

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

NEIL GIBSON AND G.J. KEIGHERY

CALMScience Division, Department of Conservation and Land Management, Wildlife Research Centre, PO Box 51, Wanneroo, Western Australia 6065.

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 sunplands 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 Kwoornicup 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 Kwoornicup 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.

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.

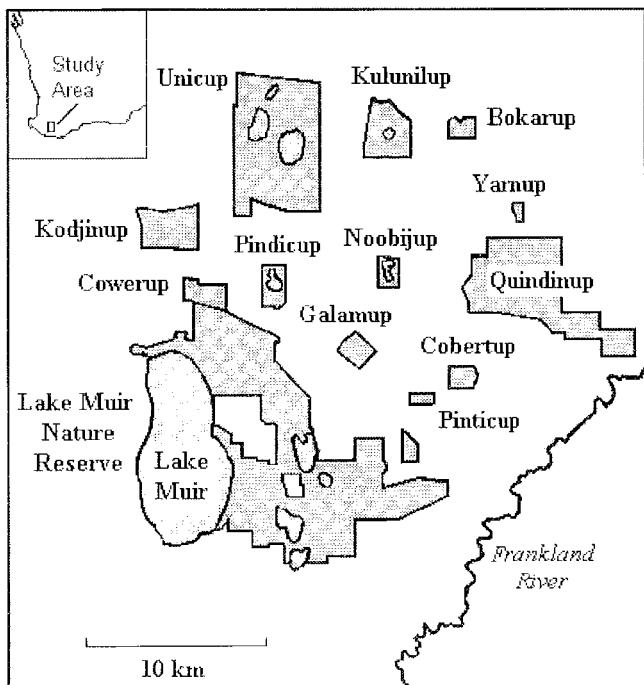


Figure 1. Location map showing the 13 reserves that make up the Byenup-Muir reserve system.

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
<i>Amphibromus vickeryae</i>	1
<i>Anthotium junciforme</i>	4
<i>Apodasmia ceramophila</i> ms	2
<i>Caladenia christineae</i> ms	DRF
<i>Caladenia harringtoniae</i> ms	DRF
<i>Caladenia starteorum</i> ms	2
<i>Caustis</i> sp. Boyanup (G.S. McCutcheon 1706)	1
<i>Diuris drummondii</i>	DRF
<i>Dryandra porrecta</i>	4
<i>Eryngium</i> sp. Lake Muir (E. Wittwer 2293)	1
<i>Eucalyptus aspersa</i>	4
<i>Eucalyptus latens</i>	4
<i>Euchiton gymnocephalus</i>	3
<i>Euphrasia scabra</i>	2
<i>Gratiola pedunculata</i>	2
<i>Hibbertia silvestris</i>	4
<i>Hydatella australis</i>	1
<i>Jacksonia sparsa</i> ms	3
<i>Leucopogon lasiophyllus</i>	2
<i>Leucopogon tamariscinus</i>	2
<i>Lilaeopsis polyantha</i>	2
<i>Melaleuca pritzelii</i>	2
<i>Opercularia rubioides</i>	2
<i>Phyllangium palustre</i>	2
<i>Pithocarpa corymbulosa</i>	2
<i>Pterostylis turfosa</i>	1
<i>Rhodanthe pyrethrum</i>	3
<i>Schoenus benthamii</i>	3
<i>Schoenus capillifolius</i>	2
<i>Schoenus loliaceus</i>	2
<i>Schoenus natans</i>	4
<i>Stylium lepidum</i>	3
<i>Stylium mimeticum</i>	3
<i>Stylium rhipidium</i>	1
<i>Synaphea decumbens</i>	1
<i>Tribonanthes</i> sp. Lake Muir (GJK & NG 2387)	Recommended P4
<i>Villarsia submersa</i>	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 Kirkpatrick 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 replaced 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. Lane¹ 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 1990) 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.

ACKNOWLEDGEMENTS

This work was partially funded under the National Wetlands Program of Environment Australia's Biodiversity Group. Jim Lane provided administrative assistance and access to his 1980 photography; Mike Lyons, Grant Pearson, Bronwen Keighery and Andrew Webb assisted with the fieldwork; and Ian Wilson, Roger Hearn and Dave Gardiner with local liaison and support. Holly Smith drafted the vegetation maps.

REFERENCES

- Atkins, K.J. (1998). Declared rare and priority flora list for Western Australia. Department of Conservation and Land Management, Perth.
- ANCA (1996). *A directory of important wetlands* (2nd edn). Australian Nature Conservation Agency, Canberra.
- Beard, J.S. (1981). The vegetation of the Swan area. Vegetation survey of Western Australia. Swan 1: 1 000 000 vegetation series. Explanatory notes to sheet 7. UWA Press, Nedlands.
- CALM (1998). Draft management plan, Perup Forest and Lake Muir/Unicup Nature Reserves. Department of Conservation and Land Management, Perth.
- Chakravartula, P.N. and Street, G. (1999). *Hydrogeological interpretation of airborne geophysical data Lake Muir Unicup catchment, Western Australia*. Agraria Ltd, Floreat WA.
- Churchward, H.M., McArthur, W.M., Sewell, P.L. and Bartle, G.A. (1988). Landforms and soils of the south coast and hinterland, Western Australia—Northcliffe to Manypeaks. CSIRO Division of Water Resources Report No. 88/1.
- Froend, R.H. and McComb, A.J. (1991). An account of the decline of Lake Towerinning, a wheatbelt wetland. *Journal of the Royal Society of Western Australia* **73**, 123–128.
- Gibson, N., and Keighery, G.J. (1999). Assessment of the nature conservation values of the Byenup-Muir peat swamp system, south western Australia: flora and vegetation. Unpublished report for Environment Australia prepared by Department of Conservation and Land Management pp. 1–167.
- Gilfedder, L. and Kirkpatrick, J.B. (1995). The conservation ecology and management of ten threatened species of lowland grassy ecosystems in Tasmania. A report for WWFN & ANCA.

- Gilfedder, L. and Kirkpatrick, J.B. (1997). Observations on the ecology and conservation of Yellow Eyebright *Euphrasia scabra* Scrophulariaceae, in Tasmania. *The Victorian Naturalist* **114**, 67–73.
- Government of Western Australia (1996). *Western Australian Salinity Action Plan*. Government of WA, Perth.
- Green, J.W. (1985). *Census of the vascular plants of Western Australia*. Department of Agriculture, Perth.
- 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.
- Griffin, E.A., Hopper, S.D. and Hopkins, A.J.M. (1990). Flora. In: Nature Conservation, Landscape and Recreational Values of the Lesueur Area. (A.A. Burbidge, S.D. Hopper and S. van Leeuwen, eds.) Environmental Protection Authority *Bulletin* **424**, 39–69.
- 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.
- Keighery, G.J. and Keighery, B.J. (1996). Re-discovery of *Schoenus natans* (Cyperaceae). *Western Australian Naturalist* **21**, 65–68.
- Newbey, K. and McQuoid, N. (1997). *Checklist of plants, Fitzgerald River National Park*. Fitzgerald River National Parks Association, Western Australia.
- 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.
- Smith, F.G. (1972). Vegetation map of Pemberton and Irwin Inlet. Western Australian Department of Agriculture, Perth.
- Thompson, B. (1992). Action Statement 10: Rough Eyebright *Euphrasia scabra*. Department of Natural Resources and Environment, Melbourne.
- Wilde, S.A. and Walker, I.W. (1984). 1:250 000 geological series – explanatory notes, Pemberton – Irwin Inlet, Western Australia. Geological Survey of Western Australia, Perth.

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	<i>Carpobrotus modestus</i>	Caryophyllaceae	<i>* Cerastium glomeratum</i> <i>* Petrorhagia velutina</i>
Amaranthaceae	<i>Alternanthera nodiflora</i> <i>Ptilotus manglesii</i>	Casuarinaceae	<i>Allocasuarina humilis</i>
Amaryllidaceae	<i>* Amaryllis belladonna</i>	Centrolepidaceae	<i>Aphelia cyperoides</i> <i>Brizula drummondii</i> <i>Centrolepis aristata</i> <i>Centrolepis glabra</i> <i>Centrolepis pilosa</i> <i>Centrolepis polygyna</i>
Anthericaceae	<i>Agrostocrinum scabrum</i> <i>Arthropodium capillipes</i> <i>Arthropodium preissii</i> <i>Borya scirpoidea</i> <i>Caesia micrantha</i> <i>Caesia occidentalis</i> <i>Chamaescilla corymbosa</i> <i>Chamaescilla spiralis</i> <i>Johnsonia acaulis</i> <i>Johnsonia lupulina</i> <i>Laxmannia sessiliflora</i> <i>Sowerbaea laxiflora</i> <i>Thysanotus patersonii</i> <i>Thysanotus tenellus</i> <i>Thysanotus thyroideus</i> <i>Thysanotus triandrus</i> <i>Tricoryne elatior</i> <i>Tricoryne humilis</i>	Colchicaceae	<i>Burchardia congesta</i> <i>Burchardia monantha</i> <i>Wurmbea dioica ssp. alba</i>
Apiaceae	<i>Daucus glochidiatus</i> <i>Eryngium pinnatifidum</i> <i>Homalosciadium homalocarpum</i> <i>Hydrocotyle alata</i> <i>Hydrocotyle diantha</i> <i>Hydrocotyle pilifera</i> <i>Schoenolaena tenuior</i> <i>Trachymene pilosa</i> <i>Xanthosia candida</i> <i>Xanthosia huegelii</i>	Convolvulaceae	<i>Dichondra repens</i>
Asteraceae	<i>Angianthus tomentosus</i> * <i>Arctotheca calendula</i> * <i>Aster subulatus</i> <i>Blennospora drummondii</i> <i>Brachyscome iberidifolia</i> * <i>Carduus pycnocephalus</i> * <i>Cirsium vulgare</i> * <i>Conyza albida</i> <i>Cotula coronopifolia</i> <i>Cotula cotuloides</i> <i>Craspedia variabilis</i> <i>Euchiton gymnocephalus</i> <i>Hyalosperma cotula</i> * <i>Hypochaeris glabra</i> <i>Lagenifera huegelii</i> <i>Millotia myosotidifolia</i> <i>Podolepis gracilis</i> <i>Podotheca angustifolia</i> <i>Pterochaeta paniculata</i> <i>Quinetia urvillei</i> <i>Senecio glomeratus</i> <i>Senecio minimus</i> <i>Senecio picridioides</i> <i>Siloxerus humifusus</i> * <i>Sonchus hydrophilus</i> * <i>Sonchus oleraceus</i> * <i>Tolpis barbata</i> * <i>Vellereophyton dealbatum</i> <i>Waitzia nitida</i>	Crassulaceae	<i>Crassula colorata</i> <i>Crassula exserta</i> * <i>Crassula natans</i>
Brassicaceae	* <i>Sisymbrium officinale</i>	Cyperaceae	<i>Baumea articulata</i> <i>Baumea juncea</i> <i>Baumea vaginalis</i> <i>Chorizandra enodis</i> <i>Cyathochaeta avenacea</i> * <i>Cyperus eragrostis</i> * <i>Cyperus tenellus</i> * <i>Isolepis cernua</i> * <i>Isolepis marginata</i> <i>Isolepis nodosa</i> <i>Isolepis oldfieldiana</i> * <i>Isolepis prolifera</i> <i>Isolepis stellata</i> <i>Lepidosperma aff. angustatum</i> <i>Lepidosperma longitudinale</i> <i>Lepidosperma squamatum</i> <i>Lepidosperma tenue</i> <i>Mesomelaena tetragona</i> <i>Schoenus benthamii</i> <i>Schoenus curvifolius</i> <i>Schoenus elegans</i> <i>Schoenus natans</i> <i>Schoenus tenellus</i> <i>Tetraaria capillaris</i> <i>Tetraaria octandra</i>
Campanulaceae	<i>Wahlenbergia multicaulis</i> <i>Wahlenbergia preissii</i>	Dasypogonaceae	<i>Chamaexeros serra</i> <i>Dasypogon bromeliifolius</i> <i>Lomandra caespitosa</i> <i>Lomandra nigricans</i> <i>Lomandra purpurea</i> <i>Lomandra sericea</i> <i>Lomandra suaveolens</i>
		Dennstaedtiaceae	<i>Pteridium esculentum</i>
		Dilleniaceae	<i>Hibbertia acerosa</i> <i>Hibbertia commutata</i> <i>Hibbertia cunninghamii</i> <i>Hibbertia racemosa</i> <i>Hibbertia stellaris</i> <i>Hibbertia vaginata</i>
		Droseraceae	<i>Drosera erythrorhiza</i> <i>Drosera glanduligera</i> <i>Drosera macrantha</i> <i>Drosera menziesii</i> <i>Drosera rosulata</i> <i>Drosera stolonifera</i>
		Epacridaceae	<i>Astroloma baxteri</i> <i>Astroloma ciliatum</i> <i>Astroloma pallidum</i>

Leucopogon australis	Lycopodiaceae
Leucopogon capitellatus	Phylloglossum drummondii
Leucopogon conostephoides	
Euphorbiaceae	Lythraceae
Monotaxis occidentalis	* Lythrum hyssopifolia
Phyllanthus calycinus	
Poranthera microphylla	Menyanthaceae
Gentianaceae	Villarsia albiflora
* Cicendia filiformis	Villarsia submersa
Geraniaceae	Villarsia ?violifolia
Geranium solanderi	Mimosaceae
Pelargonium littorale	*
Goodeniaceae	Acacia dealbata
Anthotium humile	Acacia extensa
Dampiera alata	Acacia huegelii
Dampiera cuneata	Acacia incurva
Dampiera linearis	Acacia myrtifolia
Goodenia micrantha	Acacia pulchella
Goodenia pulchella	Acacia saligna
Scaevola phlebopetala	Myoporaceae
Velleia trinervis	Myoporum caprarioides
Haemodoraceae	Myrtaceae
Anigozanthos flavidus	Agonis parviceps
Anigozanthos manglesii	Astartea fascicularis
Conostylis aculeata	Astartea sp.
Conostylis laxiflora	Baeckea camphorosmae
Conostylis setigera	Calothamnus lateralis
Haemodorum laxum	Eucalyptus calophylla
Haemodorum simplex	Eucalyptus decipiens
Haemodorum sparsiflorum	Eucalyptus marginata
Haemodorum spicatum	Eucalyptus occidentalis
Tribonanthes violacea	Eucalyptus rufida
Haloragaceae	Eucalyptus wandoo
Gonocarpus cordiger	Kunzea micrantha
Hydatellaceae	Kunzea recurva
Trithuria bibracteata	Melaleuca lateritia
Hypoxidaceae	Melaleuca leptoclada
Hypoxis occidentalis	Melaleuca preissiana
Iridaceae	Melaleuca rhamphophylla
* Iris germanica	Melaleuca viminea
Patersonia juncea	Pericalymma ellipticum
Patersonia occidentalis	Olacaceae
Patersonia occidentalis (swamp form)	Olax benthamiana
* Romulea rosea	Onagraceae
* Watsonia bulbiflora	Epilobium billardierianum
Juncaceae	Orchidaceae
* Juncus bufonius	Caladenia flava
* Juncus capitatus	Caladenia longicauda
Juncus holoschoenus	Caladenia marginata
Juncus pallidus	Caladenia radiata
Juncaginaceae	Caladenia reptans
Triglochin centrocarpum	Caladenia varians
Triglochin huegelii	Cryptostylis ovata
Triglochin lineare	Cryptostylis robusta
Triglochin mucronatum	Diuris laxiflora
Lamiaceae	Diuris longifolia
Hemiandra pungens	Drakonorchis barbarossa ms
Lauraceae	Elythranthera brunonis
Cassytha glabella	Elythranthera emarginata
Cassytha racemosa	Leporella fimbriata
Lentibulariaceae	Leptoceras menziesii
Polypompholyx multifida	Microtis atrata
Utricularia inaequalis	Microtis orbicularis
Linaceae	*
Linum marginale	Monadenia bracteata
Lindsaeaceae	Pterostylis barbata
Lindsaea linearis	Pterostylis nana
Lobeliaceae	Pterostylis recurva
Isotoma hypocrateriformis	Pterostylis vittata
Lobelia alata	Pyrorchis nigricans
Lobelia tenuior	Thelymitra crinita
Loganiaceae	Thelymitra flexuosa
Logania campanulata	Thelymitra pauciflora
Logania serpyllifolia	Orobanchaceae
Phyllangium paradoxum	*
	Orobanche minor
	Papilionaceae
	Aotus intermedia
	Bossiaea eriocarpa
	Bossiaea ornata
	Bossiaea praetermissa

Brachysema melanopetalum	Hakea ceratophylla
Callistachys lanceolata	Hakea lissocarpa
Daviesia cordata	Hakea prostrata
Daviesia physodes	Hakea ruscifolia
Daviesia preissii	Hakea sulcata
Eutaxia virgata	Hakea trifurcata
Gompholobium marginatum	Hakea varia
Gompholobium polymorphum	Persoonia longifolia
Gompholobium preissii	Petrophile media
Gompholobium tomentosum	Petrophile serruriae
Hovea chorizemifolia	Synaphea petiolaris
Hovea trisperma var. grandiflora	Ranunculaceae
Isotropis cuneifolia	Ranunculus colonorum
Jacksonia sparsa ms	Restionaceae
Kennedia coccinea	Anarthria laevis
Kennedia prostrata	Anarthria prolifera
* Lotus angustissimus	Harperia lateriflora
Oxylobium lineare	Hypolaena exsulca
Pultenaea ochreata	Lepyrodia murii
Sphaerolobium medium	Lyginia barbata
* Trifolium campestre	Meeboldina cana ms
* Trifolium dubium	Meeboldina tephrina ms
* Trifolium repens	Rhamnaceae
* Trifolium subterraneum	Trymalium ledifolium
Philydraceae	Rosaceae
Philydrella pygmaea	* Acaena echinata
Phormiaceae	Rubiaceae
Dianella brevicaulis	* Galium murale
Dianella revoluta	Opercularia apiciflora
Stypandra glauca	Opercularia hispidula
Pittosporaceae	Rutaceae
Billardiera variifolia	Boronia megastigma
Marianthus candidus	Boronia ramosa
Sollya heterophylla	Boronia spathulata
Plantaginaceae	Santalaceae
Plantago debilis	Leptomeria squarrulosa
Poaceae	Scrophulariaceae
Agrostis avenacea	* Bartsia trixago
* Aira caryophyllea	* Parentucellia latifolia
Amphipogon turbinatus	* Parentucellia viscosa
* Anthoxanthum odoratum	Selaginellaceae
Austrodanthonia occidentalis	Selaginella gracillima
Austrostipa pycnostachya	Solanaceae
Austrostipa ?trichophylla	* Solanum nigrum
* Briza maxima	Stackhousiaceae
* Briza minor	Stackhousia monogyna
* Cynodon dactylon	Tripterococcus brunonis
Deyeuxia quadriseta	Styliadiaceae
Eragrostis elongata	Levenhookia pusilla
Hemarthria uncinata	Levenhookia stipitata
* Holcus lanatus	Styliodium affine
* Hordeum leporinum	Styliodium assimile
* Lolium multiflorum	Styliodium brunonianum ssp. minor
Microlaena stipoides	Styliodium calcaratum
Poa poiformis	Styliodium ecorne
* Stenotaphrum secundatum	Styliodium guttatum
Tetraherena laevis	Styliodium hispidum
* Vulpia myuros	Styliodium juncicum
Polygonaceae	Styliodium repens
Comesperma calymega	Styliodium schoenoides
Comesperma flavum	Styliodium spathulatum
Comesperma virgatum	Thymelaeaceae
Comesperma volubile	Pimelea angustifolia
Polygonaceae	Pimelea argentea
Muehlenbeckia adpressa	Pimelea sylvestris
Persicaria prostrata	Tremandraceae
* Rumex acetosella	Platytheca galoides
Primulaceae	Typhaceae
* Anagallis arvensis	* Typha orientalis
Proteaceae	Xanthorrhoeaceae
Banksia grandis	Xanthorrhoea preissii
Banksia littoralis	Zamiaceae
Dryandra lindleyana	Macrozamia riedlei
Grevillea fasciculata	

COBERTUP NATURE RESERVE

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

Class A

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 pyrethriflora* (Priority 3)).

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

1. **Jarrahd-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. **Jarrahd-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 *Tetrapanax octandra*.
5. **Melaleuca rhamphophylla 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 rhamphophylla 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 rhamphophylla*.
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 pyrethriflora*, *Hyalosperma simplex*, *Caesia micrantha*, *Burchardia congesta*, *Wurmbea dioica*, *Goodenia mimuloides*, and *Tribonanthus* 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	<i>Ptilotus drummondii</i>	Burchardia multiflora
	<i>Ptilotus manglesii</i>	<i>Wurmbea dioica</i>
Anthericaceae		Crassulaceae
	<i>Agrostocrinum scabrum</i>	<i>Crassula colorata</i>
	<i>Arthropodium preissii</i>	* <i>Crassula decumbens</i>
	<i>Borya sphaerocephala</i>	<i>Crassula peduncularis</i>
	<i>Caesia micrantha</i>	Cyperaceae
	<i>Caesia occidentalis</i>	<i>Baumea arthrophylla</i>
	<i>Chamaescilla corymbosa</i>	<i>Baumea articulata</i>
	<i>Chamaescilla ?spiralis</i>	<i>Baumea juncea</i>
	<i>Johnsonia lupulina</i>	<i>Chorizandra enodis</i>
	<i>Laxmannia sessiliflora</i>	<i>Cyathochaeta avenacea</i>
	<i>Sowerbaea laxiflora</i>	*
	<i>Thysanotus manglesianus</i>	<i>Cyperus tenellus</i>
	<i>Thysanotus sparteus</i>	<i>Gahnia aristata</i>
	<i>Thysanotus tenellus</i>	<i>Gahnia trifida</i>
	<i>Tricoryne elatior</i>	<i>Isolepis cernua</i>
	<i>Tricoryne humilis</i>	*
Apiaceae		<i>Isolepis marginata</i>
	<i>Daucus glochidiatus</i>	<i>Isolepis nodosa</i>
	<i>Eryngium pinnatifidum</i>	<i>Isolepis oldfieldiana</i>
	<i>Homalosciadium homalocarpum</i>	<i>Isolepis producta</i>
	<i>Hydrocotyle alata</i>	<i>Lepidosperma angustatum</i>
	<i>Hydrocotyle diantha</i>	<i>Lepidosperma sp.</i>
	<i>Hydrocotyle pilifera var. glabrata</i>	<i>Lepidosperma tenue</i>
	<i>Hydrocotyle sp.</i>	<i>Mesomelaena stygia</i>
	<i>Platysace juncea</i>	<i>Mesomelaena tetragona</i>
	<i>Schoenolaena tenuior</i>	<i>Schoenus bifidus</i>
	<i>Trachymene pilosa</i>	<i>Schoenus curvifolius</i>
	<i>Xanthosia candida</i>	<i>Schoenus laevigatus</i>
	<i>Xanthosia huegelii</i>	<i>Schoenus obtusifolius</i>
Asteraceae		<i>Schoenus sculptus</i>
	*	<i>Schoenus sp.</i>
	<i>Arctotheca calendula</i>	<i>Schoenus ?tenellus</i>
	<i>Asteridea athrixioides</i>	<i>Tetraria capillaris</i>
	*	<i>Tetraria octandra</i>
	<i>Cirsium vulgare</i>	<i>Tricostularia neesii var. neesii</i>
	<i>Cotula coronopifolia</i>	Dasypogonaceae
	<i>Craspedia variabilis</i>	<i>Chamaexeros serra</i>
	<i>Hyalosperma simplex</i>	<i>Dasypogon bromeliifolius</i>
	*	<i>Lomandra caespitosa</i>
	<i>Hypochaeris glabra</i>	<i>Lomandra hermaphrodita</i>
	<i>Lagenifera huegelii</i>	<i>Lomandra micrantha</i>
	<i>Millotia myosotidifolia</i>	<i>Lomandra purpurea</i>
	<i>Podolepis gracilis</i>	<i>Lomandra sericea</i>
	<i>Quinetia urvillei</i>	<i>Lomandra suaveolens</i>
	<i>Rhodanthe pyrethrum</i>	Dennstaedtiaceae
	<i>Rutidosis multiflora</i>	<i>Pteridium esculentum</i>
	<i>Senecio glomeratus</i>	Dilleniaceae
	<i>Senecio minimus</i>	<i>Hibbertia ?acerosa</i>
	<i>Siloxerus humifusus</i>	<i>Hibbertia ?commutata</i>
*	<i>Sonchus asper</i>	<i>Hibbertia cunninghamii</i>
*	<i>Sonchus oleraceus</i>	<i>Hibbertia gracilipes</i>
*	<i>Trichocline spathulata</i>	<i>Hibbertia racemosa</i>
*	<i>Ursinia anthemoides</i>	<i>Hibbertia stellaris</i>
*	<i>Vellereophyton dealbatum</i>	Droseraceae
	<i>Waitzia nitida</i>	<i>Drosera bulbosa</i>
	<i>Waitzia suaveolens</i>	<i>Drosera erythrorhiza</i>
Campanulaceae		<i>Drosera gigantea</i>
	<i>Wahlenbergia gracilenta</i>	<i>Drosera glanduligera</i>
	<i>Wahlenbergia preissii</i>	<i>Drosera macrantha</i>
Caryophyllaceae		<i>Drosera menziesii</i>
	*	<i>Drosera stolonifera</i>
	<i>Petrorhagia velutina</i>	Epacridaceae
Casuarinaceae		<i>Astroloma ciliatum</i>
	<i>Allocasuarina humilis</i>	<i>Astroloma pallidum</i>
	<i>Allocasuarina lehmanniana</i>	<i>Leucopogon capitellatus</i>
Centrolepidaceae		<i>Leucopogon conostephoides</i>
	<i>Aphelia cyperoides</i>	<i>Leucopogon propinquus</i>
	<i>Brizula drummondii</i>	Euphorbiaceae
	<i>Centrolepis aristata</i>	<i>Monotaxis occidentalis</i>
	<i>Centrolepis drummondiana</i>	<i>Phyllanthus calycinus</i>
	<i>Centrolepis glabra</i>	<i>Poranthera microphylla</i>
Colchicaceae		Gentianaceae
	<i>Burchardia congesta</i>	*
	<i>Burchardia monantha</i>	<i>Centaurium erythraea</i>
		*
		<i>Cicendia filiformis</i>
Geraniaceae		Geraniaceae
		<i>Geranium solanderi</i>
		<i>Pelargonium littorale</i>

Goodeniaceae	
	<i>Anthotium humile</i>
	<i>Dampiera alata</i>
	<i>Dampiera linearis</i>
	<i>Dampiera trigona</i>
	<i>Goodenia micrantha</i>
	<i>Goodenia mimuloides</i>
	<i>Goodenia pulchella</i>
	<i>Lechenaultia formosa</i>
	<i>Scaevola phlebopetala</i>
	<i>Velleia trinervis</i>
Haemodoraceae	
	<i>Anigozanthos bicolor</i>
	<i>Anigozanthos flavidus</i>
	<i>Anigozanthos manglesii</i>
	<i>Conostylis aculeata</i>
	<i>Conostylis setigera</i>
	<i>Haemodorum laxum</i>
	<i>Haemodorum simplex</i>
	<i>Haemodorum sparsiflorum</i>
	<i>Haemodorum spicatum</i>
	<i>Tribonanthes australis</i>
	<i>Tribonanthes longipetala</i>
	<i>Tribonanthes sp. Lake Muir</i>
	<i>Tribonanthes violacea</i>
Haloragaceae	
	<i>Glischrocaryon aureum</i>
	<i>Gonocarpus paniculatus</i>
	<i>Haloragis brownii</i>
	<i>Myriophyllum crispatum</i>
	<i>Myriophyllum limnophilum</i>
Hydatellaceae	
	<i>Hydatella sp</i>
	<i>Trithuria submersa</i>
Hypoxidaceae	
	<i>Hypoxis occidentalis</i>
Iridaceae	
	<i>Patersonia juncea</i>
	<i>Patersonia occidentalis</i>
	<i>Patersonia occidentalis</i> (swamp form)
Isoetaceae	
	<i>Isoetes drummondii</i>
Juncaceae	
	* <i>Juncus articulatus</i>
	* <i>Juncus bufonius</i>
	* <i>Juncus capitatus</i>
	<i>Juncus pallidus</i>
	<i>Juncus planifolius</i>
Juncaginaceae	
	<i>Triglochin huegelii</i>
	<i>Triglochin sp.</i>
Lauraceae	
	<i>Cassytha glabella</i>
	<i>Cassytha racemosa</i>
Lentibulariaceae	
	<i>Poly pompholyx multifida</i>
	<i>Utricularia hookeri</i>
Lindsaeaceae	
	<i>Lindsaea linearis</i>
Lobeliaceae	
	<i>Grammatotheca bergiana</i>
	<i>Isotoma hypocrateriformis</i>
	<i>Lobelia alata</i>
	<i>Lobelia heterophylla</i>
	<i>Lobelia rhombifolia</i>
Loganiaceae	
	<i>Logania campanulata</i>
	<i>Logania serpyllifolia</i>
	<i>Phyllangium paradoxum</i>
Lythraceae	
	* <i>Lythrum hyssopifolia</i>
Menyanthaceae	
	<i>Villarsia albiflora</i>
	<i>Villarsia parnassifolia</i>
Mimosaceae	
	<i>Acacia alata</i>
	<i>Acacia extensa</i>
	<i>Acacia huegelii</i>
	<i>Acacia incurva</i>
	<i>Acacia myrtifolia</i>
	<i>Acacia nervosa</i>
	<i>Acacia pulchella</i>
	<i>Acacia saligna</i>
	<i>Acacia stenoptera</i>
Myoporaceae	
	<i>Myoporum caprarioides</i>
Myrtaceae	
	<i>Astartea fascicularis</i>
	<i>Astartea sp. (pink weeping)</i>
	<i>Baeckea camphorosmae</i>
	<i>Calothamnus lateralis</i>
	<i>Calytrix angulata</i>
	<i>Eucalyptus calophylla</i>
	<i>Eucalyptus decipiens</i>
	<i>Eucalyptus marginata</i>
	<i>Eucalyptus occidentalis</i>
	<i>Eucalyptus patens</i>
	<i>Eucalyptus rufa</i>
	<i>Hypocalymma angustifolium</i>
	<i>Kunzea ericifolia</i>
	<i>Kunzea micrantha</i>
	<i>Melaleuca densa</i>
	<i>Melaleuca lateritia</i>
	<i>Melaleuca leptoclada</i>
	<i>Melaleuca preissiana</i>
	<i>Melaleuca rhamphophylla</i>
	<i>Melaleuca spathulata</i>
	<i>Melaleuca viminea</i>
	<i>Pericalymma ellipticum</i>
	<i>Verticordia densiflora</i>
	<i>Verticordia habrantha</i>
Olacaceae	
	<i>Olax benthamiana</i>
Onagraceae	
	<i>Epilobium billardierianum</i>
	<i>Epilobium hirtigerum</i>
Orchidaceae	
	<i>Caladenia flava</i>
	<i>Caladenia longicauda</i>
	<i>Caladenia radiata</i>
	<i>Caladenia reptans</i>
	<i>Diuris laxiflora</i>
	<i>Diuris longifolia</i>
	<i>Elythranthera brunonis</i>
	<i>Elythranthera emarginata</i>
	<i>Eriochilus dilatatus</i>
	<i>Microtis atrata</i>
	<i>Microtis media</i>
	<i>Microtis orbicularis</i>
	* <i>Monadenia bracteata</i>
	<i>Prasophyllum macrostachyum</i>
	<i>Pterostylis nana</i>
	<i>Pterostylis recurva</i>
	<i>Pterostylis vittata</i>
	<i>Thelymitra crinita</i>
	<i>Thelymitra flexuosa</i>
Orobanchaceae	
	* <i>Orobanche minor</i>
Oxalidaceae	
	<i>Oxalis perennans</i>
Papilionaceae	
	<i>Bossiaea eriocarpa</i>
	<i>Bossiaea linophylla</i>
	<i>Bossiaea ornata</i>
	<i>Brachysema praemorsum</i>
	<i>Callistachys lanceolata</i>
	<i>Chorizema nanum</i>
	<i>Daviesia ?incrassata</i>
	<i>Daviesia preissii</i>

Eutaxia virgata	Hakea varia
Gompholobium knightianum	Persoonia longifolia
Gompholobium marginatum	Synaphea petiolaris
Gompholobium polymorphum	Ranunculaceae
Gompholobium preissii	Clematis pubescens
Gompholobium tomentosum	Ranunculus colonorum
Goodia lotifolia	Restionaceae
Hovea chorizemifolia	Anarthria prolifera
Hovea trisperma	Apodasmia ceramophila ms
Isotropis cuneifolia	Chordifex sp.
Jacksonia furcellata	Desmocladus fasciculatus ms
Kennedia coccinea	Desmocladus flexuosus ms
Kennedia prostrata	Harperia lateriflora
* Lotus angustissimus	Hypolaena exsulca
Oxylobium lineare	Lyginia barbata
Sphaerolobium linophyllum	Meeboldina cana ms
Sphaerolobium medium	Rhamnaceae
Sphaerolobium ?vimineum	Trymalium ledifolium
Viminaria juncea	Rosaceae
Philydraceae	* Acaena echinata
Philydrella drummondii	Rubiaceae
Philydrella pygmaea	* Galium divaricatum
Phormiaceae	Opercularia hispidula
Dianella brevicaulis	Opercularia vaginata
Dianella revoluta	Rutaceae
Stypandra glauca	Boronia juncea ssp. ?laniflora
Pittosporaceae	Boronia megastigma
Sollya heterophylla	Boronia spathulata
Poaceae	Santalaceae
Agrostis avenacea	Leptomeria squarrulosa
Amphibromus nervosus	Scrophulariaceae
Amphipogon ?debilis	Gratiola peruviana
Amphipogon turbinatus	Gratiola pedunculata
Austrodanthonia caespitosa	* Parentucellia latifolia
Austrostipa compressa	* Parentucellia viscosa
Austrostipa ?pycnostachya	Selaginellaceae
Austrostipa trichophylla	Selaginella gracillima
* Briza minor	Solanaceae
Deyeuxia quadriseta	* Solanum nigrum
Eragrostis ?brownii	Stackhousiaceae
Hemarthria uncinata	Stackhousia monogyna
* Lolium multiflorum	Tripterococcus brunonis
Microlaena stipoides	Styliidiaceae
Neurachne alopecuroidae	Levenhookia pusilla
* Poa annua	Levenhookia stipitata
Poa drummondiana	Styliidium brunonianum ssp. minor
Poa poiformis	Styliidium caespitosum
* Polypogon monspeliensis	Styliidium calcaratum
Tetrarrhena laevis	Styliidium crassifolium
* Vulpia myuros	Styliidium guttatum
Polygalaceae	Styliidium inundatum
Comesperma calymega	Styliidium perpusillum
Comesperma virgatum	Styliidium pulchellum
Comesperma volubile	Styliidium sp.
Polygonaceae	Styliidium spathulatum
Muehlenbeckia adpressa	Thymelaeaceae
Persicaria prostrata	Pimelea angustifolia
Portulacaceae	Pimelea ?rosea
Calandrinia ?composita	Pimelea suaveolens
Calandrinia granulifera	Tremandraceae
Primulaceae	Platytheca galiooides
* Anagallis arvensis	Tetrapheca sp.
Samolus junceus	Typhaceae
Proteaceae	* Typha orientalis
Banksia littoralis	Violaceae
Dryandra armata	Hybanthus floribundus
Dryandra lindleyana	Xanthorrhoeaceae
Grevillea fasciculata	Xanthorrhoea gracilis
Hakea ceratophylla	Xanthorrhoea preissii
Hakea lissocarpa	Zamiaceae
Hakea prostrata	Macrozamia riedlei
Hakea sulcata	

COWERUP NATURE RESERVE

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

Class C

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 pyrethriflora* (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*, *Astroloba 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	<i>Goodenia pulchella</i> <i>Scaevola phlebopetala</i>
<i>Johnsonia acaulis</i>	
Apiaceae	Haemodoraceae <i>Conostylis aculeata</i>
<i>Actinotus omnifertilis</i>	Haloragaceae <i>Gonocarpus hexandrus</i> ssp. <i>Gonocarpus paniculatus</i> <i>Myriophyllum ?limnophilum</i>
<i>Schoenolaena tenuior</i>	
<i>Trachymene pilosa</i>	Iridaceae <i>Patersonia occidentalis</i>
<i>Xanthosia huegelii</i>	<i>Patersonia occidentalis</i> (swamp form)
Asteraceae	Juncaginaceae <i>Triglochin huegelii</i>
<i>Craspedia</i> sp.	Lamiaceae <i>Hemiandra pungens</i>
* <i>Hypochaeris glabra</i>	Lauraceae <i>Cassytha glabella</i> <i>Cassytha racemosa</i>
<i>Podolepis gracilis</i>	Lentibulariaceae <i>Polypompholyx multifida</i>
<i>Rhodanthe pyrethrum</i>	<i>Utricularia hookeri</i> <i>Utricularia violacea</i>
<i>Senecio glomeratus</i>	Lobeliaceae <i>Lobelia alata</i>
<i>Siloxerus humifusus</i>	Loganiaceae <i>Phyllangium paradoxum</i>
<i>Waitzia suaveolens</i>	Loranthaceae <i>Nuytsia floribunda</i>
Casuarinaceae	Menyanthaceae <i>Villarsia albiflora</i> <i>Villarsia submersa</i>
<i>Allocasuarina humilis</i>	Mimosaceae <i>Acacia extensa</i> <i>Acacia myrtifolia</i> <i>Acacia saligna</i> <i>Acacia stenoptera</i>
Centrolepidaceae	Myrtaceae <i>Actinodium cunninghamii</i>
<i>Brizula drummondii</i>	<i>Agonis parviceps</i>
<i>Centrolepis aristata</i>	<i>Astartea</i> sp. (pink weeping)
<i>Centrolepis drummondiana</i>	<i>Astartea</i> sp. (white erect)
<i>Centrolepis glabra</i>	<i>Baeckea camphorosmae</i>
Colchicaceae	<i>Calothamnus hirsutus</i>
<i>Burchardia congesta</i>	<i>Calothamnus lateralis</i>
<i>Burchardia monantha</i>	<i>Calytrix angulata</i>
<i>Wurmbea dioica</i>	<i>Eucalyptus calophylla</i>
Cupressaceae	<i>Eucalyptus decipiens</i>
<i>Actinostrobus pyramidalis</i>	<i>Eucalyptus marginata</i>
Cyperaceae	<i>Eucalyptus rufa</i>
<i>Baumea articulata</i>	<i>Hypocalymma angustifolium</i>
<i>Baumea juncea</i>	<i>Kunzea ericifolia</i>
<i>Baumea vaginalis</i>	<i>Kunzea micrantha</i>
<i>Cyathochaeta avenacea</i>	<i>Melaleuca cordata</i>
<i>Gahnia trifida</i>	<i>Melaleuca cuticularis</i>
<i>Isolepis cernua</i>	<i>Melaleuca densa</i>
<i>Isolepis stellata</i>	<i>Melaleuca lateritia</i>
<i>Lepidosperma angustatum</i>	<i>Melaleuca preissiana</i>
<i>Lepidosperma longitudinale</i>	<i>Melaleuca rhiphiophylla</i>
<i>Mesomelaena tetragona</i>	<i>Melaleuca spathulata</i>
<i>Schoenus benthamii</i>	<i>Melaleuca thymoides</i>
<i>Schoenus efoliatus</i>	<i>Melaleuca viminea</i>
<i>Schoenus maschalinus</i>	<i>Melaleuca violacea</i>
<i>Schoenus natans</i>	<i>Pericalymma ellipticum</i>
<i>Schoenus tenellus</i>	<i>Verticordia densiflora</i>
<i>Tetaria octandra</i>	
<i>Tricostularia neesii</i> var. <i>elatior</i>	Olacaceae <i>Olax phyllanthi</i>
Dasypogonaceae	Orchidaceae <i>Caladenia flava</i> <i>Caladenia reptans</i> <i>Elythranthera brunonis</i> <i>Microtis atrata</i> <i>Microtis orbicularis</i> <i>Pterostylis nana</i> <i>Pterostylis vittata</i> <i>Thelymitra pauciflora</i>
<i>Dasypogon bromeliifolius</i>	
<i>Lomandra purpurea</i>	
<i>Lomandra sericea</i>	
Dennstaedtiaceae	
<i>Pteridium esculentum</i>	
Dilleniaceae	
<i>Hibbertia commutata</i>	
<i>Hibbertia cunninghamii</i>	
<i>Hibbertia racemosa</i>	
<i>Hibbertia stellaris</i>	
Epacridaceae	
<i>Astroloma baxteri</i>	
<i>Astroloma ciliatum</i>	
<i>Leucopogon australis</i>	
<i>Leucopogon glabellus</i>	
<i>Leucopogon pendulus</i>	
<i>Leucopogon propinquus</i>	
<i>Lysinema ciliatum</i>	
Euphorbiaceae	
<i>Amperea volubilis</i>	
<i>Monotaxis occidentalis</i>	
Gentianaceae	
<i>Centaurium spicatum</i>	
Goodeniaceae	
<i>Dampiera linearis</i>	
<i>Goodenia claytoniacea</i>	

Papilionaceae	Hakea sulcata
<i>Aotus intermedia</i>	Hakea trifurcata
<i>Bossiaea linophylla</i>	Hakea undulata
<i>Bossiaea rufa</i>	Hakea varia
<i>Brachysema melanopetalum</i>	<i>Persoonia longifolia</i>
<i>Callistachys lanceolata</i>	<i>Synaphea petiolaris</i>
Daviesia physodes	
Gompholobium capitatum	
Jacksonia furcellata	
Kennedia prostrata	
Pultenaea ochreata	
Pultenaea reticulata	
Viminaria juncea	
Phormiaceae	
<i>Dianella revoluta</i>	
Pittosporaceae	
<i>Marianthus candidus</i>	
<i>Sollya heterophylla</i>	
Poaceae	
* <i>Aira caryophyllea</i>	
<i>Amphipogon laguroides</i>	
<i>Austrodanthonia occidentalis</i>	
<i>Austrodanthonia</i> sp.	
<i>Austrostipa compressa</i>	
<i>Austrostipa pycnostachya</i>	
* <i>Vulpia myuros</i>	
Polygalaceae	
<i>Comesperma calymega</i>	
<i>Comesperma flavum</i>	
<i>Comesperma volubile</i>	
Primulaceae	
<i>Samolus caespitosus</i>	
Proteaceae	
<i>Adenanthes obovatus</i>	
<i>Banksia grandis</i>	
<i>Banksia ilicifolia</i>	
<i>Banksia littoralis</i>	
<i>Dryandra lindleyana</i>	
<i>Hakea ceratophylla</i>	
<i>Hakea lissocarpa</i>	
<i>Hakea prostrata</i>	
<i>Hakea ruscifolia</i>	
	Hakea sulcata
	Hakea trifurcata
	Hakea undulata
	Hakea varia
	<i>Persoonia longifolia</i>
	<i>Synaphea petiolaris</i>
	Restionaceae
	<i>Anarthria laevis</i>
	<i>Anarthria prolifera</i>
	<i>Anarthria scabra</i>
	<i>Desmocladus fasciculatus</i> ms
	<i>Hypolaena exsulca</i>
	<i>Lepyrodia muirii</i>
	<i>Lyginia barbata</i>
	<i>Meeboldina cana</i> ms
	<i>Meeboldina coangustata</i> ms
	<i>Meeboldina denmarkica</i>
	<i>Meeboldina scariosa</i> ms
	<i>Tremulina tremula</i> ms
	Rubiaceae
	<i>Opercularia hispidula</i>
	Rutaceae
	<i>Boronia juncea</i> ssp. <i>laniflora</i> ms
	<i>Boronia megastigma</i>
	<i>Boronia spathulata</i>
	Santalaceae
	<i>Leptomeria spinosa</i>
	<i>Leptomeria squarrulosa</i>
	Selaginellaceae
	<i>Selaginella gracillima</i>
	Stylidiaceae
	<i>Levenhookia pusilla</i>
	<i>Levenhookia stipitata</i>
	<i>Styliidium repens</i>
	<i>Styliidium scandens</i>
	Tremandraceae
	<i>Platytheca galoides</i>
	Xanthorrhoeaceae
	<i>Xanthorrhoea preissii</i>
	Zamiaceae
	<i>Macrozamia riedlei</i>

GALAMUP NATURE RESERVE

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

Class A

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), *Stylium 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. **Jarra-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. **Jarra-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. **Jarra-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 *Stylium* were recorded.
5. **Melaleuca raphiophylla-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 hermland 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 raphiophylla-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		Lepidosperma ?gracile
	<i>Ptilotus manglesii</i>	Lepidosperma longitudinale
Anthericaceae		Lepidosperma squamatum
	<i>Agrostocrinum scabrum</i>	Lepidosperma tenuue
	<i>Borya scirpoidea</i>	Mesomelaena stygia
	<i>Caesia micrantha</i>	Mesomelaena tetragona
	<i>Caesia occidentalis</i>	<i>Schoenus benthamii</i>
	<i>Chamaescilla corymbosa</i>	<i>Schoenus bifidus</i>
	<i>Johnsonia acaulis</i>	<i>Schoenus curvifolius</i>
	<i>Johnsonia lupulina</i>	<i>Schoenus ?humilis</i>
	<i>Sowerbaea laxiflora</i>	<i>Schoenus ?oliaceus</i>
	<i>Thysanotus manglesianus</i>	<i>Schoenus odontocarpus</i>
	<i>Thysanotus tenellus</i>	<i>Schoenus sp.</i>
	<i>Tricoryne humilis</i>	<i>Schoenus subbulbosus</i>
	<i>Tricoryne tenella</i>	<i>Schoenus unispiculatus</i>
Apiaceae		<i>Tetraena capillaris</i>
	<i>Centella cordifolia</i>	<i>Tetraena octandra</i>
	<i>Homalosciadium homalocarpum</i>	Dasypogonaceae
	<i>Hydrocotyle alata</i>	<i>Chamaexeros serra</i>
	<i>Hydrocotyle pilifera</i> var. <i>glabrata</i>	<i>Dasypogon bromeliifolius</i>
	<i>Platysace ?juncea</i>	<i>Lomandra collina</i>
	<i>Schoenolaena tenuior</i>	<i>Lomandra sericea</i>
	<i>Trachymene pilosa</i>	<i>Lomandra suaveolens</i>
	<i>Xanthosia candida</i>	Dennstaedtiaceae
	<i>Xanthosia huegelii</i>	<i>Pteridium esculentum</i>
Asteraceae		Dilleniaceae
	<i>Brachyscome iberidifolia</i>	<i>Hibbertia acerosa</i>
	<i>Craspedia variabilis</i>	<i>Hibbertia ?amplexicaulis</i>
	<i>Euchiton gymnocephalus</i>	<i>Hibbertia commutata</i>
	<i>Hyalosperma cotula</i>	<i>Hibbertia microphylla</i>
*	<i>Hypochaeris glabra</i>	<i>Hibbertia racemosa</i>
	<i>Lagenifera huegelii</i>	<i>Hibbertia stellaris</i>
	<i>Millotia tenuifolia</i>	Droseraceae
	<i>Podolepis gracilis</i>	<i>Drosera bulbosa</i>
	<i>Pterocheata paniculata</i>	<i>Drosera erythrorhiza</i>
	<i>Quinetia urvillei</i>	<i>Drosera gigantea</i>
	<i>Senecio glomeratus</i>	<i>Drosera glanduligera</i>
	<i>Senecio minimus</i>	<i>Drosera heterophylla</i>
	<i>Siloxerus humifusus</i>	<i>Drosera menziesii</i>
*	<i>Sonchus asper</i>	<i>Drosera pallida</i>
*	<i>Sonchus oleraceus</i>	<i>Drosera rosulata</i>
	<i>Waitzia suaveolens</i>	<i>Drosera stolonifera</i>
Campanulaceae		Epacridaceae
	<i>Wahlenbergia multicaulis</i>	<i>Andersonia ?caerulea</i>
	<i>Wahlenbergia preissii</i>	<i>Astroloma microcalyx</i>
Casuarinaceae		<i>Astroloma pallidum</i>
	<i>Allocasuarina humilis</i>	<i>Leucopogon australis</i>
	<i>Allocasuarina microstachya</i>	<i>Leucopogon capitellatus</i>
Centrolepidiaceae		<i>Leucopogon lasiophyllum</i>
	<i>Aphelia cyperoides</i>	<i>Leucopogon parviflorus</i>
	<i>Centrolepis aristata</i>	<i>Leucopogon ?pendulus</i>
	<i>Centrolepis glabra</i>	<i>Leucopogon propinquus</i>
Colchicaceae		<i>Leucopogon tamariscinus</i>
	<i>Burchardia congesta</i>	<i>Leucopogon verticillatus</i>
	<i>Burchardia monantha</i>	<i>Lysinema ciliatum</i>
	<i>Burchardia multiflora</i>	<i>Sphenotoma gracile</i>
Cyperaceae		Euphorbiaceae
	<i>Baumea arthropylla</i>	<i>Monotaxis occidentalis</i>
	<i>Baumea articulata</i>	<i>Phyllanthus calycinus</i>
	<i>Baumea juncea</i>	<i>Poranthera microphylla</i>
	<i>Baumea vaginalis</i>	Geraniaceae
	<i>Cyathocheta avenacea</i>	<i>Pelargonium littorale</i>
*	<i>Cyperus tenellus</i>	

Goodeniaceae	Dampiera linearis Dampiera trigona Velleia trinervis	Orchidaceae	Caladenia flava Caladenia starteorum ms Caladenia starteorum x splendens Cryptostylis ovata
Haemodoraceae	Anigozanthos bicolor Anigozanthos manglesii Conostylis aculeata Conostylis laxiflora Conostylis setigera Haemodorum simplex Haemodorum sparsiflorum Haemodorum spicatum Phlebocarya ciliata Tribonanthes australis Tribonanthes longipetala		Elythranthera brunonis Elythranthera emarginata Microtis atrata Microtis media
Haloragaceae	Glycichrocaryon aureum Gonocarpus pithyoides	*	Monadenia bracteata Prasophyllum drummondii Prasophyllum elatum Prasophyllum macrostachyum Pterostylis recurva
Iridaceae	Patersonia juncea Patersonia occidentalis Patersonia occidentalis (swamp form)		Pterostylis turfosa Pterostylis vittata Pyrorchis nigricans Thelymitra flexuosa Thelymitra macrophylla Thelymitra pauciflora
Juncaceae	Luzula meridionalis	Oxalidaceae	Oxalis perennans
Juncaginaceae	Triglochin huegelii	Papilionaceae	Aotus intermedia Bossiaea linophylla Bossiaea ornata Brachysema praemorsum Daviesia sp.
Lamiaceae	Hemiandra pungens		Gastrolobium bilobum Gompholobium capitatum Gompholobium confertum Gompholobium marginatum Gompholobium polymorphum Gompholobium preissii
Linaceae	Linum marginale		Gompholobium tomentosum Hovea trisperma var. grandiflora Isotropis cuneifolia Jacksonia ?furcellata Kennedia coccinea
Lindsaeaceae	Lindsaea linearis		Oxylobium lineare Sphaerolobium vimineum Viminaria juncea
Lobeliaceae	Isotoma hypocrateriformis Lobelia alata Lobelia gibbosa Lobelia rhombifolia Lobelia tenuior	Philydraceae	Philydrella pygmaea
Loganiaceae	Logania serpyllifolia Phyllangium paradoxum	Phormiaceae	Dianella brevicaulis Dianella revoluta Stypandra glauca
Lycopodiaceae	Phylloglossum drummondii	Pittosporaceae	Sollya heterophylla
Menyanthaceae	Villarsia albiflora	Poaceae	*
Mimosaceae	Acacia extensa Acacia huegelii * Acacia longifolia ssp. longifolia Acacia myrtifolia Acacia nervosa Acacia pulchella Acacia saligna Acacia stenoptera		Aira caryophyllea Austrodanthonia caespitosa Austrodanthonia setacea Austrostipa compressa Austrostipa ?pycnostachya
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		*
			Briza maxima Briza minor Deyeuxia quadriseta Neurachne alopecuroides Tetrarrhena laevis * Vulpia myuros
		Polygalaceae	Comesperma volubile
		Proteaceae	Adenanthes obovatus Banksia grandis Banksia littoralis Dryandra lindleyana Franklandia fucifolia Hakea lissocarpa Hakea prostrata Hakea sulcata Hakea varia Petrophile acicularis

Synaphea petiolaris	Styliadiaceae
Synaphea sp.	
Ranunculaceae	
Clematis pubescens	Levenhookia pusilla
Restionaceae	Levenhookia stipitata
Anarthria laevis	Stylium ?assimile
Anarthria prolifera	Stylium brunonianum ssp. minor
Anarthria scabra	Stylium calcaratum
Chordifex sp.	Stylium corymbosum
Cytogonidium leptocarpoides ms	Stylium guttatum
Desmocladus fasciculatus ms	Stylium inundatum
Desmocladus flexuosus ms	Stylium mimeticum
Harperia lateriflora	Stylium periscelianthum
Hypolaena exsulca	Stylium perpusillum
Lyginia barbata	Stylium petiolare
Meeboldina kraussii ms	Stylium pulchellum
Rhamnaceae	Stylium repens
Cryptandra arbutiflora ssp. minor	Stylium roseonanum
Trymalium ledifolium	Stylium schoenoides
Rubiaceae	Stylium spathulatum
Opercularia hispidula	Thymelaeaceae
Opercularia vaginata	Pimelea angustifolia
Rutaceae	Pimelea imbricata
Boronia crenulata	Pimelea rosea
Boronia spathulata	Pimelea sulphurea
Santalaceae	Pimelea sylvestris
Leptomeria cunninghamii	Tremandraceae
Leptomeria scrobiculata	Tetrahiteca affinis
Leptomeria squarrulosa	Tetrahiteca setigera
Schizaeaceae	Tetrahiteca virgata
Schizaea dichotoma	Violaceae
Scrophulariaceae	Hybanthus floribundus
Gratiola peruviana	Xanthorrhoeaceae
* Parentucellia viscosa	Xanthorrhoea gracilis
Selaginellaceae	Xanthorrhoea preissii
Selaginella gracillima	Zamiaceae
Stackhousiaceae	Macrozamia riedlei
Stackhousia monogyna	
Tripterococcus brunonis	

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), *Stylium 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*, *Astroloba 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 *Adenanthes 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 hermland 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 1998¹) 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	
<i>Agrostocrinum scabrum</i>	
<i>Chamaescilla corymbosa</i>	
<i>Johnsonia lupulina</i>	
<i>Laxmannia minor</i>	
<i>Laxmannia sessiliflora</i>	
<i>Thysanotus manglesianus</i>	
<i>Thysanotus multiflorus</i>	
<i>Thysanotus patersonii</i>	
<i>Thysanotus tenellus</i>	
<i>Tricoryne elatior</i>	
<i>Tricoryne humilis</i>	
Apiaceae	
<i>Actinotus glomeratus</i>	
<i>Centella cordifolia</i>	
<i>Homalosciadium homalocarpum</i>	
<i>Hydrocotyle alata</i>	
<i>Schoenolaena tenuior</i>	
<i>Trachymene pilosa</i>	
<i>Xanthosia atkinsoniana</i>	
<i>Xanthosia candida</i>	
<i>Xanthosia ciliata</i>	
<i>Xanthosia huegelii</i>	
Asteraceae	
<i>Angianthus preissianus</i>	
* <i>Arctotheca calendula</i>	
* <i>Aster subulatus</i>	
* <i>Cirsium vulgare</i>	
<i>Cotula coronopifolia</i>	
<i>Cotula cotuloides</i>	
<i>Hyalosperma cotula</i>	
* <i>Hypochaeris glabra</i>	
<i>Lagenifera huegelii</i>	
<i>Millotia myosotidifolia</i>	
<i>Clearia elaeophila</i>	
<i>Pithocarpa pulchella</i>	
<i>Pogonolepis stricta</i>	
* <i>Pseudognaphalium luteoalbum</i>	
<i>Rhodanthe citrina</i>	
<i>Senecio minimus</i>	
<i>Siloxerus humifusus</i>	
* <i>Sonchus asper</i>	
* <i>Sonchus hydrophilus</i>	
Campanulaceae	
<i>Wahlenbergia multicaulis</i>	
<i>Wahlenbergia preissii</i>	
<i>Wahlenbergia stricta</i>	
Casuarinaceae	
<i>Allocasuarina humilis</i>	
Centrolepidaceae	
<i>Aphelia cyperoides</i>	
<i>Brizula drummondii</i>	
<i>Centrolepis aristata</i>	
<i>Centrolepis drummondiana</i>	
<i>Centrolepis glabra</i>	
<i>Centrolepis polygyna</i>	
Colchicaceae	
<i>Burchardia congesta</i>	
<i>Burchardia monantha</i>	
<i>Burchardia multiflora</i>	
Crassulaceae	
<i>Crassula colorata</i>	
Cyperaceae	
<i>Baumea articulata</i>	
<i>Baumea juncea</i>	
<i>Baumea vaginalis</i>	
* <i>Cyathochaeta avenacea</i>	
* <i>Cyperus tenellus</i>	
<i>Gahnia trifida</i>	
<i>Isolepis cernua</i>	
<i>Isolepis congrua</i>	
* <i>Isolepis ?cyperoides</i>	
* <i>Isolepis marginata</i>	
<i>Isolepis oldfieldiana</i>	
<i>Isolepis stellata</i>	
<i>Lepidosperma angustatum</i>	
<i>Lepidosperma longitudinale</i>	
<i>Lepidosperma squamatum</i>	
<i>Lepidosperma tenue</i>	
<i>Mesomelaena graciliceps</i>	
<i>Mesomelaena tetragona</i>	
<i>Schoenus asperocarpus</i>	
<i>Schoenus benthamii</i>	
<i>Schoenus efoliatus</i>	
<i>Schoenus humilis</i>	
<i>Schoenus odontocarpus</i>	
<i>Schoenus plumosus</i>	
<i>Schoenus submicrostachyus</i>	
<i>Tetaria capillaris</i>	
<i>Tetaria octandra</i>	
<i>Tricostularia neesii</i> var. <i>neesii</i>	
Dasypogonaceae	
<i>Dasypogon bromeliifolius</i>	
<i>Lomandra hermaphrodita</i>	
<i>Lomandra micrantha</i>	
<i>Lomandra sericea</i>	
Dennstaedtiaceae	
<i>Pteridium esculentum</i>	
Dilleniaceae	
<i>Hibbertia ?amplexicaulis</i>	
<i>Hibbertia commutata</i>	
<i>Hibbertia pulchra</i>	
<i>Hibbertia racemosa</i>	
<i>Hibbertia stellaris</i>	
<i>Hibbertia vaginata</i>	
Droseraceae	
<i>Drosera erythrorhiza</i>	
<i>Drosera gigantea</i>	
<i>Drosera glanduligera</i>	
<i>Drosera menziesii</i>	
<i>Drosera pallida</i>	
<i>Drosera stolonifera</i>	

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

Epacridaceae	<i>Andersonia caerulea</i> <i>Astroloma baxteri</i> <i>Astroloma ciliatum</i> <i>Astroloma pallidum</i> <i>Leucopogon australis</i> <i>Leucopogon capitellatus</i> <i>Leucopogon glabellus</i> <i>Leucopogon oxycedrus</i> <i>Leucopogon ?polymorphus</i> <i>Leucopogon propinquus</i> <i>Leucopogon tamariscinus</i> <i>Leucopogon unilateralis</i> <i>Leucopogon verticillatus</i> <i>Lysinema ciliatum</i> <i>Styphelia tenuiflora</i>	Loganiaceae <i>Logania serpyllifolia</i> <i>Phyllangium paradoxum</i>
Euphorbiaceae	<i>Monotaxis occidentalis</i> <i>Poranthera microphylla</i>	Loranthaceae <i>Nuytsia floribunda</i>
Goodeniaceae	<i>Anthotium humile</i> <i>Dampiera alata</i> <i>Dampiera cuneata</i> <i>Dampiera ?juncea</i> <i>Dampiera linearis</i> <i>Dampiera ?pedunculata</i> <i>Dampiera aff. triloba</i> <i>Goodenia claytoniacea</i> <i>Goodenia micrantha</i> <i>Goodenia pulchella</i> <i>Velleia trinervis</i>	Lythraceae * <i>Lythrum hyssopifolia</i>
Haemodoraceae	<i>Anigozanthos bicolor</i> <i>Anigozanthos flavidus</i> <i>Conostylis aculeata</i> <i>Conostylis laxiflora</i> <i>Conostylis setigera</i> <i>Haemodorum laxum</i> <i>Haemodorum spicatum</i> <i>Tribonanthes australis</i> <i>Tribonanthes violacea</i>	Menyanthaceae <i>Villarsia albiflora</i> <i>Villarsia parnassifolia</i>
Halaragaceae	<i>Glischrocaryon aureum</i> <i>Gonocarpus hexandrus</i> ssp. <i>integrifolius</i> <i>Gonocarpus paniculatus</i>	Mimosaceae <i>Acacia extensa</i> <i>Acacia incurva</i> <i>Acacia myrtifolia</i> <i>Acacia pulchella</i> <i>Acacia stenoptera</i>
Hydatellaceae	<i>Trithuria bibracteata</i> <i>Trithuria submersa</i>	Myrtaceae <i>Agonis linearifolia</i> <i>Agonis parviceps</i> <i>Startea</i> sp. (pink weeping) <i>Startea</i> sp. (tall white)
Iridaceae	* <i>Gladiolus undulatus</i> <i>Patersonia juncea</i> <i>Patersonia occidentalis</i> <i>Patersonia occidentalis</i> (swamp form)	<i>Baeckea camphorosmae</i> <i>Baeckea aff. preissiana</i> <i>Calothamnus lateralis</i> <i>Calytrix angulata</i> <i>Eucalyptus calophylla</i> <i>Eucalyptus decipiens</i> <i>Eucalyptus marginata</i> <i>Hypocalymma angustifolium</i> <i>Hypocalymma strictum</i> <i>Kunzea recurva</i> <i>Kunzea recurva</i> x sulphurea hybrid
Juncaceae	* <i>Juncus bufonius</i> * <i>Juncus capitatus</i> <i>Juncus kraussii</i> <i>Juncus pallidus</i>	<i>Kunzea sulphurea</i> <i>Melaleuca cuticularis</i> <i>Melaleuca densa</i> <i>Melaleuca lateritia</i> <i>Melaleuca leptoclada</i> <i>Melaleuca preissiana</i> <i>Melaleuca raphiophylla</i> <i>Melaleuca spathulata</i> <i>Melaleuca thymoides</i> <i>Melaleuca viminea</i> <i>Melaleuca violacea</i> <i>Pericalymma ellipticum</i>
Juncaginaceae	<i>Triglochin calcitrupum</i> <i>Triglochin centrocarpum</i> <i>Triglochin huegelii</i> <i>Triglochin striatum</i>	Onagraceae <i>Epilobium billardierianum</i>
Lamiaceae	<i>Hemiandra pungens</i>	Orchidaceae <i>Caladenia flava</i> <i>Caladenia longicauda</i> <i>Caladenia radialis</i> <i>Caladenia radiata</i> <i>Elythranthera brunonis</i> <i>Elythranthera emarginata</i> <i>Eriochilus dilatatus</i> <i>Leporella fimbriata</i>
Lauraceae	<i>Cassytha glabella</i> <i>Cassytha micrantha</i> <i>Cassytha racemosa</i>	* <i>Monadenia bracteata</i> <i>Praecoxanthus aphyllus</i> ms <i>Prasophyllum drummondii</i> <i>Prasophyllum ?elatum</i> <i>Pterostylis barbata</i> <i>Pterostylis nana</i> <i>Pterostylis vittata</i> <i>Pyrorchis nigricans</i> <i>Thelymitra crinita</i> <i>Thelymitra flexuosa</i> <i>Thelymitra ?macrophylla</i>
Lentibulariaceae	<i>Polypompholyx multifida</i>	Orobanchaceae * <i>Orobanche minor</i>
Lindsaeaceae	<i>Lindsaea linearis</i>	Papilionaceae <i>Aotus intermedia</i>
Lobeliaeae	<i>Lobelia alata</i>	<i>Bossiaea eriocarpa</i> <i>Bossiaea linophylla</i> <i>Bossiaea ornata</i> <i>Bossiaea sp.</i> <i>Brachysema melanopetalum</i>

Brachysema praemorsum	Hakea sulcata
Chorizema ilicifolium	Hakea trifurcata
Daviesia physodes	Hakea varia
Gompholobium capitatum	Isopogon sp.
Gompholobium confertum	Persoonia longifolia
Gompholobium knightianum	Petrophile media
Gompholobium polymorphum	Petrophile rigida
Gompholobium preissii	Petrophile serruriae
Gompholobium tomentosum	Stirlingia anethifolia
Hovea chorizemifolia	Synaphea sp.
Hovea trisperma var. grandiflora	Ranunculaceae
Jacksonia furcellata	Clematis pubescens
Jacksonia sparsa ms	Restionaceae
Kennedia coccinea	Anarthria laevis
* Lotus angustissimus	Anarthria prolifera
* Lotus suaveolens	Desmocladus fasciculatus ms
* Ornithopus compressus	Desmocladus flexuosus ms
Oxylobium lineare	Hypolaena exsulca
Pultenaea ochreata	Leptocarpus tenax
Pultenaea reticulata	Lepyrodia muirii
Sphaerolobium macranthum	Lyginia barbata
Sphaerolobium medium	Meeboldina tephrina ms
Sphaerolobium vimineum	Sporadanthus strictus ms
Viminaria juncea	Stenopa ramosissima ms
Philydraceae	Tremulina tremula ms
Philydrella pygmaea	Rhamnaceae
Phormiaceae	Trymalium ledifolium
Dianella revoluta	Rubiaceae
Pittosporaceae	Opercularia hispidula
Billardiera variifolia	Rutaceae
Marianthus candidus	Boronia nematophylla
Poaceae	Boronia spathulata
* Aira caryophyllea	Eriostemon nodiflorus ssp. lasiocalyx
Amphipogon debilis	Santalaceae
Amphipogon turbinatus	Leptomeria pauciflora
Austrostipa compressa	Leptomeria scrobiculata
Austrostipa juncifolia	Leptomeria squarrulosa
Deyeuxia quadrisetoides	Scrophulariaceae
Hemarthria uncinata	Gratiola peruviana
* Holcus lanatus	Stackhousiaceae
Neurachne alopecuroidea	Stackhousia monogyna
Poa poiformis	Sterculiaceae
Tetrarrhena laevis	Thomasia ?pauciflora
* Vulpia myuros	Styliidiaceae
Podocarpaceae	Levenhookia pusilla
Podocarpus drouynianus	Levenhookia stipitata
Polygalaceae	Styliidium calcaratum
Comesperma calymega	Styliidium guttatum
Comesperma flavum	Styliidium luteum
Comesperma virgatum	Styliidium mimeticum
Comesperma volubile	Styliidium perpusillum
Polygonaceae	Styliidium repens
* Rumex acetosella	Styliidium scandens
* Rumex crispus	Styliidium schoenoides
* Rumex pulcher	Styliidium spathulatum
Primulaceae	Styliidium violaceum
Samolus junceus	Thymelaeaceae
Proteaceae	Pimelea angustifolia
Adenanthera obovatus	Pimelea ciliata ssp. ciliata
Banksia grandis	Pimelea imbricata var. major
Banksia ilicifolia	Pimelea rosea
Banksia littoralis	Pimelea sulphurea
Conospermum flexuosum	Tremandraceae
Dryandra armata	Tetrahitheca sp.
Dryandra lindleyana	Tremandra diffusa
Franklandia fucifolia	Xanthorrhoeaceae
Hakea ceratophylla	Xanthorrhoea gracilis
Hakea lissocarpa	Xanthorrhoea preissii
Hakea prostrata	Zamiaceae
Hakea ruscifolia	Macrozamia riedlei
Hakea sp.	

KULUNILUP NATURE RESERVE

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

Class A

Biological values

Flora Using Griffin² (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 pyrethriflora* (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(l). ***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 rhamphophylla* 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.

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

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

Onagraceae	
	<i>Epilobium billardierianum</i>
	<i>Epilobium hirtigerum</i>
Orchidaceae	
	<i>Caladenia flava</i>
	<i>Caladenia longicauda</i>
	<i>Caladenia marginata</i>
	<i>Caladenia radiata</i>
	<i>Caladenia splendens</i> ms
	<i>Corybas dilatatus</i>
	<i>Cyrtostylis robusta</i>
	<i>Diuris laxiflora</i>
	<i>Diuris longifolia</i>
	<i>Drakonorchis barbarossa</i> ms
	<i>Elythanthera brunonis</i>
	<i>Elythanthera emarginata</i>
	<i>Leporella fimbriata</i>
	<i>Microtis atrata</i>
	<i>Microtis media</i>
	<i>Microtis orbicularis</i>
*	<i>Monadenia bracteata</i>
	<i>Prasophyllum drummondii</i>
	<i>Prasophyllum macrostachyum</i>
	<i>Pterostylis nana</i>
	<i>Pterostylis pyramidalis</i>
	<i>Pterostylis recurva</i>
	<i>Pterostylis vittata</i>
	<i>Pyrorchis nigricans</i>
	<i>Thelymitra crinita</i>
	<i>Thelymitra pauciflora</i>
Orobanchaceae	
*	<i>Orobanche minor</i>
Papilionaceae	
	<i>Bossiaeae eriocarpa</i>
	<i>Bossiaeae linophylla</i>
	<i>Bossiaeae ornata</i>
	<i>Bossiaeae praetermissa</i>
	<i>Brachysema melanopetalum</i>
	<i>Brachysema praemorsum</i>
	<i>Chorizema aciculare</i>
	<i>Daviesia cordata</i>
	<i>Daviesia incrassata</i>
	<i>Daviesia preissii</i>
	<i>Eutaxia virgata</i>
	<i>Gompholobium capitatum</i>
	<i>Gompholobium knightianum</i>
	<i>Gompholobium marginatum</i>
	<i>Gompholobium ovatum</i>
	<i>Gompholobium polymorphum</i>
	<i>Gompholobium preissii</i>
	<i>Gompholobium scabrum</i>
	<i>Gompholobium tomentosum</i>
	<i>Hovea chorizemifolia</i>
	<i>Hovea trisperma</i> var. <i>grandiflora</i>
	<i>Isotropis cuneifolia</i>
	<i>Jacksonia furcellata</i>
	<i>Kennedia coccinea</i>
	<i>Kennedia prostrata</i>
*	<i>Lotus angustissimus</i>
*	<i>Lotus uliginosus</i>
	<i>Oxylobium lineare</i>
	<i>Pultenaea ericifolia</i>
	<i>Sphaerolobium medium</i>
	<i>Sphaerolobium vimineum</i>
*	<i>Trifolium campestre</i>
*	<i>Trifolium dubium</i>
*	<i>Trifolium subterraneum</i>
	<i>Viminaria juncea</i>
Philydraceae	
	<i>Philydrella drummondii</i>
	<i>Philydrella pygmaea</i>
Phormiaceae	
	<i>Dianella brevicaulis</i>
	<i>Dianella revoluta</i>
	<i>Stypandra glauca</i>
Pittosporaceae	
	<i>Billardiera</i> sp.
	<i>Marianthus candidus</i>
	<i>Sollya heterophylla</i>
Poaceae	
	<i>Agrostis avenacea</i>
*	<i>Aira caryophyllea</i>
	<i>Amphibromus nervosus</i>
	<i>Amphibromus vickeryae</i>
	<i>Amphipogon debilis</i>
	<i>Austrodanthonia occidentalis</i>
	<i>Austrodanthonia setacea</i>
	<i>Austrostipa compressa</i>
	<i>Austrostipa pycnostachya</i>
*	<i>Briza maxima</i>
*	<i>Briza minor</i>
	<i>Deyeuxia quadrisetata</i>
	<i>Hemarthria uncinata</i>
*	<i>Holcus lanatus</i>
	<i>Neurachne alopecuroidea</i>
	<i>Poa drummondiana</i>
*	<i>Polypogon monspeliensis</i>
	<i>Tetrarrhena laevis</i>
*	<i>Vulpia bromoides</i>
*	<i>Vulpia myuros</i>
Polygonaceae	
	<i>Comesperma calymega</i>
	<i>Comesperma ciliatum</i>
	<i>Comesperma flavum</i>
	<i>Comesperma virgatum</i>
Polygonaceae	
	<i>Persicaria prostrata</i>
*	<i>Polygonum arenastrum</i>
*	<i>Rumex conglomeratus</i>
*	<i>Rumex pulcher</i>
Primulaceae	
	<i>Samolus junceus</i>
Proteaceae	
	<i>Banksia grandis</i>
	<i>Banksia littoralis</i>
	<i>Dryandra armata</i>
	<i>Dryandra lindleyana</i>
	<i>Grevillea brownii</i>
	<i>Hakea lissocarpha</i>
	<i>Hakea prostrata</i>
	<i>Hakea ruscifolia</i>
	<i>Hakea sulcata</i>
	<i>Hakea varia</i>
	<i>Isopogon polyccephalus</i>
	<i>Isopogon teretifolius</i>
	<i>Persoonia longifolia</i>
	<i>Petrophile media</i>
	<i>Petrophile serruriae</i>
	<i>Petrophile squamata</i>
	<i>Synaphea favosa</i>
	<i>Synaphea petiolaris</i>
Ranunculaceae	
	<i>Clematis pubescens</i>
Restionaceae	
	<i>Anarthria laevis</i>
	<i>Anarthria prolifera</i>
	<i>Apodasmia ceramophila</i> ms
	<i>Desmocladius fasciculatus</i> ms
	<i>Harperia lateriflora</i>
	<i>Hypolaena exsulca</i>
	<i>Leptocarpus tenax</i>
	<i>Lepyrodia muirii</i>
	<i>Lyginia barbata</i>
	<i>Meeboldina cana</i> ms
	<i>Meeboldina coangustata</i> ms
	<i>Meeboldina scariosa</i> ms
	<i>Tremulina tremula</i> ms
Rhamnaceae	
	<i>Trymalium ledifolium</i>

Rubiaceae	
	<i>Opercularia hispidula</i>
	<i>Opercularia vaginata</i>
Rutaceae	
	<i>Boronia ?junccea</i>
	<i>Boronia megastigma</i>
	<i>Boronia ramosa</i>
	<i>Boronia spathulata</i>
Santalaceae	
	<i>Santalum acuminatum</i>
Scrophulariaceae	
	<i>Gratiola peruviana</i>
	<i>Limosella australis</i>
*	<i>Parentucellia latifolia</i>
*	<i>Parentucellia viscosa</i>
Selaginellaceae	
	<i>Selaginella gracillima</i>
Stackhousiaceae	
	<i>Stackhousia monogyna</i>
	<i>Tripterococcus brunonis</i>
Stylidiaceae	
	<i>Levenhookia pusilla</i>
	<i>Levenhookia stipitata</i>
	<i>Styliidium assimile</i>
	<i>Styliidium brunonianum ssp. minor</i>
	<i>Styliidium calcaratum</i>
	<i>Styliidium carnosum</i>
	<i>Styliidium crassifolium</i>
	<i>Styliidium emarginatum</i>
	<i>Styliidium guttatum</i>
	<i>Styliidium inundatum</i>
	<i>Styliidium miniatum</i>
	<i>Styliidium perpusillum</i>
	<i>Styliidium petiolare</i>
	<i>Styliidium pulchellum</i>
	<i>Styliidium repens</i>
	<i>Styliidium roseonanum</i>
	<i>Styliidium schoenoides</i>
	<i>Styliidium spathulatum</i>
Thymelaeaceae	
	<i>Pimelea angustifolia</i>
	<i>Pimelea ?ciliata</i>
	<i>Pimelea sulphurea</i>
Tremandraceae	
	<i>Platynthea galiooides</i>
	<i>Tetrahiteca setigera</i>
Violaceae	
	<i>Hybanthus floribundus</i>
Xanthorrhoeaceae	
	<i>Xanthorrhoea gracilis</i>
	<i>Xanthorrhoea preissii</i>
Zamiaceae	
	<i>Macrozamia riedlei</i>

LAKE MUIR RESERVE

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

Class A

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 starkeorum* 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 pyrethriflora* (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. **Jarra-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. **Jarra-marri open woodland** on sandy soils occurs widely in the southern half of the reserve, common understorey species include *Hibbertia racemosa*, *Hibbertia subvaginata*, *Astroloba 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. **Jarra-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. **Jarra-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. **Jarra 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 *Meoboldina 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*, *Meoboldina coangustata*, and *Meoboldina 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 raphiophylla* 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. arthropylla* occur. Around the edge of these wetlands taxa such as *Utricularia australis*, *Cotula coronopifolia*, *Centrolepis polystigma*, *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 October 1995 (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. rufidis* 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		Tricoryne elatior Tricoryne humilis Tricoryne tenella
Carpobrotus modestus		
Amaranthaceae		
Alternanthera nodiflora		Actinotus glomeratus
Hemicroa diandra		Actinotus omnifertilis
Ptilotus drummondii		Apium annuum
Ptilotus manglesii		Apium prostratum
Anthericaceae		Centella cordifolia
Agrostocrinum scabrum		Daucus glochidiatus
Arthropodium capillipes		Eryngium pinnatifidum
Arthropodium preissii		Eryngium sp. Lake Muir (E. Wittwer 1193)
Borya scirpoidea		Homalosciadium homalocarpum
Caesia micrantha		Hydrocotyle alata
Caesia occidentalis		Hydrocotyle diantha
Chamaescilla corymbosa		Hydrocotyle pilifera
Chamaescilla spiralis		Lilaeopsis polyantha
Johnsonia acaulis		Platysace haplosciadis
Johnsonia lupulina		Platysace filiformis
Laxmannia minor		Schoenolaena juncea
Laxmannia sessiliflora		Schoenolaena tenuior
Sowerbaea laxiflora		Trachymene pilosa
Thysanotus multiflorus		Xanthosia candida
Thysanotus patersonii		Xanthosia huegelii
Thysanotus tenellus		
Thysanotus thyrsoides		Asteraceae
		Angianthus preissianus
		Angianthus sp.

* <i>Arctotheca calendula</i>	<i>Centrolepis aristata</i>
* <i>Aster subulatus</i>	<i>Centrolepis drummondiana</i>
<i>Asteridea pulverulenta</i>	<i>Centrolepis glabra</i>
<i>Blennospora drummondii</i>	<i>Centrolepis humillima</i>
<i>Blennospora</i> sp.	<i>Centrolepis mutica</i>
<i>Brachyscome bellidoides</i>	<i>Centrolepis pilosa</i>
<i>Brachyscome iberidifolia</i>	<i>Centrolepis polygyna</i>
<i>Calotis erinacea</i>	
* <i>Carduus pycnocephalus</i>	Chenopodiaceae
* <i>Centaurea melitensis</i>	* <i>Atriplex prostrata</i>
* <i>Cirsium vulgare</i>	* <i>Chenopodium murale</i>
* <i>Conyza albida</i>	<i>Halosarcia indica</i>
<i>Cotula australis</i>	<i>Halosarcia leptoclada</i>
<i>Cotula coronopifolia</i>	<i>Rhagodia baccata</i>
<i>Cotula cotuloides</i>	<i>Sarcocornia quinqueflora</i>
* <i>Cotula turbinata</i>	<i>Suaeda australis</i>
<i>Craspedia variabilis</i>	
* <i>Dittrichia graveolens</i>	Clusiaceae
<i>Euchiton gymnocephalus</i>	<i>Hypericum gramineum</i>
<i>Euchiton sphaericus</i>	
<i>Gnephosis</i> sp.	Colchicaceae
* <i>Hedypnois rhagadioloides</i>	<i>Burchardia congesta</i>
<i>Hyalosperma cotula</i>	<i>Burchardia monantha</i>
* <i>Hypochaeris glabra</i>	<i>Burchardia multiflora</i>
<i>Ixiolaena viscosa</i>	<i>Wurmbea dioica</i>
* <i>Lactuca serriola</i>	
<i>Lagenifera huegelii</i>	Convolvulaceae
<i>Millotia myosotidifolia</i>	<i>Dichondra repens</i>
<i>Millotia tenuifolia</i>	<i>Wilsonia backhousei</i>
<i>Olearia axillaris</i>	
<i>Olearia elaeophila</i>	Crassulaceae
<i>Podolepis gracilis</i>	<i>Crassula colorata</i>
<i>Podolepis lessonii</i>	* <i>Crassula natans</i>
<i>Podotheca angustifolia</i>	<i>Crassula pedicellosa</i>
<i>Pogonolepis stricta</i>	<i>Crassula peduncularis</i>
* <i>Pseudognaphalium luteoalbum</i>	
<i>Pterocheata paniculata</i>	Cupressaceae
<i>Quinetia urvillei</i>	<i>Actinostrobus acuminatus</i>
<i>Rhodanthe pyrethrum</i>	<i>Actinostrobus pyramidalis</i>
<i>Rutidosia multiflora</i>	
<i>Senecio glomeratus</i>	Cyperaceae
<i>Senecio lautus</i>	<i>Baumea arthrophylla</i>
<i>Senecio minimus</i>	<i>Baumea articulata</i>
<i>Senecio picridioides</i>	<i>Baumea juncea</i>
<i>Senecio quadridentatus</i>	<i>Baumea vaginalis</i>
<i>Siloxerus humifusus</i>	<i>Carex appressa</i>
* <i>Sonchus asper</i>	<i>Carex preissii</i>
* <i>Sonchus hydrophilus</i>	<i>Chorizandra enodis</i>
* <i>Sonchus oleraceus</i>	<i>Cyathochaeta avenacea</i>
<i>Trichocline</i> sp.	<i>Cyathochaeta clandestina</i>
<i>Trichocline spathulata</i>	* <i>Cyperus tenellus</i>
* <i>Ursinia anthemoides</i>	<i>Gahnia ancistrophylla</i>
* <i>Vellereophytum dealbatum</i>	<i>Gahnia trifida</i>
<i>Vittadinia australasica</i> var. <i>australasica</i>	<i>Isolepis cernua</i>
<i>Waitzia nitida</i>	<i>Isolepis cyperoides</i>
<i>Waitzia suaveolens</i>	<i>Isolepis fluitans</i>
	* <i>Isolepis marginata</i>
Brassicaceae	<i>Isolepis nodosa</i>
* <i>Cardamine paucijuga</i>	<i>Isolepis oldfieldiana</i>
* <i>Lepidium africanum</i>	<i>Isolepis producta</i>
	* <i>Isolepis prolifera</i>
Callitrichaceae	<i>Isolepis stellata</i>
* <i>Callitricha stagnalis</i>	<i>Lepidosperma angustatum</i>
	<i>Lepidosperma gladiatum</i>
Campanulaceae	<i>Lepidosperma longitudinale</i>
<i>Wahlenbergia multicaulis</i>	<i>Lepidosperma squamatum</i>
<i>Wahlenbergia preissii</i>	<i>Lepidosperma tenue</i>
	<i>Mesomelaena stygia</i>
Caryophyllaceae	<i>Mesomelaena tetragona</i>
* <i>Cerastium glomeratum</i>	<i>Schoenus bifidus</i>
* <i>Corrigiola litoralis</i>	<i>Schoenus capillifolius</i>
* <i>Petrorrhiza velutina</i>	<i>Schoenus curvifolius</i>
* <i>Spergularia salina</i>	<i>Schoenus efoliatus</i>
	<i>Schoenus humilis</i>
Casuarinaceae	<i>Schoenus laevigatus</i>
<i>Allocasuarina humilis</i>	<i>Schoenus maschalinus</i>
<i>Allocasuarina lehmanniana</i>	<i>Schoenus nanus</i>
<i>Allocasuarina microstachya</i>	<i>Schoenus natans</i>
	<i>Schoenus plumosus</i>
Centrolepidaceae	<i>Schoenus rigens</i>
<i>Aphelia cyperoides</i>	<i>Schoenus sp.</i>
<i>Brizula drummondii</i>	<i>Schoenus subbulbosus</i>
	<i>Schoenus submicrostachyus</i>

Schoenus tenellus	Goodeniaceae
Tetaria capillaris	Anthotium humile
Tetaria octandra	Anthotium junciforme
Tricostularia neesii var. elatior	Dampiera alata
Dasypogonaceae	Dampiera linearis
Dasypogon bromelliifolius	Dampiera pedunculata
Lomandra caespitosa	Dampiera trigona
Lomandra nigricans	Goodenia claytoniacea
Lomandra purpurea	Goodenia micrantha
Lomandra sericea	Goodenia mimuloides
Lomandra sonderi	Goodenia pulchella
Lomandra suaveolens	Lechenaultia expansa
Dennstaedtiaceae	Scaevola globulifera
Pteridium esculentum	Scaevola lanceolata
Dilleniaceae	Scaevola phlebopetalata
Hibbertia acerosa	Velleia trinervis
Hibbertia amplexicaulis	Haemodoraceae
Hibbertia commutata	Anigozanthos bicolor
Hibbertia cunninghamii	Anigozanthos flavidus
Hibbertia racemosa	Anigozanthos manglesii
Hibbertia spicata	Anigozanthos viridis
Hibbertia stellaris	Anigozanthos bicolor x manglesii
Hibbertia subvaginata	Conostylis aculeata
Hibbertia vaginata	Conostylis laxiflora
Droseraceae	Conostylis setigera
Drosera bulbosa	Haemodorum laxum
Drosera erythrorhiza	Haemodorum simplex
Drosera gigantea	Haemodorum sparsiflorum
Drosera glanduligera	Haemodorum spicatum
Drosera macrantha	Tribonanthes australis
Drosera menziesii	Tribonanthes brachypetala
Drosera neesii	Tribonanthes longipetala
Drosera pallida	Tribonanthes violacea
Drosera pulchella	Haloragaceae
Drosera stolonifera	Glischrocaryon aureum
Epacridaceae	Gonocarpus cordiger
Andersonia caerulea	Gonocarpus paniculatus
Astroloma baxteri	Haloragis brownii
Astroloma ciliatum	Myriophyllum crispatum
Astroloma pallidum	Myriophyllum drummondii
Leucopogon australis	Myriophyllum tillaeoides
Leucopogon capitellatus	Hydatellaceae
Leucopogon conostephioides	Trithuria bibracteata
Leucopogon glabellus	Trithuria submersa
Leucopogon parviflorus	Hypoxidaceae
Leucopogon pendulus	Hypoxis occidentalis
Leucopogon propinquus	Iridaceae
Leucopogon pulchellus	* Homeria flaccida
Leucopogon sprengelioides	Patersonia juncea
Leucopogon tamariscinus	Patersonia occidentalis
Leucopogon unilateralis	Patersonia occidentalis (swamp form)
Leucopogon verticillatus	Patersonia umbrosa
Lysinema ciliatum	* Romulea rosea
Needhamiella pumilio	Isoetaceae
Sphenotoma gracile	Isoetes drummondii
Styphelia tenuiflora	Juncaceae
Euphorbiaceae	* Juncus bufonius
Amperea simulans	* Juncus capitatus
Monotaxis occidentalis	Juncus kraussii
Phyllanthus calycinus	Juncus pallidus
Poranthera huegelii	Luzula meridionalis
Poranthera microphylla	Juncaginaceae
Fumariaceae	Triglochin calcitratum
* Fumaria capreolata	Triglochin centrocarpum
Gentianaceae	Triglochin huuegeli
* Centaurium erythraea	Triglochin lineare
Centaurium spicatum	Triglochin minutissimum
* Cicendia filiformis	Triglochin mucronatum
Geraniaceae	Triglochin striatum
* Erodium botrys	Lamiaceae
* Erodium cicutarium	Hemiandra pungens
* Erodium moschatum	Lauraceae
Geranium solanderi	Cassytha flava
Pelargonium littorale	Cassytha glabella
	Cassytha micrantha
	Cassytha racemosa

Lentibulariaceae	
	<i>Polypompholyx multifida</i>
	<i>Polypompholyx teneilla</i>
	<i>Utricularia australis</i>
	<i>Utricularia inaequalis</i>
	<i>Utricularia simplex</i>
	<i>Utricularia sp.</i>
	<i>Utricularia violacea</i>
	<i>Utricularia volubilis</i>
Linaceae	
	<i>Linum marginale</i>
Lindsaeaceae	
	<i>Lindsaea linearis</i>
Lobeliaceae	
	<i>Isotoma hypocrateriformis</i>
	<i>Isotoma scapigera</i>
	<i>Lobelia alata</i>
	<i>Lobelia gibbosa</i>
	<i>Lobelia rhombifolia</i>
Loganiaceae	
	<i>Logania campanulata</i>
	<i>Logania serpyllifolia</i>
	<i>Phyllangium palustre</i>
	<i>Phyllangium paradoxum</i>
Loranthaceae	
	<i>Amyema miquelii</i>
	<i>Nuytsia floribunda</i>
Lycopodiaceae	
	<i>Phylloglossum drummondii</i>
Lythraceae	
*	<i>Lythrum hyssopifolia</i>
Malvaceae	
	<i>Lawrenция spicata</i>
*	<i>Malva parviflora</i>
	<i>Sida hookeriana</i>
Marsileaceae	
	<i>Pilularia novae-hollandiae</i>
Menyanthaceae	
	<i>Villarsia albiflora</i>
	<i>Villarsia capitata</i>
	<i>Villarsia parnassifolia</i>
	<i>Villarsia submersa</i>
	<i>Villarsia violifolia</i>
Mimosaceae	
	<i>Acacia alata</i>
	<i>Acacia cochlearis</i>
	<i>Acacia cyclops</i>
	<i>Acacia extensa</i>
	<i>Acacia huegelii</i>
	<i>Acacia incurva</i>
	<i>Acacia latipes ssp. latipes ms</i>
	<i>Acacia myrtifolia</i>
	<i>Acacia nervosa</i>
	<i>Acacia pentadenia</i>
	<i>Acacia pulchella</i>
	<i>Acacia pulchella var. goadbyi</i>
	<i>Acacia saligna</i>
	<i>Acacia stenoptera</i>
	<i>Acacia urophylla</i>
	<i>Acacia willdenowiana</i>
Molluginaceae	
	<i>Macarthuria apetala</i>
Myoporaceae	
	<i>Myoporum caprariooides</i>
Myrtaceae	
	<i>Actinodium cunninghamii</i>
	<i>Agonis hypericifolia</i>
	<i>Agonis linearifolia</i>
	<i>Agonis parviceps</i>
	<i>Astartea fascicularis</i>
	<i>Astartea sp. (pink weeping)</i>
	<i>Astartea sp. (white erect)</i>
	<i>Baeckea camphorosmae</i>
	<i>Baeckea pygmaea</i>
	<i>Calothamnus lateralis</i>
	<i>Calothamnus lehmannii</i>
	<i>Calytrix angulata</i>
	<i>Calytrix flavescens</i>
	<i>Calytrix leschenaultii</i>
	<i>Darwinia oederoides</i>
	<i>Darwinia vestita</i>
	<i>Eucalyptus calophylla</i>
	<i>Eucalyptus cornuta</i>
	<i>Eucalyptus decipiens</i>
	<i>Eucalyptus marginata</i>
	<i>Eucalyptus megacarpa</i>
	<i>Eucalyptus occidentalis</i>
	<i>Eucalyptus patens</i>
	<i>Eucalyptus rufa</i>
	<i>Hypocalymma angustifolium</i>
	<i>Kunzea ericifolia</i>
	<i>Kunzea micrantha</i>
	<i>Kunzea recurva</i>
	<i>Kunzea sulphurea</i>
	<i>Melaleuca cordata</i>
	<i>Melaleuca cuticularis</i>
	<i>Melaleuca densa</i>
	<i>Melaleuca lateriflora</i>
	<i>Melaleuca lateritia</i>
	<i>Melaleuca leptoclada</i>
	<i>Melaleuca preissiana</i>
	<i>Melaleuca pritzelii</i>
	<i>Melaleuca raphiophylla</i>
	<i>Melaleuca spathulata</i>
	<i>Melaleuca thymoides</i>
	<i>Melaleuca viminea</i>
	<i>Melaleuca violacea</i>
	<i>Pericalymma ellipticum</i>
	<i>Verticordia densiflora</i>
	<i>Verticordia densiflora ssp. caespitosa</i>
	<i>Verticordia habrantha</i>
	<i>Verticordia plumosa</i>
Olacaceae	
	<i>Oanax phyllanthi</i>
Onagraceae	
	<i>Epilobium billardierianum</i>
Ophioglossaceae	
	<i>Ophioglossum lusitanicum</i>
Orchidaceae	
	<i>Caladenia caesarea</i>
	<i>Caladenia caesarea ssp. caesarea ms</i>
	<i>Caladenia christineae ms</i>
	<i>Caladenia drummondii</i>
	<i>Caladenia ferruginea</i>
	<i>Caladenia flava</i>
	<i>Caladenia harringtoniae</i>
	<i>Caladenia latifolia</i>
	<i>Caladenia longicauda</i>
	<i>Caladenia longilavata</i>
	<i>Caladenia macrostylis</i>
	<i>Caladenia marginata</i>
	<i>Caladenia nana</i>
	<i>Caladenia radiata</i>
	<i>Caladenia reptans</i>
	<i>Caladenia starteorum ms</i>
	<i>Caladenia varians ssp. varians ms</i>
	<i>Corybas recurvus</i>
	<i>Cryptostylis ovata</i>
	<i>Cyanicula deformis ms</i>
	<i>Cyanicula gemmata ms</i>
	<i>Cyrtostylis huegelii</i>
	<i>Diuris drummondii</i>
	<i>Diuris laxiflora</i>
	<i>Diuris longifolia</i>
	<i>Drakaea glyptodon</i>
	<i>Drakaea livida</i>
	<i>Drakonorchis barbarossa ms</i>
	<i>Elythranthera brunonis</i>
	<i>Elythranthera emarginata</i>
	<i>Eriochilus dilatatus</i>
	<i>Eriochilus dilatatus ssp. undulatus ms</i>
	<i>Gastrodia lacista</i>

Leporella fimbriata	Sphaerolobium vimineum
Leptoceras menziesii	* Trifolium arvense
Microtis atrata	* Trifolium campestre
Microtis media	* Trifolium dubium
Microtis orbicularis	* Trifolium fragiferum
* Monadenia bracteata	* Trifolium glomeratum
Paracaleana nigrita	* Trifolium repens
Praecoxanthus aphyllus ms	* Trifolium subterraneum
Prasophyllum drummondii	Viminaria juncea
Prasophyllum elatum	Philydraceae
Prasophyllum fimbria	Philydrella drummondii
Prasophyllum macrostachyum	Philydrella pygmaea
Prasophyllum plumiforme	Phormiaceae
Pterostylis barbata	Dianella brevicaulis
Pterostylis nana	Dianella revoluta
Pterostylis pyramidalis	Stypandra glauca
Pterostylis recurva	Pinaceae
Pterostylis vittata	* Pinus pinaster
Pyrorchis nigricans	Pittosporaceae
Thelymitra antennifera	Billardiera variifolia
Thelymitra benthamiana	Marianthus candidus
Thelymitra crinita	Sollya heterophylla
Thelymitra cucullata	Plantaginaceae
Thelymitra flexuosa	Plantago exilis
Thelymitra fuscolutea	Poaceae
Thelymitra nuda	Agrostis avenacea
Thelymitra pauciflora	* Aira caryophyllea
Orobanchaceae	Amphibromus vickeryae
* Orobanche minor	Amphipogon debilis
Oxalidaceae	Amphipogon laguroides
Oxalis perennans	Amphipogon turbinatus
Papilionaceae	* Anthoxanthum odoratum
Aotus intermedia	* Avena fatua
Bossiaea aquifolium	* Briza maxima
Bossiaea eriocarpa	* Briza minor
Bossiaea linophylla	* Bromus diandrus
Bossiaea ornata	Austrodanthonia occidentalis
Bossiaea rufa	Austrodanthonia sp.
Brachysema melanopetalum	Austrostipa compressa
Brachysema praemorsum	Austrostipa juncifolia
Callistachys lanceolata	Austrostipa pycnostachya
Chorizema nanum	Austrostipa trichophylla
Daviesia cordata	* Cynodon dactylon
Daviesia hakeoides	* Cynosurus echinatus
Daviesia physodes	Deyeuxia quadrisetata
Daviesia preissii	Eragrostis brownii
Eutaxia virgata	Eragrostis elongata
Gastrolobium bilobum	Hemarthria uncinata
Gompholobium capitatum	* Holcus lanatus
Gompholobium confertum	* Holcus setiger
Gompholobium knightianum	* Hordeum geniculatum
Gompholobium marginatum	* Hordeum leporinum
Gompholobium ovatum	* Lolium multiflorum
Gompholobium polymorphum	* Lolium rigidum
Gompholobium preissii	Microlaena stipoides
Gompholobium scabrum	Neurachne alopecuroidea
Gompholobium tomentosum	* Parapholis incurva
Hardenbergia comptoniana	Poa drummondiana
Hovea chorizemifolia	Poa poiformis
Hovea elliptica	* Polypogon monspeliensis
Hovea trisperma	Sporobolus virginicus
Hovea trisperma var. grandiflora	Tetrarrhena laevis
Isotropis cuneifolia	* Vulpia myuros
Jacksonia furcellata	Podocarpaceae
Jacksonia sparsa ms	Podocarpus drouynianus
Kennedia coccinea	Polygonaceae
Kennedia prostrata	Comesperma calymega
Latrobea tenella	Comesperma ciliatum
* Lotus angustissimus	Comesperma drummondii
* Ornithopus compressus	Comesperma flavum
Oxylodium lineare	Comesperma virgatum
Pultenaea ericifolia	Muehlenbeckia adpressa
Pultenaea ochreata	Persicaria prostrata
Pultenaea reticulata	* Rumex acetosella
Sphaerolobium linophyllum	* Rumex brownii
Sphaerolobium medium	

* <i>Rumex crispus</i>	<i>Opercularia hispidula</i>
* <i>Rumex pulcher</i>	<i>Opercularia vaginata</i>
Portulacaceae	* <i>Sherardia arvensis</i>
<i>Calandrinia composita</i>	
<i>Montia australasica</i>	
Potamogetonaceae	
<i>Potamogeton tricarinatus</i>	
<i>Ruppia megacarpa</i>	
Primulaceae	
* <i>Anagallis arvensis</i> var. <i>arvensis</i>	
* <i>Anagallis arvensis</i> var. <i>caerulea</i>	
<i>Samolus caespitosus</i>	
<i>Samolus junceus</i>	
Proteaceae	
<i>Adenanthes obovatus</i>	
<i>Banksia grandis</i>	
<i>Banksia ilicifolia</i>	
<i>Banksia littoralis</i>	
<i>Conospermum flexuosum</i>	
<i>Dryandra armata</i>	
<i>Dryandra bipinnatifida</i>	
<i>Dryandra lindleyana</i>	
<i>Franklandia fucifolia</i>	
<i>Grevillea brownii</i>	
<i>Hakea ceratophylla</i>	
<i>Hakea lissocarpha</i>	
<i>Hakea oleifolia</i>	
<i>Hakea prostrata</i>	
<i>Hakea ruscifolia</i>	
<i>Hakea sulcata</i>	
<i>Hakea trifurcata</i>	
<i>Hakea undulata</i>	
<i>Hakea varia</i>	
<i>Isopogon polyccephalus</i>	
<i>Isopogon terebellifolius</i>	
<i>Persoonia longifolia</i>	
<i>Petrophile media</i>	
<i>Petrophile serruria</i>	
<i>Petrophile squamata</i>	
<i>Stirlingia tenuifolia</i>	
<i>Synaphea decumbens</i>	
<i>Synaphea petiolaris</i>	
Ranunculaceae	
<i>Clematis pubescens</i>	
<i>Ranunculus colonorum</i>	
* <i>Ranunculus muricatus</i>	
Restionaceae	
<i>Anarthria laevis</i>	
<i>Anarthria prolifera</i>	
<i>Anarthria scabra</i>	
<i>Apodasmia ceramophila</i> ms	
<i>Desmocladus fasciculatus</i> ms	
<i>Harperia lateriflora</i>	
<i>Hypolaena exsulca</i>	
<i>Hypolaena humilis</i> ms	
<i>Lepyrodia macra</i>	
<i>Lepyrodia muirii</i>	
<i>Lyginia barbata</i>	
<i>Meeboldina cana</i> ms	
<i>Meeboldina coangustata</i> ms	
<i>Meeboldina denmarkica</i>	
<i>Meeboldina kraussii</i> ms	
<i>Meeboldina</i> sp.	
<i>Meeboldina tephrina</i> ms	
<i>Stenopa ramosissima</i> ms	
<i>Tremulina tremula</i> ms	
Rhamnaceae	
<i>Cryptandra</i> sp.	
<i>Trymalium floribundum</i>	
<i>Trymalium ledifolium</i>	
Rosaceae	
* <i>Acaena echinata</i>	
Rubiaceae	
* <i>Galium divaricatum</i>	
* <i>Galium murale</i>	
<i>Opercularia apiciflora</i>	
	<i>Opercularia hispidula</i>
	<i>Opercularia vaginata</i>
	* <i>Sherardia arvensis</i>
Rutaceae	
<i>Boronia capitata</i>	
<i>Boronia crenulata</i>	
<i>Boronia juncea</i>	
<i>Boronia megastigma</i>	
<i>Boronia ramosa</i>	
<i>Boronia</i> sp.	
<i>Boronia spathulata</i>	
Santalaceae	
<i>Leptomeria lehmannii</i>	
<i>Leptomeria scrobiculata</i>	
<i>Leptomeria spinosa</i>	
<i>Leptomeria squarrulosa</i>	
Schizaeaceae	
<i>Schizaea dichotoma</i>	
Scrophulariaceae	
* <i>Bartsia trixago</i>	
<i>Euphrasia scabra</i>	
<i>Glossostigma diandrum</i>	
<i>Glossostigma drummondii</i>	
<i>Gratiola peruviana</i>	
* <i>Parentucellia latifolia</i>	
* <i>Parentucellia viscosa</i>	
Selaginellaceae	
<i>Selaginella gracillima</i>	
Solanaceae	
* <i>Solanum americanum</i>	
* <i>Solanum nigrum</i>	
Stackhousiaceae	
<i>Stackhousia monogyna</i>	
<i>Tripterococcus brunonis</i>	
Sterculiaceae	
<i>Guichenotia</i> sp.	
<i>Rulingia corylifolia</i>	
<i>Thomasia foliosa</i>	
<i>Thomasia paniculata</i>	
<i>Thomasia pauciflora</i>	
Stylidiaceae	
<i>Levenhookia pusilla</i>	
<i>Levenhookia stipitata</i>	
<i>Stylium adnatum</i>	
<i>Stylium amoenum</i>	
<i>Stylium assimile</i>	
<i>Stylium brunonianum</i> ssp. <i>minor</i>	
<i>Stylium calcaratum</i>	
<i>Stylium corymbosum</i>	
<i>Stylium crassifolium</i>	
<i>Stylium ecorne</i>	
<i>Stylium emarginatum</i>	
<i>Stylium guttatum</i>	
<i>Stylium hispidum</i>	
<i>Stylium inundatum</i>	
<i>Stylium junceum</i>	
<i>Stylium lepidum</i>	
<i>Stylium periscelianthum</i>	
<i>Stylium perpusillum</i>	
<i>Stylium petiolare</i>	
<i>Stylium pulchellum</i>	
<i>Stylium repens</i>	
<i>Stylium rhipidium</i>	
<i>Stylium scandens</i>	
<i>Stylium schoenoides</i>	
<i>Stylium</i> sp.	
<i>Stylium spathulatum</i>	
<i>Stylium spinulosum</i>	
Thymelaeaceae	
<i>Pimelea angustifolia</i>	
<i>Pimelea argentea</i>	
<i>Pimelea ciliata</i>	
<i>Pimelea cracens</i> ssp. <i>cracens</i>	
<i>Pimelea imbricata</i> var. <i>gracillima</i>	
<i>Pimelea imbricata</i> var. <i>piligera</i>	
<i>Pimelea rosea</i>	

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

NOOBIJUP NATURE RESERVE

Reserve number 26680

Class A

Location 34°24'18"S 116°47'11"E

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 pyrethriflora* (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. Gardner³, 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 Galalup 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 rhamphophylla-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 rhamphophylla 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. rhamphophylla* and becomes inundated in winter. As the wetland dries aquatic species such as *Villarsia submersa*, and *Schoenus natans* dominate to be replaced by a diverse herband which includes *Rhodanthe pyrethriflora*, *Anthotium junciforme*, *Tribonanthus 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 1998⁴).

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 thyrsoides
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*
Trichoclone spathulata
* *Velleereophyton 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	<i>Drosera bulbosa</i> <i>Drosera erythrorhiza</i> <i>Drosera gigantea</i> <i>Drosera glanduligera</i> <i>Drosera macrantha</i> <i>Drosera menziesii</i> <i>Drosera neesii</i>	Linaceae <i>Linum marginale</i>
Epacridaceae	<i>Astroloma baxteri</i> <i>Astroloma ciliatum</i> <i>Astroloma pallidum</i> <i>Leucopogon australis</i> <i>Leucopogon capitellatus</i> <i>Leucopogon glabellus</i> <i>Leucopogon pendulus</i> <i>Leucopogon propinquus</i> <i>Leucopogon ?sprengelioides</i> <i>Leucopogon tamariscinus</i> <i>Leucopogon verticillatus</i> <i>Styphelia tenuiflora</i>	Lindsaeaceae <i>Lindsaea linearis</i>
Euphorbiaceae	<i>Phyllanthus calycinus</i> <i>Poranthera huegelii</i> <i>Poranthera microphylla</i>	Lobeliaceae <i>Lobelia alata</i> <i>Lobelia tenuior</i>
Gentianaceae	* <i>Cicendia filiformis</i>	Loganiaceae <i>Logania serpyllifolia</i>
Geraniaceae	<i>Pelargonium littorale</i>	Menyanthaceae <i>Villarsia albiflora</i> <i>Villarsia submersa</i>
Goodeniaceae	<i>Anthotium junciforme</i> <i>Dampiera alata</i> <i>Dampiera cuneata</i> <i>Goodenia micrantha</i> <i>Goodenia mimosoides</i> <i>Scaevola phlebopetala</i> <i>Velleia trinervis</i>	Mimosaceae <i>Acacia browniana</i> <i>Acacia cochlearis</i> <i>Acacia cyclops</i> <i>Acacia extensa</i> <i>Acacia incurva</i> <i>Acacia myrtifolia</i> <i>Acacia pulchella</i> <i>Acacia saligna</i> <i>Acacia stenoptera</i>
Haemodoraceae	<i>Anigozanthos bicolor</i> <i>Anigozanthos manglesii</i> <i>Conostylis aculeata</i> <i>Conostylis laxiflora</i> <i>Conostylis setigera</i> <i>Haemodorum laxum</i> <i>Haemodorum sparsiflorum</i> <i>Haemodorum spicatum</i> <i>Tribonanthes longipetala</i> <i>Tribonanthes violacea</i>	Myrtaceae <i>Agonis juniperina</i> <i>Astartea sp. (pink weeping)</i> <i>Calothamnus lateralis</i> <i>Eucalyptus calophylla</i> <i>Eucalyptus decipiens</i> <i>Eucalyptus marginata</i> <i>Eucalyptus occidentalis</i> <i>Eucalyptus rufa</i> <i>Hypocalymma angustifolium</i> <i>Kunzea micrantha</i> <i>Kunzea recurva</i> <i>Melaleuca cordata</i> <i>Melaleuca densa</i> <i>Melaleuca leptoclada</i> <i>Melaleuca rhaphiophylla</i> <i>Melaleuca thymoides</i> <i>Melaleuca viminea</i> <i>Melaleuca violacea</i> <i>Pericalymma ellipticum</i>
Haloragaceae	<i>Glischrocaryon aureum</i> <i>Gonocarpus paniculatus</i> <i>Myriophyllum crispatum</i>	Orchidaceae <i>Caladenia flava</i> <i>Caladenia longicauda</i> <i>Caladenia radialis</i> <i>Caladenia radiata</i> <i>Cryptostylis ovata</i> <i>Diuris laxiflora</i> <i>Diuris longifolia</i> <i>Elythranthera brunonis</i> <i>Elythranthera emarginata</i> <i>Hyperanthus serratus</i> <i>Microtis atrata</i> <i>Microtis media</i> <i>Microtis orbicularis</i>
Hydatellaceae	<i>Trituria bibracteata</i> <i>Trituria submersa</i>	*
Hypoxidaceae	<i>Hypoxis occidentalis</i>	<i>Monadenia bracteata</i> <i>Prasophyllum elatum</i> <i>Prasophyllum macrostachyum</i> <i>Pterostylis recurva</i> <i>Pyrorchis nigricans</i> <i>Thelymitra crinita</i> <i>Thelymitra flexuosa</i> <i>Thelymitra macrophylla</i>
Iridaceae	<i>Patersonia juncea</i> <i>Patersonia occidentalis</i> * <i>Patersonia occidentalis</i> (swamp form)	Orobanchaceae * <i>Orobanche minor</i>
Isoetaceae	<i>Isoetes drummondii</i>	Oxalidaceae <i>Oxalis perennans</i>
Juncaceae	* <i>Juncus bufonius</i> <i>Juncus pallidus</i>	Papilionaceae <i>Bossiae eriocarpa</i> <i>Bossiae linophylla</i> <i>Bossiae ornata</i>
Juncaginaceae	<i>Triglochin centrocarpum</i> <i>Triglochin huegelii</i> <i>Triglochin mucronatum</i>	<i>Brachysema melanopetalum</i> <i>Brachysema praemorsum</i> <i>Callistachys lanceolata</i> <i>Daviesia incrassata</i> <i>Daviesia preissii</i>
Lamiaceae	<i>Hemiandra pungens</i>	
Lauraceae	<i>Cassytha racemosa</i>	
Lentibulariaceae	<i>Poly pompholyx multifida</i> <i>Utricularia inaequalis</i>	

Gompholobium marginatum	Restionaceae
Gompholobium polymorphum	Anarthria laevis
Gompholobium preissii	Anarthria prolifera
Gompholobium tomentosum	Desmocladus fasciculatus ms
Hovea trisperma var. grandiflora	Desmocladus flexuosus ms
Isotropis cuneifolia	Harperia lateriflora
Jacksonia furcellata	Hypolaena exsulca
Kennedia coccinea	Leptocarpus tenax
Kennedia prostrata	Lepyrodia drummondiana
Sphaerolobium vimineum	Lepyrodia muirii
Viminaria juncea	Lyginia barbata
Philydraceae	Meeboldina cana ms
Philydrella pygmaea	Rhamnaceae
Phormiaceae	Trymalium ledifolium
Dianella revoluta	Rosaceae
Stypandra glauca	* Acaena echinata
Pittosporaceae	Rubiaceae
Sollya heterophylla	Opercularia apiciflora
Poaceae	Opercularia hispidula
* Aira caryophyllea	Opercularia vaginata
Amphipogon amphipogonoides	* Sherardia arvensis
Amphipogon laguroides	Rutaceae
Amphipogon turbinatus	Boronia crenulata
* Avena barbata	Boronia megastigma
Austrodanthonia caespitosa	Boronia spathulata
Austrostipa pycnostachya	Santalaceae
* Briza maxima	Leptomeria cunninghamii
* Briza minor	Leptomeria scrobiculata
Deyeuxia quadrisetia	Scrophulariaceae
Hemarthria uncinata	* Parentucellia latifolia
* Holcus lanatus	Selaginellaceae
* Hordeum murinum	Selaginella gracillima
Neurachne alopecuroidea	Stackhousiaceae
Poa poiformis	Stackhousia monogyna
* Polypogon monspeliensis	Tripterococcus brunonis
Tetrastrymenia laevis	Styliidiaceae
* Vulpia myuros	Levenhookia pusilla
Polygonaceae	Levenhookia stipitata
Comesperma calymega	Styliidium brunonianum ssp. minor
Comesperma flavum	Styliidium calcaratum
Comesperma virgatum	Styliidium junceum ssp. brevius
Comesperma volubile	Styliidium luteum
* Polygala myrtifolia	Styliidium petiolare
Potamogetonaceae	Styliidium pulchellum
Ruppia megacarpa	Styliidium repens
Primulaceae	Styliidium schoenoides
* Anagallis arvensis	Styliidium sp.
Samolus junceus	Styliidium spathulatum
Proteaceae	Thymelaeaceae
Banksia grandis	Pimelea angustifolia
Banksia littoralis	Pimelea cracens ssp. glabra
Dryandra armata	Pimelea imbricata
Dryandra lindleyana	Pimelea ?lanata
Grevillea leptobotrys	Pimelea preissii
Hakea lissocarpha	Pimelea rosea
Hakea oleifolia	Pimelea suaveolens
Hakea prostrata	Pimelea sylvestris
Hakea ruscifolia	Tremandraceae
Hakea sulcata	Platytheca galiooides
Hakea trifurcata	Tetratheca hispidissima
Hakea undulata	Violaceae
Hakea varia	Hybanthus floribundus
Isopogon polypecephalus	Xanthorrhoeaceae
Isopogon teretifolius	Xanthorrhoea gracilis
Persoonia longifolia	Xanthorrhoea preissii
Petrophile media	Zamiaceae
Petrophile serruria	Macrozamia riedlei
Petrophile squamata	
Synaphea ?favosa	
Synaphea petiolaris	

PINDICUP NATURE RESERVE

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

Class A

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* sedge land (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 raphiophylla 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 royei* 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 sedge land** 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 sedge land** occurs on the lake floor and is flooded late into summer. The sedge land generally comprises monospecific stands of *B. vaginalis* although in some areas *B. arthrophylla* may dominate or co-dominate.
11. **Gahnia sedge land** 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 herland 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	
	<i>Ptilotus manglesii</i>
Anthericaceae	
	<i>Arthropodium preissii</i>
	<i>Caesia micrantha</i>
	<i>Caesia occidentalis</i>
	<i>Chamaescilla corymbosa</i>
	<i>Laxmannia sessiliflora</i>
	<i>Sowerbaea laxiflora</i>
	<i>Thysanotus manglesianus</i>
	<i>Thysanotus sparteus</i>
	<i>Thysanotus tenellus</i>
	<i>Tricoryne elatior</i>
Apiaceae	
	<i>Daucus glochidiatus</i>
	<i>Homalosciadium homalocarpum</i>
	<i>Hydrocotyle alata</i>
	<i>Platysace filiformis</i>
	<i>Schoenolaena tenuior</i>
	<i>Trachymene pilosa</i>
	<i>Xanthosia candida</i>
	<i>Xanthosia huegelii</i>
Asteraceae	
*	<i>Arctotheca calendula</i>
	<i>Asteridea pulverulenta</i>
	<i>Cotula cotuloides</i>
*	<i>Cotula turbinata</i>
	<i>Craspedia variabilis</i>
	<i>Euchiton gymnocephalus</i>
	<i>Gnephosis ?tenuissima</i>
	<i>Hyalosperma cotula</i>
*	<i>Hypochaeris glabra</i>
	<i>Lagenifera huegelii</i>
	<i>Millotia myosotidifolia</i>
	<i>Podolepis gracilis</i>
	<i>Podotheca angustifolia</i>
	<i>Polygonalepis stricta</i>
	<i>Pterochaeta paniculata</i>
	<i>Quinetia urvillei</i>
	<i>Rhodanthe citrina</i>
	<i>Rutidosis multiflora</i>
	<i>Siloxerus humifusus</i>
*	<i>Sonchus hydrophilus</i>
*	<i>Sonchus oleraceus</i>
*	<i>Vellereophyton dealbatum</i>
Caesalpiniaceae	
	<i>Labichea punctata</i>
Campanulaceae	
	<i>Wahlenbergia preissii</i>
Caryophyllaceae	
*	<i>Cerastium glomeratum</i>
Casuarinaceae	
	<i>Allocasuarina humilis</i>
	<i>Allocasuarina thuyoides</i>
Centrolepidaceae	
	<i>Aphelia cyperoides</i>
	<i>Brizula drummondii</i>
	<i>Centrolepis aristata</i>
	<i>Centrolepis drummondiana</i>
	<i>Centrolepis glabra</i>
Colchicaceae	
	<i>Burchardia congesta</i>
	<i>Burchardia monantha</i>
Crassulaceae	
	<i>Crassula colorata</i>
	<i>Crassula peduncularis</i>
Cupressaceae	
	<i>Actinostrobus pyramidalis</i>
Cyperaceae	
	<i>Baumea arthrophylla</i>
	<i>Baumea articulata</i>
	<i>Baumea juncea</i>
	<i>Baumea vaginalis</i>
	<i>Caustis sp. Boyanup(G.S. McCutcheon 1706)</i>
	<i>Chorizandra enodis</i>
*	<i>Cyathochaeta avenacea</i>
*	<i>Cyperus tenellus</i>
	<i>Gahnia trifida</i>
	<i>Isolepis cernua</i>
	<i>Isolepis stellata</i>
	<i>Lepidosperma angustatum</i>
	<i>Lepidosperma longitudinale</i>
	<i>Lepidosperma squamatum</i>
	<i>Lepidosperma tenuie</i>
	<i>Mesomelaena tetragona</i>
	<i>Schoenus ?caespitius</i>
	<i>Schoenus curvifolius</i>
	<i>Schoenus humilis</i>
	<i>Schoenus laevigatus</i>
	<i>Schoenus subbulbosus</i>
	<i>Schoenus subfascicularis</i>
	<i>Tetraria capillaris</i>
	<i>Tetraria octandra</i>
	<i>Tricostularia neesii</i>
Dasypogonaceae	
	<i>Dasypogon bromeliifolius</i>
	<i>Lomandra collina</i>
	<i>Lomandra micrantha</i>
	<i>Lomandra sericea</i>
	<i>Lomandra sonderi</i>
	<i>Lomandra suaveolens</i>
Dennstaedtiaceae	
	<i>Pteridium esculentum</i>
Dilleniaceae	
	<i>Hibbertia ?commutata</i>
	<i>Hibbertia amplexicaulis</i>
	<i>Hibbertia cunninghamii</i>
	<i>Hibbertia glomerata</i>
	<i>Hibbertia racemosa</i>
	<i>Hibbertia stellaris</i>
Droseraceae	
	<i>Drosera glanduligera</i>
	<i>Drosera macrantha</i>
	<i>Drosera menziesii</i>
	<i>Drosera stolonifera</i>
Epacridaceae	
	<i>Astroloma baxteri</i>
	<i>Astroloma ciliatum</i>
	<i>Astroloma pallidum</i>
	<i>Astroloma prostratum</i>

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

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

PINTICUP NATURE RESERVE

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

Class A

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), *Stylium 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 illicifolia woodland** occurs on poorly drained sandy flats in the western part of the reserve. Common understorey elements include *Adenanthes 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 raphiophylla 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		Crassulaceae
	Carpobrotus modestus	Crassula colorata
Amaranthaceae		Cyperaceae
	Ptilotus manglesii	Baumea articulata
Anthericaceae		Baumea juncea
	Borya scirpoidea	Baumea vaginalis
	Caesia micrantha	Caustis dioica
	Caesia occidentalis	Chorizandra enodis
	Chamaescilla corymbosa	Cyathochaeta avenacea
	Johnsonia acaulis	*
	Johnsonia lupulina	Cyperus tenellus
	Laxmannia sessiliflora	Gahnia ?aristata
	Sowerbaea laxiflora	Gahnia trifida
	Thysanotus arenarius	*
	Thysanotus manglesianus	Isolepis marginata
	Thysanotus patersonii	Lepidosperma ?gracile
	Thysanotus sparteus	Lepidosperma longitudinale
	Thysanotus tenellus	Lepidosperma squamatum
	Thysanotus triandrus	Lepidosperma tenue
	Tricoryne elatior	Mesomelaena stygia
Apiaceae		Mesomelaena tetragona
	Daucus glochidiatus	Schoenus curvifolius
	Homalosciadium homalocarpum	Schoenus efoliatus
	Hydrocotyle alata	Schoenus elegans
	Hydrocotyle pilifera	Schoenus humilis
	Platysace juncea	Schoenus tenellus
	Schoenolaena tenuior	Tetraria capillaris
	Trachymene pilosa	Tetraria octandra
	Xanthosia candida	Tricostularia neesii
	Xanthosia huegelii	
Asteraceae		Dasypogonaceae
*	Arctotheca calendula	Dasypogon bromeliifolius
	Brachyscome iberidifolia	Lomandra collina
	Craspedia variabilis	Lomandra sericea
	Euchiton sphaericus	Lomandra sonderi
	Hyalosperma cotula	Lomandra suaveolens
*	Hypochaeris glabra	Dennstaedtiaceae
	Lagenifera huegelii	Pteridium esculentum
	Millotia myosotidifolia	
	Podolepis gracilis	Dilleniaceae
	Rhodanthe pyrethrum	Hibbertia amplexicaulis
	Siloxerus humifusus	Hibbertia cunninghamii
*	Sonchus hydrophilus	Hibbertia racemosa
	Trichocline spathulata	Hibbertia stellaris
Campanulaceae		Droseraceae
	Wahlenbergia multicaulis	Drosera gigantea
	Wahlenbergia preissii	Drosera glanduligera
Casuarinaceae		Drosera menziesii
	Allocasuarina humilis	
Centrolepidiaceae		Epacridaceae
	Aphelia cyperoides	Andersonia sp.
	Centrolepis aristata	Astroloma baxteri
	Centrolepis drummondiana	Astroloma ciliatum
	Centrolepis mutica	Astroloma pallidum
Colchicaceae		Leucopogon australis
	Burchardia congesta	Leucopogon capitellatus
	Burchardia monantha	Leucopogon glabellus
		Leucopogon oxycedrus
		Lysinema ciliatum
		Sphenotoma gracile
Euphorbiaceae		
		Monotaxis occidentalis
		Phyllanthus calycinus
		Poranthera microphylla

Goodeniaceae	
<i>Anthotium junciforme</i>	<i>Eucalyptus cornuta</i>
<i>Dampiera alata</i>	<i>Eucalyptus decipiens</i>
<i>Dampiera diversifolia</i>	<i>Eucalyptus marginata</i>
<i>Dampiera hederacea</i>	<i>Eucalyptus occidentalis</i>
<i>Dampiera linearis</i>	<i>Eucalyptus rufa</i>
<i>Goodenia claytoniacea</i>	<i>Hypocalymma angustifolium</i>
<i>Goodenia micrantha</i>	<i>Kunzea micrantha</i>
<i>Goodenia mimuloides</i>	<i>Melaleuca cuticularis</i>
<i>Goodenia pulchella</i>	<i>Melaleuca densa</i>
<i>Scaevola phlebopetala</i>	<i>Melaleuca lateritia</i>
<i>Velleia trinervis</i>	<i>Melaleuca leptoclada</i>
Haemodoraceae	<i>Melaleuca preissiana</i>
<i>Anigozanthos bicolor</i>	<i>Melaleuca rhamphophylla</i>
<i>Anigozanthos flavidus</i>	<i>Melaleuca thymoides</i>
<i>Anigozanthos manglesii</i>	<i>Melaleuca viminea</i>
<i>Conostylis aculeata</i>	<i>Pericalymma ellipticum</i>
<i>Haemodorum laxum</i>	<i>Verticordia sp.</i>
<i>Haemodorum simplex</i>	
<i>Haemodorum sparsiflorum</i>	
<i>Haemodorum spicatum</i>	
<i>Tribonanthes violacea</i>	
Haloragaceae	
<i>Gonocarpus cordiger</i>	<i>Orchidaceae</i>
<i>Gonocarpus hexandrus</i>	<i>Caladenia flava</i>
<i>Gonocarpus paniculatus</i>	<i>Caladenia longicauda</i>
Hypoxidaceae	<i>Caladenia radialis</i>
<i>Hypoxis occidentalis</i>	<i>Drakaea sp.</i>
Iridaceae	<i>Elythranthera brunonis</i>
<i>Patersonia juncea</i>	<i>Elythranthera emarginata</i>
<i>Patersonia umbrosa</i>	<i>Microris atrata</i>
* <i>Watsonia bulbillifera</i>	<i>Microris media</i>
Juncaceae	<i>Microris orbicularis</i>
* <i>Juncus bufonius</i>	<i>* Monadenia bracteata</i>
<i>Juncus pallidus</i>	<i>Paracaleana nigrita</i>
<i>Juncus sp.</i>	<i>Prasophyllum drummondii</i>
Juncaginaceae	<i>Prasophyllum macrostachyum</i>
<i>Triglochin huegelii</i>	<i>Pterostylis recurva</i>
Lamiaceae	<i>Pterostylis vittata</i>
<i>Hemiandra pungens</i>	<i>Pyrorchis nigricans</i>
Lauraceae	<i>Thelymitra crinita</i>
<i>Cassytha glabella</i>	<i>Thelymitra pauciflora</i>
<i>Cassytha micrantha</i>	
<i>Cassytha racemosa</i>	
Lentibulariaceae	
<i>Polypompholyx multifida</i>	<i>Papilionaceae</i>
Lindsaeaceae	<i>Bossiaea linophylla</i>
<i>Lindsaea linearis</i>	<i>Bossiaea ornata</i>
Lobeliaceae	<i>Bossiaea praetermissa</i>
<i>Lobelia alata</i>	<i>Brachysema melanopetalum</i>
Loganiaceae	<i>Callistachys lanceolata</i>
<i>Logania campanulata</i>	<i>Daviesia hakeoides</i>
<i>Logania serpyllifolia</i>	<i>Daviesia incrassata</i>
Loranthaceae	<i>Daviesia physodes</i>
<i>Nuytsia floribunda</i>	<i>Daviesia preissii</i>
Menyanthaceae	<i>Gompholobium capitatum</i>
<i>Villarsia albiflora</i>	<i>Gompholobium confertum</i>
<i>Villarsia submersa</i>	<i>Gompholobium marginatum</i>
Mimosaceae	<i>Gompholobium polymorphum</i>
<i>Acacia biflora</i>	<i>Gompholobium preissii</i>
<i>Acacia extensa</i>	<i>Gompholobium scabrum</i>
<i>Acacia incurva</i>	<i>Gompholobium tomentosum</i>
<i>Acacia stenoptera</i>	<i>Hovea chorizemifolia</i>
Myoporaceae	<i>Hovea trisperma</i>
<i>Myoporum caprioides</i>	<i>Jacksonia furcellata</i>
Myrtaceae	<i>Jacksonia sparsa ms</i>
<i>Agonis juniperina</i>	<i>Kennedia prostrata</i>
<i>Astartea fascicularis</i>	<i>Oxylobium lineare</i>
<i>Astartea sp. (pink weeping)</i>	<i>Sphaerolobium vimineum</i>
<i>Baeckea camphorosmae</i>	
<i>Callistemon phoeniceus</i>	<i>Philydraceae</i>
<i>Calothamnus lateralis</i>	<i>Philydrella pygmaea</i>
<i>Calothamnus ?schaueri</i>	
<i>Calytrix angulata</i>	<i>Phormiaceae</i>
<i>Calytrix leschenaultii</i>	<i>Dianella revoluta</i>
<i>Eucalyptus calophylla</i>	
	<i>Pittosporaceae</i>
	<i>Billardiera parviflora</i>
	<i>Marianthus candidus</i>
	<i>Sollya heterophylla</i>
	<i>Poaceae</i>
	<i>Agrostis avenacea</i>
	<i>Amphipogon debilis</i>
	<i>Amphipogon turbinatus</i>
	* <i>Briza maxima</i>
	* <i>Briza minor</i>
	<i>Austrodanthonia setacea</i>
	<i>Austrostipa compressa</i>

Austrostipa pycnostachya	Harperia lateriflora
Austrostipa trichophylla	Hypolaena exsulca
Deyeuxia quadriseta	Leptocarpus tenax
Hemarthria uncinata	Lepyrodia muirii
* Holcus lanatus	Lyginia barbata
Neurachne alopecuroides	Meeboldina cana ms
Tetrarrhena laevis	Meeboldina tephrina ms
* Vulpia myuros	Tremulina tremula ms
Polygalaceae	Rhamnaceae
Comesperma calymega	Trymalium ledifolium
Comesperma flavum	Rubiaceae
Comesperma virgatum	Opercularia apiciflora
Comesperma volubile	Opercularia hispidula
Primulaceae	Opercularia vaginata
Samolus junceus	Rutaceae
Proteaceae	Boronia crenulata
Adenanthes obovatus	Boronia juncea ssp. laniflora
Banksia grandis	Boronia spathulata
Banksia illicifolia	Santalaceae
Banksia littoralis	Leptomeria squarrulosa
Dryandra bipinnatifida	Selaginellaceae
Dryandra lindleyana	Selaginella gracillima
Franklandia fucifolia	Stackhousiaceae
Grevillea depauperata	Stackhousia monogyna
Grevillea fasciculata	Tripterococcus brunonis
Hakea lissocarpa	Styliadiaceae
Hakea prostrata	Levenhookia pusilla
Hakea ruscifolia	Levenhookia stipitata
Hakea sulcata	Stylium brunonianum
Hakea undulata	Stylium crassifolium
Hakea varia	Stylium guttatum
Persoonia longifolia	Stylium mimeticum
Petrophile media	Stylium pulchellum
Stirlingia ?seselifolia	Stylium repens
Synaphea petiolaris	Stylium sp.
Restionaceae	Stylium spathulatum
Anarthria gracilis	Thymelaeaceae
Anarthria prolifera	Pimelea sulphurea
Apodasmia ceramophila ms	Zamiaceae
Chaetanthus aristatus ms	Macrozamia riedlei
Cytogonidium leptocarpoides ms	Zannichelliaceae
Desmocladus fasciculatus ms	Lepilaena australis

QUINDINUP NATURE RESERVE

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

Class C

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 aspera* (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 raphiophylla*-*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		
	<i>Ptilotus manglesii</i>	
Anthericaceae		
	<i>Agrostocrinum scabrum</i>	
	<i>Borya scirpoidea</i>	
	<i>Caesia micrantha</i>	
	<i>Caesia occidentalis</i>	
	<i>Chamaescilla corymbosa</i>	
	<i>Johnsonia acaulis</i>	
	<i>Johnsonia lupulina</i>	
	<i>Laxmannia sessiliflora</i>	
	<i>Sowerbaea laxiflora</i>	
	<i>Thysanotus manglesianus</i>	
	<i>Thysanotus multiflorus</i>	
	<i>Thysanotus thyrsoides</i>	
	<i>Tricoryne elatior</i>	
	<i>Tricoryne tenella</i>	
Apiaceae		
	<i>Daucus glochidiatus</i>	
	<i>Eryngium pinnatifidum</i>	
	<i>Homalosciadium homalocarpum</i>	
	<i>Hydrocotyle pilifera</i>	
	<i>Platysace juncea</i>	
	<i>Schoenolaena tenuior</i>	
	<i>Trachymene pilosa</i>	
	<i>Xanthosia atkinsoniana</i>	
	<i>Xanthosia candida</i>	
Asteraceae		
	* <i>Arctotheca calendula</i>	
	* <i>Conyza albida</i>	
	<i>Cotula coronopifolia</i>	
	<i>Craspedia variabilis</i>	
	<i>Euchiton sphaericus</i>	
	<i>Hyalosperma cotula</i>	
	* <i>Hypochaeris glabra</i>	
Lagenifera huegelii		
Millotia myosotidifolia		
Olearia paucidentata		
Picris angustifolia		
Podolepis gracilis		
Pterochaeta paniculata		
Quinetia urvillei		
Senecio minimus		
*	<i>Sonchus oleraceus</i>	
	<i>Trichocline spathulata</i>	
	<i>Waitzia nitida</i>	
	<i>Waitzia suaveolens</i>	
Campanulaceae		
	<i>Wahlenbergia multicaulis</i>	
	<i>Wahlenbergia preissii</i>	
Caryophyllaceae		
	*	<i>Cerastium glomeratum</i>
	*	<i>Petrorhagia velutina</i>
Casuarinaceae		
	<i>Allocasuarina ?microstachya</i>	
Centrolepidaceae		
	<i>Aphelia cyperoides</i>	
	<i>Centrolepis aristata</i>	
	<i>Centrolepis drummondiana</i>	
	<i>Centrolepis pilosa</i>	
Colchicaceae		
	<i>Burchardia congesta</i>	
	<i>Burchardia multiflora</i>	
Crassulaceae		
	<i>Crassula colorata</i>	
Cyperaceae		
	<i>Baumea juncea</i>	
	<i>Chorizandra enodis</i>	
	<i>Cyathochaeta avenacea</i>	
*	<i>Cyperus tenellus</i>	
	<i>Gahnia drummondii</i>	
	<i>Isolepis cernua</i>	

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

Daviesia cordata	Persoonia longifolia
Daviesia preissii	Petrophile serruriae
Gastrolobium bilobum	Stirlingia tenuifolia
Gompholobium confertum	Synaphea petiolaris
Gompholobium knightianum	Ranunculaceae
Gompholobium marginatum	Clematis aristata
Gompholobium preissii	Ranunculus colonorum
Gompholobium tomentosum	Restionaceae
Hardenbergia comptoniana	Anarthria prolifera
Hovea chorizemifolia	Desmocladus fasciculatus ms
Hovea trisperma	Desmocladus flexuosus ms
Isotropis cuneifolia	Hypolaena exsulca
Jacksonia furcellata	Lyginia barbata
Kennedia prostrata	Rhamnaceae
Sphaerolobium medium	Trymalium ledifolium
* Trifolium campestre	Rubiaceae
* Trifolium dubium	Opercularia apiciflora
* Trifolium subterraneum	Opercularia hispidula
Philydraceae	Rutaceae
Philydrella pygmaea	Boronia ramosa
Phormiaceae	Boronia spathulata
Dianella brevicaulis	Santalaceae
Dianella revoluta	Leptomeria scrobiculata
Pittosporaceae	Leptomeria squarrulosa
Billardiera ?variifolia	Scrophulariaceae
Sollya heterophylla	* Bellardia trixago
Poaceae	* Parentucellia latifolia
Agrostis avenacea	Selaginellaceae
* Aira caryophyllea	Selaginella gracillima
Amphipogon turbinatus	Stackhousiaceae
* Briza minor	Stackhousia monogyna
Austrodanthonia occidentalis	Tripterococcus brunonis
Austrostipa compressa	Styliadiaceae
Austrostipa pycnostachya	Levenhookia pusilla
* Holcus lanatus	Levenhookia stipitata
Microlaena stipoides	Stylium amoenum
Neurachne alopecuroides	Stylium brunonianum ssp. minor
* Polypogon monspeliensis	Stylium calcaratum
Tetrarhena laevis	Stylium junceum
* Vulpia myuros	Stylium luteum
Polygalaceae	Stylium piliferum
Comesperma virgatum	Stylium repens
Primulaceae	Stylium schoenoides
* Anagallis arvensis	Stylium spathulatum
Proteaceae	Thymelaeaceae
Banksia grandis	Pimelea angustifolia
Banksia littoralis	Pimelea rosea
Dryandra armata	Tremandraceae
Dryandra lindleyana	Tetratheca ?hirsuta
Dryandra sessilis	Violaceae
Grevillea fasciculata	Hybanthus floribundus
Hakea amplexicaulis	Xanthorrhoeaceae
Hakea lisocarpa	Xanthorrhoea gracilis
Hakea prostrata	Xanthorrhoea preissii
Hakea undulata	Zamiaceae
Hakea varia	Macrozamia riedlei

UNICUP NATURE RESERVE

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

Class A

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), *Stylium 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 rhamphophylla* 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 hermland 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	<i>Carpobrotus modestus</i>	Caryophyllaceae	<i>* Cerastium glomeratum</i> <i>Petrorhagia prolifera</i> <i>* Silene gallica</i>
Amaranthaceae	<i>Ptilotus manglesii</i>	Casuarinaceae	<i>Allocasuarina humilis</i> <i>Allocasuarina microstachya</i> <i>Allocasuarina thuyoides</i>
Anthericaceae	<i>Agrostocrinum scabrum</i> <i>Arthropodium preissii</i> <i>Borya scirpoidea</i> <i>Caesia micrantha</i> <i>Caesia occidentalis</i> <i>Chamaescilla corymbosa</i> <i>Chamaescilla spiralis</i> <i>Johnsonia acaulis</i> <i>Johnsonia lupulina</i> <i>Laxmannia minor</i> <i>Laxmannia sessiliflora</i> <i>Sowerbaea laxiflora</i> <i>Thysanotus manglesianus</i> <i>Thysanotus patersonii</i> <i>Thysanotus tenellus</i> <i>Thysanotus thyrsoides</i> <i>Tricoryne elatior</i> <i>Tricoryne humilis</i>	Centrolepidaceae	<i>Aphelia cyperoides</i> <i>Centrolepis alepyroides</i> <i>Centrolepis aristata</i> <i>Centrolepis drummondiana</i> <i>Centrolepis glabra</i> <i>Centrolepis pilosa</i> <i>Centrolepis polygyna</i>
Apiaceae	<i>Daucus glochidiatus</i> <i>Homalosciadium homalocarpum</i> <i>Hydrocotyle alata</i> <i>Hydrocotyle pilifera</i> <i>Platysace filiformis</i> <i>Platysace juncea</i> <i>Schoenolaena tenuior</i> <i>Trachymene pilosa</i> <i>Xanthosia candida</i> <i>Xanthosia huegelii</i>	Chenopodiaceae	<i>Dysphania glomulifera</i> ssp. <i>glomulifera</i> <i>Dysphania plantaginella</i> <i>Halosarcia ?indica</i> <i>Sarcocornia quinqueflora</i>
Aspleniaceae	<i>Asplenium flabellifolium</i>	Colchicaceae	<i>Burchardia congesta</i> <i>Burchardia monantha</i> <i>Burchardia multiflora</i>
Asteraceae	<i>Angianthus preissianus</i> <i>Angianthus tomentosus</i> * <i>Arctotheca calendula</i> <i>Asteridea pulverulenta</i> <i>Brachyscome ciliaris</i> <i>Brachyscome iberidifolia</i> <i>Cotula coronopifolia</i> <i>Cotula cotuloides</i> <i>Craspedia variabilis</i> <i>Euchiton sphaericus</i> <i>Gnephosis tenuissima</i> <i>Hyalosperma cotula</i> * <i>Hypochaeris glabra</i> <i>Lagenifera huegelii</i> <i>Millotia tenuifolia</i> <i>Olearia paucidentata</i> <i>Pithocarpa corymbulosa</i> <i>Podolepis gracilis</i> <i>Podolepis lessonii</i> <i>Podotheca angustifolia</i> <i>Pogonolepis stricta</i> * <i>Pseudognaphalium luteoalbum</i> <i>Pterochaeta paniculata</i> <i>Quinetia urvillei</i> <i>Rhodanthe citrina</i> <i>Rutidosis multiflora</i> <i>Senecio glomeratus</i> <i>Senecio minimus</i> <i>Siloxerus humifusus</i> * <i>Vellereophyton dealbatum</i> <i>Vittadinia australasica</i>	Convolvulaceae	<i>Wilsonia backhousei</i> <i>Wilsonia humilis</i>
Campanulaceae	<i>Wahlenbergia multicaulis</i> <i>Wahlenbergia preissii</i> <i>Wahlenbergia stricta</i>	Crassulaceae	<i>Crassula colorata</i> <i>Crassula pedicellosa</i>
		Cupressaceae	<i>Actinostrobus pyramidalis</i>
		Cyperaceae	<i>Baumea articulata</i> <i>Baumea juncea</i> <i>Baumea rubiginosa</i> <i>Baumea vaginalis</i> <i>Caustis dioica</i> <i>Chorizandra enodis</i> <i>Cyathochaeta avenacea</i> <i>Cyathochaeta clandestina</i> <i>Gahnia trifida</i> <i>Isolepis cernua</i> <i>Isolepis fluitans</i> * <i>Isolepis marginata</i> <i>Isolepis oldfieldiana</i> <i>Isolepis stellata</i> <i>Lepidosperma angustatum</i> <i>Lepidosperma longitudinale</i> <i>Lepidosperma squamatum</i> <i>Lepidosperma ?tenue</i> <i>Mesomelaena graciliceps</i> <i>Mesomelaena stygia</i> <i>Mesomelaena tetragona</i> <i>Schoenus curvifolius</i> <i>Schoenus efoliatus</i> <i>Schoenus elegans</i> <i>Schoenus grandiflorus</i> <i>Schoenus humilis</i> <i>Schoenus loliaceus</i> <i>Schoenus nanus</i> <i>Schoenus natans</i> <i>Schoenus odontocarpus</i> <i>Schoenus subbulbosus</i> <i>Schoenus subflavus</i> <i>Schoenus sublateralis</i> <i>Schoenus submicrostachyus</i> <i>Schoenus tenellus</i> <i>Tetraira capillaris</i> <i>Tetraira octandra</i> <i>Tricostularia neesii</i>
		Dasypogonaceae	<i>Chamaexeros serra</i> <i>Dasypogon bromeliifolius</i>

Lomandra caespitosa	Haloragaceae
Lomandra collina	Glischrocaryon aureum
Lomandra hermaphrodita	Hydatellaceae
Lomandra micrantha	Hydatella sp.
Lomandra nigricans	Trituria submersa
Lomandra purpurea	Hypoxidaceae
Lomandra sericea	Hypoxis occidentalis
Lomandra suaveolens	Iridaceae
Dilleniaceae	Patersonia juncea
Hibbertia acerosa	Patersonia occidentalis
Hibbertia commutata	Patersonia occidentalis (swamp form)
Hibbertia cunninghamii	*
Hibbertia ?polystachya	Romulea rosea
Hibbertia pulchra	Juncaceae
Hibbertia racemosa	* Juncus bufonius
Hibbertia silvestris	Juncus pallidus
Hibbertia stellaris	Juncaginaceae
Hibbertia subvaginata	Triglochin calcitrapum
Hibbertia vaginata	Triglochin centrocarpum
Droseraceae	Triglochin huegelii
Drosera bulbigena	Triglochin mucronatum
Drosera erythrorhiza	Lamiaceae
Drosera gigantea	Hemiandra pungens
Drosera glanduligera	Lauraceae
Drosera macrantha	Cassytha glabella
Drosera menziesii	Cassytha racemosa
Drosera paleacea	Lentibulariaceae
Drosera pallida	Polypompholyx multifida
Drosera stolonifera	Polypompholyx tenella
Epacridaceae	Utricularia volubilis
Andersonia ?caerulea	Lindsaeaceae
Astroloma ?baxteri	Lindsaea linearis
Astroloma ciliatum	Lobeliaceae
Astroloma pallidum	Grammatotheca bergiana
Astroloma prostratum	Isotoma hypocrateriformis
Leucopogon australis	Lobelia alata
Leucopogon capitellatus	Lobelia gibbosa
Leucopogon conostephoides	Lobelia heterophylla
Leucopogon ?elatior	Loganiaceae
Leucopogon gibbosus	Logania serpyllifolia
Leucopogon pendulus	Phyllangium paradoxum
Leucopogon propinquus	Loranthaceae
Leucopogon verticillatus	Nuytsia floribunda
Lysinema ciliatum	Lycopodiaceae
Euphorbiaceae	Phylloglossum drummondii
Monotaxis occidentalis	Lythraceae
Phyllanthus calycinus	* Lythrum hyssopifolia
Poranthera huegelii	Menyanthaceae
Poranthera microphylla	Villarsia albiflora
Pseudanthus virgatus	Villarsia parnassifolia
Gentianaceae	Mimosaceae
* Centaurium erythraea	Acacia biflora
* Cicendia filiformis	Acacia cyclops
Sebaea ovata	Acacia extensa
Geraniaceae	Acacia huegelii
Geranium solanderi	Acacia laricina var. laricina
Pelargonium littorale	Acacia latipes
Goodeniaceae	Acacia pulchella
Anthotium junciforme	Acacia rostellifera
Dampiera ?alata	Acacia saligna
Dampiera linearis	Acacia stenoptera
Dampiera trigona	Acacia tetragonocarpa
Goodenia micrantha	Acacia varia
Goodenia pulchella	Myoporaceae
Velleia trinervis	Myoporum caprarioides
Haemodoraceae	Myrtaceae
Anigozanthos humilis	Actinodium cunninghamii
Anigozanthos manglesii	Agonis parviceps
Conostylis aculeata	Astartea sp. (pink weeping)
Conostylis setigera	Astartea sp. (pink weeping)
Haemodorum laxum	Baeckea camphorosmae
Haemodorum simplex	Calothamnus lateralis
Haemodorum sparsiflorum	Calothamnus lehmannii
Haemodorum spicatum	Calothamnus ?preissii
Tribonanthes sp Lake Muir	Calytrix flavescens
	Calytrix leschenaultii

Calytrix ?tenuiramea	Papilionaceae
Darwinia ?vestita	Bossiaeae eriocarpa
Eremaea pauciflora	Bossiaeae linophylla
Eucalyptus calophylla	Bossiaeae ornata
Eucalyptus cornuta	Bossiaeae praetermissa
Eucalyptus decipiens	Brachysema melanopetalum
Eucalyptus ?latens	Brachysema praemorsum
Eucalyptus occidentalis	Chorizema aciculare
Eucalyptus rufa	Chorizema ?ilicifolium
Eucalyptus wandoo	Daviesia cordata
Hypocalymma angustifolium	Daviesia hakeoides
Hypocalymma strictum	Daviesia ?incrastata
Kunzea ericifolia	Daviesia preissii
Kunzea recurva	Gompholobium aristatum
Leptospermum erubescens	Gompholobium burtonioides
Melaleuca cuticularis	Gompholobium capitatum
Melaleuca densa	Gompholobium confertum
Melaleuca lateritia	Gompholobium knightianum
Melaleuca pauciflora	Gompholobium marginatum
Melaleuca preissiana	Gompholobium ovatum
Melaleuca rhamphophylla	Gompholobium polymorphum
Melaleuca thymoides	Gompholobium preissii
Melaleuca viminea	Gompholobium scabrum
Pericalymma ellipticum	Hovea chorizemifolia
Verticordia densiflora	Hovea trisperma var. grandiflora
Verticordia habrantha	Isotropis cuneifolia
Olacaceae	Jacksonia ?furcellata
Olax phyllanthi	Kennedia prostrata
Onagraceae	Pultenaea ericifolia
Epilobium billardierianum	Pultenaea ochreata
Ophioglossaceae	Pultenaea reticulata
Ophioglossum lusitanicum	Sphaerolobium drummondii
Orchidaceae	Sphaerolobium linophyllum
Caladenia cairnsiana	Sphaerolobium medium
Caladenia flava	*
Caladenia latifolia	Trifolium campestre
Caladenia longicauda	*
Caladenia macrostylis	Trifolium cernuum
Caladenia magniclavata	Viminaria juncea
Caladenia marginata	Philydraceae
Caladenia radiata	Philydrella pygmaea
Caladenia reptans	Phormiaceae
Caladenia rhomboidiformis	Dianella brevicaulis
Caladenia splendens ms	Dianella revoluta
Corybas recurvus	Stypandra glauca
Cryptostylis ovata	Pittosporaceae
Cyrtostylis robusta	Billardiera drummondiana var.
Drakaea livida	Billardiera erubescens
Elythranthera brunonis	Billardiera parviflora var. parviflora
Elythranthera emarginata	Marianthus candidus
Leporella fimbriata	Sollya heterophylla
Lyperanthus serratus	Poaceae
Microtis atrata	Agrostis avenacea
Microtis media	*
Microtis orbicularis	Aira caryophyllea
*	Amphipogon debilis
Monadenia bracteata	Amphipogon strictus
Paracaleana nigrita	*
Praecoxanthus aphyllus ms	Anthoxanthum odoratum
Prasophyllum macrostachyum	*
Pterostylis barbata	Briza maxima
Pterostylis nana	*
Pterostylis recurva	Briza minor
Pterostylis sanguinea	*
Pyrorchis nigricans	Bromus diandrus
Thelymitra antennifera	Austrodanthonia occidentalis
Thelymitra benthamiana	Austrostipa compressa
Thelymitra crinita	Austrostipa ?pycnostachya
Thelymitra flexuosa	Deyeuxia quadriseta
Thelymitra pauciflora	Dichelachne crinita
Orobanchaceae	Hemarthria uncinata
*	*
Orobanche minor	Holcus lanatus
Oxalidaceae	*
Oxalis perennans	Holcus setiger
*	*
Oxalis purpurea	Lolium multiflorum
	Microlaena stipoides
	Neurachne alopecuroides
	Poa drummondiana
	Poa poiformis
	*
	Polypogon monspeliensis
	Polypogon tenellus
	Sporobolus virginicus
	Tetraherena laevis
	*
	Vulpia myuros

Polygalaceae		
	<i>Comesperma calymega</i>	
	<i>Comesperma drummondii</i>	
	<i>Comesperma flavum</i>	
	<i>Comesperma ?volubile</i>	
Polygonaceae		
	<i>Muehlenbeckia adpressa</i>	
	<i>Persicaria prostrata</i>	
Potamogetonaceae		
	<i>Potamogeton drummondii</i>	
	<i>Ruppia megacarpa</i>	
Primulaceae		
	*	<i>Anagallis arvensis</i>
		<i>Samolus juncetus</i>
Proteaceae		
	<i>Adenanthes obovatus</i>	
	<i>Banksia grandis</i>	
	<i>Banksia ilicifolia</i>	
	<i>Banksia littoralis</i>	
	<i>Banksia meisneri</i> ssp. <i>meisneri</i>	
	<i>Conospermum capitatum</i>	
	<i>Conospermum flexuosum</i> ssp. <i>laevigatum</i>	
	<i>Dryandra armata</i>	
	<i>Dryandra bipinnatifida</i>	
	<i>Dryandra lindleyana</i>	
	<i>Dryandra porrecta</i>	
	<i>Franklandia fucifolia</i>	
	<i>Grevillea brownii</i>	
	<i>Grevillea leptobotrys</i>	
	<i>Grevillea pilulifera</i>	
	<i>Grevillea pulchella</i>	
	<i>Grevillea quercifolia</i>	
	<i>Hakea ceratophylla</i>	
	<i>Hakea corymbosa</i>	
	<i>Hakea gilbertii</i>	
	<i>Hakea lissocarpha</i>	
	<i>Hakea prostrata</i>	
	<i>Hakea ruscifolia</i>	
	<i>Hakea trifurcata</i>	
	<i>Hakea undulata</i>	
	<i>Hakea varia</i>	
	<i>Isopogon ?attenuatus</i>	
	<i>Isopogon teretifolius</i>	
	<i>Personia longifolia</i>	
	<i>Petrophile acicularis</i>	
	<i>Petrophile divaricata</i>	
	<i>Petrophile ?longifolia</i>	
	<i>Petrophile media</i>	
	<i>Petrophile rigida</i>	
	<i>Petrophile serruriae</i>	
	<i>Petrophile squamata</i>	
	<i>Stirlingia simplex</i>	
	<i>Synaphea decumbens</i>	
	<i>Synaphea petiolaris</i>	
	<i>Synaphea ?reticulata</i>	
Ranunculaceae		
	<i>Clematis pubescens</i>	
	<i>Ranunculus colonorum</i>	
Restionaceae		
	<i>Anarthria ?gracilis</i>	
	<i>Anarthria prolifera</i>	
	<i>Anarthria scabra</i>	
	<i>Chaetanthus aristatus</i> ms	
	<i>Desmocladus fasciculatus</i> ms	
	<i>Desmocladus flexuosus</i> ms	
	<i>Harperia lateriflora</i>	
	<i>Hypolaena exsulca</i>	
	<i>Leptocarpus ?tenellus</i>	
	<i>Lepyrodia macra</i>	
	<i>Lepyrodia muiiri</i>	
	<i>Lyginia barbata</i>	
	<i>Meeboldina coangustata</i> ms	
	<i>Meeboldina scariosa</i> ms	
	<i>Meeboldina tephrina</i> ms	
	<i>Tremulina tremula</i> ms	
Rhamnaceae		
	<i>Cryptandra</i> sp.	
	<i>Trymalium ?ledifolium</i>	
Rubiaceae		
	*	<i>Galium murale</i>
		<i>Opercularia apiciflora</i>
		<i>Opercularia hispidula</i>
		<i>Opercularia ?rubiooides</i>
		<i>Opercularia vaginata</i>
Rutaceae		
	<i>Boronia crenulata</i>	
	<i>Boronia megastigma</i>	
	<i>Boronia nematophylla</i>	
	<i>Boronia ramosa</i>	
	<i>Boronia spathulata</i>	
Santalaceae		
	<i>Leptomeria cunninghamii</i>	
	<i>Leptomeria spinosa</i>	
	<i>Leptomeria squarrulosa</i>	
Scrophulariaceae		
	<i>Gratiola peruviana</i>	
	*	<i>Parentucellia latifolia</i>
	*	<i>Parentucellia viscosa</i>
Selaginellaceae		
	<i>Selaginella gracillima</i>	
Stackhousiaceae		
	<i>Stackhousia monogyna</i>	
	<i>Tripterococcus brunonis</i>	
Sterculiaceae		
	<i>Thomasia foliosa</i>	
	<i>Thomasia pauciflora</i>	
Stylidiaceae		
	<i>Levenhookia pusilla</i>	
	<i>Levenhookia stipitata</i>	
	<i>Styliidium amoenum</i>	
	<i>Styliidium assimile</i>	
	<i>Styliidium brunonianum</i> ssp. <i>minor</i>	
	<i>Styliidium calcaratum</i>	
	<i>Styliidium guttatum</i>	
	<i>Styliidium inundatum</i>	
	<i>Styliidium junceum</i> ssp. <i>brevius</i>	
	<i>Styliidium mimeticum</i>	
	<i>Styliidium perpusillum</i>	
	<i>Styliidium petiolare</i>	
	<i>Styliidium repens</i>	
	<i>Styliidium ?roseonanum</i>	
	<i>Styliidium scandens</i>	
	<i>Styliidium schoenoides</i>	
	<i>Styliidium spathulatum</i>	
Thymelaeaceae		
	<i>Pimelea angustifolia</i>	
	<i>Pimelea rosea</i>	
	<i>Pimelea suaveolens</i>	
Tremandraceae		
	<i>Tetrapeteca setigera</i>	
	<i>Tetrapeteca virgata</i>	
	<i>Tremandra diffusa</i>	
Typhaceae		
	*	<i>Typha orientalis</i>
Violaceae		
	<i>Hybanthus floribundus</i>	
Xanthorrhoeaceae		
	<i>Xanthorrhoea gracilis</i>	
	<i>Xanthorrhoea preissii</i>	
Zamiaceae		
	<i>Macrozamia riedlei</i>	
Zannichelliaceae		
	<i>Lepilaena australis</i>	

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), *Stylium 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 raphiophylla* 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 hermland 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	Tricoryne elatior Tricoryne tenella
Carpobrotus modestus	
Amaranthaceae	Apiaceae
Ptilotus manglesii	Daucus glochidiatus Eryngium pinnatifidum Homalosciadium homalocarpum Hydrocotyle alata Hydrocotyle callicarpa Schoenolaena tenuior Trachymene pilosa
Anthericaceae	Xanthosia candida Xanthosia huegelii
Agrostocrinum scabrum	Asteraceae
Arthropodium preissii	Blennospora drummondii Cotula coronopifolia Craspedia variabilis
Borya scirpoidea	*
Caesia micrantha	Dittrichia graveolens
Caesia occidentalis	
Chamaescilla corymbosa	
Chamaescilla sp.	
Johnsonia lupulina	
Sowerbaea laxiflora	
Thysanotus manglesianus	

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	Euphorbiaceae
Hyalosperma cotula	Phyllanthus calycinus
* Hypochaeris glabra	Poranthera microphylla
Lagenifera huegelii	Gentianaceae
Millotia myosotidifolia	* Centaurium erythraea
Myriocephalus occidentalis	* Cicendia filiformis
Podolepis gracilis	Geraniaceae
* Pseudognaphalium luteoalbum	Geranium solanderi
Rhodanthe citrina	Goodeniaceae
Senecio glomeratus	Dampiera alata
Siloxerus humifusus	Dampiera linearis
* Sonchus asper	Lechenaultia formosa
* Sonchus oleraceus	Scaevola platyphylla
Trichocline sp.	Haemodoraceae
* Vellereophyton dealbatum	Anigozanthos manglesii
Centrolepidaceae	Conostylis aculeata
Aphelia cyperoides	Conostylis aurea
Centrolepis aristata	Haemodorum laxum
Centrolepis glabra	Haemodorum simplex
Centrolepis humillima	Haemodorum spicatum
Centrolepis polygyna	Tribonanthes australis
Chenopodiaceae	Tribonanthes longipetala
* Atriplex prostrata	Tribonanthes violacea
Colchicaceae	Haloragaceae
Burchardia congesta	Glischrocaryon aureum
Burchardia monantha	Gonocarpus paniculatus
Burchardia multiflora	Myriophyllum limnophilum
Cyperaceae	Hydatellaceae
Baumea articulata	Hydatella australis
Baumea juncea	Hypoxidaceae
Baumea vaginalis	Hypoxis occidentalis
Chorizandra enodis	Iridaceae
Cyathochaeta avenacea	Patersonia juncea
* Cyperus tenellus	Patersonia occidentalis
Isolepis cernua	Isoetaceae
Isolepis oldfieldiana	Isoetes drummondii
Lepidosperma angustatum	Juncaceae
Lepidosperma longitudinale	* Juncus bufonius
Lepidosperma squamatum	* Juncus capitatus
Lepidosperma tenue	Juncaginaceae
Mesomelaena stygia	Triglochin centrocarpum
Mesomelaena tetragona	Triglochin huegelii
Schoenus brevisetis	Lauraceae
Schoenus efoliatus	Cassytha racemosa
Schoenus laevigatus	Lentibulariaceae
Tetraria capillaris	Polypompholyx multifida
Tetraria octandra	Utricularia hookeri
Tricostularia neesii var. neesii	Linaceae
Dasypogonaceae	Linum marginale
Chamaexeros serra	Lindsaeaceae
Lomandra caespitosa	Lindsaea linearis
Lomandra sericea	Lobeliaceae
Lomandra suaveolens	Lobelia alata
Dilleniaceae	Lobelia gibbosa
Hibbertia ?amplexicaulis	Loganiaceae
Hibbertia commutata	Logania serpyllifolia
Hibbertia cunninghamii	Lycopodiaceae
Hibbertia racemosa	Phylloglossum drummondii
Hibbertia spicata ssp. spicata	Menyanthaceae
Hibbertia stellaris	Villarsia albiflora
Droseraceae	Mimosaceae
Drosera erythrorhiza	Acacia alata
Drosera gigantea	Acacia extensa
Drosera glanduligera	Acacia huegelii
Drosera macrantha	Acacia incurva
Drosera neesii	Acacia nervosa
Epacridaceae	Acacia pulchella
Astroloba baxteri	Acacia saligna
Astroloba ciliatum	Acacia stenoptera
Astroloba pallidum	Myrtaceae
Leucopogon capitellatus	Agonis parviceps
Leucopogon parviflorus	Calothamnus preissii
Leucopogon propinquus	Eucalyptus calophylla
Leucopogon verticillatus	Eucalyptus cornuta

Eucalyptus decipiens	Microlaena stipoides
Eucalyptus marginata	Neurachne alopecuroidea
Eucalyptus rufis	Poa poiformis
Hypocalymma angustifolium	*
Kunzea ?micrantha	Polypogon monspeliensis
Kunzea recurva	Tetrastrrena laevis
Melaleuca lateritia	*
Melaleuca preissiana	Vulpia myuros
Melaleuca rhaphiophylla	Polygalaceae
Melaleuca thymoides	Comesperma virgatum
Melaleuca viminea	Comesperma volubile
Pericalymma ellipticum	Polygonaceae
Onagraceae	*
Epilobium billardierianum	Rumex pulcher
Orchidaceae	Primulaceae
Caladenia flava	Samolus junceus
Caladenia longicauda	Proteaceae
Caladenia marginata	Banksia grandis
Caladenia radialis	Banksia littoralis
Cystostylis robusta	Dryandra lindleyana
Diuris carinata	Grevillea fasciculata
Diuris laxiflora	Grevillea pluriflora
Elythranthera brunonis	Hakea corymbosa
Elythranthera emarginata	Hakea lissocarpa
Microtis media	Hakea prostrata
*	Hakea ruscifolia
Monadenia bracteata	Hakea varia
Pterostylis nana	Persoonia longifolia
Pterostylis recurva	Petrophile media
Pterostylis vittata	Synaphea aff. petiolaris
Pyrorchis nigricans	Synaphea petiolaris
Thelymitra antennifera	Restionaceae
Thelymitra crinita	Anarthria prolifera
Thelymitra flexuosa	Chordifex latus ms
Thelymitra pauciflora	Desmocladus fasciculatus ms
Papilionaceae	Desmocladus flexuosus ms
Bossiaea eriocarpa	Harperia lateriflora
Bossiaea linophylla	Hypolaena exsulca
Bossiaea ornata	Lepyrodia macra
Brachysema praemorsum	Lyginia barbata
Chorizema aciculare	Meeboldina cana ms
Daviesia preissii	Rosaceae
Gompholobium marginatum	*
Gompholobium ovatum	Acaena echinata
Gompholobium preissii	Rubiaceae
Gompholobium tomentosum	Opercularia hispidula
Jacksonia furcellata	Rutaceae
Kennedia prostrata	Boronia spathulata
*	Santalaceae
Lotus angustissimus	Leptomeria squarrulosa
Sphaerolobium medium	Scrophulariaceae
Viminaria juncea	*
Philydraceae	Parentucellia latifolia
Philydrella drummondii	*
Philydrella pygmaea	Parentucellia viscosa
Phormiaceae	Selaginellaceae
Dianella brevicaulis	Selaginella gracillima
Dianella revoluta	Stackhousiaceae
Stypandra glauca	Stackhousia monogyna
Pittosporaceae	Styliadiaceae
Sollya heterophylla	Styliodium brunonianum ssp. minor
Plantaginaceae	Styliodium calcaratum
Plantago debilis	Styliodium ecorne
Poaceae	Styliodium inundatum
*	Styliodium junceum
Aira caryophyllea	Styliodium mimeticum
Austrostipa compressa	Styliodium petiolare
Austrostipa pycnostachya	Styliodium pulchellum
*	Styliodium repens
Briza maxima	Styliodium sp.
*	Styliodium spathulatum
Briza minor	Thymelaeaceae
*	Pimelea angustifolia
Bromus diandrus	Pimelea lehmanniana
Deyeuxia quadrisetata	Tremandraceae
Hemarthria uncinata	Platytheca galiooides
*	Tetratheca affinis
Hordeum leporinum	Tetratheca setigera
*	Tetratheca virgata
Hordeum ?muranum	
*	
Lolium rigidum	

Violaceae

Hybanthus floribundus

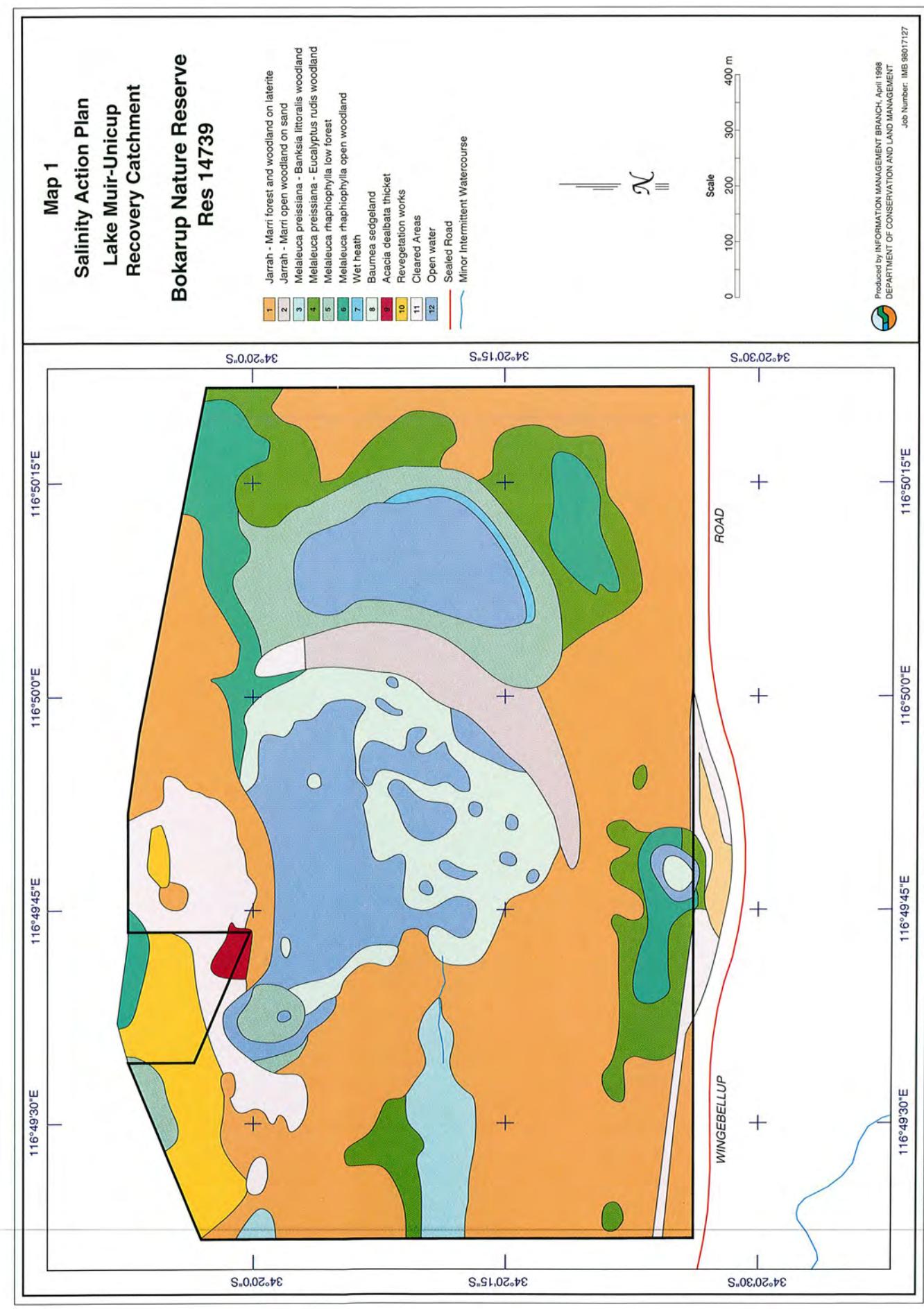
Xanthorrhoeaceae

Xanthorrhoea gracilis

Xanthorrhoea preissii

Zamiaceae

Macrozamia riedlei

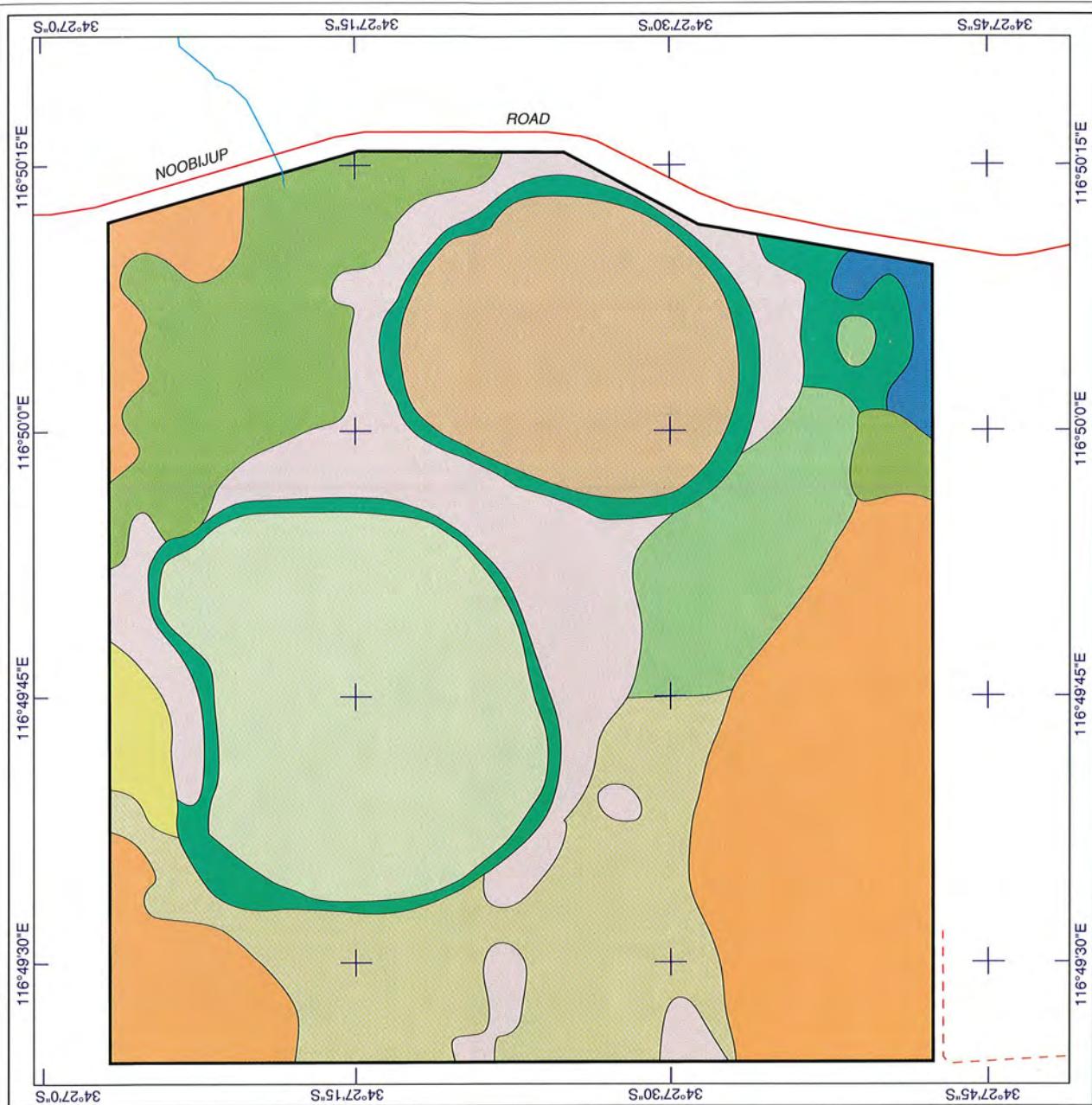


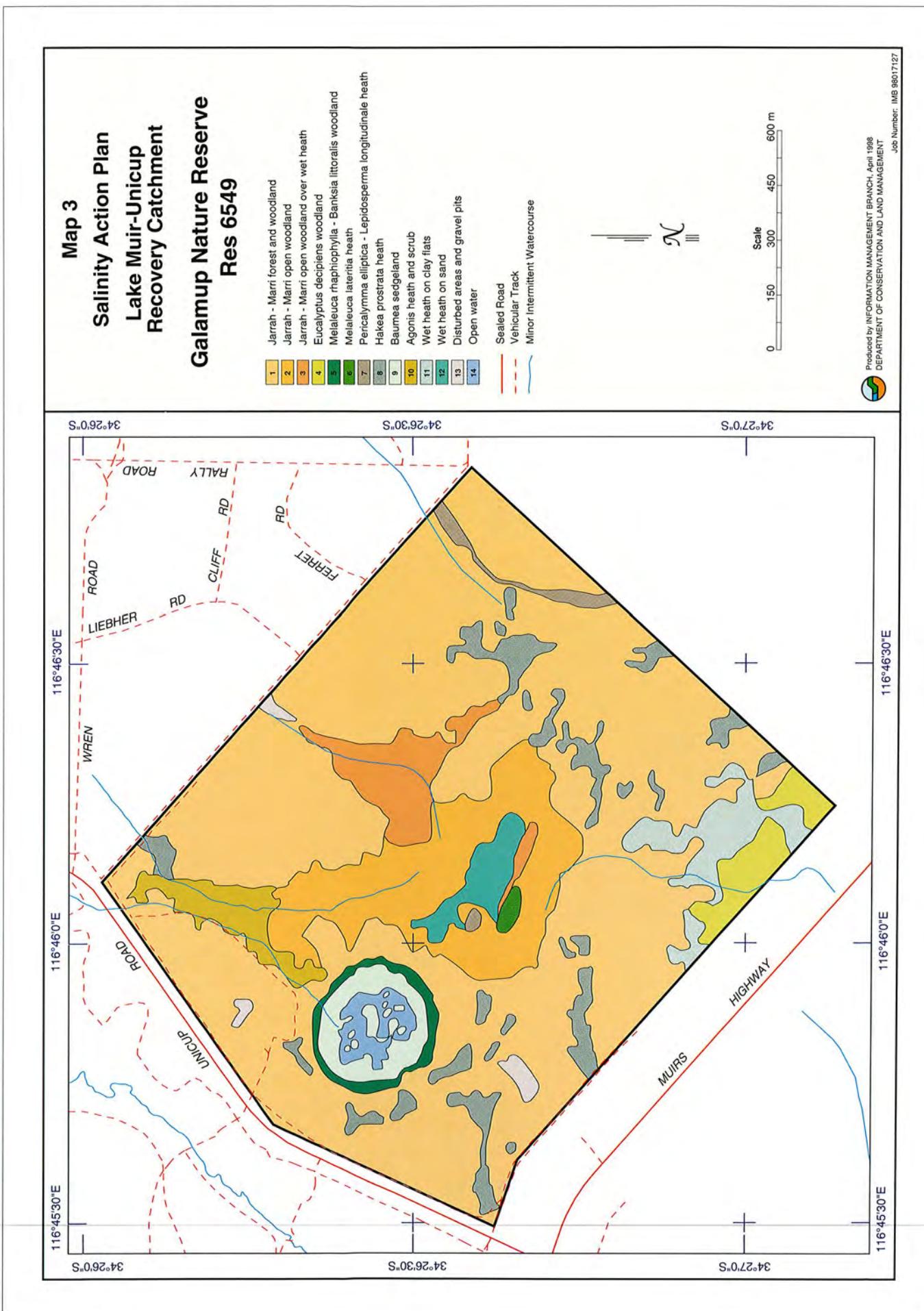
Map 2
Salinity Action Plan
Lake Muir-Unicup
Recovery Catchment
Res 26681

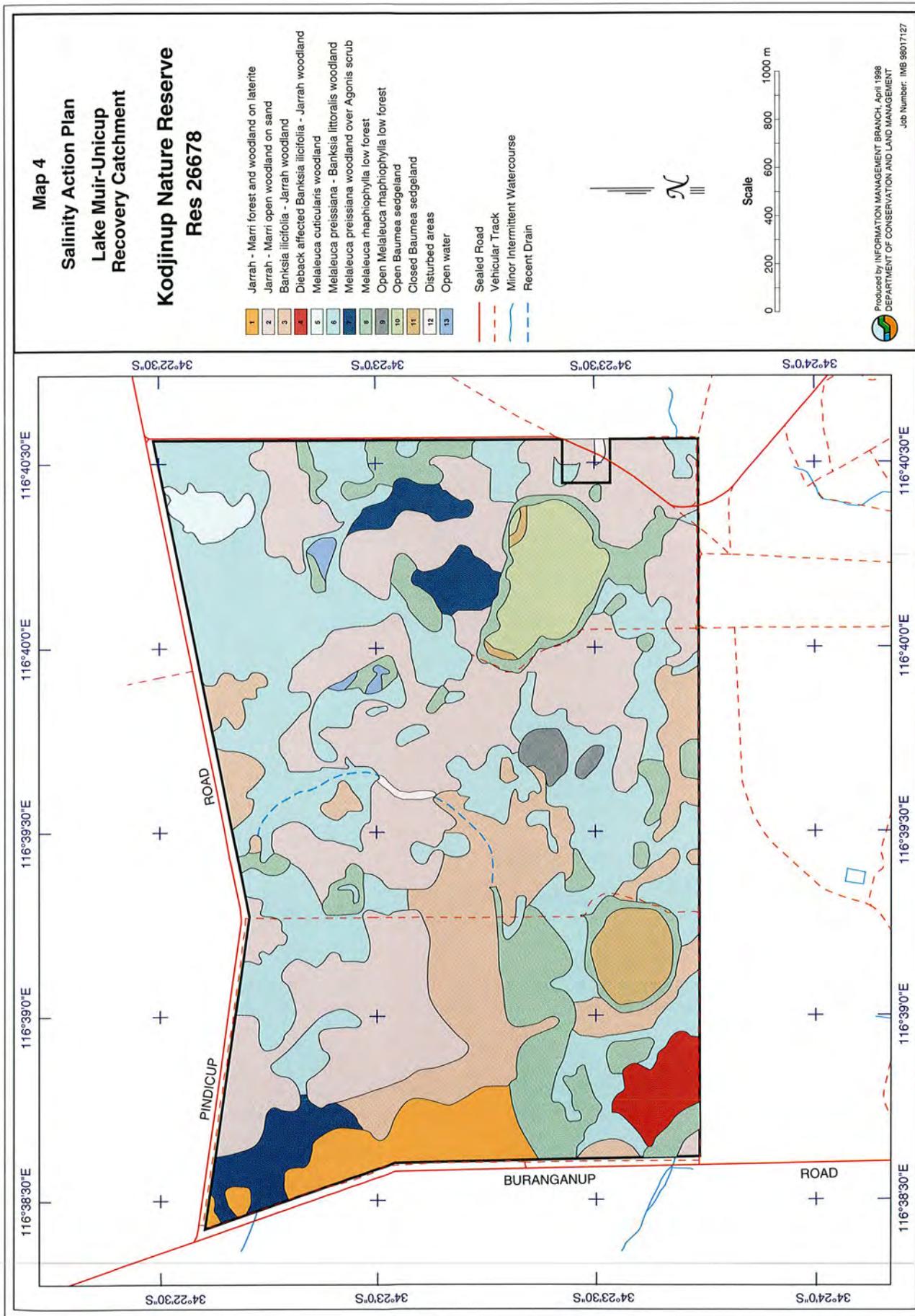
- 1 Jarrah - Marri open woodland on sand
 - 2 Melaleuca preissiana woodland
 - 3 Eucalyptus decipiens woodland
 - 4 Melaleuca rhamphophylla woodland
 - 5 Melaleuca rhamphophylla over wet heath
 - 6 Melaleuca lateritia - Hakea varia heath
 - 7 Heathland on clay flats
 - 8 Open Baumea sedge land
 - 9 Closed Baumea sedge land
- 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: IML 98017127







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

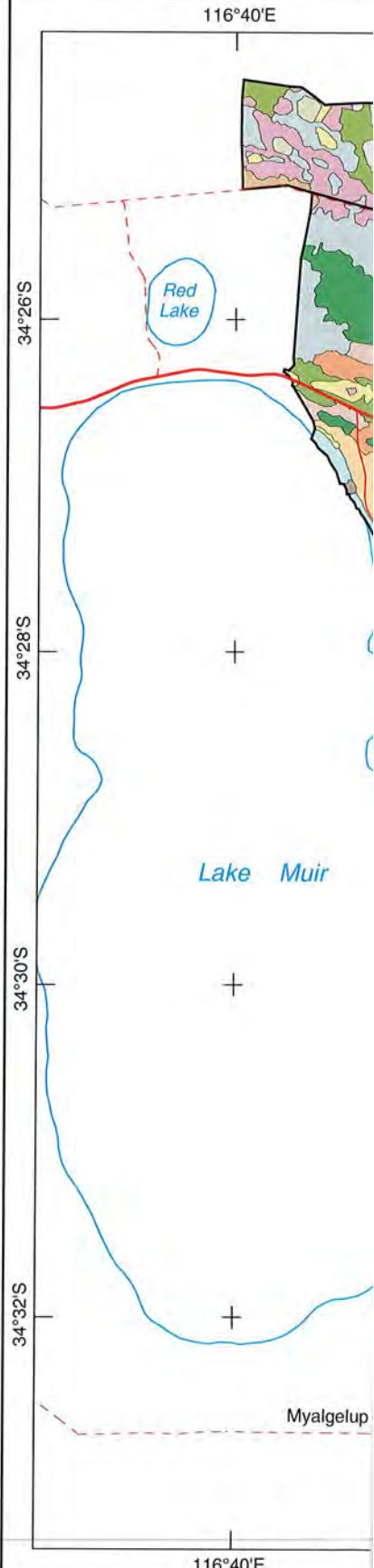


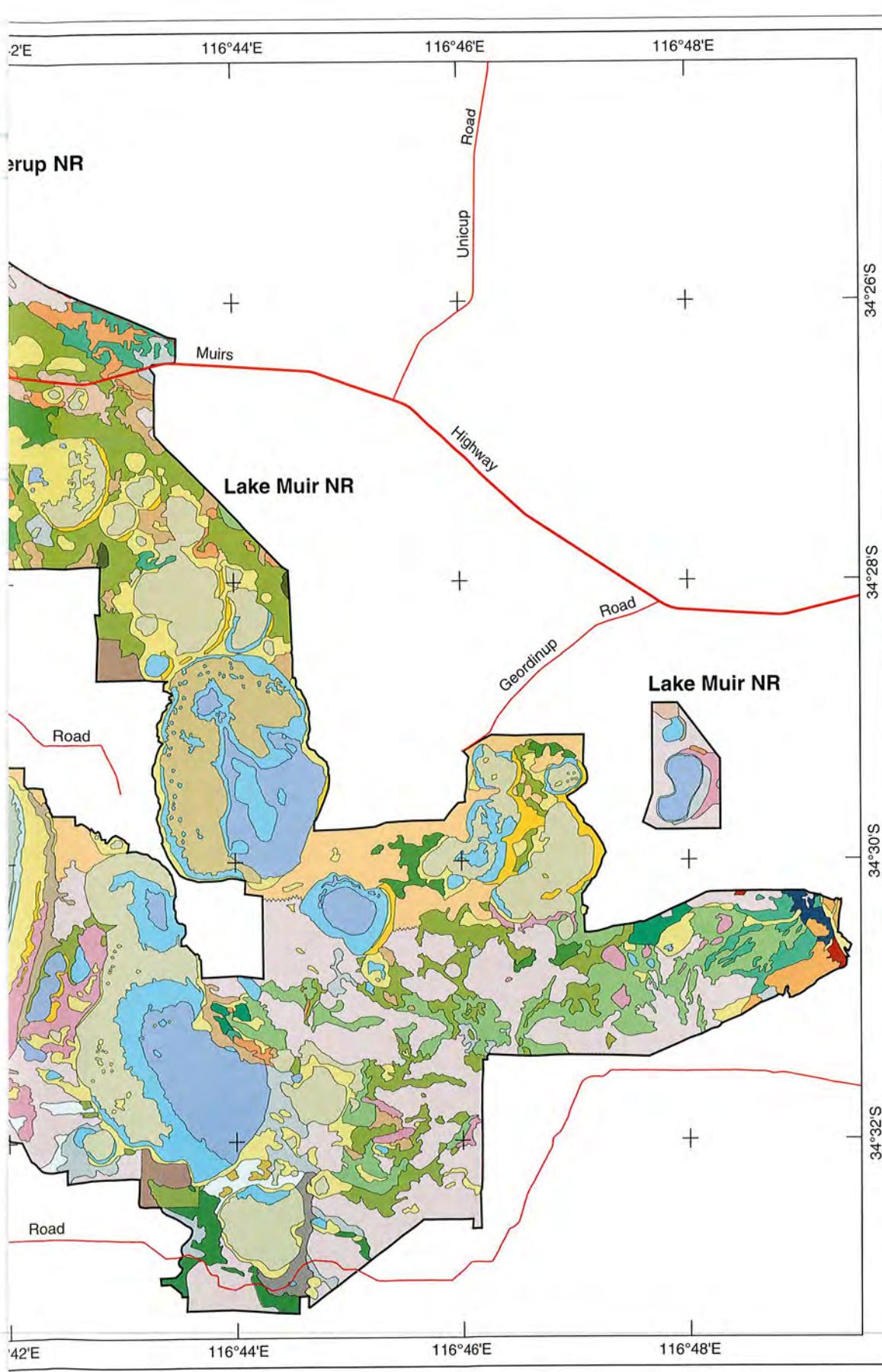
Scale
 0 1 2 3 4 5 km



Produced by INFORMATION MANAGEMENT BRANCH, August 1999
 DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

Job Number: IMB 98017127





Map 6
Salinity Action Plan
Lake Muir-Unicup
Recovery Catchment

Noobijup Nature Reserve
Res 26680

- 1 Jarrah - Marri forest and woodland on laterite
- 2 Jarrah - Marri open woodland on sand
- 3 Eucalyptus decipiens, open woodland
- 4 Melaleuca rhaphiophylla - Eucalyptus rufida open woodland
- 5 Melaleuca rhaphiophylla low forest
- 6 Wet heath on clay flats
- 7 Open Baumea sedge land
- 8 Closed Baumea sedge land
- 9 Salt affected vegetation

- Sealed Road
- Vehicular Track
- Minor Intermittent Watercourse



Scale
 0 125 250 375 500 m

34°24'30"S

34°24'0"S

34°24'0"S

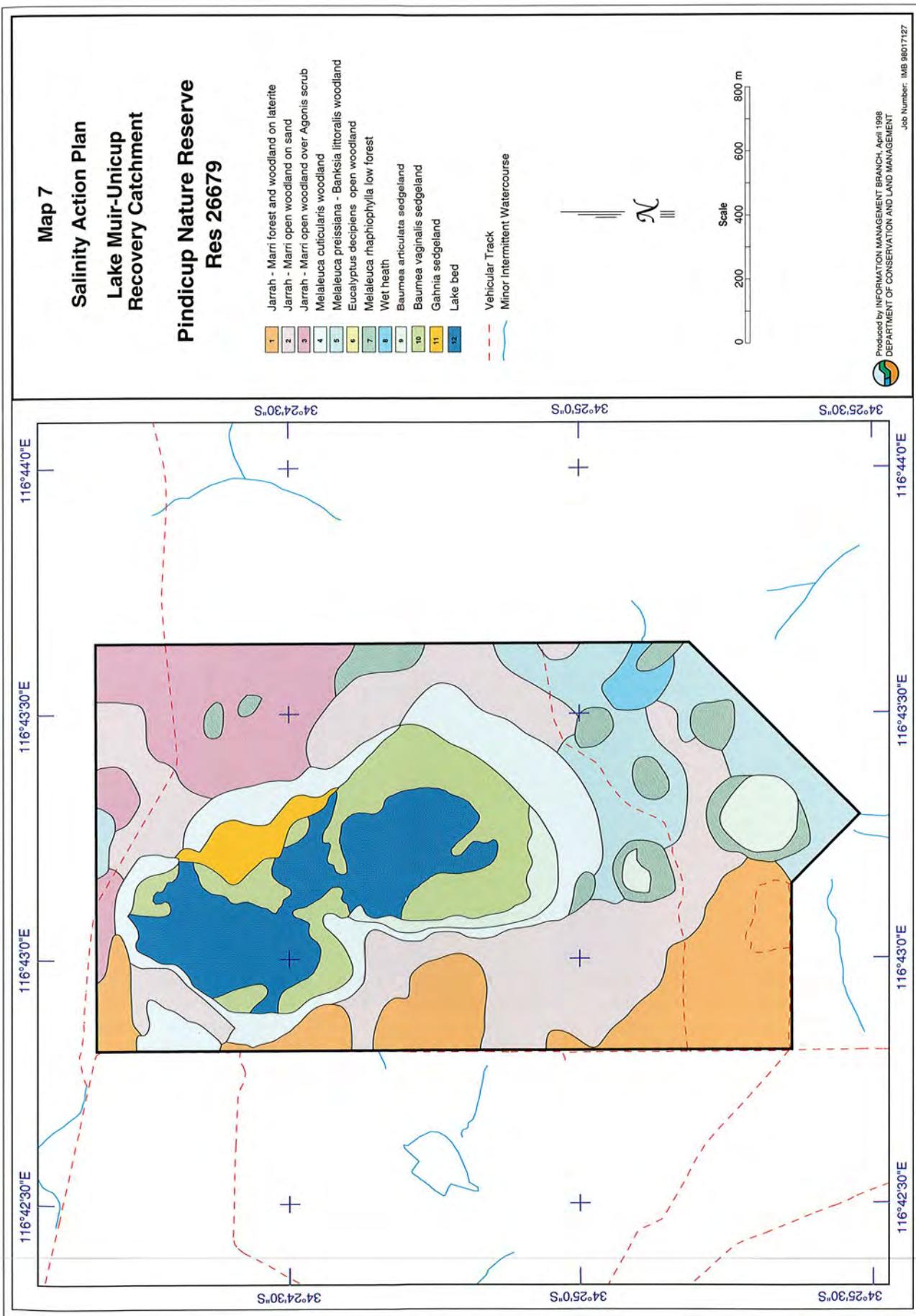
116°47'0"E

116°47'30"E

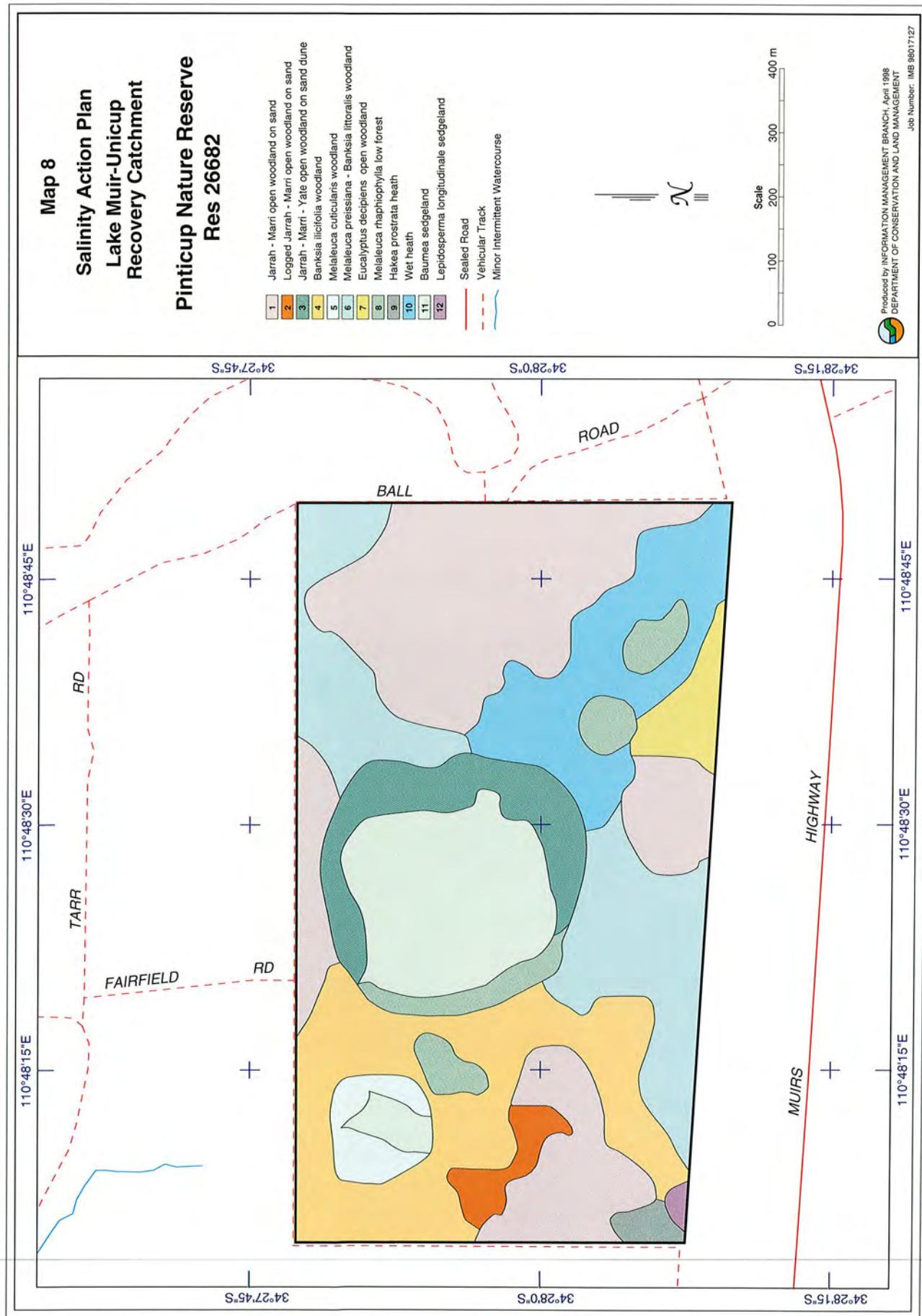
34°24'0"S

116°47'0"E

Job Number: IMB 080/7127



Produced by INFORMATION MANAGEMENT BRANCH, April 1998
DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
Job Number: IMLB 98017127



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*
- Hemicroa 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 laetus*
- 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

- * *Callitrichie stagnalis*

Campanulaceae

- Wahlenbergia gracilenta*
- Wahlenbergia multicaulis*
- Wahlenbergia preissii*
- Wahlenbergia stricta*

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

Hibbertia stellaris	Dampiera ?juncea
Hibbertia subvaginata	Dampiera linearis
Hibbertia vaginata	Dampiera pedunculata
Droseraceae	Dampiera trigona
Drosera bulbigena	Goodenia claytoniacea
Drosera bulbosa	Goodenia micrantha
Drosera erythrorhiza	Goodenia mirmuloides
Drosera gigantea	Goodenia pulchella
Drosera glanduligera	Lechenaultia biloba
Drosera heterophylla	Lechenaultia expansa
Drosera macrantha	Lechenaultia formosa
Drosera menziesii	Scaevola globulifera
Drosera neesii	Scaevola lanceolata
Drosera paleacea	Scaevola phlebopetala
Drosera pallida	Scaevola platyphylla
Drosera pulchella	Velleia trinervis
Drosera rosulata	
Drosera stolonifera	
Epacridaceae	Haemodoraceae
Andersonia caerulea	Anigozanthos bicolor
Astroloma baxteri	Anigozanthos flavidus
Astroloma ciliatum	Anigozanthos humilis
Astroloma microcalyx	Anigozanthos manglesii
Astroloma pallidum	Anigozanthos viridis
Astroloma prostratum	Conostylis aculeata
Leucopogon australis	Conostylis aurea
Leucopogon capitellatus	Conostylis laxiflora
Leucopogon conostephoides	Conostylis setigera
Leucopogon ?elatior	Haemodorum laxum
Leucopogon gibbosus	Haemodorum simplex
Leucopogon glabellus	Haemodorum sparsiflorum
Leucopogon lasiophyllus	Haemodorum spicatum
Leucopogon oxycedrus	Phlebocarya ciliata
Leucopogon parviflorus	Tribonanthes australis
Leucopogon pendulus	Tribonanthes brachypetala
Leucopogon ?polymorphus	Tribonanthes longipetala
Leucopogon propinquus	Tribonanthes sp Lake Muir (GJK & NG 2387)
Leucopogon pulchellus	Tribonanthes violacea
Leucopogon ?sprengelioides	
Leucopogon tamariscinus	Haloragaceae
Leucopogon unilateralis	Glischrocaryon aureum
Leucopogon verticillatus	Gonocarpus cordiger
Lysinema ciliatum	Gonocarpus hexandrus ssp. integrifolius
Needhamiella pumilio	Gonocarpus paniculatus
Sphenotoma capitatum	Gonocarpus pithyoides
Sphenotoma gracile	Haloragis brownii
Styphelia tenuiflora	Myriophyllum crispatum
Euphorbiaceae	Myriophyllum drummondii
Amperea simulans	Myriophyllum limnophilum
Amperea volubilis	Myriophyllum tillaeoides
Monotaxis occidentalis	Myriophyllum verrucosum
Phyllanthus calycinus	
Poranthera huegelii	Hydatellaceae
Poranthera microphylla	Hydatella australis
Pseudanthus virgatus	Hydatella sp.
Fumariaceae	Trithuria bibracteata
* Fumaria capreolata	Trithuria submersa
Gentianaceae	
* Centaurium erythraea	Hypoxidaceae
Centaurium spicatum	Hypoxis glabella
* Cicindia filiformis	Hypoxis occidentalis
Sebaea ovata	Iridaceae
Geraniaceae	* Gladiolus undulatus
* Erodium botrys	* Homeria flaccida
* Erodium cicutarium	* Iris germanica
* Erodium moschatum	Patersonia juncea
Geranium solanderi	Patersonia occidentalis
Pelargonium littorale	Patersonia occidentalis (swamp form)
Goodeniaceae	Patersonia umbrosa
Anthotium humile	* Romulea rosea
Anthotium junciforme	* Watsonia bulbillifera
Dampiera alata	Isoetaceae
Dampiera cuneata	Isoetes drummondii
Dampiera diversifolia	
Dampiera fasciculata	Juncaceae
Dampiera hederacea	* Juncus acutus
	* Juncus articulatus
	* Juncus bufonius
	* Juncus capitatus
	Juncus holoschoenus
	Juncus kraussii
	Juncus pallidus

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

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

Philydraceae	<i>Comesperma virgatum</i>
<i>Philydrella drummondii</i>	<i>Comesperma volubile</i>
<i>Philydrella pygmaea</i>	*
Phormiaceae	<i>Polygala myrtifolia</i>
<i>Dianella brevicaulis</i>	<i>Polygonaceae</i>
<i>Dianella revoluta</i>	<i>Muehlenbeckia adpressa</i>
<i>Stypandra glauca</i>	<i>Persicaria prostrata</i>
Pinaceae	*
* <i>Pinus pinaster</i>	<i>Polygonum arenastrum</i>
Pittosporaceae	*
<i>Billardiera drummondiana</i> var. <i>drummondiana</i>	<i>Rumex acetosella</i>
<i>Billardiera erubescens</i>	*
<i>Billardiera parviflora</i> var. <i>parviflora</i>	<i>Rumex brownii</i>
<i>Billardiera variifolia</i>	*
<i>Marianthus candidus</i>	<i>Rumex conglomeratus</i>
<i>Sollya heterophylla</i>	*
Plantaginaceae	<i>Rumex crispus</i>
<i>Plantago debilis</i>	*
<i>Plantago exilis</i>	<i>Rumex pulcher</i>
Poaceae	<i>Portulacaceae</i>
<i>Agrostis avenacea</i>	<i>Calandrinia ?composita</i>
* <i>Aira caryophyllea</i>	<i>Calandrinia granulifera</i>
<i>Amphibromus nervosus</i>	<i>Montia australasica</i>
<i>Amphibromus vickeryae</i>	<i>Potamogetonaceae</i>
<i>Amphipogon amphipogonoides</i>	<i>Potamogeton drummondii</i>
<i>Amphipogon debilis</i>	<i>Potamogeton tricarinatus</i>
<i>Amphipogon laguroides</i>	<i>Ruppia megacarpa</i>
<i>Amphipogon strictus</i>	<i>Primulaceae</i>
<i>Amphipogon turbinatus</i>	* <i>Anagallis arvensis</i> var. <i>arvensis</i>
* <i>Anthoxanthum odoratum</i>	* <i>Anagallis arvensis</i> var. <i>caerulea</i>
* <i>Avena barbata</i>	<i>Samolus caespitosus</i>
* <i>Avena fatua</i>	<i>Samolus junceus</i>
<i>Austrodanthonia caespitosa</i>	<i>Proteaceae</i>
<i>Austrodanthonia occidentalis</i>	<i>Adenanthes obovatus</i>
<i>Austrodanthonia setacea</i>	<i>Banksia grandis</i>
<i>Austrostipa compressa</i>	<i>Banksia ilicifolia</i>
<i>Austrostipa juncifolia</i>	<i>Banksia littoralis</i>
<i>Austrostipa pycnostachya</i>	<i>Banksia meisneri</i> ssp. <i>meisneri</i>
<i>Austrostipa trichophylla</i>	<i>Conospermum capitatum</i>
* <i>Briza maxima</i>	<i>Conospermum flexuosum</i> ssp. <i>laevigatum</i>
* <i>Briza minor</i>	<i>Dryandra armata</i>
* <i>Bromus diandrus</i>	<i>Dryandra bipinnatifida</i>
* <i>Cynodon dactylon</i>	<i>Dryandra lindleyana</i>
* <i>Cynosurus echinatus</i>	<i>Dryandra porrecta</i>
<i>Deyeuxia quadrisetoides</i>	<i>Dryandra sessilis</i>
<i>Dichelachne crinita</i>	<i>Franklandia fucifolia</i>
<i>Eragrostis ?brownii</i>	<i>Grevillea brownii</i>
<i>Eragrostis elongata</i>	<i>Grevillea depauperata</i>
<i>Hemarthria uncinata</i>	<i>Grevillea ?diversifolia</i>
* <i>Holcus lanatus</i>	<i>Grevillea fasciculata</i>
* <i>Holcus setiger</i>	<i>Grevillea leptobotrys</i>
* <i>Hordeum geniculatum</i>	<i>Grevillea pilulifera</i>
* <i>Hordeum leporinum</i>	<i>Grevillea pulchella</i>
* <i>Hordeum murinum</i>	<i>Grevillea quercifolia</i>
* <i>Lolium multiflorum</i>	<i>Hakea amplexicaulis</i>
* <i>Lolium rigidum</i>	<i>Hakea ceratophylla</i>
<i>Microlaena stipoides</i>	<i>Hakea corymbosa</i>
<i>Neurachne alopecuroides</i>	<i>Hakea gilbertii</i>
* <i>Parapholis incurva</i>	<i>Hakea lissocarpa</i>
* <i>Poa annua</i>	<i>Hakea oleifolia</i>
<i>Poa drummondiana</i>	<i>Hakea prostrata</i>
<i>Poa poiformis</i>	<i>Hakea ruscifolia</i>
* <i>Polypogon monspeliensis</i>	<i>Hakea sulcata</i>
<i>Polypogon tenellus</i>	<i>Hakea trifurcata</i>
<i>Sporobolus virginicus</i>	<i>Hakea undulata</i>
* <i>Stenotaphrum secundatum</i>	<i>Hakea varia</i>
<i>Tetrarrhena laevis</i>	<i>Isopogon ?attenuatus</i>
* <i>Vulpia bromoides</i>	<i>Isopogon polycephalus</i>
* <i>Vulpia myuros</i>	<i>Isopogon teretifolius</i>
Podocarpaceae	<i>Persoonia longifolia</i>
<i>Podocarpus drouynianus</i>	<i>Petrophile acicularis</i>
Polygalaceae	<i>Petrophile divaricata</i>
<i>Comesperma calymega</i>	<i>Petrophile ?longifolia</i>
<i>Comesperma ciliatum</i>	<i>Petrophile media</i>
<i>Comesperma drummondii</i>	<i>Petrophile rigida</i>
<i>Comesperma flavum</i>	<i>Petrophile serruria</i>
	<i>Petrophile squamata</i>
	<i>Stirlingia anethifolia</i>
	<i>Stirlingia ?seselifolia</i>
	<i>Stirlingia ?simplex</i>
	<i>Stirlingia tenuifolia</i>
	<i>Synaphea decumbens</i>
	<i>Synaphea favosa</i>

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

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