glanduligera
- Drosera macrantha
- Drosera menziesii
- Drosera neesii

Epacridaceae
- Astroloma baxteri
- Astroloma ciliatum
- Astroloma pallidum
- Leucopogon australis
- Leucopogon capitellatus
- Leucopogon glabellus
- Leucopogon pendulus
- Leucopogon propinquus
- Leucopogon ?sprengelioides
- Leucopogon tamariscinus
- Leucopogon verticillatus
- Styphelia tenuiflora

Euphorbiaceae
- Phyllanthus calycinus
- Poranthera huegelii
- Poranthera microphylla

Gentianaceae
- * Cicendia filiformis

Geraniaceae
- Pelargonium littorale

Goodeniaceae
- Anthotium junciforme
- Dampiera alata
- Dampiera cuneata
- Goodenia micrantha
- Goodenia mimuloides
- Scaevola phlebopetala
- Velleia trinervis

Haemodoraceae
- Anigozanthos bicolor
- Anigozanthos manglesii
- Conostylis aculeata
- Conostylis laxiflora
- Conostylis setigera
- Haemodorum laxum
- Haemodorum sparsiflorum
- Haemodorum spicatum
- Tribonanthes longipetala
- Tribonanthes violacea

Haloragaceae
- Glischrocaryon aureum
- Gonocarpus paniculatus
- Myriophyllum crispatum

Hydatellaceae
- Trithuria bibracteata
- Trithuria submersa

Hypoxidaceae
- Hypoxis occidentalis

Iridaceae
- Patersonia juncea
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)

Isoetaceae
- Isoetes drummondii

Juncaceae
- * Juncus bufonius
- Juncus pallidus

Juncaginaceae
- Triglochin centrocarpum
- Triglochin huegelii
- Triglochin mucronatum

Lamiaceae
- Hemiandra pungens

Lauraceae
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida
- Utricularia inaequalis

Linaceae
- Linum marginale

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Lobelia alata
- Lobelia tenuior

Loganiaceae
- Logania serpyllifolia

Menyanthaceae
- Villarsia albiflora
- Villarsia submersa

Mimosaceae
- Acacia browniana
- Acacia cochlearis
- Acacia cyclops
- Acacia extensa
- Acacia incurva
- Acacia myrtifolia
- Acacia pulchella
- Acacia saligna
- Acacia stenoptera

Myrtaceae
- Agonis juniperina
- Astartea sp. (pink weeping)
- Calothamnus lateralis
- Eucalyptus calophylla
- Eucalyptus decipiens
- Eucalyptus marginata
- Eucalyptus occidentalis
- Eucalyptus rudis
- Hypocalymma angustifolium
- Kunzea micrantha
- Kunzea recurva
- Melaleuca cordata
- Melaleuca densa
- Melaleuca leptoclada
- Melaleuca rhaphiophylla
- Melaleuca thymoides
- Melaleuca viminea
- Melaleuca violacea
- Pericalymma ellipticum

Orchidaceae
- Caladenia flava
- Caladenia longicauda
- Caladenia radialis
- Caladenia radiata
- Cryptostylis ovata
- Diuris laxiflora
- Diuris longifolia
- Elythranthera brunonis
- Elythranthera emarginata
- Lyperanthus serratus
- Microtis atrata
- Microtis media
- Microtis orbicularis
- * Monadenia bracteata
- Prasophyllum elatum
- Prasophyllum macrostachyum
- Pterostylis recurva
- Pyrorchis nigricans
- Thelymitra crinita
- Thelymitra flexuosa
- Thelymitra macrophylla

Orobanchaceae
- * Orobanche minor

Oxalidaceae
- Oxalis perennans

Papilionaceae
- Bossiaea eriocarpa
- Bossiaea linophylla
- Bossiaea ornata
- Brachysema melanopetalum
- Brachysema praemorsum
- Callistachys lanceolata
- Daviesia incrassata
- Daviesia preissii

- Gompholobium marginatum
- Gompholobium polymorphum
- Gompholobium preissii
- Gompholobium tomentosum
- Hovea trisperma var. grandiflora
- Isotropis cuneifolia
- Jacksonia furcellata
- Kennedia coccinea
- Kennedia prostrata
- Sphaerolobium vimineum
- Viminaria juncea

Philydraceae
- Philydrella pygmaea

Phormiaceae
- Dianella revoluta
- Stypandra glauca

Pittosporaceae
- Sollya heterophylla

Poaceae
- * Aira caryophyllea
- Amphipogon amphipogonoides
- Amphipogon laguroides
- Amphipogon turbinatus
- * Avena barbata
- Austrodanthonia caespitosa
- Austrostipa pycnostachya
- * Briza maxima
- * Briza minor
- Deyeuxia quadriseta
- Hemarthria uncinata
- * Holcus lanatus
- * Hordeum murinum
- Neurachne alopecuroidea
- Poa poiformis
- * Polypogon monspeliensis
- Tetrarrhena laevis
- * Vulpia myuros

Polygalaceae
- Comesperma calymega
- Comesperma flavum
- Comesperma virgatum
- Comesperma volubile
- * Polygala myrtifolia

Potamogetonaceae
- Ruppia megacarpa

Primulaceae
- * Anagallis arvensis
- Samolus junceus

Proteaceae
- Banksia grandis
- Banksia littoralis
- Dryandra armata
- Dryandra lindleyana
- Grevillea leptobotrys
- Hakea lissocarpha
- Hakea oleifolia
- Hakea prostrata
- Hakea ruscifolia
- Hakea sulcata
- Hakea trifurcata
- Hakea undulata
- Hakea varia
- Isopogon polycephalus
- Isopogon teretifolius
- Persoonia longifolia
- Petrophile media
- Petrophile serruriae
- Petrophile squamata
- Synaphea ?favosa
- Synaphea petiolaris

Restionaceae
- Anarthria laevis
- Anarthria prolifera
- Desmocladus fasciculatus ms
- Desmocladus flexuosus ms
- Harperia lateriflora
- Hypolaena exsulca
- Leptocarpus tenax
- Lepyrodia drummondiana
- Lepyrodia muirii
- Lyginia barbata
- Meeboldina cana ms

Rhamnaceae
- Trymalium ledifolium

Rosaceae
- * Acaena echinata

Rubiaceae
- Opercularia apiciflora
- Opercularia hispidula
- Opercularia vaginata
- * Sherardia arvensis

Rutaceae
- Boronia crenulata
- Boronia megastigma
- Boronia spathulata

Santalaceae
- Leptomeria cunninghamii
- Leptomeria scrobiculata

Scrophulariaceae
- * Parentucellia latifolia

Selaginellaceae
- Selaginella gracillima

Stackhousiaceae
- Stackhousia monogyna
- Tripterococcus brunonis

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium brunonianum ssp. minor
- Stylidium calcaratum
- Stylidium junceum ssp. brevius
- Stylidium luteum
- Stylidium petiolare
- Stylidium pulchellum
- Stylidium repens
- Stylidium schoenoides
- Stylidium sp.
- Stylidium spathulatum

Thymelaeaceae
- Pimelea angustifolia
- Pimelea cracens ssp. glabra
- Pimelea imbricata
- Pimelea ?lanata
- Pimelea preissii
- Pimelea rosea
- Pimelea suaveolens
- Pimelea sylvestris

Tremandraceae
- Platytheca galioides
- Tetratheca hispidissima

Violaceae
- Hybanthus floribundus

Xanthorrhoeaceae
- Xanthorrhoea gracilis
- Xanthorrhoea preissii

Zamiaceae
- Macrozamia riedlei

PINDICUP NATURE RESERVE

Reserve number 26679 **Class** A
Location 34 24 49S 116 43 14E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 281 ha

Biological values

Flora A total of 303 taxa, including three priority taxa (*Anthotium junciforme* (Priority 4), *Euchiton gymnocephalus* (Priority 3), *Leucopogon tamariscinus* (Priority 2)), have been recorded from the reserve (see flora list below).

Vegetation description Lake Pindicup is a naturally saline wetland and is the major feature in the Pindicup Nature Reserve: several small freshwater wetlands also occur in the reserve, the largest being Bodjinup Swamp located near the southern boundary of the reserve. Thirteen vegetation units have been recorded from the reserve (Map 8), with the disturbed areas (unit 13) and the areas of *Eucalyptus decipiens* woodland (unit 6) being too small to show on the vegetation map.

1. **Jarrah-marri forest and woodland** on laterite occur as a series of ridges on the western side of the reserve. In terms of species composition they are essentially similar to those described for Noobijup Nature Reserve. The understorey is typically diverse in both herbs and shrubs.

2. **Jarrah-marri open woodland** on sand occurs in the valleys between the laterite ridges, along dunes on northern and eastern boundaries and on the flats to the west of the Lake. The vegetation is again essentially similar to the sandy jarrah unit described for Noobijup Nature Reserve.

3. **Jarrah-marri forest and woodland over *Agonis* scrub** occurred on the wet sandy flats in the north-eastern corner of the reserve. This community had an understorey dominated by *Agonis parviceps* which can form dense thickets. Where it was more open *Bossiaea praetermissa, Gompholobium confertum, Astroloma baxteri* were common as well as the sedges *Caustis* sp. Boyanup, *Lepidosperma squamatum* and *Anarthria scabra*. The collection of *Caustis* sp. Boyanup represents the most southern collection of this taxon.

4. ***Melaleuca cuticularis* woodland** occurs on the flats at the edge of the lake. This unit usually has an understorey of *Gahnia trifida*. Immediately adjacent to the lake the *Melaleuca* can drop out and the vegetation intergrades into a *Gahnia* sedgeland (unit 11). The inland boundary of this unit around the lake is some narrow ridges of *Eucalyptus decipiens* woodland (unit 6) running parallel to the shoreline. This unit was too narrow to map.

5. ***Melaleuca preissiana-Banksia littoralis* woodland** occupies sandy substrates in more low-lying situations than the sandy jarrah-marri woodland (unit 2). *Banksia ilicifolia* can occur as a co-dominant canopy species. Common components of the understorey include *Lepidosperma longitudinale, Baumea juncea, Agonis parviceps, Astartea* sp., *Calothamnus lateralis, Kunzea recurva* and in the wettest parts *Pericalymma ellipticum.* This unit intergrades with the wet heath unit (unit 7).

6. ***Eucalyptus decipiens* open woodland** forms a narrow band around the edge of the lake immediately inland of the *Melaleuca cuticularis* woodland. South of the lake it occurs on narrow raised dunes at the inland side of the *Melaleuca cuticularis* flat. This community also occurs on the ecotone between the sandy jarrah unit (unit 2) and the wet flats; in this situation it has a diverse understorey dominated by *Astartea* sp., *Melaleuca viminea,* and *Pericalymma ellipticum.*

7. ***Melaleuca rhaphiophylla* low forest** is the dominant vegetation on long seasonally inundated wetlands and the fringing unit around the freshwater basin wetlands. It is typically dense with a sparse understorey usually dominated by *Lepidosperma longitudinale,* in slightly more open areas *Melaleuca viminea, Aotus intermedia* and the perennial rushes *Meeboldina tephrina* and *Meeboldina roycei* are found.

8. **Wet heath** dominated by *Pericalymma ellipticum, Melaleuca viminea* and *Lepidosperma longitudinale* occupy the lowest lying areas outside the basin wetlands.

9. ***Baumea articulata* sedgeland** occurs along the south-western edge of Lake Pindicup, in a small basin wetland immediately south of Lake Pindicup and in Bodjinup Swamp near the southern boundary of the reserve. In the deepest sections *Baumea articulata* is the sole dominant while closer to the shore *Triglochin huegelii* becomes more apparent.

10. ***Baumea vaginalis* sedgeland** occurs on the lake floor and is flooded late into summer. The sedgeland generally comprises monospecific stands of *B. vaginalis* although in some areas *B. arthrophylla* may dominate or co-dominate.

11. ***Gahnia* sedgeland** occurs on the flats on the eastern side of the lake. *Gahnia trifida* was the dominant taxon but species such as the shrubs *Thomasia grandiflora,* and *Grevillea ?diversifolia,* and the annuals *Cotula cotuloides, Gnephosis ?tenuissima, Vellereophyton dealbatum* were also common.

12. **Lake bed** was clayey and before it completely dried out was covered with an annual herbland primarily made up of *Myriophyllum verrucosum*. While the lake contained water *Lepilaena australis* was a common aquatic.

13. **Disturbed areas** are small and confined to areas near tracks and firebreaks; a series of weedy grasses and *Rumex* spp. were collected from these areas.

Vegetation change Oblique aerial photographs from February and April 1980 show little change since then in the vegetation of Bodjinup Swamp or Lake Pindicup itself.

Disturbance or threats No immediate threat is apparent but 1995 aerial photographs show further recent clearance.

Pindicup Nature Reserve flora list.

Amaranthaceae
- Ptilotus manglesii

Anthericaceae
- Arthropodium preissii
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Laxmannia sessiliflora
- Sowerbaea laxiflora
- Thysanotus manglesianus
- Thysanotus sparteus
- Thysanotus tenellus
- Tricoryne elatior

Apiaceae
- Daucus glochidiatus
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Platysace filiformis
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Asteraceae
- * Arctotheca calendula
- Asteridea pulverulenta
- Cotula cotuloides
- * Cotula turbinata
- Craspedia variabilis
- Euchiton gymnocephalus
- Gnephosis ?tenuissima
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia myosotidifolia
- Podolepis gracilis
- Podotheca angustifolia
- Pogonolepis stricta
- Pterochaeta paniculata
- Quinetia urvillei
- Rhodanthe citrina
- Rutidosis multiflora
- Siloxerus humifusus
- * Sonchus hydrophilus
- * Sonchus oleraceus
- * Vellereophyton dealbatum

Caesalpiniaceae
- Labichea punctata

Campanulaceae
- Wahlenbergia preissii

Caryophyllaceae
- * Cerastium glomeratum

Casuarinaceae
- Allocasuarina humilis
- Allocasuarina thuyoides

Centrolepidaceae
- Aphelia cyperoides
- Brizula drummondii
- Centrolepis aristata
- Centrolepis drummondiana
- Centrolepis glabra
- Centrolepis mutica
- Centrolepis pilosa

Colchicaceae
- Burchardia congesta
- Burchardia monantha

Crassulaceae
- Crassula colorata
- Crassula peduncularis

Cupressaceae
- Actinostrobus pyramidalis

Cyperaceae
- Baumea arthrophylla
- Baumea articulata
- Baumea juncea
- Baumea vaginalis
- Caustis sp. Boyanup(*G.S. McCutcheon* 1706)
- Chorizandra enodis
- Cyathochaeta avenacea
- * Cyperus tenellus
- Gahnia trifida
- Isolepis cernua
- Isolepis stellata
- Lepidosperma angustatum
- Lepidosperma longitudinale
- Lepidosperma squamatum
- Lepidosperma tenue
- Mesomelaena tetragona
- Schoenus ?caespititius
- Schoenus curvifolius
- Schoenus humilis
- Schoenus laevigatus
- Schoenus subbulbosus
- Schoenus subfascicularis
- Tetraria capillaris
- Tetraria octandra
- Tricostularia neesii

Dasypogonaceae
- Dasypogon bromeliifolius
- Lomandra collina
- Lomandra micrantha
- Lomandra sericea
- Lomandra sonderi
- Lomandra suaveolens

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia ?commutata
- Hibbertia amplexicaulis
- Hibbertia cunninghamii
- Hibbertia glomerata
- Hibbertia racemosa
- Hibbertia stellaris

Droseraceae
- Drosera glanduligera
- Drosera macrantha
- Drosera menziesii
- Drosera stolonifera

Epacridaceae
- Astroloma baxteri
- Astroloma ciliatum
- Astroloma pallidum
- Astroloma prostratum

Leucopogon ?sprengelioides
Leucopogon australis
Leucopogon capitellatus
Leucopogon glabellus
Leucopogon pendulus
Leucopogon tamariscinus
Leucopogon verticillatus
Euphorbiaceae
Amperea volubilis
Monotaxis occidentalis
Phyllanthus calycinus
Poranthera microphylla
Gentianaceae
* Centaurium erythraea
Centaurium spicatum
Geraniaceae
* Erodium botrys
Goodeniaceae
Anthotium junciforme
Dampiera alata
Dampiera fasciculata
Dampiera linearis
Goodenia micrantha
Goodenia pulchella
Scaevola phlebopetala
Velleia trinervis
Haemodoraceae
Anigozanthos flavidus
Conostylis aculeata
Conostylis laxiflora
Conostylis setigera
Haemodorum laxum
Haemodorum spicatum
Hydatellaceae
Hydatella sp.
Haloragaceae
Myriophyllum verrucosum
Iridaceae
Patersonia occidentalis
Patersonia occidentalis (swamp form)
* Romulea rosea
Juncaceae
* Juncus bufonius
* Juncus capitatus
Juncus pallidus
Juncaginaceae
Triglochin huegelii
Lamiaceae
Hemiandra pungens
* Mentha pulegium
Lauraceae
Cassytha glabella
Cassytha racemosa
Lindsaeaceae
Lindsaea linearis
Lobeliaceae
Lobelia alata
Lobelia gibbosa
Loganiaceae
Logania serpyllifolia
Phyllangium paradoxum
Loranthaceae
Nuytsia floribunda
Menyanthaceae
Villarsia parnassifolia
Mimosaceae
Acacia ?biflora
Acacia extensa
Acacia huegelii
Acacia myrtifolia
Acacia stenoptera
Myoporaceae
Myoporum caprarioides
Myrtaceae
Agonis parviceps
Astartea sp. (pink weeping)
Baeckea camphorosmae
Calothamnus ?schaueri
Calothamnus lateralis
Calytrix flavescens
Calytrix leschenaultii
Calytrix sp.
Eucalyptus calophylla
Eucalyptus decipiens
Eucalyptus marginata
Hypocalymma angustifolium
Kunzea ericifolia
Kunzea recurva
Melaleuca cuticularis
Melaleuca densa
Melaleuca lateritia
Melaleuca preissiana
Melaleuca rhaphiophylla
Melaleuca sp.
Melaleuca thymoides
Melaleuca viminea
Pericalymma ellipticum
Onagraceae
Epilobium billardierianum
Orchidaceae
Caladenia flava
Cyrtostylis robusta
Elythranthera brunonis
Microtis atrata
Microtis media
Microtis orbicularis
* Monadenia bracteata
Praecoxanthus aphyllus ms
Thelymitra benthamiana
Thelymitra crinita
Thelymitra flexuosa
Thelymitra pauciflora
Orobanchaceae
* Orobanche minor
Papilionaceae
Aotus intermedia
Bossiaea eriocarpa
Bossiaea linophylla
Bossiaea ornata
Bossiaea praetermissa
Brachysema melanopetalum
Chorizema aciculare
Daviesia ?physodes
Gompholobium confertum
Gompholobium knightianum
Gompholobium marginatum
Gompholobium preissii
Gompholobium tomentosum
Hovea chorizemifolia
Hovea trisperma
Jacksonia furcellata
Kennedia coccinea
Kennedia prostrata
* Ornithopus compressus
Pultenaea ochreata
Viminaria juncea
Phormiaceae
Dianella revoluta
Stypandra glauca
Pittosporaceae
Billardiera variifolia
Pronaya fraseri
Sollya heterophylla
Poaceae
Agrostis avenacea
* Aira caryophyllea
Amphipogon turbinatus
Austrodanthonia occidentalis
Austrostipa pycnostachya
* Briza minor
* Bromus diandrus
Deyeuxia quadriseta

Hemarthria uncinata
* Hordeum leporinum
Neurachne alopecuroidea
Tetrarrhena laevis
* Vulpia myuros
Polygalaceae
Comesperma calymega
Comesperma volubile
Polygonaceae
Persicaria prostrata
* Rumex acetosella
* Rumex pulcher
Primulaceae
Samolus junceus
Proteaceae
Adenanthos obovatus
Banksia grandis
Banksia ilicifolia
Banksia littoralis
Dryandra armata
Dryandra lindleyana
Grevillea ?diversifolia
Hakea corymbosa
Hakea lissocarpha
Hakea prostrata
Hakea sulcata
Hakea trifurcata
Hakea varia
Persoonia longifolia
Petrophile acicularis
Petrophile serruriae
Synaphea ?petiolaris
Ranunculaceae
Clematis pubescens
Restionaceae
Anarthria prolifera
Anarthria scabra
Desmocladus fasciculatus ms
Desmocladus flexuosus ms
Hypolaena exsulca
Lepyrodia muirii
Lyginia barbata
Meeboldina ?coangustata ms
Meeboldina ?tephrina ms
Meeboldina cana ms
Meeboldina roycei ms
Restio sp.
Stenopa ramosissima ms
Rhamnaceae
Trymalium ledifolium
Rubiaceae
Opercularia apiciflora
Opercularia hispidula
Opercularia vaginata
Rutaceae
Boronia crenulata
Boronia ramosa
Boronia sp.
Boronia spathulata
Santalaceae
Leptomeria spinosa
Leptomeria squarrulosa
Selaginellaceae
Selaginella gracillima
Solanaceae
* Solanum nigrum
Stackhousiaceae
Stackhousia monogyna
Tripterococcus brunonis
Sterculiaceae
Thomasia grandiflora
Thomasia pauciflora
Stylidiaceae
Levenhookia pusilla
Levenhookia stipitata
Stylidium brunonianum ssp. minor
Stylidium caespitosum
Stylidium corymbosum
Stylidium repens
Stylidium schoenoides
Stylidium spathulatum
Thymelaeaceae
Pimelea angustifolia
Pimelea ciliata
Pimelea sulphurea
Tremandraceae
Tetratheca affinis
Xanthorrhoeaceae
Xanthorrhoea gracilis
Xanthorrhoea preissii
Zamiaceae
Macrozamia riedlei
Zannichelliaceae
Lepilaena australis

PINTICUP NATURE RESERVE

Reserve number 26682 **Class** A
Location 34 27 59S 116 48 27E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 75 ha

Biological values

Flora A total of 297 taxa have been recorded from the reserve (see flora list below). This includes six priority taxa (*Anthotium junciforme* (Priority 4), *Apodasmia ceramophila* ms (Priority 2), *Jacksonia sparsa* ms (Priority 3), *Rhodanthe pyrethrum* (Priority 3), *Stylidium mimeticum* (Priority 3), *Villarsia submersa* (Priority 4)).

Vegetation description Fourteen vegetation units were identified in Pinticup Nature Reserve, two of these (jarrah-marri woodland on laterite - unit 13; and the disturbed areas - unit 14) were too small to map (Map 9).

1. **Jarrah-marri open woodland** on sand occurs on the sandy rises and the better drained flats. This community is essentially similar to sandy jarrah-marri in Galamup and Noobijup Nature Reserves. The understorey is diverse in shrubs and herbs with *Leucopogon* spp., *Acacia* spp., *Melaleuca thymoides*, *Gompholobium* spp. and *Hakea ruscifolia* the obvious components. In the dampest areas *Hypocalymma angustifolium* and *Kunzea micrantha* become more common.

2. **Logged jarrah-marri open woodland** on sand occurs near the western boundary of the reserve. The result has been an opening up of the canopy, species composition is the same as in vegetation unit 1.

3. **Jarrah-marri-yate open woodland** occurs on the sand dune on the eastern side of Pinticup Swamp. It has a similar species composition to the jarrah-marri open woodland with the addition of yate as a canopy co-dominant.

4. ***Banksia ilicifolia* woodland** occurs on poorly drained sandy flats in the western part of the reserve. Common understorey elements include *Adenanthos obovatus, Hakea sulcata, Brachysema melanopetalum* and *Lysinema ciliatum. Franklandia fucifolia* was also found in this unit. In the wettest sites this community grades into *Melaleuca preissiana-Banksia littoralis* woodland (vegetation unit 6).

5. ***Melaleuca cuticularis* woodland** occupies most of a small basin wetland in the north-west of the reserve. The understorey is dominated by *Gahnia trifida* with other common taxa including *Astartea, Melaleuca lateritia, Melaleuca viminea, Chaetanthus aristatus*, and *Meeboldina cana*. The soil in this area has a higher clay content than the surrounding areas.

6. ***Melaleuca preissiana-Banksia littoralis* woodland** occurs on the poorest drained areas of sandy soil. As a consequence the understorey is variously dominated by *Anigozanthos flavidus, Agonis juniperina, Calothamnus lateralis, Hypocalymma angustifolium, Melaleuca* spp. (including *Melaleuca densa* and *Melaleuca viminea), Pericalymma ellipticum, Hakea varia*, and the perennial rushes *Lepyrodia muirii, Meeboldina tephrina, Tremulina tremula. Eucalyptus rudis* occasionally occurs in the canopy layer.

7. ***Eucalyptus decipiens* open woodland** occurs on the wet clay flats on the southern boundary of the reserve. It is a diverse community with rich shrub layer and large numbers of annual herbs as has been described for Noobijup Nature Reserve.

8. ***Melaleuca rhaphiophylla* low forest** occurs in areas of the longest inundation and as the fringing vegetation on the western shore of Pinticup Swamp. It typically has a sparse understorey of *Lepidosperma longitudinale, Baumea articulata, Baumea vaginalis, Villarsia albiflora*, and where gaps in canopy occur *Astartea fascicularis* and *Callistachys lanceolata* occur.

9. ***Hakea prostrata* heath** occurs in a small area in the south-west corner of the reserve. This is an equivalent unit to that described in Galamup Nature Reserve.

10. **Wet heath** occurs on the wettest parts of the clay flats in the south-eastern corner of the reserve. These flats are dominated by *Melaleuca* spp. and perennial rushes (*Apodasmia ceramophila* and *Harperia lateriflora).* In late winter the flats are completely flooded and aquatic taxa such as *Villarsia submersa* are conspicuous. As the wetland dries a diverse suite of annual herbs emerges. These include annual *Schoenus* spp., *Tribonanthes violacea*, and an array of orchids.

11. ***Baumea* sedgeland** occurs in the two basin wetlands, the deepest parts being dominated by *Baumea articulata* while toward the shore *Triglochin huegelii* and *Villarsia albiflora* co-dominate.

12. ***Lepidosperma longitudinale* sedgeland** occurs in a small patch in the south-west corner of the reserve in a winter-wet drainage line.

13. **Disturbed areas** occur associated with firebreaks; these areas are too small to map but are a major source of weed concentration.

14. **Jarrah-marri woodland** on laterite occurs as small patches within the sandy jarrah-marri unit (vegetation unit 1). This unit was also too small to map but did show significant change in understorey species as has been described for other reserves.

Vegetation change Oblique aerial photographs from February and April 1980 showed no obvious changes in the vegetation.

Disturbance or threats No obvious threat is apparent at this time, run-off from tree farming which occurs on three sides of the reserve should be monitored.

Pinticup Nature Reserve flora list.

Aizoaceae
- Carpobrotus modestus

Amaranthaceae
- Ptilotus manglesii

Anthericaceae
- Borya scirpoidea
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Johnsonia acaulis
- Johnsonia lupulina
- Laxmannia sessiliflora
- Sowerbaea laxiflora
- Thysanotus arenarius
- Thysanotus manglesianus
- Thysanotus patersonii
- Thysanotus sparteus
- Thysanotus tenellus
- Thysanotus triandrus
- Tricoryne elatior

Apiaceae
- Daucus glochidiatus
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Hydrocotyle pilifera
- Platysace juncea
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Asteraceae
- * Arctotheca calendula
- Brachyscome iberidifolia
- Craspedia variabilis
- Euchiton sphaericus
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia myosotidifolia
- Podolepis gracilis
- Rhodanthe pyrethrum
- Siloxerus humifusus
- * Sonchus hydrophilus
- Trichocline spathulata

Campanulaceae
- Wahlenbergia multicaulis
- Wahlenbergia preissii

Casuarinaceae
- Allocasuarina humilis

Centrolepidaceae
- Aphelia cyperoides
- Centrolepis aristata
- Centrolepis drummondiana
- Centrolepis mutica

Colchicaceae
- Burchardia congesta
- Burchardia monantha

Crassulaceae
- Crassula colorata

Cyperaceae
- Baumea articulata
- Baumea juncea
- Baumea vaginalis
- Caustis dioica
- Chorizandra enodis
- Cyathochaeta avenacea
- * Cyperus tenellus
- Gahnia ?aristata
- Gahnia trifida
- * Isolepis marginata
- Lepidosperma ?gracile
- Lepidosperma longitudinale
- Lepidosperma squamatum
- Lepidosperma tenue
- Mesomelaena stygia
- Mesomelaena tetragona
- Schoenus curvifolius
- Schoenus efoliatus
- Schoenus elegans
- Schoenus humilis
- Schoenus tenellus
- Tetraria capillaris
- Tetraria octandra
- Tricostularia neesii

Dasypogonaceae
- Dasypogon bromeliifolius
- Lomandra collina
- Lomandra sericea
- Lomandra sonderi
- Lomandra suaveolens

Dennstaedtiaceae
- Pteridium esculentum

Dilleniaceae
- Hibbertia amplexicaulis
- Hibbertia cunninghamii
- Hibbertia racemosa
- Hibbertia stellaris

Droseraceae
- Drosera gigantea
- Drosera glanduligera
- Drosera menziesii

Epacridaceae
- Andersonia sp.
- Astroloma baxteri
- Astroloma ciliatum
- Astroloma pallidum
- Leucopogon australis
- Leucopogon capitellatus
- Leucopogon glabellus
- Leucopogon oxycedrus
- Lysinema ciliatum
- Sphenotoma gracile

Euphorbiaceae
- Monotaxis occidentalis
- Phyllanthus calycinus
- Poranthera microphylla

Goodeniaceae
- Anthotium junciforme
- Dampiera alata
- Dampiera diversifolia
- Dampiera hederacea
- Dampiera linearis
- Goodenia claytoniacea
- Goodenia micrantha
- Goodenia mimuloides
- Goodenia pulchella
- Scaevola phlebopetala
- Velleia trinervis

Haemodoraceae
- Anigozanthos bicolor
- Anigozanthos flavidus
- Anigozanthos manglesii
- Conostylis aculeata
- Haemodorum laxum
- Haemodorum simplex
- Haemodorum sparsiflorum
- Haemodorum spicatum
- Tribonanthes violacea

Haloragaceae
- Gonocarpus cordiger
- Gonocarpus hexandrus
- Gonocarpus paniculatus

Hypoxidaceae
- Hypoxis occidentalis

Iridaceae
- Patersonia juncea
- Patersonia umbrosa
- * Watsonia bulbillifera

Juncaceae
- * Juncus bufonius
- Juncus pallidus
- Juncus sp.

Juncaginaceae
- Triglochin huegelii

Lamiaceae
- Hemiandra pungens

Lauraceae
- Cassytha glabella
- Cassytha micrantha
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Lobelia alata

Loganiaceae
- Logania campanulata
- Logania serpyllifolia

Loranthaceae
- Nuytsia floribunda

Menyanthaceae
- Villarsia albiflora
- Villarsia submersa

Mimosaceae
- Acacia biflora
- Acacia extensa
- Acacia incurva
- Acacia stenoptera

Myoporaceae
- Myoporum caprarioides

Myrtaceae
- Agonis juniperina
- Astartea fascicularis
- Astartea sp. (pink weeping)
- Baeckea camphorosmae
- Callistemon phoeniceus
- Calothamnus lateralis
- Calothamnus ?schaueri
- Calytrix angulata
- Calytrix leschenaultii
- Eucalyptus calophylla
- Eucalyptus cornuta
- Eucalyptus decipiens
- Eucalyptus marginata
- Eucalyptus occidentalis
- Eucalyptus rudis
- Hypocalymma angustifolium
- Kunzea micrantha
- Melaleuca cuticularis
- Melaleuca densa
- Melaleuca lateritia
- Melaleuca leptoclada
- Melaleuca preissiana
- Melaleuca rhaphiophylla
- Melaleuca thymoides
- Melaleuca viminea
- Pericalymma ellipticum
- Verticordia sp.

Orchidaceae
- Caladenia flava
- Caladenia longicauda
- Caladenia radialis
- Drakaea sp.
- Elythranthera brunonis
- Elythranthera emarginata
- Microtis atrata
- Microtis media
- Microtis orbicularis
- * Monadenia bracteata
- Paracaleana nigrita
- Prasophyllum drummondii
- Prasophyllum macrostachyum
- Pterostylis recurva
- Pterostylis vittata
- Pyrorchis nigricans
- Thelymitra crinita
- Thelymitra pauciflora

Papilionaceae
- Bossiaea linophylla
- Bossiaea ornata
- Bossiaea praetermissa
- Brachysema melanopetalum
- Callistachys lanceolata
- Daviesia hakeoides
- Daviesia incrassata
- Daviesia physodes
- Daviesia preissii
- Gompholobium capitatum
- Gompholobium confertum
- Gompholobium marginatum
- Gompholobium polymorphum
- Gompholobium preissii
- Gompholobium scabrum
- Gompholobium tomentosum
- Hovea chorizemifolia
- Hovea trisperma
- Jacksonia furcellata
- Jacksonia sparsa ms
- Kennedia prostrata
- Oxylobium lineare
- Sphaerolobium vimineum

Philydraceae
- Philydrella pygmaea

Phormiaceae
- Dianella revoluta

Pittosporaceae
- Billardiera parviflora
- Marianthus candidus
- Sollya heterophylla

Poaceae
- Agrostis avenacea
- Amphipogon debilis
- Amphipogon turbinatus
- * Briza maxima
- * Briza minor
- Austrodanthonia setacea
- Austrostipa compressa

- Austrostipa pycnostachya
- Austrostipa trichophylla
- Deyeuxia quadriseta
- Hemarthria uncinata
- * Holcus lanatus
- Neurachne alopecuroidea
- Tetrarrhena laevis
- * Vulpia myuros

Polygalaceae
- Comesperma calymega
- Comesperma flavum
- Comesperma virgatum
- Comesperma volubile

Primulaceae
- Samolus junceus

Proteaceae
- Adenanthos obovatus
- Banksia grandis
- Banksia ilicifolia
- Banksia littoralis
- Dryandra bipinnatifida
- Dryandra lindleyana
- Franklandia fucifolia
- Grevillea depauperata
- Grevillea fasciculata
- Hakea lissocarpha
- Hakea prostrata
- Hakea ruscifolia
- Hakea sulcata
- Hakea undulata
- Hakea varia
- Persoonia longifolia
- Petrophile media
- Stirlingia ?seselifolia
- Synaphea petiolaris

Restionaceae
- Anarthria gracilis
- Anarthria prolifera
- Apodasmia ceramophila ms
- Chaetanthus aristatus ms
- Cytogonidium leptocarpoides ms
- Desmocladus fasciculatus ms
- Harperia lateriflora
- Hypolaena exsulca
- Leptocarpus tenax
- Lepyrodia muirii
- Lyginia barbata
- Meeboldina cana ms
- Meeboldina tephrina ms
- Tremulina tremula ms

Rhamnaceae
- Trymalium ledifolium

Rubiaceae
- Opercularia apiciflora
- Opercularia hispidula
- Opercularia vaginata

Rutaceae
- Boronia crenulata
- Boronia juncea ssp. laniflora
- Boronia spathulata

Santalaceae
- Leptomeria squarrulosa

Selaginellaceae
- Selaginella gracillima

Stackhousiaceae
- Stackhousia monogyna
- Tripterococcus brunonis

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium brunonianum
- Stylidium crassifolium
- Stylidium guttatum
- Stylidium mimeticum
- Stylidium pulchellum
- Stylidium repens
- Stylidium sp.
- Stylidium spathulatum

Thymelaeaceae
- Pimelea sulphurea

Zamiaceae
- Macrozamia riedlei

Zannichelliaceae
- Lepilaena australis

QUINDINUP NATURE RESERVE

Reserve number 25506 **Class** C
Location 34 24 41S 116 52 41E
Land tenure Nature Reserve
Purpose Conservation of flora and fauna
Area 2653 ha

Biological values

Flora A brief survey was undertaken of Quindinup Reserve, this found 276 taxa. This list should be considered preliminary (see flora list below). One priority flora species (*Eucalyptus aspersa* (Priority 4)) was recorded from the reserve.

Vegetation description No vegetation mapping was undertaken for this reserve. Six major habitat types were defined while compiling the flora.

1. ***Melaleuca rhaphiophylla-M. preissiana* woodland** along creek lines.
2. **Disturbed areas.**
3. **Lateritic heath.**
4. **Jarrah-marri woodland** on sand.
5. **Jarrah-marri woodland** on laterite.
6. **Wandoo woodland.**

Vegetation change This reserve was not photographed in 1980.

Disturbance or threats Upland areas are in excellent condition. An increase in salinity in some of the creek lines is causing impacts to the riparian vegetation.

Quindinup Nature Reserve flora list.

Amaranthaceae
- Ptilotus manglesii

Anthericaceae
- Agrostocrinum scabrum
- Borya scirpoidea
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Johnsonia acaulis
- Johnsonia lupulina
- Laxmannia sessiliflora
- Sowerbaea laxiflora
- Thysanotus manglesianus
- Thysanotus multiflorus
- Thysanotus thyrsoideus
- Tricoryne elatior
- Tricoryne tenella

Apiaceae
- Daucus glochidiatus
- Eryngium pinnatifidum
- Homalosciadium homalocarpum
- Hydrocotyle pilifera
- Platysace juncea
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia atkinsoniana
- Xanthosia candida

Asteraceae
- * Arctotheca calendula
- * Conyza albida
- Cotula coronopifolia
- Craspedia variabilis
- Euchiton sphaericus
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia myosotidifolia
- Olearia paucidentata
- Picris angustifolia
- Podolepis gracilis
- Pterochaeta paniculata
- Quinetia urvillei
- Senecio minimus
- * Sonchus oleraceus
- Trichocline spathulata
- Waitzia nitida
- Waitzia suaveolens

Campanulaceae
- Wahlenbergia multicaulis
- Wahlenbergia preissii

Caryophyllaceae
- * Cerastium glomeratum
- * Petrorhagia velutina

Casuarinaceae
- Allocasuarina ?microstachya

Centrolepidaceae
- Aphelia cyperoides
- Centrolepis aristata
- Centrolepis drummondiana
- Centrolepis pilosa

Colchicaceae
- Burchardia congesta
- Burchardia multiflora

Crassulaceae
- Crassula colorata

Cyperaceae
- Baumea juncea
- Chorizandra enodis
- Cyathochaeta avenacea
- * Cyperus tenellus
- Gahnia drummondii
- Isolepis cernua

* Isolepis marginata
Isolepis oldfieldiana
Isolepis stellata
Lepidosperma angustatum
Lepidosperma tenue
Mesomelaena tetragona
Schoenus nanus
Tetraria capillaris
Tetraria octandra
Dasypogonaceae
Chamaexeros serra
Lomandra caespitosa
Lomandra micrantha
Lomandra purpurea
Lomandra sericea
Lomandra sonderi
Lomandra suaveolens
Dennstaedtiaceae
Pteridium esculentum
Dilleniaceae
Hibbertia ?amplexicaulis
Hibbertia commutata
Hibbertia racemosa
Hibbertia vaginata
Droseraceae
Drosera bulbosa
Drosera erythrorhiza
Drosera gigantea
Drosera glanduligera
Drosera macrantha
Drosera stolonifera
Epacridaceae
Astroloma ciliatum
Astroloma pallidum
Astroloma prostratum
Leucopogon australis
Leucopogon capitellatus
Leucopogon pendulus
Leucopogon propinquus
Leucopogon sp.
Leucopogon verticillatus
Styphelia tenuiflora
Euphorbiaceae
Monotaxis occidentalis
Phyllanthus calycinus
Poranthera microphylla
Gentianaceae
* Centaurium erythraea
Geraniaceae
Geranium solanderi
Goodeniaceae
Dampiera ?alata
Dampiera linearis
Goodenia micrantha
Goodenia pulchella
Lechenaultia biloba
Lechenaultia expansa
Scaevola phlebopetala
Velleia trinervis
Haemodoraceae
Anigozanthos manglesii
Conostylis aculeata
Conostylis setigera
Haemodorum laxum
Haemodorum simplex
Haemodorum sparsiflorum
Haemodorum spicatum
Haloragaceae
Glischrocaryon aureum
Gonocarpus paniculatus
Hypoxidaceae
Hypoxis glabella
Iridaceae
Patersonia juncea
Patersonia occidentalis
Patersonia umbrosa
Juncaceae
* Juncus acutus
* Juncus bufonius
* Juncus capitatus
Luzula meridionalis
Lauraceae
Cassytha glabella
Cassytha racemosa
Lentibulariaceae
Polypompholyx multifida
Lindsaeaceae
Lindsaea linearis
Lobeliaceae
Lobelia tenuior
Loganiaceae
Logania serpyllifolia
Phyllangium paradoxum
Mimosaceae
Acacia extensa
Acacia incurva
Acacia myrtifolia
Acacia nervosa
Acacia pulchella
Acacia saligna
Acacia stenoptera
Acacia willdenowiana
Myrtaceae
Agonis juniperina
Astartea sp. (pink weeping)
Baeckea camphorosmae
Eucalyptus aspersa
Eucalyptus calophylla
Eucalyptus marginata
Eucalyptus wandoo
Hypocalymma angustifolium
Kunzea ?micrantha
Kunzea recurva
Melaleuca preissiana
Melaleuca rhaphiophylla
Melaleuca thymoides
Melaleuca viminea
Verticordia densiflora
Olacaceae
Olax benthamiana
Onagraceae
Epilobium billardierianum
Orchidaceae
Caladenia flava
Caladenia longiclavata
Caladenia marginata
Caladenia nana
Caladenia varians ms
Cryptostylis ovata
Cyanicula deformis ms
Diuris longifolia
Elythranthera brunonis
Elythranthera emarginata
Eriochilus dilatatus
Eriochilus scaber
Leporella fimbriata
Microtis media
* Monadenia bracteata
Pterostylis barbata
Pterostylis recurva
Pterostylis vittata
Thelymitra antennifera
Thelymitra crinita
Orobanchaceae
* Orobanche minor
Oxalidaceae
Oxalis perennans
Papilionaceae
Aotus intermedia
Bossiaea linophylla
Bossiaea ornata
Bossiaea praetermissa

Daviesia cordata
Daviesia preissii
Gastrolobium bilobum
Gompholobium confertum
Gompholobium knightianum
Gompholobium marginatum
Gompholobium preissii
Gompholobium tomentosum
Hardenbergia comptoniana
Hovea chorizemifolia
Hovea trisperma
Isotropis cuneifolia
Jacksonia furcellata
Kennedia prostrata
Sphaerolobium medium
* Trifolium campestre
* Trifolium dubium
* Trifolium subterraneum

Philydraceae
Philydrella pygmaea

Phormiaceae
Dianella brevicaulis
Dianella revoluta

Pittosporaceae
Billardiera ?variifolia
Sollya heterophylla

Poaceae
Agrostis avenacea
* Aira caryophyllea
Amphipogon turbinatus
* Briza minor
Austrodanthonia occidentalis
Austrostipa compressa
Austrostipa pycnostachya
* Holcus lanatus
Microlaena stipoides
Neurachne alopecuroidea
* Polypogon monspeliensis
Tetrarrhena laevis
* Vulpia myuros

Polygalaceae
Comesperma virgatum

Primulaceae
* Anagallis arvensis

Proteaceae
Banksia grandis
Banksia littoralis
Dryandra armata
Dryandra lindleyana
Dryandra sessilis
Grevillea fasciculata
Hakea amplexicaulis
Hakea lissocarpha
Hakea prostrata
Hakea undulata
Hakea varia
Persoonia longifolia
Petrophile serruriae
Stirlingia tenuifolia
Synaphea petiolaris

Ranunculaceae
Clematis aristata
Ranunculus colonorum

Restionaceae
Anarthria prolifera
Desmocladus fasciculatus ms
Desmocladus flexuosus ms
Hypolaena exsulca
Lyginia barbata

Rhamnaceae
Trymalium ledifolium

Rubiaceae
Opercularia apiciflora
Opercularia hispidula

Rutaceae
Boronia ramosa
Boronia spathulata

Santalaceae
Leptomeria scrobiculata
Leptomeria squarrulosa

Scrophulariaceae
* Bellardia trixago
* Parentucellia latifolia

Selaginellaceae
Selaginella gracillima

Stackhousiaceae
Stackhousia monogyna
Tripterococcus brunonis

Stylidiaceae
Levenhookia pusilla
Levenhookia stipitata
Stylidium amoenum
Stylidium brunonianum ssp. minor
Stylidium calcaratum
Stylidium junceum
Stylidium luteum
Stylidium piliferum
Stylidium repens
Stylidium schoenoides
Stylidium spathulatum

Thymelaeaceae
Pimelea angustifolia
Pimelea rosea

Tremandraceae
Tetratheca ?hirsuta

Violaceae
Hybanthus floribundus

Xanthorrhoeaceae
Xanthorrhoea gracilis
Xanthorrhoea preissii

Zamiaceae
Macrozamia riedlei

UNICUP NATURE RESERVE

Reserve number 25798 **Class** A
Location 34 21 35S 116 43 18E
Land tenure Nature Reserve
Purpose Conservation of flora and fauna
Area 3296 ha

Biological values

Flora Using Griffin (1984) data as a basis, a flora list of 512 taxa was compiled from the reserve (see flora list below). This included ten priority taxa (*Anthotium junciforme* (Priority 4), *Dryandra porrecta* (Priority 4), *Eucalyptus latens* (Priority 4), *Hibbertia silvestris* (Priority 4), *Opercularia rubioides* (Priority 2), *Pithocarpa corymbulosa* (Priority 2), *Schoenus loliaceus* (Priority 2), *Schoenus natans* (Priority 4), *Stylidium mimeticum* (Priority 3), *Synaphea decumbens* (Priority 1)).

Vegetation description Griffin (1984) mapped the reserve and described 12 vegetation units. Brief descriptions of these units are given below.

2. ***Eucalyptus marginata* (jarrah) forest (Type 1)** Jarrah/marri forest on the top and upper slopes of the lateritic ridges.

3/9. ***Eucalyptus marginata* (jarrah) forest (Type 2)/*Agonis parviceps* thicket** Variable unit similar to Kodjinup vegetation unit 2, common on low-lying sandy substrates.

5. ***Eucalyptus wandoo* forest** occurs as small patches in jarrah forest on loamy gravels or clayey soils.

7. ***Eucalyptus decipiens* open low woodland B (Type 1)** occurs on loamy sand usually on terraces above drainage lines. It is essentially similar to the Lake Muir vegetation unit 6.

9. ***Agonis parviceps* thicket** A variable unit which may have an overstorey of jarrah and/or *Banksia ilicifolia*. Appears essentially similar to Muir vegetation unit 3.

10. ***Melaleuca preissiana-Banksia littoralis* open low woodland A** A complex unit essentially similar to Kodjinup vegetation unit 6.

12. ***Melaleuca lateritia* dense low heath** Essentially similar to Galamup vegetation unit 6, these are small basin wetlands on loamy clays.

13. ***Melaleuca rhaphiophylla* dense low forest B** Occurs as circular or ring shaped areas in centre of some basin wetlands. This unit is equivalent to Muir vegetation unit 15.

15. ***Melaleuca cuticularis* complex** *Melaleuca cuticularis* woodlands to forests with an understorey variously dominated by *Melaleuca densa, Kunzea recurva, Pericalymma ellipticum* or *Gahnia trifida* giving way to very little understoreys under the densest canopies

17. ***Halosarcia-Wilsonia* mat plants** form areas of herbland around several of the salt lakes. Similar in many respects to Muir vegetation unit 27.

19. ***Baumea* sedges** occupying basin wetlands, essentially the same as Kodjinup vegetation units 10 and 11.

24. ***Leptocarpus* sedges** Clay flats dominated by *Apodasmia ceramophila* ms. Griffin (1984) states that there are few herbs, however, these winter-wet flats have a diverse annual herb flora in spring and early summer as these seasonally inundated wetlands dry.

Disturbed areas These were not mapped by Griffin (1984) but were used in compiling the species lists.

Vegetation change This reserve was not photographed in 1980.

Disturbance or threats Inundation of a small wetland on the eastern side of the reserve owing to rising water table. Destruction of woodland communities on the eastern boundary owing to rising saline water table.

Unicup Nature Reserve flora list.

Aizoaceae
- Carpobrotus modestus

Amaranthaceae
- Ptilotus manglesii

Anthericaceae
- Agrostocrinum scabrum
- Arthropodium preissii
- Borya scirpoidea
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Chamaescilla spiralis
- Johnsonia acaulis
- Johnsonia lupulina
- Laxmannia minor
- Laxmannia sessiliflora
- Sowerbaea laxiflora
- Thysanotus manglesianus
- Thysanotus patersonii
- Thysanotus tenellus
- Thysanotus thyrsoideus
- Tricoryne elatior
- Tricoryne humilis

Apiaceae
- Daucus glochidiatus
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Hydrocotyle pilifera
- Platysace filiformis
- Platysace juncea
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Aspleniaceae
- Asplenium flabellifolium

Asteraceae
- Angianthus preissianus
- Angianthus tomentosus
- * Arctotheca calendula
- Asteridea pulverulenta
- Brachyscome ciliaris
- Brachyscome iberidifolia
- Cotula coronopifolia
- Cotula cotuloides
- Craspedia variabilis
- Euchiton sphaericus
- Gnephosis tenuissima
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia tenuifolia
- Olearia paucidentata
- Pithocarpa corymbulosa
- Podolepis gracilis
- Podolepis lessonii
- Podotheca angustifolia
- Pogonolepis stricta
- * Pseudognaphalium luteoalbum
- Pterochaeta paniculata
- Quinetia urvillei
- Rhodanthe citrina
- Rutidosis multiflora
- Senecio glomeratus
- Senecio minimus
- Siloxerus humifusus
- * Vellereophyton dealbatum
- Vittadinia australasica

Campanulaceae
- Wahlenbergia multicaulis
- Wahlenbergia preissii
- Wahlenbergia stricta

Caryophyllaceae
- * Cerastium glomeratum
- Petrorhagia prolifera
- * Silene gallica

Casuarinaceae
- Allocasuarina humilis
- Allocasuarina microstachya
- Allocasuarina thuyoides

Centrolepidaceae
- Aphelia cyperoides
- Centrolepis alepyroides
- Centrolepis aristata
- Centrolepis drummondiana
- Centrolepis glabra
- Centrolepis pilosa
- Centrolepis polygyna

Chenopodiaceae
- Dysphania glomulifera ssp. glomulifera
- Dysphania plantaginella
- Halosarcia ?indica
- Sarcocornia quinqueflora

Colchicaceae
- Burchardia congesta
- Burchardia monantha
- Burchardia multiflora

Convolvulaceae
- Wilsonia backhousei
- Wilsonia humilis

Crassulaceae
- Crassula colorata
- Crassula pedicellosa

Cupressaceae
- Actinostrobus pyramidalis

Cyperaceae
- Baumea articulata
- Baumea juncea
- Baumea rubiginosa
- Baumea vaginalis
- Caustis dioica
- Chorizandra enodis
- Cyathochaeta avenacea
- Cyathochaeta clandestina
- Gahnia trifida
- Isolepis cernua
- Isolepis fluitans
- * Isolepis marginata
- Isolepis oldfieldiana
- Isolepis stellata
- Lepidosperma angustatum
- Lepidosperma longitudinale
- Lepidosperma squamatum
- Lepidosperma ?tenue
- Mesomelaena graciliceps
- Mesomelaena stygia
- Mesomelaena tetragona
- Schoenus curvifolius
- Schoenus efoliatus
- Schoenus elegans
- Schoenus grandiflorus
- Schoenus humilis
- Schoenus loliaceus
- Schoenus nanus
- Schoenus natans
- Schoenus odontocarpus
- Schoenus subbulbosus
- Schoenus subflavus
- Schoenus sublateralis
- Schoenus submicrostachyus
- Schoenus tenellus
- Tetraria capillaris
- Tetraria octandra
- Tricostularia neesii

Dasypogonaceae
- Chamaexeros serra
- Dasypogon bromeliifolius

- Lomandra caespitosa
- Lomandra collina
- Lomandra hermaphrodita
- Lomandra micrantha
- Lomandra nigricans
- Lomandra purpurea
- Lomandra sericea
- Lomandra suaveolens

Dilleniaceae
- Hibbertia acerosa
- Hibbertia commutata
- Hibbertia cunninghamii
- Hibbertia ?polystachya
- Hibbertia pulchra
- Hibbertia racemosa
- Hibbertia silvestris
- Hibbertia stellaris
- Hibbertia subvaginata
- Hibbertia vaginata

Droseraceae
- Drosera bulbigena
- Drosera erythrorhiza
- Drosera gigantea
- Drosera glanduligera
- Drosera macrantha
- Drosera menziesii
- Drosera paleacea
- Drosera pallida
- Drosera stolonifera

Epacridaceae
- Andersonia ?caerulea
- Astroloma ?baxteri
- Astroloma ciliatum
- Astroloma pallidum
- Astroloma prostratum
- Leucopogon australis
- Leucopogon capitellatus
- Leucopogon conostephioides
- Leucopogon ?elatior
- Leucopogon gibbosus
- Leucopogon pendulus
- Leucopogon propinquus
- Leucopogon verticillatus
- Lysinema ciliatum

Euphorbiaceae
- Monotaxis occidentalis
- Phyllanthus calycinus
- Poranthera huegelii
- Poranthera microphylla
- Pseudanthus virgatus

Gentianaceae
- * Centaurium erythraea
- * Cicendia filiformis
- Sebaea ovata

Geraniaceae
- Geranium solanderi
- Pelargonium littorale

Goodeniaceae
- Anthotium junciforme
- Dampiera ?alata
- Dampiera linearis
- Dampiera trigona
- Goodenia micrantha
- Goodenia pulchella
- Velleia trinervis

Haemodoraceae
- Anigozanthos humilis
- Anigozanthos manglesii
- Conostylis aculeata
- Conostylis setigera
- Haemodorum laxum
- Haemodorum simplex
- Haemodorum sparsiflorum
- Haemodorum spicatum
- Tribonanthes sp Lake Muir

Haloragaceae
- Glischrocaryon aureum

Hydatellaceae
- Hydatella sp.
- Trithuria submersa

Hypoxidaceae
- Hypoxis occidentalis

Iridaceae
- Patersonia juncea
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)
- * Romulea rosea

Juncaceae
- * Juncus bufonius
- Juncus pallidus

Juncaginaceae
- Triglochin calcitrapum
- Triglochin centrocarpum
- Triglochin huegelii
- Triglochin mucronatum

Lamiaceae
- Hemiandra pungens

Lauraceae
- Cassytha glabella
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida
- Polypompholyx tenella
- Utricularia volubilis

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Grammatotheca bergiana
- Isotoma hypocrateriformis
- Lobelia alata
- Lobelia gibbosa
- Lobelia heterophylla

Loganiaceae
- Logania serpyllifolia
- Phyllangium paradoxum

Loranthaceae
- Nuytsia floribunda

Lycopodiaceae
- Phylloglossum drummondii

Lythraceae
- * Lythrum hyssopifolia

Menyanthaceae
- Villarsia albiflora
- Villarsia parnassifolia

Mimosaceae
- Acacia biflora
- Acacia cyclops
- Acacia extensa
- Acacia huegelii
- Acacia laricina var. laricina
- Acacia latipes
- Acacia pulchella
- Acacia rostellifera
- Acacia saligna
- Acacia stenoptera
- Acacia tetragonocarpa
- Acacia varia

Myoporaceae
- Myoporum caprarioides

Myrtaceae
- Actinodium cunninghamii
- Agonis parviceps
- Astartea sp. (pink weeping)
- Astartea sp. (pink weeping)
- Baeckea camphorosmae
- Calothamnus lateralis
- Calothamnus lehmannii
- Calothamnus ?preissii
- Calytrix flavescens
- Calytrix leschenaultii

- Calytrix ?tenuiramea
- Darwinia ?vestita
- Eremaea pauciflora
- Eucalyptus calophylla
- Eucalyptus cornuta
- Eucalyptus decipiens
- Eucalyptus ?latens
- Eucalyptus occidentalis
- Eucalyptus rudis
- Eucalyptus wandoo
- Hypocalymma angustifolium
- Hypocalymma strictum
- Kunzea ericifolia
- Kunzea recurva
- Leptospermum erubescens
- Melaleuca cuticularis
- Melaleuca densa
- Melaleuca lateritia
- Melaleuca pauciflora
- Melaleuca preissiana
- Melaleuca rhaphiophylla
- Melaleuca thymoides
- Melaleuca viminea
- Pericalymma ellipticum
- Verticordia densiflora
- Verticordia habrantha

Olacaceae
- Olax phyllanthi

Onagraceae
- Epilobium billardierianum

Ophioglossaceae
- Ophioglossum lusitanicum

Orchidaceae
- Caladenia cairnsiana
- Caladenia flava
- Caladenia latifolia
- Caladenia longicauda
- Caladenia macrostylis
- Caladenia magniclavata
- Caladenia marginata
- Caladenia radiata
- Caladenia reptans
- Caladenia rhomboidiformis
- Caladenia splendens ms
- Corybas recurvus
- Cryptostylis ovata
- Cyrtostylis robusta
- Drakaea livida
- Elythranthera brunonis
- Elythranthera emarginata
- Leporella fimbriata
- Lyperanthus serratus
- Microtis atrata
- Microtis media
- Microtis orbicularis
- * Monadenia bracteata
- Paracaleana nigrita
- Praecoxanthus aphyllus ms
- Prasophyllum macrostachyum
- Pterostylis barbata
- Pterostylis nana
- Pterostylis recurva
- Pterostylis sanguinea
- Pyrorchis nigricans
- Thelymitra antennifera
- Thelymitra benthamiana
- Thelymitra crinita
- Thelymitra flexuosa
- Thelymitra pauciflora

Orobanchaceae
- * Orobanche minor

Oxalidaceae
- Oxalis perennans
- * Oxalis purpurea

Papilionaceae
- Bossiaea eriocarpa
- Bossiaea linophylla
- Bossiaea ornata
- Bossiaea praetermissa
- Brachysema melanopetalum
- Brachysema praemorsum
- Chorizema aciculare
- Chorizema ?ilicifolium
- Daviesia cordata
- Daviesia hakeoides
- Daviesia ?incrassata
- Daviesia preissii
- Gompholobium aristatum
- Gompholobium burtonioides
- Gompholobium capitatum
- Gompholobium confertum
- Gompholobium knightianum
- Gompholobium marginatum
- Gompholobium ovatum
- Gompholobium polymorphum
- Gompholobium preissii
- Gompholobium scabrum
- Hovea chorizemifolia
- Hovea trisperma var. grandiflora
- Isotropis cuneifolia
- Jacksonia ?furcellata
- Kennedia prostrata
- Pultenaea ericifolia
- Pultenaea ochreata
- Pultenaea reticulata
- Sphaerolobium drummondii
- Sphaerolobium linophyllum
- Sphaerolobium medium
- * Trifolium campestre
- * Trifolium cernuum
- Viminaria juncea

Philydraceae
- Philydrella pygmaea

Phormiaceae
- Dianella brevicaulis
- Dianella revoluta
- Stypandra glauca

Pittosporaceae
- Billardiera drummondiana var.
- Billardiera erubescens
- Billardiera parviflora var. parviflora
- Marianthus candidus
- Sollya heterophylla

Poaceae
- Agrostis avenacea
- * Aira caryophyllea
- Amphipogon debilis
- Amphipogon strictus
- * Anthoxanthum odoratum
- * Briza maxima
- * Briza minor
- * Bromus diandrus
- Austrodanthonia occidentalis
- Austrostipa compressa
- Austrostipa ?pycnostachya
- Deyeuxia quadriseta
- Dichelachne crinita
- Hemarthria uncinata
- * Holcus lanatus
- * Holcus setiger
- * Lolium multiflorum
- Microlaena stipoides
- Neurachne alopecuroidea
- Poa drummondiana
- Poa poiformis
- * Polypogon monspeliensis
- Polypogon tenellus
- Sporobolus virginicus
- Tetrarrhena laevis
- * Vulpia myuros

Polygalaceae
- Comesperma calymega
- Comesperma drummondii
- Comesperma flavum
- Comesperma ?volubile

Polygonaceae
- Muehlenbeckia adpressa
- Persicaria prostrata

Potamogetonaceae
- Potamogeton drummondii
- Ruppia megacarpa

Primulaceae
- * Anagallis arvensis
- Samolus junceus

Proteaceae
- Adenanthos obovatus
- Banksia grandis
- Banksia ilicifolia
- Banksia littoralis
- Banksia meisneri ssp. meisneri
- Conospermum capitatum
- Conospermum flexuosum ssp. laevigatum
- Dryandra armata
- Dryandra bipinnatifida
- Dryandra lindleyana
- Dryandra porrecta
- Franklandia fucifolia
- Grevillea brownii
- Grevillea leptobotrys
- Grevillea pilulifera
- Grevillea pulchella
- Grevillea quercifolia
- Hakea ceratophylla
- Hakea corymbosa
- Hakea gilbertii
- Hakea lissocarpha
- Hakea prostrata
- Hakea ruscifolia
- Hakea trifurcata
- Hakea undulata
- Hakea varia
- Isopogon ?attenuatus
- Isopogon teretifolius
- Persoonia longifolia
- Petrophile acicularis
- Petrophile divaricata
- Petrophile ?longifolia
- Petrophile media
- Petrophile rigida
- Petrophile serruriae
- Petrophile squamata
- Stirlingia simplex
- Synaphea decumbens
- Synaphea petiolaris
- Synaphea ?reticulata

Ranunculaceae
- Clematis pubescens
- Ranunculus colonorum

Restionaceae
- Anarthria ?gracilis
- Anarthria prolifera
- Anarthria scabra
- Chaetanthus aristatus ms
- Desmocladus fasciculatus ms
- Desmocladus flexuosus ms
- Harperia lateriflora
- Hypolaena exsulca
- Leptocarpus ?tenellus
- Lepyrodia macra
- Lepyrodia muirii
- Lyginia barbata
- Meeboldina coangustata ms
- Meeboldina scariosa ms
- Meeboldina tephrina ms
- Tremulina tremula ms

Rhamnaceae
- Cryptandra sp.
- Trymalium ?ledifolium

Rubiaceae
- * Galium murale
- Opercularia apiciflora
- Opercularia hispidula
- Opercularia ?rubioides
- Opercularia vaginata

Rutaceae
- Boronia crenulata
- Boronia megastigma
- Boronia nematophylla
- Boronia ramosa
- Boronia spathulata

Santalaceae
- Leptomeria cunninghamii
- Leptomeria spinosa
- Leptomeria squarrulosa

Scrophulariaceae
- Gratiola peruviana
- * Parentucellia latifolia
- * Parentucellia viscosa

Selaginellaceae
- Selaginella gracillima

Stackhousiaceae
- Stackhousia monogyna
- Tripterococcus brunonis

Sterculiaceae
- Thomasia foliosa
- Thomasia pauciflora

Stylidiaceae
- Levenhookia pusilla
- Levenhookia stipitata
- Stylidium amoenum
- Stylidium assimile
- Stylidium brunonianum ssp. minor
- Stylidium calcaratum
- Stylidium guttatum
- Stylidium inundatum
- Stylidium junceum ssp. brevius
- Stylidium mimeticum
- Stylidium perpusillum
- Stylidium petiolare
- Stylidium repens
- Stylidium ?roseonanum
- Stylidium scandens
- Stylidium schoenoides
- Stylidium spathulatum

Thymelaeaceae
- Pimelea angustifolia
- Pimelea rosea
- Pimelea suaveolens

Tremandraceae
- Tetratheca setigera
- Tetratheca virgata
- Tremandra diffusa

Typhaceae
- * Typha orientalis

Violaceae
- Hybanthus floribundus

Xanthorrhoeaceae
- Xanthorrhoea gracilis
- Xanthorrhoea preissii

Zamiaceae
- Macrozamia riedlei

Zannichelliaceae
- Lepilaena australis

YARNUP NATURE RESERVE

Reserve number 29601 **Class** A
Location 34 22 34S 116 51 53E
Land tenure Nature Reserve
Purpose Water, and Conservation of flora and fauna
Area 62 ha

Biological values

Flora Using Griffin (1984) data as a basis, a flora list of 272 taxa was compiled from the reserve (see flora list below). This included three priority taxa (*Euchiton gymnocephalus* (Priority 3), *Hydatella australis* (Priority 1), *Stylidium mimeticum* (Priority 3))

Vegetation description Griffin (1984) mapped the reserve and described six vegetation units. Brief descriptions of these units are given below.

2. ***Eucalyptus marginata* (jarrah) forest (Type 1)** Jarrah/marri forest on the top and upper slopes of the lateritic ridges.

3/9. ***Eucalyptus marginata* (jarrah) forest (Type 2)/*Agonis parviceps* thicket** Variable unit similar to Kodjinup vegetation unit 2, common on low-lying sandy substrates.

10. ***Melaleuca preissiana-Banksia littoralis* open low woodland A** A complex unit essentially similar to Kodjinup vegetation unit 6.

13. ***Melaleuca rhaphiophylla* dense low forest B** Occurs as circular or ring shaped areas in the centre of some basin wetlands. This unit is equivalent to Muir vegetation unit 15.

17. ***Halosarcia-Wilsonia* mat plants** form areas of herbland around several of the salt lakes. Similar in many respects to Muir vegetation unit 27.

19. ***Baumea* sedges** Occupying basin wetlands, essentially the same as Kodjinup vegetation units 10 and 11.

Disturbed areas These were not mapped by Griffin (1984) but were used in compiling the species lists.

Vegetation change Oblique aerial photographs from April 1980 show extensive recent (1980) clearing to the south of the reserve. The area of salt scald crossing the road on the south side of the swamp is not visible on the 1980 photography. Halse *et al.*[5] (1993) reported that the salt scalding had been noted since 1988. The area of open water visible in the swamp in 1980 is comparable to that mapped in 1984 by Griffin and to the 1995 aerial photography (WA3619-5172).

Disturbance or threats Death of woodland communities on the western boundary, south of the swamp, appears to be the result of saline run-off from private property.

Yarnup Nature Reserve flora list.

Aizoaceae
- Carpobrotus modestus

Amaranthaceae
- Ptilotus manglesii

Anthericaceae
- Agrostocrinum scabrum
- Arthropodium preissii
- Borya scirpoidea
- Caesia micrantha
- Caesia occidentalis
- Chamaescilla corymbosa
- Chamaescilla sp.
- Johnsonia lupulina
- Sowerbaea laxiflora
- Thysanotus manglesianus
- Tricoryne elatior
- Tricoryne tenella

Apiaceae
- Daucus glochidiatus
- Eryngium pinnatifidum
- Homalosciadium homalocarpum
- Hydrocotyle alata
- Hydrocotyle callicarpa
- Schoenolaena tenuior
- Trachymene pilosa
- Xanthosia candida
- Xanthosia huegelii

Asteraceae
- Blennospora drummondii
- Cotula coronopifolia
- Craspedia variabilis
- * Dittrichia graveolens

[5] Halse, S.A., Pearson, G.B. and Patrick, S. (1993). Vegetation of depth-gauged wetlands in nature reserves of south-west Western Australia. Department of Conservation and Land Management *Technical Report* No. 30.

- Euchiton gymnocephalus
- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Millotia myosotidifolia
- Myriocephalus occidentalis
- Podolepis gracilis
- * Pseudognaphalium luteoalbum
- Rhodanthe citrina
- Senecio glomeratus
- Siloxerus humifusus
- * Sonchus asper
- * Sonchus oleraceus
- Trichocline sp.
- * Vellereophyton dealbatum

Centrolepidaceae
- Aphelia cyperoides
- Centrolepis aristata
- Centrolepis glabra
- Centrolepis humillima
- Centrolepis polygyna

Chenopodiaceae
- * Atriplex prostrata

Colchicaceae
- Burchardia congesta
- Burchardia monantha
- Burchardia multiflora

Cyperaceae
- Baumea articulata
- Baumea juncea
- Baumea vaginalis
- Chorizandra enodis
- Cyathochaeta avenacea
- * Cyperus tenellus
- Isolepis cernua
- Isolepis oldfieldiana
- Lepidosperma angustatum
- Lepidosperma longitudinale
- Lepidosperma squamatum
- Lepidosperma tenue
- Mesomelaena stygia
- Mesomelaena tetragona
- Schoenus brevisetis
- Schoenus efoliatus
- Schoenus laevigatus
- Tetraria capillaris
- Tetraria octandra
- Tricostularia neesii var. neesii

Dasypogonaceae
- Chamaexeros serra
- Lomandra caespitosa
- Lomandra sericea
- Lomandra suaveolens

Dilleniaceae
- Hibbertia ?amplexicaulis
- Hibbertia commutata
- Hibbertia cunninghamii
- Hibbertia racemosa
- Hibbertia spicata ssp. spicata
- Hibbertia stellaris

Droseraceae
- Drosera erythrorhiza
- Drosera gigantea
- Drosera glanduligera
- Drosera macrantha
- Drosera neesii

Epacridaceae
- Astroloma baxteri
- Astroloma ciliatum
- Astroloma pallidum
- Leucopogon capitellatus
- Leucopogon parviflorus
- Leucopogon propinquus
- Leucopogon verticillatus

Euphorbiaceae
- Phyllanthus calycinus
- Poranthera microphylla

Gentianaceae
- * Centaurium erythraea
- * Cicendia filiformis

Geraniaceae
- Geranium solanderi

Goodeniaceae
- Dampiera alata
- Dampiera linearis
- Lechenaultia formosa
- Scaevola platyphylla

Haemodoraceae
- Anigozanthos manglesii
- Conostylis aculeata
- Conostylis aurea
- Haemodorum laxum
- Haemodorum simplex
- Haemodorum spicatum
- Tribonanthes australis
- Tribonanthes longipetala
- Tribonanthes violacea

Haloragaceae
- Glischrocaryon aureum
- Gonocarpus paniculatus
- Myriophyllum limnophilum

Hydatellaceae
- Hydatella australis

Hypoxidaceae
- Hypoxis occidentalis

Iridaceae
- Patersonia juncea
- Patersonia occidentalis

Isoetaceae
- Isoetes drummondii

Juncaceae
- * Juncus bufonius
- * Juncus capitatus

Juncaginaceae
- Triglochin centrocarpum
- Triglochin huegelii

Lauraceae
- Cassytha racemosa

Lentibulariaceae
- Polypompholyx multifida
- Utricularia hookeri

Linaceae
- Linum marginale

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Lobelia alata
- Lobelia gibbosa

Loganiaceae
- Logania serpyllifolia

Lycopodiaceae
- Phylloglossum drummondii

Menyanthaceae
- Villarsia albiflora

Mimosaceae
- Acacia alata
- Acacia extensa
- Acacia huegelii
- Acacia incurva
- Acacia nervosa
- Acacia pulchella
- Acacia saligna
- Acacia stenoptera

Myrtaceae
- Agonis parviceps
- Calothamnus preissii
- Eucalyptus calophylla
- Eucalyptus cornuta

- Eucalyptus decipiens
- Eucalyptus marginata
- Eucalyptus rudis
- Hypocalymma angustifolium
- Kunzea ?micrantha
- Kunzea recurva
- Melaleuca lateritia
- Melaleuca preissiana
- Melaleuca rhaphiophylla
- Melaleuca thymoides
- Melaleuca viminea
- Pericalymma ellipticum

Onagraceae
- Epilobium billardierianum

Orchidaceae
- Caladenia flava
- Caladenia longicauda
- Caladenia marginata
- Caladenia radialis
- Cyrtostylis robusta
- Diuris carinata
- Diuris laxiflora
- Elythranthera brunonis
- Elythranthera emarginata
- Microtis media
- * Monadenia bracteata
- Pterostylis nana
- Pterostylis recurva
- Pterostylis vittata
- Pyrorchis nigricans
- Thelymitra antennifera
- Thelymitra crinita
- Thelymitra flexuosa
- Thelymitra pauciflora

Papilionaceae
- Bossiaea eriocarpa
- Bossiaea linophylla
- Bossiaea ornata
- Brachysema praemorsum
- Chorizema aciculare
- Daviesia preissii
- Gompholobium marginatum
- Gompholobium ovatum
- Gompholobium preissii
- Gompholobium tomentosum
- Jacksonia furcellata
- Kennedia prostrata
- * Lotus angustissimus
- Sphaerolobium medium
- Viminaria juncea

Philydraceae
- Philydrella drummondii
- Philydrella pygmaea

Phormiaceae
- Dianella brevicaulis
- Dianella revoluta
- Stypandra glauca

Pittosporaceae
- Sollya heterophylla

Plantaginaceae
- Plantago debilis

Poaceae
- * Aira caryophyllea
- Austrostipa compressa
- Austrostipa pycnostachya
- * Briza maxima
- * Briza minor
- * Bromus diandrus
- Deyeuxia quadriseta
- Hemarthria uncinata
- * Hordeum leporinum
- * Hordeum ?murinum
- * Lolium rigidum
- Microlaena stipoides
- Neurachne alopecuroidea
- Poa poiformis
- * Polypogon monspeliensis
- Tetrarrhena laevis
- * Vulpia myuros

Polygalaceae
- Comesperma virgatum
- Comesperma volubile

Polygonaceae
- * Rumex pulcher

Primulaceae
- Samolus junceus

Proteaceae
- Banksia grandis
- Banksia littoralis
- Dryandra lindleyana
- Grevillea fasciculata
- Grevillea pilulifera
- Hakea corymbosa
- Hakea lissocarpha
- Hakea prostrata
- Hakea ruscifolia
- Hakea varia
- Persoonia longifolia
- Petrophile media
- Synaphea aff. petiolaris
- Synaphea petiolaris

Restionaceae
- Anarthria prolifera
- Chordifex laxus ms
- Desmocladus fasciculatus ms
- Desmocladus flexuosus ms
- Harperia lateriflora
- Hypolaena exsulca
- Lepyrodia macra
- Lyginia barbata
- Meeboldina cana ms

Rosaceae
- * Acaena echinata

Rubiaceae
- Opercularia hispidula

Rutaceae
- Boronia spathulata

Santalaceae
- Leptomeria squarrulosa

Scrophulariaceae
- * Parentucellia latifolia
- * Parentucellia viscosa

Selaginellaceae
- Selaginella gracillima

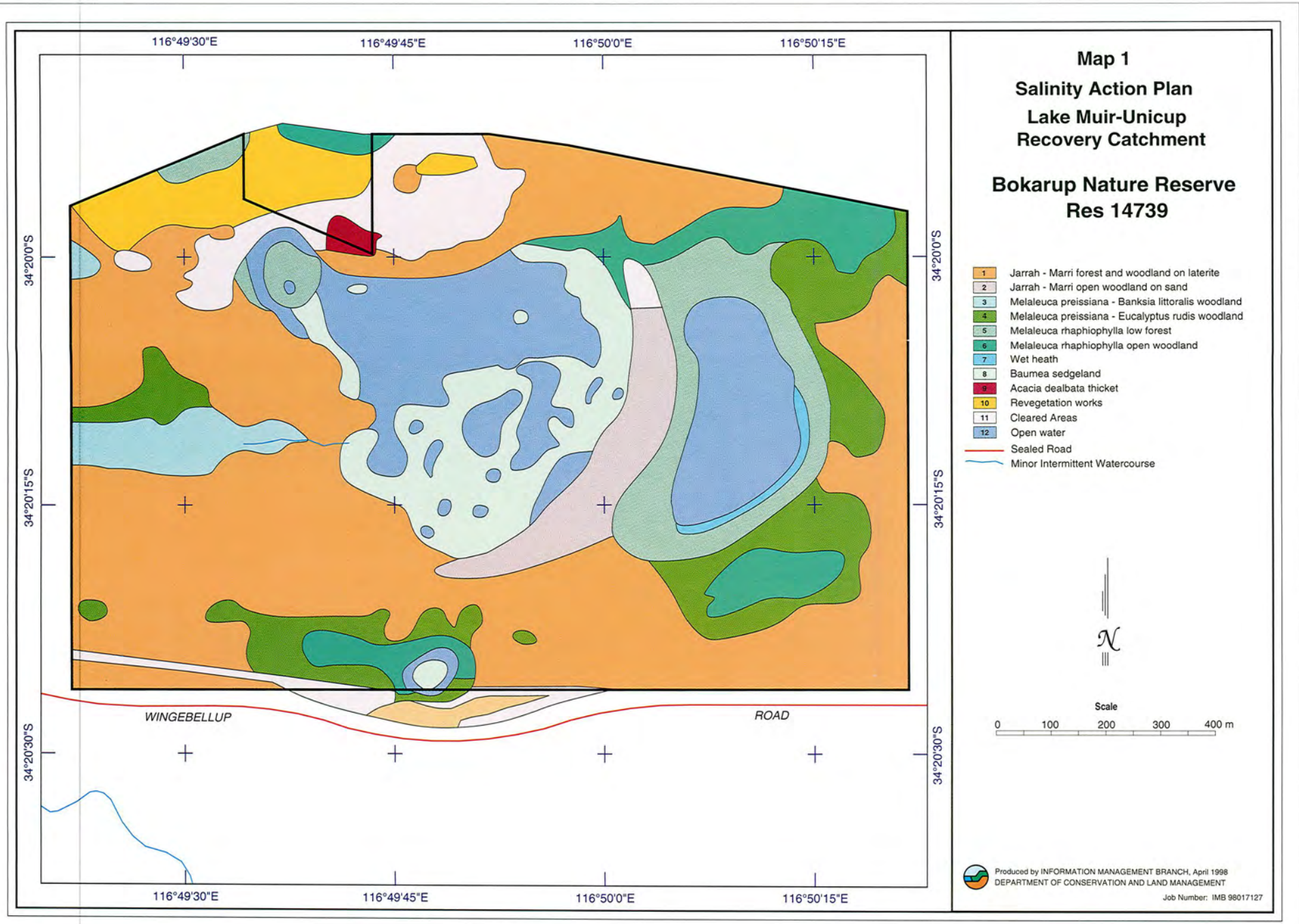
Stackhousiaceae
- Stackhousia monogyna

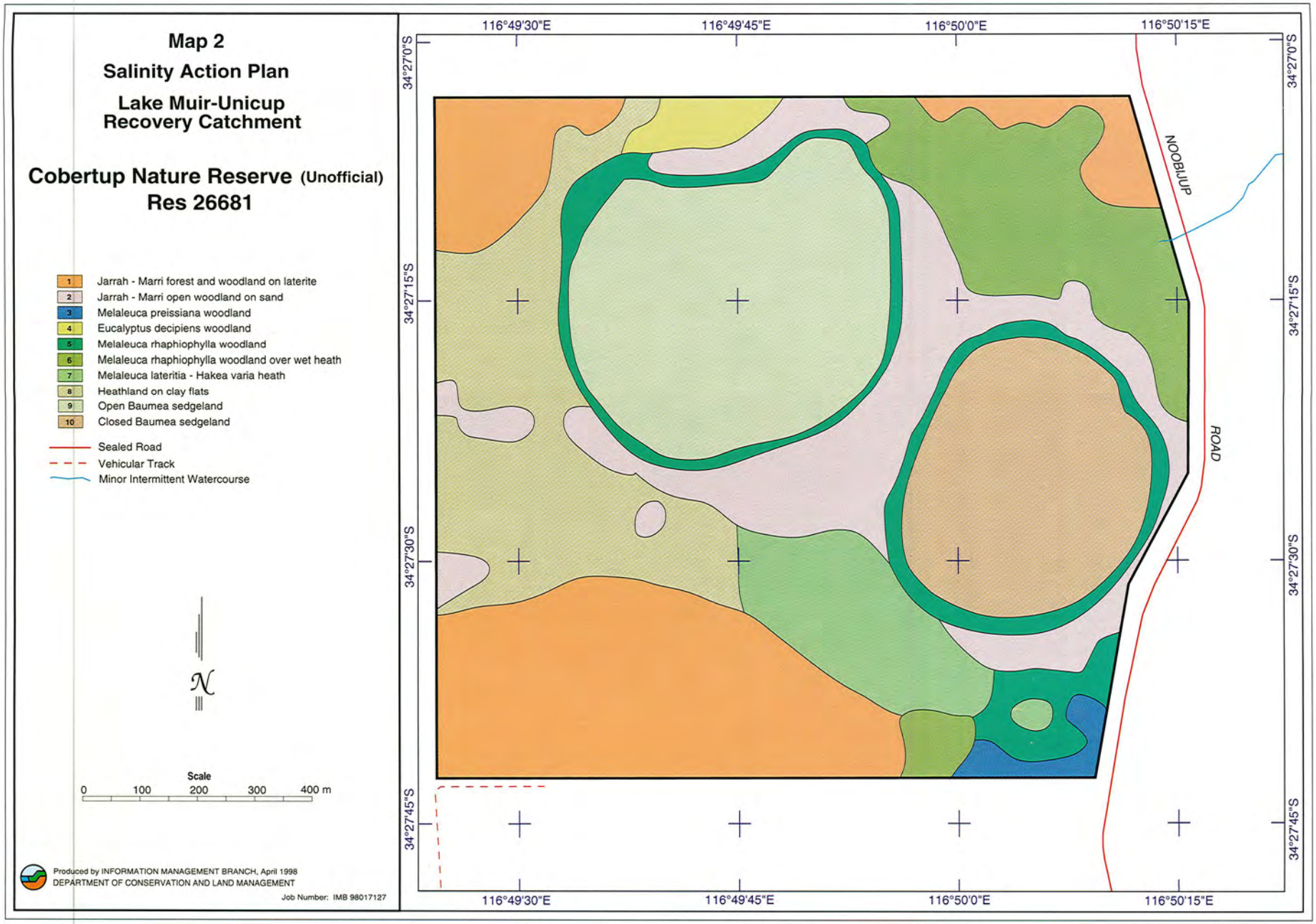
Stylidiaceae
- Stylidium brunonianum ssp. minor
- Stylidium calcaratum
- Stylidium ecorne
- Stylidium inundatum
- Stylidium junceum
- Stylidium mimeticum
- Stylidium petiolare
- Stylidium pulchellum
- Stylidium repens
- Stylidium sp.
- Stylidium spathulatum

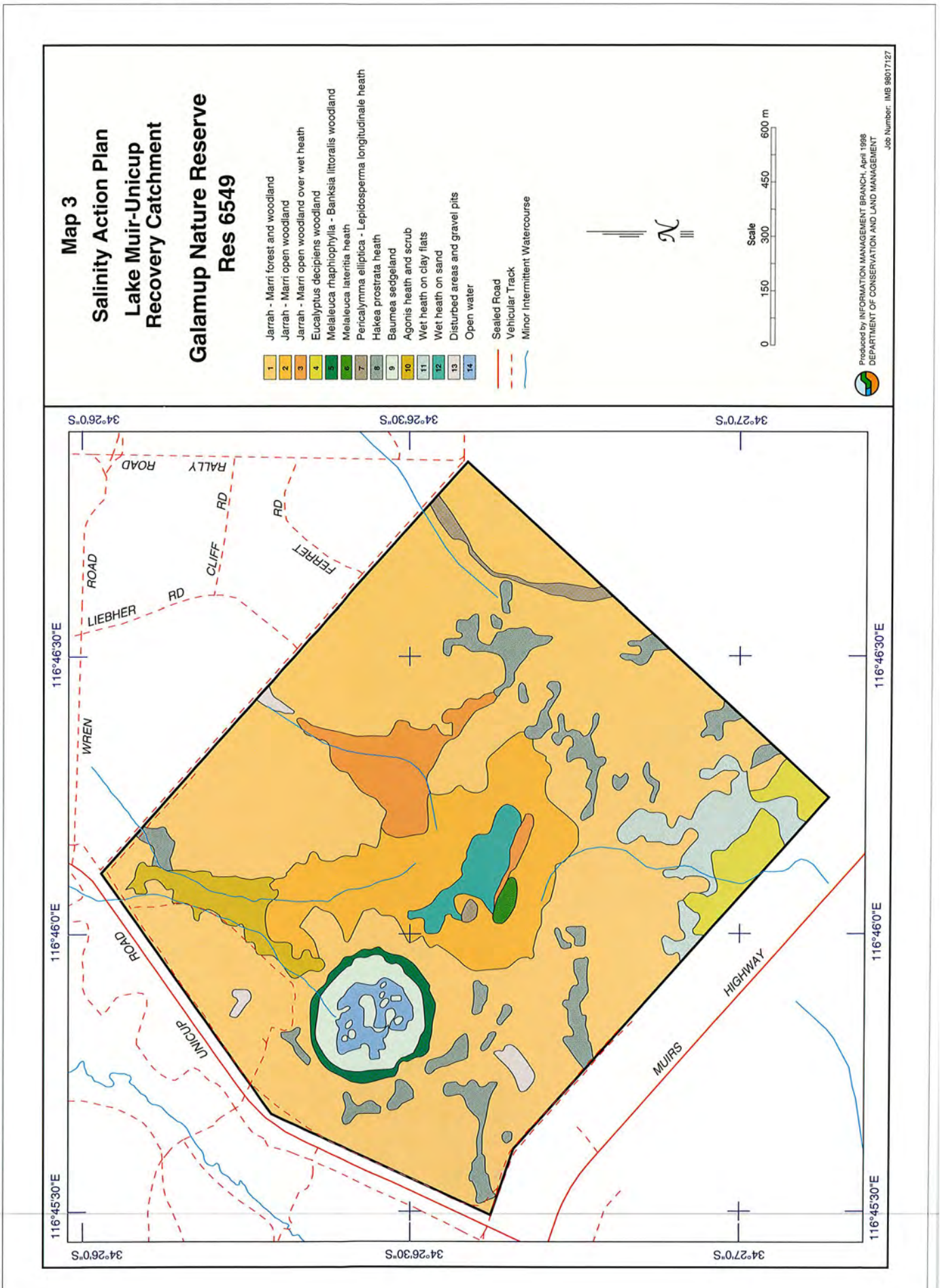
Thymelaeaceae
- Pimelea angustifolia
- Pimelea lehmanniana

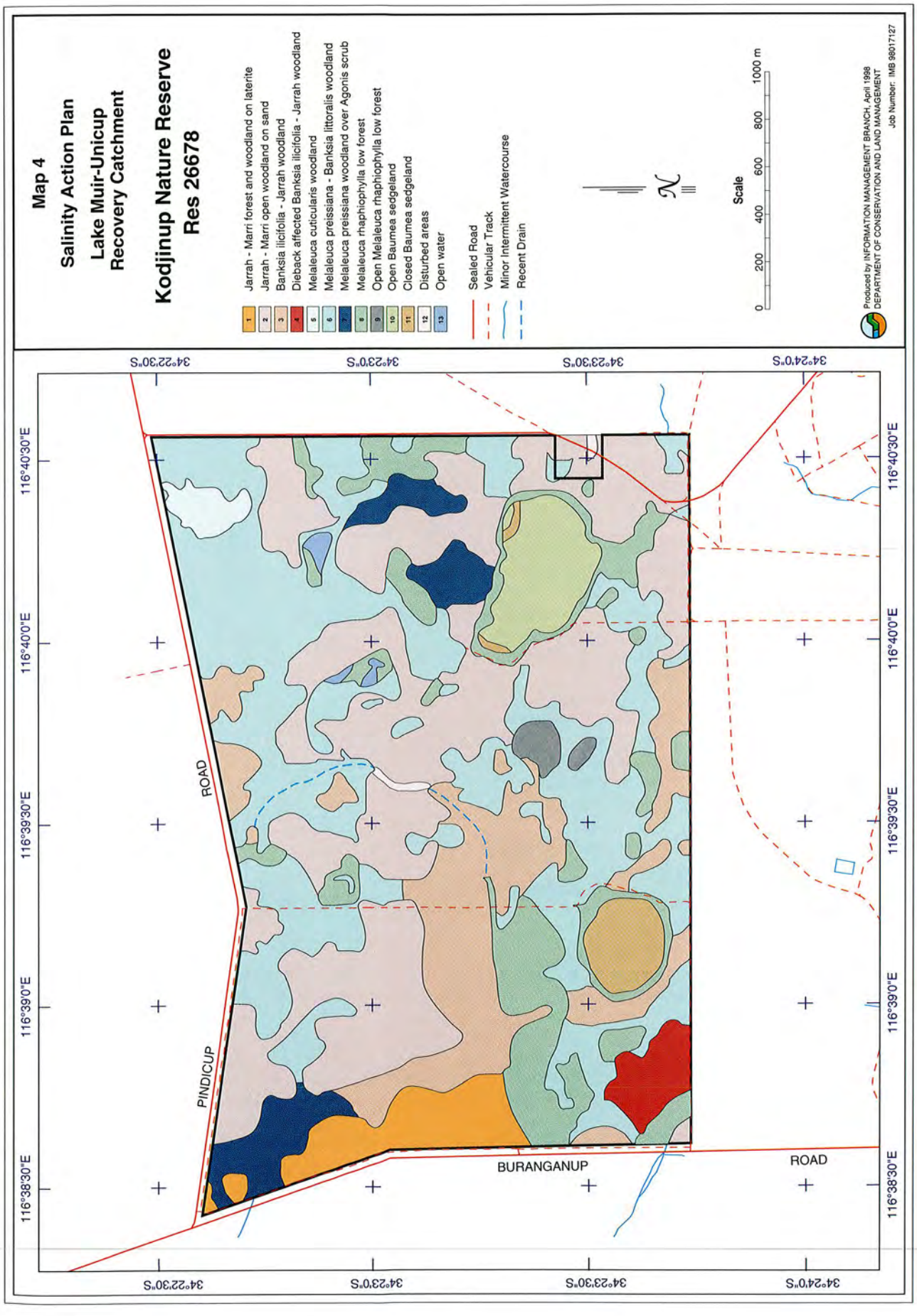
Tremandraceae
- Platytheca galioides
- Tetratheca affinis
- Tetratheca setigera
- Tetratheca virgata

Violaceae
    Hybanthus floribundus
Xanthorrhoeaceae
    Xanthorrhoea gracilis
    Xanthorrhoea preissii
Zamiaceae
    Macrozamia riedlei


116°49'30"E
116°49'45"E
116°50'0"E
116°50'15"E
34°20'0"S
34°20'15"S
34°20'30"S
WINGEBELLUP
ROAD
Map 1
Salinity Action Plan
Lake Muir-Unicup
Recovery Catchment
Bokarup Nature Reserve
Res 14739
1 Jarrah - Marri forest and woodland on laterite
2 Jarrah - Marri open woodland on sand
3 Melaleuca preissiana - Banksia littoralis woodland
4 Melaleuca preissiana - Eucalyptus rudis woodland
5 Melaleuca rhaphiophylla low forest
6 Melaleuca rhaphiophylla open woodland
7 Wet heath
8 Baumea sedgeland
9 Acacia dealbata thicket
10 Revegetation works
11 Cleared Areas
12 Open water
Sealed Road
Minor Intermittent Watercourse
N
Scale
0 100 200 300 400 m
Produced by INFORMATION MANAGEMENT BRANCH, April 1998
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
Job Number: IMB 98017127


Map 2
Salinity Action Plan
Lake Muir-Unicup Recovery Catchment
Cobertup Nature Reserve (Unofficial)
Res 26681
1 Jarrah - Marri forest and woodland on laterite
2 Jarrah - Marri open woodland on sand
3 Melaleuca preissiana woodland
4 Eucalyptus decipiens woodland
5 Melaleuca rhaphiophylla woodland
6 Melaleuca rhaphiophylla woodland over wet heath
7 Melaleuca lateritia - Hakea varia heath
8 Heathland on clay flats
9 Open Baumea sedgeland
10 Closed Baumea sedgeland
Sealed Road
Vehicular Track
Minor Intermittent Watercourse
N
Scale
0 100 200 300 400 m
Produced by INFORMATION MANAGEMENT BRANCH, April 1998
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
Job Number: IMB 98017127
116°49'30"E
116°49'45"E
116°50'0"E
116°50'15"E
34°27'0"S
34°27'15"S
34°27'30"S
34°27'45"S
NOOBIJUP
ROAD


Map 3
Salinity Action Plan
Lake Muir-Unicup
Recovery Catchment
Galamup Nature Reserve
Res 6549
Jarrah - Marri forest and woodland
Jarrah - Marri open woodland
Jarrah - Marri open woodland over wet heath
Eucalyptus decipiens woodland
Melaleuca rhaphiophylla - Banksia littoralis woodland
Melaleuca lateritia heath
Pericalymma elliptica - Lepidosperma longitudinale heath
Hakea prostrata heath
Baumea sedgeland
Agonis heath and scrub
Wet heath on clay flats
Wet heath on sand
Disturbed areas and gravel pits
Open water
Sealed Road
Vehicular Track
Minor Intermittent Watercourse
Scale
0 150 300 450 600 m
Produced by INFORMATION MANAGEMENT BRANCH, April 1998
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
Job Number: IMB 98017127
34°26'0"S
34°26'30"S
34°27'0"S
116°45'30"E
116°46'0"E
116°46'30"E
WREN ROAD
LIEBHER RD
ROAD
CLIFF RD
RD
FERRET
RALLY ROAD
UNICUP ROAD
MUIRS HIGHWAY


Map 4
Salinity Action Plan
Lake Muir-Unicup
Recovery Catchment
Kodjinup Nature Reserve
Res 26678
1 Jarrah - Marri forest and woodland on laterite
2 Jarrah - Marri open woodland on sand
3 Banksia ilicifolia - Jarrah woodland
4 Dieback affected Banksia ilicifolia - Jarrah woodland
5 Melaleuca cuticularis woodland
6 Melaleuca preissiana - Banksia littoralis woodland
7 Melaleuca preissiana woodland over Agonis scrub
8 Melaleuca rhaphiophylla low forest
9 Open Melaleuca rhaphiophylla low forest
10 Open Baumea sedgeland
11 Closed Baumea sedgeland
12 Disturbed areas
13 Open water
Sealed Road
Vehicular Track
Minor Intermittent Watercourse
Recent Drain
N
Scale
0 200 400 600 800 1000 m
Produced by INFORMATION MANAGEMENT BRANCH, April 1998
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
Job Number: IMB 98017127
34°22'30"S
34°23'0"S
34°23'30"S
34°24'0"S
116°38'30"E
116°39'0"E
116°39'30"E
116°40'0"E
116°40'30"E
ROAD
PINDICUP
BURANGANUP
ROAD

Map 5

Salinity Action Plan
Lake Muir-Unicup Recovery Catchment

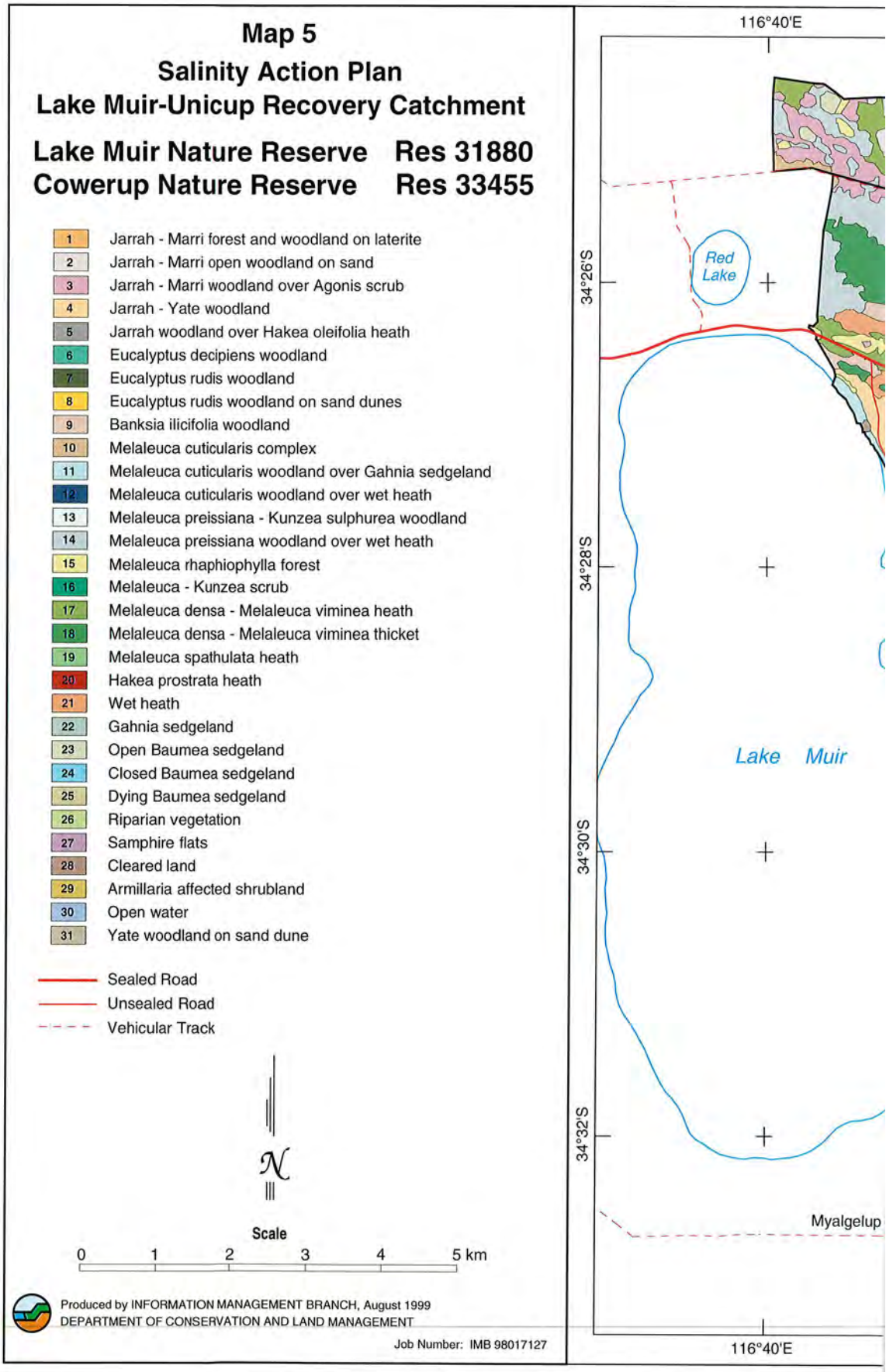
Lake Muir Nature Reserve Res 31880
Cowerup Nature Reserve Res 33455

1	Jarrah - Marri forest and woodland on laterite
2	Jarrah - Marri open woodland on sand
3	Jarrah - Marri woodland over Agonis scrub
4	Jarrah - Yate woodland
5	Jarrah woodland over Hakea oleifolia heath
6	Eucalyptus decipiens woodland
7	Eucalyptus rudis woodland
8	Eucalyptus rudis woodland on sand dunes
9	Banksia ilicifolia woodland
10	Melaleuca cuticularis complex
11	Melaleuca cuticularis woodland over Gahnia sedgeland
12	Melaleuca cuticularis woodland over wet heath
13	Melaleuca preissiana - Kunzea sulphurea woodland
14	Melaleuca preissiana woodland over wet heath
15	Melaleuca rhaphiophylla forest
16	Melaleuca - Kunzea scrub
17	Melaleuca densa - Melaleuca viminea heath
18	Melaleuca densa - Melaleuca viminea thicket
19	Melaleuca spathulata heath
20	Hakea prostrata heath
21	Wet heath
22	Gahnia sedgeland
23	Open Baumea sedgeland
24	Closed Baumea sedgeland
25	Dying Baumea sedgeland
26	Riparian vegetation
27	Samphire flats
28	Cleared land
29	Armillaria affected shrubland
30	Open water
31	Yate woodland on sand dune

Sealed Road
Unsealed Road
Vehicular Track

N

Scale
0 1 2 3 4 5 km



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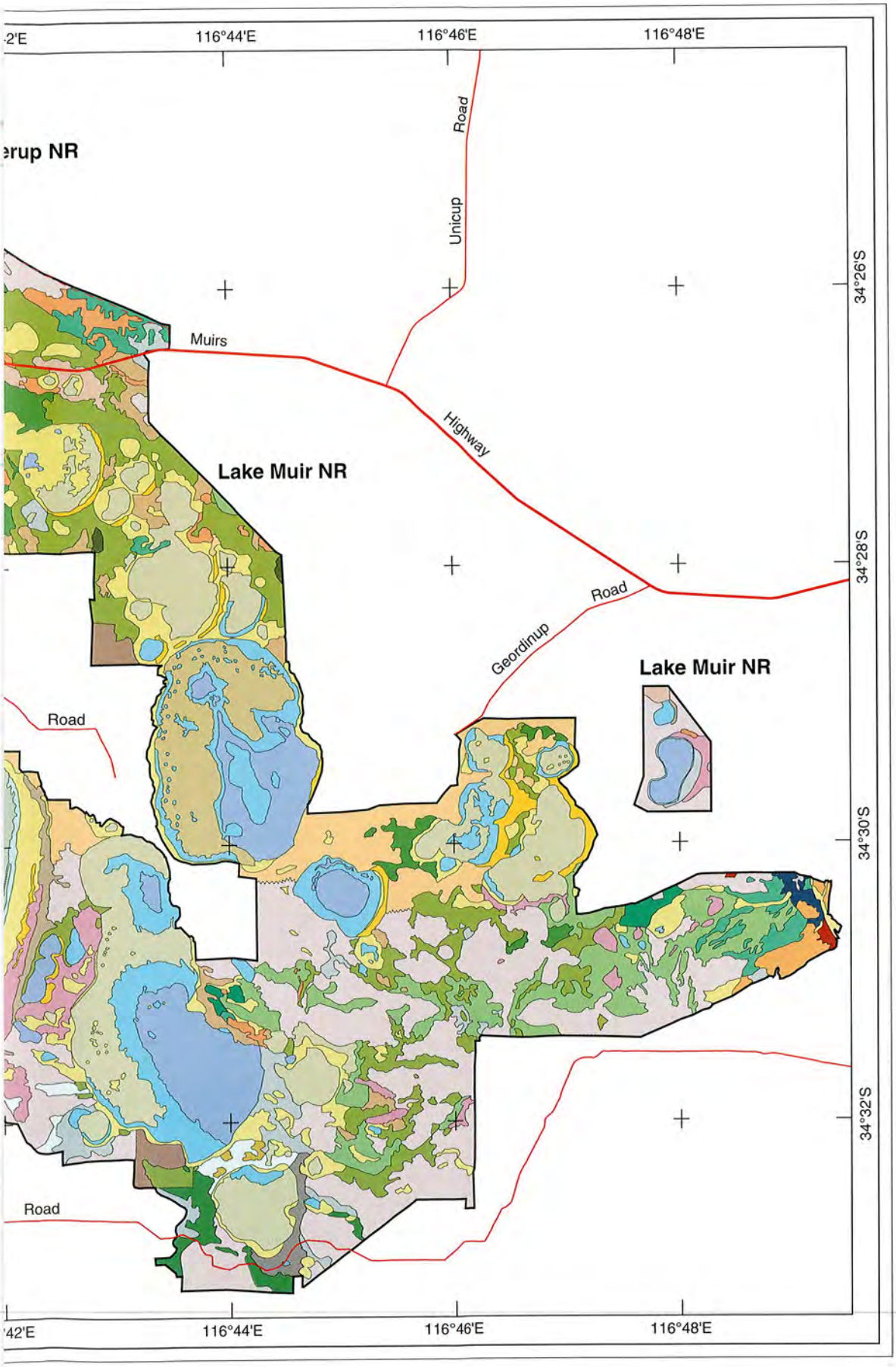
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

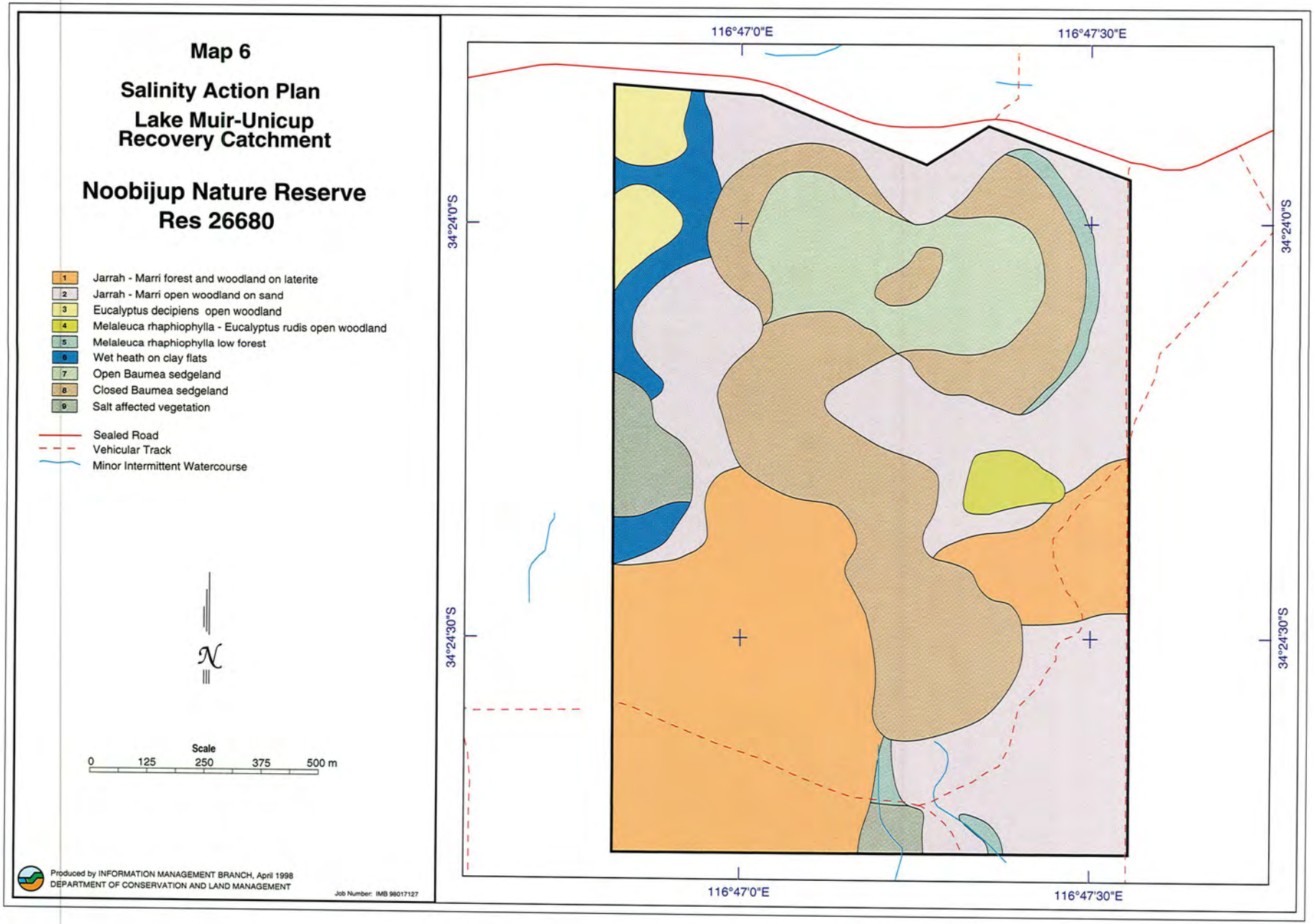
Job Number: IMB 98017127


2'E
116°44'E
116°46'E
116°48'E
erup NR
Road
Unicup
34°26'S
Muirs
Highway
Lake Muir NR
34°28'S
Road
Geordinup
Lake Muir NR
Road
34°30'S
34°32'S
Road
42'E
116°44'E
116°46'E
116°48'E

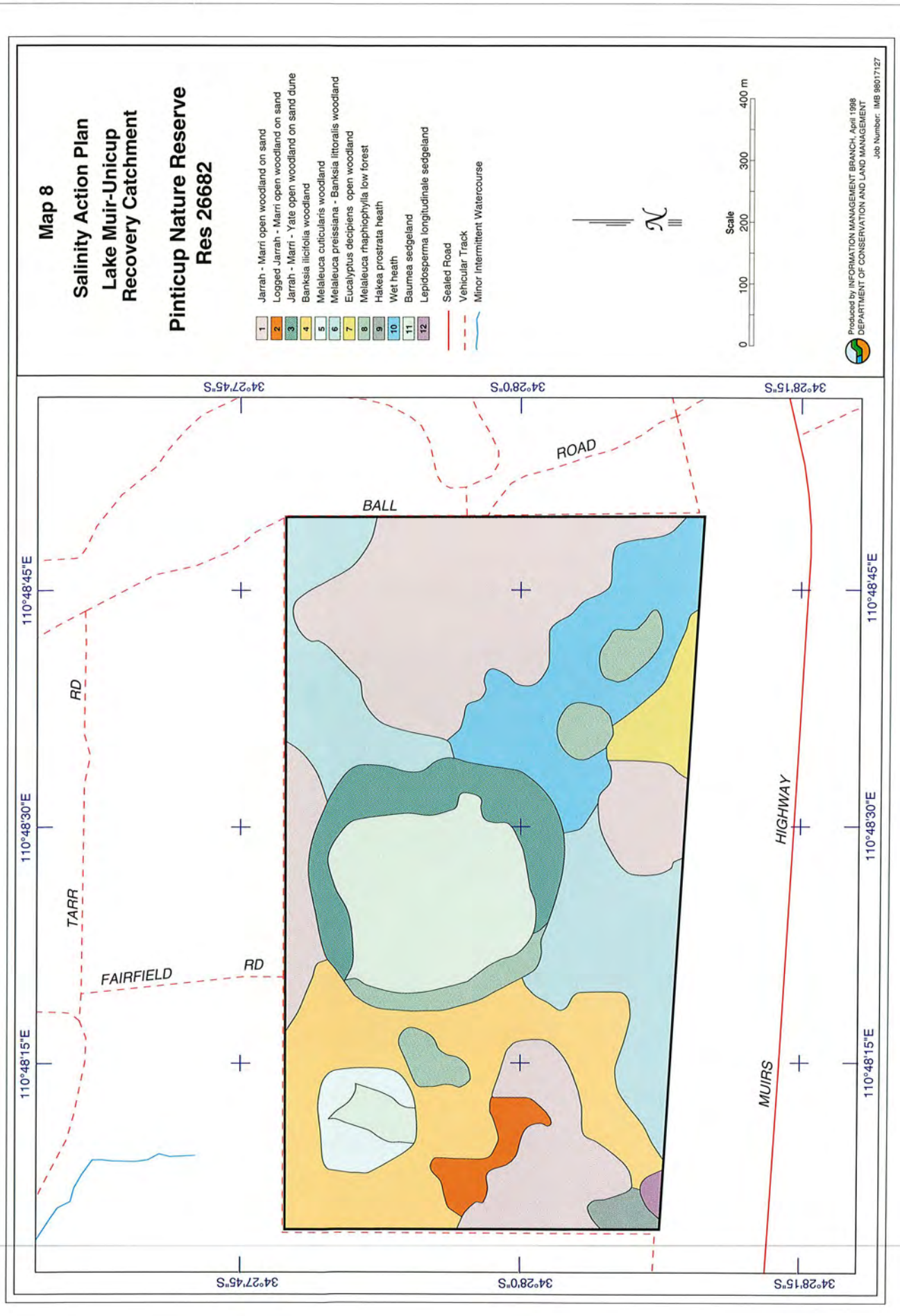
Map 6

Salinity Action Plan
Lake Muir-Unicup Recovery Catchment

Noobijup Nature Reserve
Res 26680



Map 7
Salinity Action Plan
Lake Muir-Unicup
Recovery Catchment
Pindicup Nature Reserve
Res 26679
Jarrah - Marri forest and woodland on laterite
Jarrah - Marri open woodland on sand
Jarrah - Marri open woodland over Agonis scrub
Melaleuca cuticularis woodland
Melaleuca preissiana - Banksia littoralis woodland
Eucalyptus decipiens open woodland
Melaleuca rhaphiophylla low forest
Wet heath
Baumea articulata sedgeland
Baumea vaginalis sedgeland
Gahnia sedgeland
Lake bed
Vehicular Track
Minor Intermittent Watercourse
Scale
0
200
400
600
800 m
Produced by INFORMATION MANAGEMENT BRANCH, April 1998
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
Job Number: IMB 98017127
116°42'30"E
116°43'0"E
116°43'30"E
116°44'0"E
34°24'30"S
34°25'0"S
34°25'30"S


Map 8
Salinity Action Plan
Lake Muir-Unicup
Recovery Catchment
Pinticup Nature Reserve
Res 26682
Jarrah - Marri open woodland on sand
Logged Jarrah - Marri open woodland on sand
Jarrah - Marri - Yate open woodland on sand dune
Banksia ilicifolia woodland
Melaleuca cuticularis woodland
Melaleuca preissiana - Banksia littoralis woodland
Eucalyptus decipiens open woodland
Melaleuca rhaphiophylla low forest
Hakea prostrata heath
Wet heath
Baumea sedgeland
Lepidosperma longitudinale sedgeland
Sealed Road
Vehicular Track
Minor Intermittent Watercourse
Scale
0
100
200
300
400 m
Produced by INFORMATION MANAGEMENT BRANCH, April 1998
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
Job Number: IMB 98017127
34°27'45"S
34°28'0"S
34°28'15"S
110°48'45"E
110°48'30"E
110°48'15"E
BALL
ROAD
RD
TARR
FAIRFIELD
RD
HIGHWAY
MUIRS

APPENDIX 2

Total flora list for the 13 reserves of the Byenup-Muir wetland system.

(* indicates an introduced taxon, ms indicates a manuscript name)

Aizoaceae
* Carpobrotus edulis
Carpobrotus modestus
Amaranthaceae
Alternanthera nodiflora
Hemichroa diandra
Ptilotus drummondii
Ptilotus manglesii
Amaryllidaceae
* Amaryllis belladonna
Anthericaceae
Agrostocrinum scabrum
Arthropodium capillipes
Arthropodium preissii
Borya scirpoidea
Borya sphaerocephala
Caesia micrantha
Caesia occidentalis
Chamaescilla corymbosa
Chamaescilla spiralis
Johnsonia acaulis
Johnsonia lupulina
Laxmannia minor
Laxmannia sessiliflora
Sowerbaea laxiflora
Thysanotus arenarius
Thysanotus manglesianus
Thysanotus multiflorus
Thysanotus patersonii
Thysanotus sparteus
Thysanotus tenellus
Thysanotus thyrsoideus
Thysanotus triandrus
Tricoryne elatior
Tricoryne humilis
Tricoryne tenella
Apiaceae
Actinotus glomeratus
Apium annuum
Apium prostratum
Centella cordifolia
Daucus glochidiatus
Eryngium pinnatifidum
Eryngium sp. Lake Muir (*E.Wittwer* 2293)
Homalosciadium homalocarpum
Hydrocotyle alata
Hydrocotyle callicarpa
Hydrocotyle diantha
Hydrocotyle pilifera var. glabrata
Lilaeopsis polyantha
Platysace filiformis
Platysace juncea
Schoenolaena juncea
Schoenolaena tenuior
Trachymene pilosa
Xanthosia atkinsoniana
Xanthosia candida
Xanthosia ciliata
Xanthosia huegelii
Aspleniaceae
Asplenium flabellifolium
Asteraceae
Angianthus preissianus
Angianthus sp.
Angianthus tomentosus
* Arctotheca calendula
* Aster subulatus
Asteridea athrixioides
Asteridea pulverulenta
Blennospora drummondii
Brachyscome bellidioides
Brachyscome ciliaris
Brachyscome iberidifolia
Calotis erinacea
* Carduus pycnocephalus
* Centaurea melitensis
* Cirsium vulgare
* Conyza albida
Cotula australis
Cotula coronopifolia
Cotula cotuloides
* Cotula turbinata
Craspedia variabilis
* Dittrichia graveolens
Euchiton gymnocephalus
Euchiton sphaericus
Gnephosis tenuissima
* Hedypnois rhagadioloides
Hyalosperma cotula
Hyalosperma simplex
* Hypochaeris glabra
Ixiolaena viscosa
* Lactuca serriola
Lagenifera huegelii
Millotia myosotidifolia
Millotia tenuifolia
Myriocephalus occidentalis
Olearia axillaris
Olearia elaeophila
Olearia paucidentata
Picris angustifolia
Pithocarpa corymbulosa
Pithocarpa pulchella
Podolepis gracilis
Podolepis lessonii
Podotheca angustifolia
Pogonolepis stricta
* Pseudognaphalium luteoalbum
Pterochaeta paniculata
Quinetia urvillei
Rhodanthe citrina
Rhodanthe pyrethrum
Rutidosis multiflora
Senecio glomeratus
Senecio lautus
Senecio minimus
Senecio picridioides
Senecio quadridentatus
Siloxerus humifusus
* Sonchus asper
* Sonchus hydrophilus
* Sonchus oleraceus
* Tolpis barbata
Trichocline sp.
Trichocline spathulata
* Ursinia anthemoides
* Vellereophyton dealbatum
Vittadinia australasica var. australasica
Waitzia nitida
Waitzia suaveolens
Brassicaceae
* Cardamine paucijuga
* Lepidium africanum
* Sisymbrium officinale
Caesalpiniaceae
Labichea punctata
Callitrichaceae
* Callitriche stagnalis
Campanulaceae
Wahlenbergia gracilenta
Wahlenbergia multicaulis
Wahlenbergia preissii
Wahlenbergia stricta

Caryophyllaceae
* Cerastium glomeratum
* Corrigiola litoralis
Petrorhagia prolifera
* Petrorhagia velutina
* Silene gallica
* Spergularia salina
Casuarinaceae
Allocasuarina humilis
Allocasuarina lehmanniana
Allocasuarina microstachya
Allocasuarina thuyoides
Centrolepidaceae
Aphelia cyperoides
Brizula drummondii
Centrolepis alepyroides
Centrolepis aristata
Centrolepis drummondiana
Centrolepis glabra
Centrolepis humillima
Centrolepis mutica
Centrolepis pilosa
Centrolepis polygyna
Chenopodiaceae
* Atriplex prostrata
* Chenopodium murale
Dysphania glomulifera ssp. glomulifera
Dysphania plantaginella
Halosarcia indica
Halosarcia leptoclada
Rhagodia baccata
Sarcocornia quinqueflora
Suaeda australis
Clusiaceae
Hypericum gramineum
Colchicaceae
Burchardia congesta
Burchardia monantha
Burchardia multiflora
Wurmbea dioica ssp. alba
Convolvulaceae
Dichondra repens
Pronaya fraseri
Wilsonia backhousei
Wilsonia humilis
Crassulaceae
Crassula colorata
Crassula decumbens var. decumbens
Crassula exserta
* Crassula natans
Crassula pedicellosa
Crassula peduncularis
Cupressaceae
Actinostrobus acuminatus
Actinostrobus pyramidalis
Cyperaceae
Baumea arthrophylla
Baumea articulata
Baumea juncea
Baumea rubiginosa
Baumea vaginalis
Carex appressa
Carex preissii
Caustis dioica
Caustis sp. Boyanup (*G.S. McCutcheon* 1706)
Chorizandra enodis
Cyathochaeta avenacea
Cyathochaeta clandestina
* Cyperus eragrostis
* Cyperus tenellus
Eleocharis sphacelata
Gahnia ancistrophylla
Gahnia aristata
Gahnia drummondii
Gahnia trifida
Isolepis cernua
Isolepis congrua
Isolepis cyperoides
Isolepis fluitans
* Isolepis marginata
Isolepis nodosa
Isolepis oldfieldiana
Isolepis producta
* Isolepis prolifera
Isolepis stellata
Lepidosperma angustatum
Lepidosperma gladiatum
Lepidosperma ?gracile
Lepidosperma longitudinale
Lepidosperma squamatum
Lepidosperma tenue
Mesomelaena graciliceps
Mesomelaena stygia
Mesomelaena tetragona
Schoenus asperocarpus
Schoenus benthamii
Schoenus bifidus
Schoenus brevisetis
Schoenus capillifolius
Schoenus curvifolius
Schoenus efoliatus
Schoenus elegans
Schoenus grandiflorus
Schoenus humilis
Schoenus laevigatus
Schoenus loliaceus
Schoenus maschalinus
Schoenus nanus
Schoenus natans
Schoenus obtusifolius
Schoenus odontocarpus
Schoenus plumosus
Schoenus rigens
Schoenus sculptus
Schoenus subbulbosus
Schoenus subflavus
Schoenus ?sublateralis
Schoenus submicrostachyus
Schoenus tenellus
Schoenus unispiculatus
Tetraria capillaris
Tetraria octandra
Tricostularia compressa
Tricostularia neesii var. elatior
Tricostularia neesii var. neesii
Dasypogonaceae
Chamaexeros serra
Dasypogon bromeliifolius
Lomandra caespitosa
Lomandra collina
Lomandra hermaphrodita
Lomandra micrantha
Lomandra nigricans
Lomandra purpurea
Lomandra sericea
Lomandra sonderi
Lomandra suaveolens
Dennstaedtiaceae
Pteridium esculentum
Dilleniaceae
Hibbertia acerosa
Hibbertia amplexicaulis
Hibbertia commutata
Hibbertia cunninghamii
Hibbertia glomerata
Hibbertia gracilipes
Hibbertia microphylla
Hibbertia ?polystachya
Hibbertia pulchra
Hibbertia racemosa
Hibbertia silvestris
Hibbertia spicata ssp. spicata

- Hibbertia stellaris
- Hibbertia subvaginata
- Hibbertia vaginata

Droseraceae
- Drosera bulbigena
- Drosera bulbosa
- Drosera erythrorhiza
- Drosera gigantea
- Drosera glanduligera
- Drosera heterophylla
- Drosera macrantha
- Drosera menziesii
- Drosera neesii
- Drosera paleacea
- Drosera pallida
- Drosera pulchella
- Drosera rosulata
- Drosera stolonifera

Epacridaceae
- Andersonia caerulea
- Astroloma baxteri
- Astroloma ciliatum
- Astroloma microcalyx
- Astroloma pallidum
- Astroloma prostratum
- Leucopogon australis
- Leucopogon capitellatus
- Leucopogon conostephioides
- Leucopogon ?elatior
- Leucopogon gibbosus
- Leucopogon glabellus
- Leucopogon lasiophyllus
- Leucopogon oxycedrus
- Leucopogon parviflorus
- Leucopogon pendulus
- Leucopogon ?polymorphus
- Leucopogon propinquus
- Leucopogon pulchellus
- Leucopogon ?sprengelioides
- Leucopogon tamariscinus
- Leucopogon unilateralis
- Leucopogon verticillatus
- Lysinema ciliatum
- Needhamiella pumilio
- Sphenotoma capitatum
- Sphenotoma gracile
- Styphelia tenuiflora

Euphorbiaceae
- Amperea simulans
- Amperea volubilis
- Monotaxis occidentalis
- Phyllanthus calycinus
- Poranthera huegelii
- Poranthera microphylla
- Pseudanthus virgatus

Fumariaceae
- * Fumaria capreolata

Gentianaceae
- * Centaurium erythraea
- Centaurium spicatum
- * Cicendia filiformis
- Sebaea ovata

Geraniaceae
- * Erodium botrys
- * Erodium cicutarium
- * Erodium moschatum
- Geranium solanderi
- Pelargonium littorale

Goodeniaceae
- Anthotium humile
- Anthotium junciforme
- Dampiera alata
- Dampiera cuneata
- Dampiera diversifolia
- Dampiera fasciculata
- Dampiera hederacea
- Dampiera ?juncea
- Dampiera linearis
- Dampiera pedunculata
- Dampiera trigona
- Goodenia claytoniacea
- Goodenia micrantha
- Goodenia mimuloides
- Goodenia pulchella
- Lechenaultia biloba
- Lechenaultia expansa
- Lechenaultia formosa
- Scaevola globulifera
- Scaevola lanceolata
- Scaevola phlebopetala
- Scaevola platyphylla
- Velleia trinervis

Haemodoraceae
- Anigozanthos bicolor
- Anigozanthos flavidus
- Anigozanthos humilis
- Anigozanthos manglesii
- Anigozanthos viridis
- Conostylis aculeata
- Conostylis aurea
- Conostylis laxiflora
- Conostylis setigera
- Haemodorum laxum
- Haemodorum simplex
- Haemodorum sparsiflorum
- Haemodorum spicatum
- Phlebocarya ciliata
- Tribonanthes australis
- Tribonanthes brachypetala
- Tribonanthes longipetala
- Tribonanthes sp Lake Muir (*GJK & NG* 2387)
- Tribonanthes violacea

Haloragaceae
- Glischrocaryon aureum
- Gonocarpus cordiger
- Gonocarpus hexandrus ssp. integrifolius
- Gonocarpus paniculatus
- Gonocarpus pithyoides
- Haloragis brownii
- Myriophyllum crispatum
- Myriophyllum drummondii
- Myriophyllum limnophilum
- Myriophyllum tillaeoides
- Myriophyllum verrucosum

Hydatellaceae
- Hydatella australis
- Hydatella sp.
- Trithuria bibracteata
- Trithuria submersa

Hypoxidaceae
- Hypoxis glabella
- Hypoxis occidentalis

Iridaceae
- * Gladiolus undulatus
- * Homeria flaccida
- * Iris germanica
- Patersonia juncea
- Patersonia occidentalis
- Patersonia occidentalis (swamp form)
- Patersonia umbrosa
- * Romulea rosea
- * Watsonia bulbillifera

Isoetaceae
- Isoetes drummondii

Juncaceae
- * Juncus acutus
- * Juncus articulatus
- * Juncus bufonius
- * Juncus capitatus
- Juncus holoschoenus
- Juncus kraussii
- Juncus pallidus

Juncus planifolius
Juncus radula
Luzula meridionalis
Juncaginaceae
Triglochin calcitrapum
Triglochin centrocarpum
Triglochin huegelii
Triglochin lineare
Triglochin minutissimum
Triglochin mucronatum
Triglochin striatum
Lamiaceae
Hemiandra pungens
* Mentha pulegium
Lauraceae
Cassytha flava
Cassytha glabella
Cassytha micrantha
Cassytha racemosa
Lentibulariaceae
Polypompholyx multifida
Utricularia australis
Utricularia hookeri
Utricularia inaequalis
Utricularia simplex
Utricularia sp.
Utricularia violacea
Utricularia volubilis
Linaceae
Linum marginale
Lindsaeaceae
Lindsaea linearis
Lobeliaceae
Grammatotheca bergiana
Isotoma hypocrateriformis
Isotoma scapigera
Lobelia alata
Lobelia gibbosa
Lobelia heterophylla
Lobelia rhombifolia
Lobelia tenuior
Loganiaceae
Logania campanulata
Logania serpyllifolia
Phyllangium palustre
Phyllangium paradoxum
Loranthaceae
Amyema miquelii
Nuytsia floribunda
Lycopodiaceae
Phylloglossum drummondii
Lythraceae
* Lythrum hyssopifolia
Malvaceae
Lawrencia spicata
* Malva parviflora
Sida hookeriana
Marsileaceae
Pilularia novae-hollandiae
Menyanthaceae
Villarsia albiflora
Villarsia capitata
Villarsia parnassifolia
Villarsia submersa
Villarsia violifolia
Mimosaceae
Acacia alata
Acacia biflora
Acacia browniana
Acacia cochlearis
Acacia cyclops
* Acacia dealbata
Acacia extensa
Acacia huegelii
Acacia incurva
Acacia laricina var. laricina
Acacia latipes ssp. latipes ms
* Acacia longifolia ssp. longifolia ms
Acacia myrtifolia
Acacia nervosa
Acacia pentadenia
Acacia pulchella var. goadbyi
Acacia pulchella var. pulchella
Acacia rostellifera
Acacia saligna
Acacia stenoptera
Acacia tetragonocarpa
Acacia urophylla
Acacia varia
Acacia willdenowiana
Molluginaceae
Macarthuria apetala
Myoporaceae
Myoporum caprarioides
Myrtaceae
Actinodium cunninghamii
Agonis hypericifolia
Agonis juniperina
Agonis linearifolia
Agonis parviceps
Astartea fascicularis
Astartea sp. (pink weeping)
Astartea sp. (white erect)
Baeckea camphorosmae
Baeckea aff. preissiana
Baeckea pygmaea
Callistemon phoeniceus
Calothamnus lateralis
Calothamnus lehmannii
Calothamnus preissii
Calothamnus sanguineus
Calothamnus schaueri
Calytrix angulata
Calytrix flavescens
Calytrix leschenaultii
Calytrix ?tenuiramea
Darwinia oederoides
Darwinia vestita
Eremaea pauciflora
Eucalyptus aspersa
Eucalyptus calophylla
Eucalyptus cornuta
Eucalyptus decipiens
Eucalyptus latens
Eucalyptus marginata
Eucalyptus megacarpa
Eucalyptus occidentalis
Eucalyptus patens
Eucalyptus rudis
Eucalyptus wandoo
Hypocalymma angustifolium
Hypocalymma strictum
Kunzea ericifolia
Kunzea micrantha
Kunzea recurva
Kunzea sulphurea
Leptospermum erubescens
Melaleuca cordata
Melaleuca cuticularis
Melaleuca densa
Melaleuca lateriflora
Melaleuca lateritia
Melaleuca leptoclada
Melaleuca pauciflora
Melaleuca preissiana
Melaleuca pritzelii
Melaleuca rhaphiophylla
Melaleuca spathulata
Melaleuca thymoides
Melaleuca viminea
Melaleuca violacea
Pericalymma ellipticum

Verticordia densiflora ssp. caespitosa
Verticordia habrantha
Verticordia plumosa
Olacaceae
Olax benthamiana
Olax phyllanthi
Onagraceae
Epilobium billardierianum
Epilobium hirtigerum
Ophioglossaceae
Ophioglossum lusitanicum
Orchidaceae
Caladenia caesarea ssp. caesarea ms
Caladenia cairnsiana
Caladenia christineae ms
Caladenia drummondii
Caladenia ferruginea
Caladenia flava
Caladenia harringtoniae
Caladenia latifolia
Caladenia longicauda
Caladenia longiclavata
Caladenia macrostylis
Caladenia magniclavata
Caladenia marginata
Caladenia nana
Caladenia radialis
Caladenia radiata
Caladenia reptans
Caladenia rhomboidiformis
Caladenia splendens ms
Caladenia starteorum ms
Caladenia varians ssp. varians ms
Corybas dilatatus
Corybas recurvus
Cryptostylis ovata
Cyanicula deformis ms
Cyanicula ?gemmata ms
Cyrtostylis huegelii
Cyrtostylis robusta
Diuris carinata
Diuris drummondii
Diuris laxiflora
Diuris longifolia
Drakaea glyptodon
Drakaea livida
Drakonorchis barbarossa ms
Elythranthera brunonis
Elythranthera emarginata
Eriochilus dilatatus ssp. undulatus ms
Eriochilus scaber
Gastrodia lacista
Leporella fimbriata
Leptoceras menziesii
Lyperanthus serratus
Microtis atrata
Microtis media
Microtis orbicularis
* Monadenia bracteata
Paracaleana nigrita
Praecoxanthus aphyllus ms
Prasophyllum drummondii
Prasophyllum elatum
Prasophyllum fimbria
Prasophyllum macrostachyum
Prasophyllum plumiforme
Pterostylis barbata
Pterostylis nana
Pterostylis pyramidalis
Pterostylis recurva
Pterostylis sanguinea
Pterostylis turfosa
Pterostylis vittata
Pyrorchis nigricans
Thelymitra antennifera
Thelymitra benthamiana
Thelymitra crinita
Thelymitra cucullata
Thelymitra flexuosa
Thelymitra fuscolutea
Thelymitra macrophylla
Thelymitra nuda
Thelymitra pauciflora
Orobanchaceae
* Orobanche minor
Oxalidaceae
Oxalis perennans
* Oxalis purpurea
Papilionaceae
Aotus intermedia
Bossiaea aquifolium
Bossiaea eriocarpa
Bossiaea linophylla
Bossiaea ornata
Bossiaea praetermissa
Bossiaea rufa
Brachysema melanopetalum
Brachysema praemorsum
Callistachys lanceolata
Chorizema aciculare
Chorizema ilicifolium
Chorizema nanum
Daviesia cordata
Daviesia hakeoides
Daviesia incrassata
Daviesia physodes
Daviesia preissii
Eutaxia virgata
Gastrolobium bilobum
Gompholobium aristatum
Gompholobium burtonioides
Gompholobium capitatum
Gompholobium confertum
Gompholobium knightianum
Gompholobium marginatum
Gompholobium ovatum
Gompholobium polymorphum
Gompholobium preissii
Gompholobium scabrum
Gompholobium tomentosum
Goodia lotifolia
Hardenbergia comptoniana
Hovea chorizemifolia
Hovea elliptica
Hovea trisperma var. grandiflora
Isotropis cuneifolia
Jacksonia furcellata
Jacksonia sparsa ms
Kennedia coccinea
Kennedia prostrata
Latrobea tenella
* Lotus angustissimus
* Lotus suaveolens
* Lotus uliginosus
* Ornithopus compressus
Oxylobium lineare
Pultenaea ericifolia
Pultenaea ochreata
Pultenaea reticulata
Sphaerolobium drummondii
Sphaerolobium linophyllum
Sphaerolobium macranthum
Sphaerolobium medium
Sphaerolobium vimineum
* Trifolium arvense
* Trifolium campestre
* Trifolium cernuum
* Trifolium dubium
* Trifolium fragiferum
* Trifolium glomeratum
* Trifolium repens
* Trifolium subterraneum
Viminaria juncea

Philydraceae
- Philydrella drummondii
- Philydrella pygmaea

Phormiaceae
- Dianella brevicaulis
- Dianella revoluta
- Stypandra glauca

Pinaceae
- * Pinus pinaster

Pittosporaceae
- Billardiera drummondiana var. drummondiana
- Billardiera erubescens
- Billardiera parviflora var. parviflora
- Billardiera variifolia
- Marianthus candidus
- Sollya heterophylla

Plantaginaceae
- Plantago debilis
- Plantago exilis

Poaceae
- Agrostis avenacea
- * Aira caryophyllea
- Amphibromus nervosus
- Amphibromus vickeryae
- Amphipogon amphipogonoides
- Amphipogon debilis
- Amphipogon laguroides
- Amphipogon strictus
- Amphipogon turbinatus
- * Anthoxanthum odoratum
- * Avena barbata
- * Avena fatua
- Austrodanthonia caespitosa
- Austrodanthonia occidentalis
- Austrodanthonia setacea
- Austrostipa compressa
- Austrostipa juncifolia
- Austrostipa pycnostachya
- Austrostipa trichophylla
- * Briza maxima
- * Briza minor
- * Bromus diandrus
- * Cynodon dactylon
- * Cynosurus echinatus
- Deyeuxia quadriseta
- Dichelachne crinita
- Eragrostis ?brownii
- Eragrostis elongata
- Hemarthria uncinata
- * Holcus lanatus
- * Holcus setiger
- * Hordeum geniculatum
- * Hordeum leporinum
- * Hordeum murinum
- * Lolium multiflorum
- * Lolium rigidum
- Microlaena stipoides
- Neurachne alopecuroidea
- * Parapholis incurva
- * Poa annua
- Poa drummondiana
- Poa poiformis
- * Polypogon monspeliensis
- Polypogon tenellus
- Sporobolus virginicus
- * Stenotaphrum secundatum
- Tetrarrhena laevis
- * Vulpia bromoides
- * Vulpia myuros

Podocarpaceae
- Podocarpus drouynianus

Polygalaceae
- Comesperma calymega
- Comesperma ciliatum
- Comesperma drummondii
- Comesperma flavum
- Comesperma virgatum
- Comesperma volubile
- * Polygala myrtifolia

Polygonaceae
- Muehlenbeckia adpressa
- Persicaria prostrata
- * Polygonum arenastrum
- * Rumex acetosella
- * Rumex brownii
- * Rumex conglomeratus
- * Rumex crispus
- * Rumex pulcher

Portulacaceae
- Calandrinia ?composita
- Calandrinia granulifera
- Montia australasica

Potamogetonaceae
- Potamogeton drummondii
- Potamogeton tricarinatus
- Ruppia megacarpa

Primulaceae
- * Anagallis arvensis var. arvensis
- * Anagallis arvensis var. caerulea
- Samolus caespitosus
- Samolus junceus

Proteaceae
- Adenanthos obovatus
- Banksia grandis
- Banksia ilicifolia
- Banksia littoralis
- Banksia meisneri ssp. meisneri
- Conospermum capitatum
- Conospermum flexuosum ssp. laevigatum
- Dryandra armata
- Dryandra bipinnatifida
- Dryandra lindleyana
- Dryandra porrecta
- Dryandra sessilis
- Franklandia fucifolia
- Grevillea brownii
- Grevillea depauperata
- Grevillea ?diversifolia
- Grevillea fasciculata
- Grevillea leptobotrys
- Grevillea pilulifera
- Grevillea pulchella
- Grevillea quercifolia
- Hakea amplexicaulis
- Hakea ceratophylla
- Hakea corymbosa
- Hakea gilbertii
- Hakea lissocarpha
- Hakea oleifolia
- Hakea prostrata
- Hakea ruscifolia
- Hakea sulcata
- Hakea trifurcata
- Hakea undulata
- Hakea varia
- Isopogon ?attenuatus
- Isopogon polycephalus
- Isopogon teretifolius
- Persoonia longifolia
- Petrophile acicularis
- Petrophile divaricata
- Petrophile ?longifolia
- Petrophile media
- Petrophile rigida
- Petrophile serruriae
- Petrophile squamata
- Stirlingia anethifolia
- Stirlingia ?seselifolia
- Stirlingia ?simplex
- Stirlingia tenuifolia
- Synaphea decumbens
- Synaphea favosa

Synaphea petiolaris
Synaphea ?reticulata
Ranunculaceae
Clematis aristata
Clematis pubescens
Ranunculus colonorum
* Ranunculus muricatus
Restionaceae
Anarthria gracilis
Anarthria laevis
Anarthria prolifera
Anarthria scabra
Apodasmia ceramophila ms
Chaetanthus aristatus ms
Chordifex laxus ms
Cytogonidium leptocarpoides ms
Desmocladus fasciculatus ms
Desmocladus flexuosus ms
Harperia lateriflora
Hypolaena exsulca
Hypolaena ?humilis ms
Leptocarpus tenax
Lepyrodia drummondiana
Lepyrodia macra
Lepyrodia muirii
Lyginia barbata
Meeboldina cana ms
Meeboldina coangustata ms
Meeboldina denmarkica
Meeboldina kraussii ms
Meeboldina roycei ms
Meeboldina scariosa ms
Meeboldina sp.
Meeboldina tephrina ms
Sporadanthus strictus ms
Stenopa ramosissima ms
Tremulina tremula ms
Rhamnaceae
Cryptandra arbutiflora ssp. minor
Trymalium floribundum
Trymalium ledifolium
Rosaceae
* Acaena echinata
Rubiaceae
* Galium divaricatum
* Galium murale
Opercularia apiciflora
Opercularia hispidula
Opercularia ?rubioides
Opercularia vaginata
* Sherardia arvensis
Rutaceae
Boronia capitata
Boronia crenulata
Boronia juncea ssp. laniflora
Boronia megastigma
Boronia nematophylla
Boronia ramosa
Boronia spathulata
Eriostemon nodiflorus ssp. lasiocalyx
Santalaceae
Leptomeria cunninghamii
Leptomeria lehmannii
Leptomeria pauciflora
Leptomeria scrobiculata
Leptomeria spinosa
Leptomeria squarrulosa
Santalum acuminatum
Schizaeaceae
Schizaea dichotoma
Scrophulariaceae
* Bartsia trixago
Euphrasia scabra
Glossostigma diandrum
Glossostigma drummondii
Gratiola peruviana
Gratiola pedunculata
Limosella australis
* Parentucellia latifolia
* Parentucellia viscosa
Selaginellaceae
Selaginella gracillima
Solanaceae
* Solanum americanum
* Solanum nigrum
Stackhousiaceae
Stackhousia monogyna
Tripterococcus brunonis
Sterculiaceae
Rulingia corylifolia
Thomasia foliosa
Thomasia paniculata
Thomasia pauciflora
Stylidiaceae
Levenhookia pusilla
Levenhookia stipitata
Stylidium adnatum
Stylidium affine
Stylidium amoenum
Stylidium assimile
Stylidium brunonianum ssp. brunonianum
Stylidium brunonianum ssp. minor
Stylidium caespitosum
Stylidium calcaratum
Stylidium carnosum
Stylidium corymbosum
Stylidium crassifolium
Stylidium ecorne
Stylidium emarginatum
Stylidium guttatum
Stylidium hispidum
Stylidium inundatum
Stylidium junceum ssp. brevius
Stylidium lepidum
Stylidium luteum
Stylidium mimeticum
Stylidium miniatum
Stylidium periscelianthum
Stylidium perpusillum
Stylidium petiolare
Stylidium piliferum
Stylidium pulchellum
Stylidium repens
Stylidium rhipidium
Stylidium roseonanum
Stylidium scandens
Stylidium schoenoides
Stylidium spathulatum
Stylidium spinulosum
Stylidium violaceum
Thymelaeaceae
Pimelea angustifolia
Pimelea argentea
Pimelea ciliata ssp. ciliata
Pimelea cracens ssp. cracens
Pimelea cracens ssp. glabra
Pimelea imbricata var. gracillima
Pimelea imbricata var. major
Pimelea imbricata var. piligera
Pimelea ?lanata
Pimelea lehmanniana
Pimelea preissii
Pimelea rosea
Pimelea suaveolens
Pimelea sulphurea
Pimelea sylvestris
Tremandraceae
Platytheca galioides
Tetratheca affinis
Tetratheca hirsuta
Tetratheca hispidissima
Tetratheca nuda

Tetratheca setigera
Tetratheca virgata
Tremandra diffusa
Typhaceae
Typha domingensis
* Typha orientalis
Urticaceae
Parietaria debilis
Violaceae
Hybanthus debilissimus
Hybanthus floribundus
Xanthorrhoeaceae
Xanthorrhoea gracilis
Xanthorrhoea preissii
Zamiaceae
Macrozamia riedlei
Zannichelliaceae
Lepilaena australis