



Lake Campion Nature Reserve (24789) and Reserve (21759) revisited

BOTANICAL CONSULTANTS REPORT
FOR THE DEPARTMENT OF ENVIRONMENT AND
CONSERVATION
WESTERN AUSTRALIA
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Also a sincere thank you to Ben Bayliss for providing the NVIS descriptions. Thankyou to Ben and Judith Harvey for assistance in the field.

1.0 Introduction

Lake Champion is situated approximately 40kms north of Merredin. In April 1990 the present author carried out a vegetation and flora survey of Lake Champion Nature Reserve and Reserve (21759). Ben Bayliss is now digitising the vegetation map and using NVIS vegetation descriptions to describe each map polygon. Ecoscape remapped Reserve 21759 in 2005 and there are some discrepancies between the 1990 map and the Ecoscape map.

The present author is also examining plant communities growing on gypsum in the wheatbelt region and information from the Lake Champion area is limited. SAP sites in the area do not record gypsum as present and the only sites recording gypsum by Mattiske (1995) are adjacent to Lake Brown to the NW. The taxonomy of plants listed as growing on dunes in the 1990 survey needed updating and the gypsum content of the *Eucalyptus salicola* dune areas verified.

Aims

- Check the *Eucalyptus salicola/salmonophloia* sites on Reserve 21759 to clarify mapping by Anne Coates and Ecoscape
- Supply simplified Muir and NVIS descriptions of Vegetation types to assist with the descriptions of map polygons
- Take soil samples from *Eucalyptus salicola* dune sites to test for gypsum
- Collect plant specimens from gypsum dunes and dunes carrying *Eucalyptus salicola* vegetation communities to clarify which plant species grow on gypsiferous soils.

2.0 Method

Gypsum Dunes

The field work was carried out on 30th August 2010. The work included the sampling of sites up to 60m in diameter on dune areas. Information recorded at each site included:

- GPS location at the centre of sites
- Vegetation classification - Muir description (1977)
- Vegetation condition
- Inventory of plant species
- Any DRF or priority species
- Physical description including soils and topography. Soil samples were taken from *Eucalyptus salicola* sites and analysed by the Chemical Centre of WA.
- A high resolution digital photograph

Vegetation association descriptions in the field were based on the classification system devised by Muir (1977) which was specifically designed for describing wheatbelt vegetation (see Table 1). The condition of the vegetation described follows the Vegetation Condition Scale modified from Trudgen 1991 by B.J. Keighery for the Swan Coastal Plain Survey 1993 (Table 3).

TABLE 1 - MUIR SYSTEM OF VEGETATION CLASSIFICATION

LIFE FORM/ HEIGHT CLASS	CANOPY COVER			
	DENSE 70-100% d	MID-DENSE 30-70% c	SPARSE 10-30% i	VERY SPARSE 2-10% r
T Trees > 30m M Trees 15-30m LA Trees 5-15m LB Trees < 5m	Dense Tall Forest Dense Forest Dense Low Forest A Dense Low Forest B	Tall Forest Forest Low Forest A Low Forest B	Tall Woodland Woodland Low Woodland A Low Woodland B	Open Tall Woodland Open Woodland Open Low Woodland A Open Low Woodland B
KT Mallee tree form KS Mallee shrub form	Dense Tree Mallee Dense Shrub Mallee	Tree Mallee Shrub Mallee	Open Tree Mallee Open Shrub Mallee	Very Open Tree Mallee Very Open Shrub Mallee
S Shrubs > 2m SA Shrubs 1.5-2.0m SB Shrubs 1.0-1.5m SC Shrubs 0.5-1.0m SD Shrubs 0.0-0.5m	Dense Thicket Dense Heath A Dense Heath B Dense Low Heath C Dense Low Heath D	Thicket Heath A Heath B Low Heath C Low Heath D	Scrub Low Scrub A Low Scrub B Dwarf Scrub C Dwarf Scrub D	Open Scrub Open Low Scrub A Open Low Scrub B Open Dwarf Scrub C Open Dwarf Scrub D
P Mat plants H Hummock Grass GT Bunch grass > 0.5m GL Bunch grass < 0.5m J Herbaceous spp.	Dense Mat plants Dense Hum. Grass Dense Tall Grass Dense Low Grass Dense Herbs	Mat plants Mid-Dense Hum. Grass Tall Grass Low Grass Herbs	Open Mat plants Hummock Grass Open Tall Grass Open Low Grass Open Herbs	Very Open Mat plants Open Hummock Grass Very Open Tall Grass Very Open Low Grass Very Open Herbs
VT Sedges > 0.5m VL Sedges < 0.5m	Dense Tall Sedges Dense Low Sedges	Tall Sedges Low Sedges	Open Tall Sedges Open Low Sedges	Very Open Tall Sedges Very Open Low Sedges
X Ferns Mosses, liverwort	Dense Ferns Dense Mosses	Ferns Mosses	Open Ferns Open Mosses	Very Open Ferns Very Open Mosses

Table 2 Vegetation Condition Scale

Modified from Trudgen 1991 by B.J. Keighery for the Swan Coastal Plain Survey 1993
1 = Pristine Pristine or nearly so, no obvious signs of disturbance
2 = Excellent Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. For example damage to trees caused by fire, the presence of non - aggressive weeds and occasional vehicle tracks.
3 = Very Good Vegetation structure altered, obvious signs of disturbance. For example disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4 = Good Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate to it. For example disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
5 = Degraded Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds, partial clearing, dieback and grazing.
6 = Completely degraded The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

Specimens of plant species encountered were collected and identified using keys and by comparison with specimens at the Western Australian Herbarium. Plant specimens of interest will be lodged in the WA Herbarium. Experts involved in revising particular genera were consulted wherever possible to ensure accuracy with identification.

Map Work

Areas of reserve 21759 adjacent to the Chandler – Nungarin Road were examined including the Ecoscape sites MD05-17-02, MD05-17-03 and MD05-17-05. Eucalyptus specimens were examined and identified in the field and a voucher collected from site MD05-17-03. The NVIS system of vegetation classification was used to describe the vegetation associations for each map polygons see Table 4 from the Australian Vegetation attribute Manual Version 6.0.

Table 4: NVIS Structural Formation Terminology

	Cover Characteristics							
	Foliage cover *	70-100	30-70	10-30	<10	≈0	0-5	unknown
	Crown cover **	>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
	% Cover ***	>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
	Cover code	d	c	i	r	bi	bc	unknown
Growth Form	Height Ranges (m)	Structural Formation Classes						
tree, palm	<10, 10-30, >30	closed forest	open forest	woodland	open woodland	isolated trees	isolated clumps of trees	trees
tree mallee	<3, <10, 10-30	closed mallee forest	open mallee forest	mallee woodland	open mallee woodland	isolated mallee trees	isolated clumps of mallee trees	mallee trees
shrub, cycad, grass-tree, tree-fern	<1, 1-2, >2	closed shrubland	shrubland	open shrubland	sparse shrubland	isolated shrubs	isolated clumps of shrubs	shrubs
mallee shrub	<3, <10, 10-30	closed mallee shrubland	mallee shrubland	open mallee shrubland	sparse mallee shrubland	isolated mallee shrubs	isolated clumps of mallee shrubs	mallee shrubs
heath shrub	<1, 1-2, >2	closed heathland	heathland	open heathland	sparse heathland	isolated heath shrubs	isolated clumps of heath shrubs	heath shrubs
chenopod shrub	<1, 1-2, >2	closed chenopod shrubland	chenopod shrubland	open chenopod shrubland	sparse chenopod shrubland	isolated chenopod shrubs	isolated clumps of chenopod shrubs	chenopod shrubs
samphire shrub	<0.5, >0.5	closed samphire shrubland	samphire shrubland	open samphire shrubland	sparse samphire shrubland	isolated samphire shrubs	isolated clumps of samphire shrubs	samphire shrubs
hummock grass	<2, >2	closed hummock grassland	hummock grassland	open hummock grassland	sparse hummock grassland	isolated hummock grasses	isolated clumps of hummock grasses	hummock grasses
tussock grass	<0.5, >0.5	closed tussock grassland	tussock grassland	open tussock grassland	sparse tussock grassland	isolated tussock grasses	isolated clumps of tussock grasses	tussock grasses
other grass	<0.5, >0.5	closed grassland	grassland	open grassland	sparse grassland	isolated grasses	isolated clumps of grasses	other grasses
sedge	<0.5, >0.5	closed sedgeland	sedgeland	open sedgeland	sparse sedgeland	isolated sedges	isolated clumps of sedges	sedges
rush	<0.5, >0.5	closed rushland	rushland	open rushland	sparse rushland	isolated rushes	isolated clumps of rushes	rushes
forb	<0.5, >0.5	closed forland	forland	open forland	sparse forland	isolated forbs	isolated clumps of forbs	forbs
fern	<1, 1-2, >2	closed fernland	fernland	open fernland	sparse fernland	isolated ferns	isolated clumps of ferns	ferns
bryophyte	<0.5	closed bryophyteland	bryophyteland	open bryophyteland	sparse bryophyteland	isolated bryophytes	isolated clumps of bryophytes	bryophytes
lichen	<0.5	closed lichenland	lichenland	open lichenland	sparse lichenland	isolated lichens	isolated clumps of lichens	lichens
vine	<10, 10-30, >30	closed vineland	vineland	open vineland	sparse vineland	isolated vines	isolated clumps of vines	vines
aquatic	0-0.5, <1	closed aquatic bed	aquatic bed	open aquatic bed	sparse aquatics	isolated aquatics	isolated clumps of aquatics	aquatics
seagrass	0-0.5, <1	closed seagrass bed	seagrassbed	open seagrassbed	sparse seagrassbed	isolated seagrasses	isolated clumps of seagrasses	seagrasses

3.0 Results

3.1 Vegetation Survey

3.1.1 Previous surveys in the Lake Campion area.

The present author surveyed the Lake Campion Nature Reserve and Reserve 21759 in 1990. Vegetation descriptions from this report can be found in Appendix 3. Ecoscape surveyed Reserve 21759 in 2005. Vegetation descriptions including Muir (1977) and NVIS from the ecoscape survey can be found in Appendix 5. All NVIS description were supplied by Ben Bayliss (Dept. Environment and Conservation)

3.1.2 Current Survey

3.1.3 Vegetation Mapping reserve 21759 – Lake Campion area (See Figure 1 for changes to mapping)

***Eucalyptus salicola* Woodland Map Units Ws 1 and 2 (Coates 1990)**

Voucher specimen AC 2136 (*E. salicola*) at site 3 was re identified as *Eucalyptus salmonophloia*. Most of the the Ws areas on Reserve 21759 will therefore change to Ecoscape vegetation type MD05-17-05 or MD05-17-02 with *Eucalyptus salmonophloia* dominant. Sites 7 and 10 are typical of Ws2 (*Eucalyptus salicola* woodlands) occurring on gypsum dunes and have an understorey of *Callitris glaucophylla* and will be mapped as Ws 2.

Ecoscape MD05-17-05 *E salmonophloia* /*E loxophleba*

A voucher specimen was not collected from site 12 in 1990. Trees at the Ecoscape site visited in the recent field trip were identified as *Eucalyptus salmonophloia*. This area will therefore be mapped using the Ecoscape map unit.

Ecoscape MD05-17-02 *E salmonophloia* & *E salubris* woodland

The site of the description for Ecoscape MD05-17-02 *E salmonophloia* & *E salubris* woodland is south of the Chandler – Nungarin road. This area was not visited in the 1990 survey and therefore the Ecoscape description will be used to map this area.

Ecoscape MD05-17-09 *E salmonophloia* & *E salubris* woodland

The site description in the field notes for Site 2 Wg from the 1990 survey includes scattered trees of *E salicola*/*E salmonophloia* and will be retained as Wg.

Ecoscape MD05-17-03 *Eucalyptus salicola*

Trees at this site were rough barked and not *Eucalyptus salicola*. Voucher specimens collected from site 4 in 1990 and adjacent to the road at MD05-17-03 in 2010 were rough barked trees and need to be confirmed as *E myriadena* or *E yilgarnensis*. This area has therefore been mapped as mixed woodland and other areas retain the map units from the Coates survey until further field work can clarify the taxonomy of the *E myriadena* and *E yilgarnensis* trees occurring in the area.

Other Ecoscape sites are similar to the 1990 map units see Table 3. The 1990 units are composite descriptions of sites described in Lake Campion NR as well as Reserve 21759 and are therefore

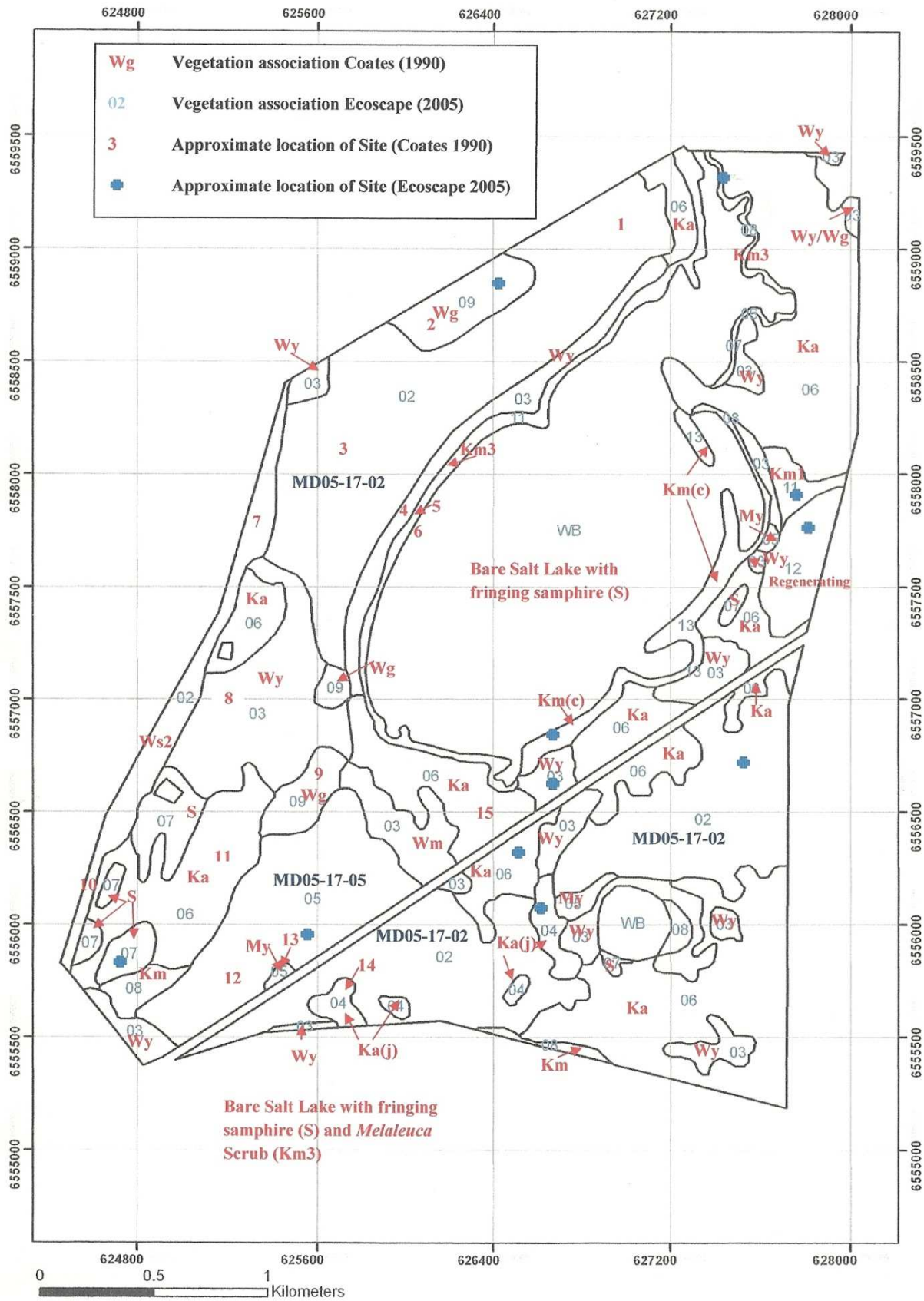
broader in description (see Appendix 3). It was therefore decided to retain the 1990 map units for continuity in mapping over the Lake Campion area.

Table 3 Comparison of some of the Ecoscape and Coates 1990 vegetation units

Ecoscape Map Unit	Coates 1990 map Unit	Ecoscape site Description
MD05-17-04	Ka(j) Acacia Scrub/thicket with <i>Acacia acuminata</i> prominent	Acacia acuminata Dense Thicket over Acacia tetragonophylla & Hakea recurva Low Scrub A
MD05-17-06	Ka Acacia Scrub/Thicket	Westringia cephalantha & Acacia coolgardiensis subsp. effusa Heath A over Atriplex sp. & Chenopodium sp. Dwarf Scrub D
MD05-17-07	S Halosarcia Heath	Westringia cephalantha & Acacia coolgardiensis subsp. effusa DenseHeath A (now all dead) over Halosarcia pterygosperma subsp. pterygosperma & Roycea divaricata Dense Herbs
MD05-17-08	Km3 Melaleuca Scrub with M lateriflora or M. halmaturorum prominent	Melaleuca lateriflora subsp. lateriflora Open Low Scrub A over Roycea divaricata Open Herbs
MD05-17-11	Km1 Melaleuca Thicket with M lateriflora or M. uncinata prominent	Melaleuca lateriflora subsp. lateriflora Dense Heath A over Roycea divaricata & Halosarcia pterygosperma subsp. pterygosperma Very Open Herbs
MD05-17-13	Km (c) Melaleuca Scrub/Thicket with scattered trees of Callitris glaucophylla	Callitris glaucophylla Open Low Woodland B over Senna artemisioides subsp. x artemisioides Open Scrub over Roycea divaricata & Halosarcia pterygosperma subsp. pterygosperma Herbs

Simplified Muir (1977) and NVIS descriptions for map units used in the Coates 1990 survey can be found in Appendix 4. NVIS descriptions were provided by Ben Bayliss. Separate descriptions are also included for the map units Ka(j), Km(c), Ws and Ws(c). The map unit Km is a mosaic of Km1 and Km2.

Figure 1 **Vegetation map of Reserve No. 21759.**



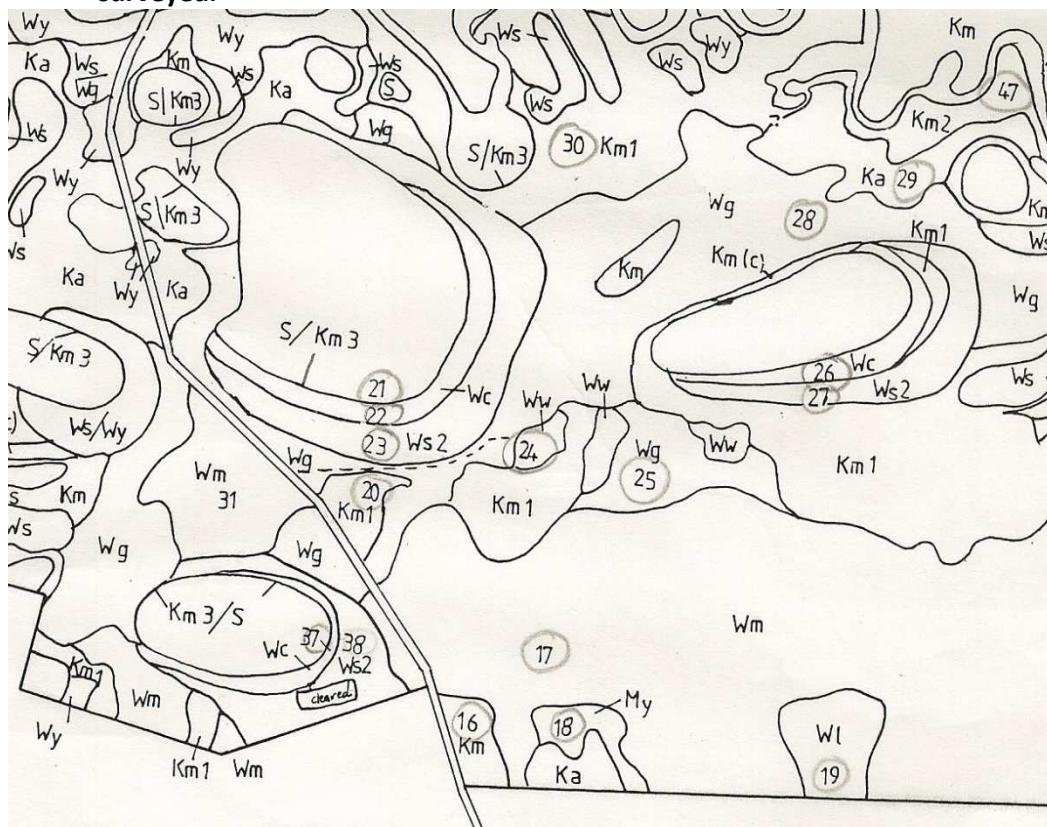
3.2 Flora of the gypsum dunes

Appendix 1 and 2 include site descriptions and plant species lists for the dunes visited. Figure 2 has been taken from the 1990 vegetation map of Lake Campion and shows the approximate location of site 22 (gypsum dune), 23 (*E salicola* dune), 37 (gypsum dune) and 38 (*E salicola* dune). Figure 3 is taken from Figure 5 of the 1990 report and indicates the position of the old mining leases in the area surveyed.

The results of the soil analysis indicate that at 50 cm no significant amounts of gypsum (<1.0%) was found at sites 23 and 38 on the lunette dunes next to the gypsum dunes that occur adjacent to the salt lake bed. Further soil testing is needed to determine whether gypsum is present at a greater depth. The following is a quote from Bettenay describing the soils of the lunette dunes.

“The sandy lunettes show a moderate degree of soil development both in the accumulation of organic matter in their surfaces and in the downward leaching of gypsum to form a pan below the upper leached, siliceous skeleton.” (Bettenay, 1962).

Figure 2 Part of the 1990 vegetation map indicating the approximate location of the sites surveyed.



The taxonomy of many of the plants growing in the Lake Campion area requires further investigation. The initial survey in 1990 was carried out in April when little flowering material was available. Because of the dry season 2010 has been a difficult time for conducting flora surveys and at the time of the survey (end of August) again very few plants were in flower. Fieldwork which covers only a few days cannot be expected to exclude the possibility that there are still rare flora and other plants in the sites surveyed that have not as yet been located. The best time for survey is during the spring however some plant species will flower at other times of the year, some species do not flower every year and some species are not identifiable or even visible except for short periods of time.

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5.0 References

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Appendix 1

Lake Campion Nature Reserve

Vegetation and Flora

Site

Descriptions

Site 37 and surrounds *Callitris columellaris* open Low Woodland Wc

Soils and Topography: Gypsum dune on the edge of a salt lake.

GPS (WGS 84) 31° 09' 53.49" 118° 17' 33.2"

Diagnosis (Muir 1977): Open Low Woodland B over Open Scrub over Open Low Scrub
B over Open Dwarf Scrub D

Condition: Excellent. Some disturbance from previous mining operations ~20 years ago— some regeneration.

Vegetation Description

Stratum 1 Shrubs/trees to 5m (2-10% canopy cover) of *Callitris columellaris*

Stratum 2 Shrubs over 2m (2-10% canopy cover) including *Alyxia buxifolia*,
Allocasuarina acutivalvis, *Melaleuca uncinata*, *Santalum acuminatum*,
Leptospermum ?erubescens and *Hakea ?rigida*.

Stratum 3 Shrubs to 1.5m (2-10% canopy cover) including *Acacia prainii*, *Acacia rigens*,
Daviesia benthamii, *Grevillea hookeriana* subsp. *apiculoba*,
Grevillea huegelii, *Jacksonia arida* and *Persoonia saundersiana*.

Stratum 4 Shrubs to 0.5m (2-10% canopy cover) including *Conostephium* sp. Salt
Lake (J. Buegge D7), *Darwinia* sp. Karonie (K. Newbey 8503),
Leucopogon inflexifolius ms, *Leucopogon* sp. Kau Rock (M.A. Burgman
1126), *Astroloma serratifolium* and *Tecticornia lylei* (edge).

Perennial herb *Lomandra effusa* and creeper *Billardiera lehmanniana* were also recorded.



Photograph 1. Gypsum dune at site 37.



Photograph 2. Gypsum dune at site 37. Some areas regenerating after mining.

Site 22 and surrounds *Callitris columellaris* open Low Woodland Wc

Soils and Topography: Gypsum dune on the edge of a salt lake.

GPS (WGS 84) 31° 09' 18.8" 118° 25' 14.0"

Diagnosis (Muir 1977): Open Low Woodland B over Open Scrub over Open Low Scrub B over Dwarf Scrub C

Condition: Pristine.

Vegetation Description

- Stratum 1** Shrubs/trees to 5m (2-10% canopy cover) of *Callitris columellaris*.
Scattered trees of *Eucalyptus salicola*.
- Stratum 2** Shrubs over 2m (2-10% canopy cover) of *Acacia rigens*, *Melaleuca halmaturorum*, *Melaleuca uncinata*, *Santalum acuminatum*, *Persoonia saundersiana*, *Leptospermum ?erubescens* and *Hakea ?rigida*.
- Stratum 3** Shrubs to 1.5m (2-10% canopy cover) including *Acacia prainii*, *Alyxia buxifolia*, *Daviesia benthamii*, *Grevillea hookeriana* subsp. *apiculoba* and *Persoonia saundersiana*
- Stratum 4** Shrubs to 1.0m (2-10% canopy cover) including *Darwinia* sp. Karonie (K. Newbey 8503), *Leucopogon inflexifolius* ms, *Leucopogon* sp. Kau Rock (M.A. Burgman 1126), *Jacksonia arida*, *Conostephium* sp. Salt Lake (J. Buegge D7), *Grevillea huegelii*, *Westringia cephalantha*, *Westringia rigida* and *Tecticornia lylei* (edge).

Creeper *Billardiera lehmanniana* was also recorded.



Photograph 3. Gypsum dune at site22



Photograph 4. Gypsum dune at site 22. *Acacia rigens* in flower.

Site 38 and surrounds	<i>Eucalyptus salicola</i> (salt gum) Woodland	Wc
Soils and Topography:	Lunette dune adjacent to gypsum dune. Sandy loam with gypsum at depth? Gypsum content at 50cm <1.0%	
GPS (WGS 84)	31° 09' 48.36"	118° 25' 08.37"
Diagnosis (Muir 1977):	Low Woodland A over Scrub over Open Low Scrub B over Open Dwarf Scrub C over Open Dwarf Scrub D	

Condition: Pristine.

Vegetation Description

- Stratum 1** Trees to 10m (10-30% canopy cover) of *Eucalyptus salicola*. Scattered *Eucalyptus sheathiana* mallee.
- Stratum 2** Scattered trees to 4m of *Callitris columellaris*. 2-10% canopy cover in some areas.
- Stratum 3** Shrubs over 2m (10-30% canopy cover) including *Acacia acuminata*, *Allocasuarina acutivalvis*, *Alyxia buxifolia*, *Pittosporum angustifolium*, *Grevillea juncijolia/sarrisa*, *Hakea invaginata*, *Hakea preissii*, *Melaleuca lanceolata*, *Melaleuca uncinata*, *Santalum acuminatum* and *Santalum spicatum*
- Stratum 4** Shrubs to 1.5m (2-10% canopy cover) including *Acacia prainii*, *Daviesia benthamii*, *Exocarpos aphyllus*, *Exocarpos sparteus* and *Lycium australe*.
- Stratum 5** Shrubs to 1.0m (2-10% canopy cover) including *Acacia hemiteles*, *Acacia merrallii*, *Acacia colletioides*, *Bertya dimerostigma*, *Beyeria lechenaultii*, *Bossiaea walkeri*, *Dodonaea bursariifolia*, *Grevillea huegelii*, *Olearia exiguifolia*, *Olearia pimeleoides*, *Phebalium filifolium*, *Scaevola spinescens* and *Templetonia sulcata*.
- Stratum 6** Shrubs to 0.5m (2-10% canopy cover) including *Acacia erinacea*, *Darwinia sp. Karonie* (K. Newbey 8503), *Disphyma crassifolium*, *Grevillea acuaria*, *Olearia muelleri*, *Rhagodia preissii*, *Westringia cephalantha* and *Westringia rigida*.

Perennial herbs *Lomandra collina* and *Dianella ?revoluta* recorded 1990

Sedge *Lepidosperma ?drummondii* recorded 1990

Annual herb *Waitzia acuminata* recorded 1990

Grass *Ampipogon ?strictus* recorded 1990



Photograph 5. *Eucalyptus salicola* dune at site 38.



Photograph 6. *Eucalyptus salicola* dune at site 38.

Site 23 and surrounds	<i>Eucalyptus salicola</i> (salt gum) Woodland	Wc
Soils and Topography:	Lunette dune adjacent to gypsum dune. Sandy loam with gypsum at depth?	
GPS (WGS 84)	31° 09' 48.36"	118° 25' 08.37"
Diagnosis (Muir 1977):	Low Woodland A over Scrub over Low Scrub B over Open Dwarf Scrub C over Open Dwarf Scrub D	
Condition:	Excellent. Some disturbance	

Vegetation Description

- Stratum 1** Trees to 10m (10-30% canopy cover) of *Eucalyptus salicola*. Scattered trees of *Callitris columellaris* and occasional *Callitris preissii*. *Eucalyptus sheathiana* mallee at the base of the dune.
- Stratum 2** Shrubs over 2m (10-30% canopy cover) including *Acacia acuminata*, *Acacia assimilis*, *Acacia prainii*, *Allocasuarina acutivalvis*, *Alyxia buxifolia*, *Grevillea juncijolia* subsp. *temulenta*, *Hakea invaginata*, *Hakea preissii*, *Hakea minima* 1990, *Melaleuca lanceolata*, *Leptospermum ?erubescens*, *Melaleuca uncinata* and *Santalum acuminatum*.
- Stratum 3** Shrubs to 1.5m (10-30% canopy cover) including, *Baeckea* sp. Lake Champion (Anne Coates 2285), *Calothamnus gilesii* 1990, *Daviesia benthamii*, *Exocarpos aphyllus* and *Exocarpos sparteus* 1990.
- Stratum 4** Shrubs to 1.0m (2-10% canopy cover) including *Acacia hemiteles*, *Acacia merrallii*, *Acacia colletioides*, *Bertya dimerostigma*, *Beyeria lechenaultii*, *Bossiaea walkeri*, *Dodonaea bursariifolia*, *Dodonaea viscosa*, *Eremophila ?scoparia*, *Grevillea huegelii*, *Melaleuca ?cordata*, *Microcybe multiflora* 1990, *Olearia exiguiifolia*, *Olearia revolute* 1990, *Phebalium filifolium*, *Phebalium tuberculatum*, *Prostanthera* sp., *Rinzia carnosa*, *Scaevola spinescens* and *Templetonia sulcata*.
- Stratum 5** Shrubs to 0.5m (2-10% canopy cover) including) *Acacia erinacea*, *Astroloma serratifolium*, *Cryptandra minutifolia*, *Enchylaena tomentosa*, *Grevillea acuaria*, *Leucopogon inflexifolius* ms, *Olearia muelleri*, *Rhagodia preissii*, *Westringia cephalantha* and *Westringia rigida*.

Perennial herbs *Lomandra effusa* and *Dianella ?revoluta*
Goodenia pinifolia recorded 1990

Sedge *Lepidobolus preissianus* and *Lepidosperma ?drummondii* recorded 1990
Annual herbs *Lawrencella rosea*, *Waitzia acuminata* and *Podolepis capillaris*.



Photograph 7. *Eucalyptus salicola* dune at site 23.



Photograph 8. *Eucalyptus salicola* dune at site 23.

Appendix 2

Lake Campion Nature Reserve

Plant Species Lists for

Sites Surveyed

Taxon Name	Site	
Acacia colletioides	22 gypsum dune	
Acacia prainii	22 gypsum dune	
Acacia rigens	22 gypsum dune	
Alyxia buxifolia	22 gypsum dune	
Billardiera lehmanniana	22 gypsum dune	
Callitris columellaris	22 gypsum dune	pre. Callitris glaucophylla
Conostephium sp. Salt Lake (J. Buegge D7)	22 gypsum dune	pre. C. preissii
Darwinia sp. Karonie (K. Newbey 8503)	22 gypsum dune	pre. D. drummondii
Daviesia benthamii	22 gypsum dune	
Eucalyptus salicola	22 gypsum dune	
Grevillea hookeriana subsp. apiculoba	22 gypsum dune	pre. G. apiculoba
Grevillea huegelii	22 gypsum dune	
Hakea ?rigida	22 gypsum dune	need flowering material
Jacksonia arida	22 gypsum dune	pre J. hakeoides
Leptospermum ? erubescens	22 gypsum dune	need flowering material pre. L roei
Leucopogon inflexifolius ms	22 gypsum dune	pre. L. cuneifolius reident Mike Hislop
Leucopogon sp. Kau Rock (M.A. Burgman 1126)	22 gypsum dune	pre. L. ?nutans reident Mike Hislop
Melaleuca halmaturorum	22 gypsum dune	
Melaleuca uncinata group	22 gypsum dune	
Olearia exiguifolia	22 gypsum dune	
Persoonia saundersiana	22 gypsum dune	pre. P. ?angustifolia
Santalum acuminatum	22 gypsum dune	
Tecticornia lylei	22 gypsum dune	
Westringia cephalantha	22 gypsum dune	
Westringia rigida	22 gypsum dune	pre W. dampieri
Acacia acuminata	23 E.salicola dune	1990 record
Acacia assimilis	23 E.salicola dune	
Acacia colletioides	23 E.salicola dune	
Acacia erinacea	23 E.salicola dune	
Acacia hemiteles	23 E.salicola dune	
Acacia merrallii	23 E.salicola dune	
Acacia prainii	23 E.salicola dune	
Allocasuarina acutivalvis	23 E.salicola dune	
Alyxia buxifolia	23 E.salicola dune	
Astroloma serratifolium	23 E.salicola dune	
Baeckea sp. Lake Champion (Anne Coates 2285)	23 E.salicola dune	pre. Baeckea aff behrii reident Malcolm Trudgen
Bertya dimerostigma	23 E.salicola dune	
Beyeria lechenaultii	23 E.salicola dune	
Bossiaea walkeri	23 E.salicola dune	
Callitris columellaris	23 E.salicola dune	pre. Callitris glaucophylla
Callitris preissii	23 E.salicola dune	
Calothamnus gilesii	23 E.salicola dune	1990 voucher AC2212
Choretrum glomeratum	23 E.salicola dune	
Cryptandra minutifolia	23 E.salicola dune	pre. Cryptandra parvifolia
Daviesia benthamii	23 E.salicola dune	
Dianella ? revoluta	23 E.salicola dune	1990 record
Dodonaea bursariifolia	23 E.salicola dune	
Dodonaea viscosa	23 E.salicola dune	1990 record

Enchylaena tomentosa	23 E.salicola dune	
Eremophila ionantha	23 E.salicola dune	
Eremophila scoparia	23 E.salicola dune	1990 record
Eucalyptus salicola	23 E.salicola dune	
Eucalyptus sheathiana	23 E.salicola dune	
Exocarpos aphyllus	23 E.salicola dune	
Exocarpos sparteus	23 E.salicola dune	1990 record
Goodenia pinifolia	23 E.salicola dune	1990 record
Grevillea ?juncifolia subsp. temulenta	23 E.salicola dune	need flowering material
Grevillea acuaria	23 E.salicola dune	
Grevillea huegelii	23 E.salicola dune	
Hakea invaginata	23 E.salicola dune	1990 voucher AC2258
Hakea minyma	23 E.salicola dune	1990 voucher AC2193
Hakea preissii	23 E.salicola dune	
Lawrencella rosea	23 E.salicola dune	
Lepidobolus preissianus	23 E.salicola dune	
Lepidosperma ? drummondii	23 E.salicola dune	1990 record
Leptospermum ? erubescens	23 E.salicola dune	need flowering material pre. L roei
Leucopogon inflexifolius ms	23 E.salicola dune	pre. L. cuneifolius reident Mike Hislop
Lomandra effusa	23 E.salicola dune	
Melaleuca ?cordata	23 E.salicola dune	need flowering material
Melaleuca lanceolata	23 E.salicola dune	1990 record
Melaleuca uncinata group	23 E.salicola dune	
Microcybe multiflora	23 E.salicola dune	1990 record
Olearia exiguiifolia	23 E.salicola dune	
Olearia muelleri	23 E.salicola dune	
Olearia revoluta	23 E.salicola dune	1990 record
Phebalium filifolium	23 E.salicola dune	
Phebalium tuberosum	23 E.salicola dune	
Podolepis capillaris	23 E.salicola dune	
Prostanthera sp.	23 E.salicola dune	pre P. baxteri which only occurs in the Esperance area
Rhagodia preissii	23 E.salicola dune	
Rinzia carnosia	23 E.salicola dune	
Santalum acuminatum	23 E.salicola dune	
Scaevola spinescens	23 E.salicola dune	
Templetonia sulcata	23 E.salicola dune	
Waitzia acuminata	23 E.salicola dune	
Westringia cephalantha	23 E.salicola dune	
Westringia rigida	23 E.salicola dune	pre W. dampieri
Acacia prairii	37 gypsum dune	
Acacia rigens	37 gypsum dune	
Allocasuarina acutivalvis	37 gypsum dune	
Alyxia buxifolia	37 gypsum dune	
Astroloma serratifolium	37 gypsum dune	1990 record
Billardiera lehmanniana	37 gypsum dune	
Callitris columellaris	37 gypsum dune	pre. Callitris glaucophylla
Conostephium sp. Salt Lake (J. Buegge D7)	37 gypsum dune	pre. C. preissii
Darwinia sp. Karonie (K. Newbey 8503)	37 gypsum dune	pre. D. drummondii
Daviesia benthamii	37 gypsum dune	
Grevillea hookeriana subsp. apiciloba	37 gypsum dune	

Grevillea huegelii	37 gypsum dune	
Hakea ?rigida	37 gypsum dune	need flowering material
Jacksonia arida	37 gypsum dune	pre J. hakeoides
Leptospermum ? erubescens	37 gypsum dune	need flowering material pre. L roei
Leucopogon inflexifolius ms	37 gypsum dune	pre. L. cuneifolius reident Mike Hislop
Leucopogon sp. Kau Rock (M.A. Burgman 1126)	37 gypsum dune	pre. L. ?nutans reident Mike Hislop
Lomandra effusa	37 gypsum dune	
Melaleuca uncinata group	37 gypsum dune	
Persoonia saundersiana	37 gypsum dune	pre. P. ?angustifolia
Santalum acuminatum	37 gypsum dune	
Tecticornia lylei	37 gypsum dune	
Acacia acuminata	38 E. salicola dune	1990 record
Acacia colletioides	38 E. salicola dune	
Acacia erinacea	38 E. salicola dune	
Acacia hemiteles	38 E. salicola dune	
Acacia merrallii	38 E. salicola dune	
Acacia prainii	38 E. salicola dune	
Allocasuarina acutivalvis	38 E. salicola dune	
Alyxia buxifolia	38 E. salicola dune	
Amphipogon ? strictus	38 E. salicola dune	1990 record
Bertya dimerostigma	38 E. salicola dune	
Beyeria lechenaultii	38 E. salicola dune	
Bossiaea walkeri	38 E. salicola dune	
Callitris columellaris	38 E. salicola dune	pre. Callitris glaucophylla
Darwinia sp. Karonie (K. Newbey 8503)	38 E. salicola dune	pre. D. drummondii
Daviesia benthamii	38 E. salicola dune	
Dianella ? revoluta	38 E. salicola dune	1990 record
Disphyma crassifolium	38 E. salicola dune	1990 record
Dodonaea bursariifolia	38 E. salicola dune	
Eucalyptus salicola	38 E. salicola dune	
Eucalyptus sheathiana	38 E. salicola dune	
Exocarpos aphyllus	38 E. salicola dune	
Exocarpos sparteus	38 E. salicola dune	1990 record
Grevillea ?sarissa	38 E. salicola dune	need flowering material
Grevillea acuaria	38 E. salicola dune	
Grevillea huegelii	38 E. salicola dune	
Hakea invaginata	38 E. salicola dune	
Hakea preissii	38 E. salicola dune	
Lepidosperma ? drummondii	38 E. salicola dune	1990 record
Lomandra collina	38 E. salicola dune	1990 record
Lycium australe	38 E. salicola dune	
Melaleuca lanceolata	38 E. salicola dune	1990 record
Melaleuca uncinata group	38 E. salicola dune	
Olearia exiguiifolia	38 E. salicola dune	
Olearia muelleri	38 E. salicola dune	
Olearia pimeleoides	38 E. salicola dune	1990 record
Phebalium filifolium	38 E. salicola dune	
Pittosporum angustifolium	38 E. salicola dune	
Rhagodia preissii	38 E. salicola dune	
Santalum acuminatum	38 E. salicola dune	
Santalum spicatum	38 E. salicola dune	1990 record

Scaevola spinescens	38 E. salicola dune	
Templetonia sulcata	38 E. salicola dune	1990 record
Waitzia acuminata	38 E. salicola dune	
Westringia cephalantha	38 E. salicola dune	
Westringia rigida	38 E. salicola dune	pre W. dampieri

Appendix 3

Lake Campion Nature Reserve and

Reserve 21759

Vegetation Descriptions

Coates (1990)

TABLE 2 - VEGETATION ASSOCIATIONS OF THE LAKE CAMPION NATURE RESERVE (NO. 24789) AND RESERVE NO. 21759

Woodlands, Low Woodlands, Low Forests

	Map Unit
1a. <i>Eucalyptus salicola</i> (salt gum) Woodland - Type 1	Ws1
1b. <i>Eucalyptus salicola</i> (salt gum) Woodland - Type 2	Ws2
2. <i>Eucalyptus yilgarnensis</i> (yorrell) Woodland	Wy
3. <i>Eucalyptus salubris</i> (gimlet) Woodland	Wg
4. <i>Eucalyptus longicornis</i> (red morrel) <i>Eucalyptus melanoxydon</i> (black morrel) Woodland	Wl
5. <i>Eucalyptus myriadena</i> , <i>Eucalyptus salubris</i> (gimlet) <i>Eucalyptus yilgarnensis</i> (yorell) Woodland	Wm
6. <i>Eucalyptus capillosa</i> (wheatbelt wandoo) Woodland	Ww
7. <i>Callitris glaucophylla</i> (native Cypress pine) Open Low Woodland	Wc

Mallee

8. <i>Eucalyptus loxophleba</i> (York gum) Tree Mallee	My
9. <i>Eucalyptus leptopoda</i> Open Shrub Mallee over Thicket	Ml

Kwongan (Shrublands)

10. <i>Acacia</i> Scrub	Ka
11. Thicket/ <i>Borya constricta</i> Herbs	Kh
12a. <i>Melaleuca</i> Thicket - Type 1	Km1
12b. <i>Melaleuca</i> Thicket - Type 2	Km2
13. <i>Melaleuca</i> Scrub	Km3

Samphire

14. <i>Halosarcia</i> Heath	S
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WOODLANDS, LOW WOODLANDS, LOW FORESTS

Ws1 *Eucalyptus salicola* (salt gum) Woodland - Type 1

Diagnosis Woodland (Open Woodland, Woodland, Low Woodland A) over Scrub over Low Heath D/Dwarf Scrub D.

Sites 1, 3, 12.

Description

Stratum 1 Woodland to Low Woodland A of *Eucalyptus salicola* becoming Open Woodland in some areas. *Eucalyptus salubris*, *Eucalyptus yilgarnensis* and *Eucalyptus loxophleba* occur as scattered individuals but may become dominant over short distances within the association.

Stratum 2 Open Scrub to Scrub (rarely Thicket) of mixed shrubs from 1.5 to 4 metres, forming a discontinuous and patchy stratum. Characteristic species include *Acacia colletoides*, *Acacia tetragonophylla*, *Dodonaea viscosa*, *Eremophila oppositifolia*, *Exocarpus aphyllus*, *Melaleuca lanceolata* ssp. *thaeroides*, *Pittosporum phylliraeoides*, *Santalum acuminatum*, *Santalum spicatum*, *Scaevola spinescens* and *Templetonia sulcata*.

Stratum 3 Low Heath D to Dwarf Scrub D of mixed shrub species including *Acacia erinacea*, *Atriplex paludosa*, *Atriplex stipitata*, *Enchylaena tomentosa*, *Maireana triptera*, *Olearia muelleri*, *Olearia pimeleoides*, *Olearia revoluta*, *Rhagodia drummondii*, *Rhagodia preissii* and *Zygophyllum fruticulosum*. Low Grass of *Stipa* species occurs near farmland at Site 1.

Comments

Eucalyptus salicola Woodland - Type 1 occurs on loamy soils over clay on the gently sloping rises covering the highest ground on Reserve No. 21759. *Eucalyptus salmonophloia* has also been recorded for the area but was not found during the present survey. The smooth bark and crown of *Eucalyptus salicola* resembles that of the salmon gum and some confusion between the two may exist.

Photograph 1: *Eucalyptus salicola* (salt gum) Woodland - Type 1 near Site 1 on Reserve No. 21759

Ws *Eucalyptus salicola* (salt gum) Woodland - Type 2

Diagnosis Open Low Woodland A to Low Forest A over *Callitris galucophylla* Open Low Woodland B/Low Woodland B over Scrub (Open Low Scrub A to Scrub) over variable lower stratum.

Sites 7, 10, 23, 27, 35, 38, 39, 41, 42, 43, 49.

Description

Stratum 1 Low Woodland A of *Eucalyptus salicola* becoming Open Low Woodland A or occasionally Forest A at different localities. In some areas *Eucalyptus salicola* may be present only as scattered individuals. Occasional *Eucalyptus salubris*, *Eucalyptus yilgarnensis*, *Eucalyptus melanoxylon* or *Eucalyptus sheathiana* may occur on the lee slope of the dunes or on the adjacent flats.

Stratum 2 Open Low Woodland B to Low Woodland B of *Callitris glaucophylla* and occasionally *Callitris preissii* ssp. *verrucosa*. *Callitris* species may only be present as scattered individuals in some areas.

Stratum 3 Open Low Scrub A to Scrub (rarely thicket) of mixed shrubs and species form a discontinuous and patchy stratum. Characteristic species include *Acacia colletioides*, *Acacia prainii*, *Acacia acuminata*, *Allocasuarina acutivalvis*, *Alyxia buxifolia*, *Bossiaea walkeri*, *Baeckea* aff. *behrii*, *Beyeria lechenaultii*, *Daviesia benthamii*, *Dodonaea viscosa*, *Exocarpus aphyllus*, *Eremophila scoparia*, *Grevillea juncifolia*, *Leptospermum roei*, *Melaleuca lanceolata*, *Melaleuca uncinata*, *Santalum acuminatum*, *Santalum spicatum* and *Templetonia sulcata*.

Stratum 4

The lower stratum varies from Dwarf Scrub D to Low Heath C with Low Scrub B and Open Low Grass also recorded. Characteristic species include *Acacia merrallii*, *Astroloma serratifolium*, *Atriplex paludosa*, *Grevillea huegelii*, *Lepidosperma drummondii*, *Melaleuca cordata*, *Melaleuca conothamnoides*, *Phebalium canaliculatum*, *Phebalium filifolium*, *Phebalium tuberculatum*, *Westringia cephalantha*, *Westringia dampieri* and *Zygophyllum fruticulosum*.

Comments

Eucalyptus salicola Woodland - Type 2 is typically found on the dunes which have developed on the eastern and south eastern shores of some of the large salt lakes. these dunes consist of quartzose and gypsiferous soils. The understorey is rich in plant species, many confined to this habitat, for example, *Prostanthera baxteri*, *Calothamnus gilesii*, *Melaleuca cordata*, *Melaleuca conothamnoides*, *Leucopogon cuneifolius* and *Exocarpus sparteus*. In areas adjacent to small lakes and channels where dunes form only low mounds on ridges, *Eucalyptus salicola* may only form a very sparse stratum or be present only as scattered individuals. These areas are mapped as Es or Es(c) where *Callitris glaucophylla* is dominant.

Photograph 2: *Eucalyptus salicola* Woodland - Type 2 on dunes on the eastern shore of Lake Chandler

Ey *Eucalyptus yilgarnensis* (yorrell) Woodland

Diagnosis Low Forest A/Low Woodland A over variable understorey.

Sites 4, 8, 33.

Description

Stratum 1 Low Woodland A to Low Forest A of *Eucalyptus yilgarnensis* with occasional *Eucalyptus salicola* and *Eucalyptus salubris* in some areas.

Stratum 2 Open Scrub to Scrub of mixed shrub species including *Acacia colletioides*, *Alyxia buxifolia*, *Dodonaea lobulata*, *Exocarpus aphyllus*, *Eremophila oppositifolia*, *Hakea preissii*, *Hakea recurva*, *Pittosporum phylliraeoides*, *Santalum acuminatum*, *Scaevola spinescens* and *Templetonia sulcata*. These species may be present as scattered individuals only or completely absent in some localities where only small areas of yorrell woodland occur.

Stratum 3 Dwarf Scrub D to Low Heath D with *Atriplex paludosa*, *Atriplex stipitata* and *Olearia muelleri* prominent in some areas. Other commonly occurring species include *Enchylaena tomentosa*, *Eremophila drummondii*, *Olearia pimeleoides*, *Ptilotus eriostichus*, *Rhagodia drummondii*, *Rhagodia preissii*, *Stipa* sp. and *Zygophyllum fruticulosum*.

Comments

Eucalyptus yilgarnensis is found on sandy loam soils. Of the woodland communities this association tends to occupy the lower areas adjacent to salt lakes or interspersed between dunes. The smaller patches of *Eucalyptus yilgarnensis* Woodland have fewer understorey species.

Photograph 3: *Eucalyptus yilgarnensis* (yorrell) on Lake Campion Nature Reserve

Eg *Eucalyptus salubrus* (gimlet) Woodland

Diagnosis Low Woodland A over variable understorey.

Sites 2, 9, 25, 28.

Description

Stratum 1 Low Woodland A of *Eucalyptus salubris* occasionally forming Low Forest A. This stratum is discontinuous and patchy with occasional *Eucalyptus salicola*, *Eucalyptus yilgarnensis*, *Eucalyptus loxophleba* or *Eucalyptus sheathiana*.

Stratum 2 Open Scrub to Open Low Scrub A of mixed shrub species including *Acacia colletioides*, *Daviesia benthamii*, *Dodonaea viscosa*, *Eremophila oppositifolia*, *Exocarpus aphyllus*, *Melaleuca lanceolata*, *Santalum acuminatum*, and *Scaevola spinescens*. *Melaleuca uncinata* and *Melaleuca lateriflora* Low Scrub A forms an understorey at Site 25. Stratum 2 is variable and may be absent in some areas.

Stratum 3 Dwarf Scrub D to Low Heath C of mixed shrub species with Low Grass of *Stipa* sp. at Site 2. Commonly occurring species include: *Acacia erinacea*, *Acacia merrallii*, *Atriplex paludosa*, *Atriplex stipitata*, *Enchylaena tomentosa*, *Eremophila drummondii*, *Grevillea huegelii*, *Grevillea acuaria*, *Olearia muelleri*, *Olearia pimeleiodes*, *Olearia revoluta*, *Podolepis capillaris*, *Maireana diffusa*, *Maireana triptera*, *Rhagodia preissii*, *Stipa elegantissima* and *Westringia cephalantha*.

Comments

Eucalyptus salubris Woodland occurs on heavier soils where the clay is closer to the surface. In some areas, usually adjacent to farmland, the trees show signs of stress probably due to an increase in surface salt.

Photograph 4: *Eucalyptus salubris* (gimlet) at Site 5. The trees show signs of stress probably due to salt encroachment.

W1 *Eucalyptus longicornis* (red morrel), *Eucalyptus melanoxylon*
(black morrel) Woodland

Diagnosis Woodland over variable understorey.

Sites 19, 45, 55.

Description

Stratum 1 Woodland of *Eucalyptus longicornis* with *Eucalyptus melanoxylon* present in most areas. Occasional *Eucalyptus yilgarnensis*, *Eucalyptus salubris* and *Eucalyptus* sp. (2269) may also be present.

Stratum 2 Open Low Woodland B of *Melaleuca lanceolata* ssp. *thaeroides* occurring in patches with areas of Open Low Scrub A occasionally to Low Scrub A forming a discontinuous stratum. Commonly occurring species include: *Alyxia buxifolia*, *Acacia colletioides*, *Bossiaea walkeri*, *Eremophila scoparia*, *Exocarpus aphyllus*, *Lycium australe*, *Pittosporum phylliraeoides* and *Santalum acuminatum*.

Stratum 3 Low Heath D to Low Heath C of mixed shrub species with Open Dwarf Scrub D in some areas. At Site 55 *Atriplex paludosa* is prominent. Other commonly occurring species include *Acacia merrallii*, *Atriplex stipitata*, *Lomandra collina*, *Olearia muelleri*, *Podolepis capillaris*, *Stipa elegantissima* and *Westringia dampieri*.

Comments

Eucalyptus longicornis, *Eucalyptus melanoxylon*
Woodland occurs on the periphery of the mosaic of salt lakes and channels on loam and clay loam soils. These woodlands occupy part of the area covered by the Geological Map Unit Qa - alluvium (Department of Mines, 1986).

Photograph 5: *Eucalyptus longicornis* (red morrel), *Eucalyptus melanoxylon* (black morrel) Woodland at Site 55

Wm *Eucalyptus myriadena*, *Eucalyptus salubris* (gimlet), *Eucalyptus yilgarnensis* (yorrell) Woodland

Diagnosis Open Low Woodland A/Low Woodland A over *Melaleuca lanceolata* Open Low Woodland B or Open Low Scrub A/Low Scrub A over Dwarf Scrub C/Dwarf Scrub D.

Sites 17, 31, 54.

Description

Stratum 1 Open Low Woodland A to Low Woodland A of *Eucalyptus myriadena*, *Eucalyptus salubris* and *Eucalyptus yilgarnensis*. This stratum is discontinuous and patchy and areas of Low Forest A occur in some places. Each species may either become dominant over short distances or occur in mixed stands forming a complex mosaic.

Stratum 2 This stratum is very variable with Open Low Woodland B of *Melaleuca lanceolata*, which is patchily distributed, occurring in some areas.

Stratum 3 Open Low Scrub A to Low Scrub A of mixed shrub species occurring at most sites. Common Stratum 3 species include: *Acacia colletioides*, *Acacia acuminata*, *Acacia nyssophylla*, *Acacia hemiteles*, *Alyxia buxifolia*, *Cassia nemophila*, *Cassia chatelainiana*, *Dodonaea viscosa*, *Eremophila drummondii*, *Eremophila oppositifolia*, *Eremophila scoparia*, *Exocarpus aphyllus*, *Lycium australe*, *Melaleuca uncinata*, *Pittosporum phylliraeoides*, *Santalum acuminata*, *Scaevola spinescens* and *Templetonia sulcata*.

Stratum 4

Dwarf Scrub D with Dwarf Scrub C occasionally found in some areas. Commonly occurring species include *Atriplex stipitata*, *Atriplex paludosa* and *Olearia muelleri*. *Acacia erinacea*, *Acacia merrallii*, *Amphipogon ?strictus*, *Borya constricta*, *Enchylaena tomentosa*, *Grevillea acuaria*, *Podolepis capillaris*, *Ptilotus exaltatus*, *Rhagodia preissii*, *Sclerolaena fusiformis*, *Stipa elegantissima*, *Westringia dampieri* and *Zygophyllum fruticulosum* were also recorded.

Comments

This woodland association forms a complex mosaic of *Eucalyptus myriadena*, *Eucalyptus salubris* and *Eucalyptus yilgarnensis* with a patchy, discontinuous understorey on sandy clay loam soils. The woodland is mainly on the periphery of the salt lake system occurring on the Geological Map Unit Qa - alluvium. Extensive timber cutting has taken place at Site 17.

Photograph 6: *Eucalyptus salubris* (gimlet) and *Eucalyptus yilgarnensis* with an understorey of *Melaleuca lanceolata* at Site 17

Photograph 7: *Eucalyptus myriadena* prominent in Woodland at Site 31

Ww *Eucalyptus capillosa* (wheatbelt wandoo) Woodland

Diagnosis Low Woodland A over Open Dwarf Scrub C.

Sites 24.

Description

Stratum 1 Low Woodland A of *Eucalyptus capillosa* with scattered *Eucalyptus salubris*, *Eucalyptus salicola* and *Eucalyptus sheathiana* at the edge of the association.

Stratum 2 Open Dwarf Scrub C of mixed shrub species with scattered shrubs to 2 metres. Species recorded include *Daviesia benthamii*, *Eremophila drummondii*, *Grevillea acuaria*, *Lomandra collina*, *Melaleuca lateriflora*, *Melaleuca uncinata*, *Podolepis* sp. and *Templetonia sulcata*.

Comments *Eucalyptus capillosa* Woodland was found on only three small areas of the reserve on clay loam soils probably underlain by granite. Brooker and Kleinig (1990) indicate that *Eucalyptus capillosa* often occurs on low rises of decomposed granite. In the Muntadgin and Moorine Rock vegetation systems *Eucalyptus capillosa* (referred to as *Eucalyptus wandoo*) is typically found in the vicinity of granite outcrops, bordering Kwongan where there may have been some surface wash from the sandplain, immediately below distinct break-aways or where quartz dykes are situated (Beard, 1980).

Photograph 8: *Eucalyptus capillosa* Woodland at Site 24

Wc *Callitris glaucophylla* (native Cypress pine) Open Low Woodland

Diagnosis Open Low Woodland B over Scrub over Dwarf Scrub C.

Sites 22, 26, 37, 48.

Description

Stratum 1 Open Low Woodland B to Scrub in some places of *Callitris glaucophylla*. This stratum is patchy and discontinuous with *Callitris glaucophylla* present only as scattered individuals in some areas. Occasional *Callitris preissii* ssp. *verrucosa*, *Allocasuarina acutivalvis* and *Eucalyptus salicola* may be present.

Stratum 2 Very patchy stratum of Scrub to Low Scrub A present in some areas. Characteristic species include *Acacia rigens*, *Acacia prainii*, *Alyxia buxifolia*, *Grevillea juncifolia*, *Leptospermum roei*, *Persoonia ?angustiflora*, *Melaleuca halmaturorum* ssp. *cymbifolia*, *Melaleuca uncinata* and *Santalum acuminatum*.

Stratum 3 A very patchy and discontinuous stratum of Dwarf Scrub C with only scattered shrubs present in some areas. Characteristic species include *Astroloma serratifolium*, *Darwinia drummondii*, *Conostephium preissii*, *Jacksonia* aff. *hakeoides*, *Grevillea apiciloba*, *Leucopogon cuneifolius*, and *Leucopogon ?nutans*.

Comments

Callitris glaucophylla Open Low Woodland is found on low gypsum dunes adjacent to the edge of the larger lakes and preceeding the larger lunette dunes which carry *Eucalyptus salicola* Woodland - Type 2. These "foredunes" consist of crystalline gypsum. They are of recent origin and are being added to at the present time from material crystallizing on the lake surface.

Photograph 9: *Callitris glaucophylla* and *Callitris preissii* on gypsum dunes at Site 48 on the shore of Lake Chandler

MALLEE

Wy *Eucalyptus loxophleba* (York gum) Tree Mallee

Diagnosis Tree Mallee/Shrub Mallee over variable understorey.

Sites 13, 18, 44, 52.

Description

Stratum 1 Tree Mallee to Shrub Mallee of *Eucalyptus loxophleba*.

Stratum 2 Open Scrub to Open Low Scrub A forms a lower stratum in some areas. Commonly occurring species include *Acacia acuminata*, *Acacia colletioides*, *Alyxia buxifolia*, *Dodonaea viscosa*, *Exocarpus aphyllus*, *Eremophila oppositifolia*, *Lycium australe*, *Pittosporum phylliraeoides* and *Templetonia sulcata*.

Stratum 3 Dwarf Scrub D to Low Heath D of mixed shrub species with Dwarf Scrub C in some areas. Stratum 3 species include *Acacia prainii*, *Atriplex stipitata*, *Dianella revoluta*, *Eremophila drummondii*, *Eremophila decipiens*, *Olearia exiguifolia*, *Olearia muelleri*, *Olearia pimeleoides*, *Prostanthera grylloana*, *Rhagodia drummondii*, *Rinzia carnosae*, *Westringia cephalantha*, *Waitzia acuminata* and *Zygophyllum fruticulosum*. Open Low grass of *Amphigogon ?strictus* forms a third stratum at Site 18.

Comments

Eucalyptus loxophleba Tree Mallee occurs on areas of sandy loam where the top soil increased in depth over the clay substrate. This association occurs infrequently and covers only small sections of the reserves. The Mallee associations in the Muntadgin and Moorine Rock vegetation systems become more extensive further up slope from the valley bottoms and salt lake systems.

Photograph 10: *Eucalyptus loxophleba* (York gum) Tree Mallee at Site 44

M1 *Eucalyptus leptopoda* Open Shrub Mallee over Thicket

Diagnosis Very Open Shrub Mallee over Thicket over Low Grass.

Sites 56.

Description

Stratum 1 Very Open Shrub Mallee of *Eucalyptus leptopoda*. This stratus is discontinuous with *Eucalyptus leptopoda* present only as scattered individuals emergent to 5 metres in some areas. An area of *Eucalyptus leptopoda* Shrub Mallee was also recorded near the gravel pit.

Stratum 2 Thicket to 3 metres in some areas. Prominent species include *Acacia coolgardiensis*, *Melaleuca uncinata*, *Baeckea* aff. *behrii* and *Hakea minyma*.

Stratum 3 Low Grass of *Amphipogon ?strictus*. Other Stratum 3 species recorded include *Glischrocaryon aureum*, *Prostanthera grylloana* and *Westringia dampieri*.

Comments *Eucalyptus leptopoda* Open Shrub Mallee over Thicket occurs on loamy sandy soils containing laterite pebbles covering a small area in the south east corner of the reserve. This association is adjacent to the area covered by the Geological Map Unit Czs - reworked sandplain, sand containing locally abundant limonite pebbles.

Photograph 11: *Eucalyptus leptopoda* Open Shrub Mallee over Thicket at Site 56

KWONGAN

Ka *Acacia* Scrub

Diagnosis Scrub to Thicket over variable understorey.

Sites 11, 14, 15, 29, 32.

Description

Stratum 1 Scrub to Thicket reaching a height of 3 metres in places. This stratum is patchy with *Acacia assimilis* prominent in most areas. Other frequently occurring species which may be prominent at some localities include *Acacia colletioides*, *Acacia tetragonophylla*, *Dodonaea viscosa*, *Exocarpus aphyllus*, *Hakea preissii*, and *Templetonia sulcata*. *Alyxia buxifolia*, *Eremophila oppositifolia*, *Lycium australe*, *Santalum acuminatum* and *Scaevola spinescens* were also recorded. *Acacia acuminata* very occasionally becomes dominant over small areas.

Stratum 2 Open Dwarf Scrub D to Dwarf Scrub C of mixed shrub species forms a variable understorey in some areas. Commonly occurring species include *Atriplex hymenotheca*, *Atriplex stipitata*, *Disphyma crassifolium*, *Eremophyllum tenellum*, *Enchylaena tomentosa*, *Frankenia desertorum*, *Eremophila decipiens*, *Grevillea acuaria*, *Maireana oppositifolia*, *Maireana diffusa*, *Maireana triptera*, *Pimelea microcephala*, *Podolepis capillaris*, *Rhagodia preissii* and *Zygophyllum fruticulosum*.

Comments

Acacia Scrub occurs on saline sands and loams over clay often on low rises between the salt flats. This association occupies areas on the landscape between the low lying margins of the salt lakes and the Woodlands which occupy the higher ground. *Acacia acuminata* becomes prominent infrequently and only over small areas. These areas are indicated on the vegetation map using the letter (j).

Photograph 12: *Acacia* Scrub on the Lake Campion Nature Reserve

Kh Thicket/*Borya constricta* Herbs

Diagnosis	Thicket with areas of <i>Borya constricta</i> Herbs interspersed.
Sites	50.
Description	Thicket of <i>Acacia coolgardiensis</i> reaching a height of 3 metres in places. Other species recorded include <i>Acacia acuminata</i> , <i>Acacia colletioides</i> , <i>Amphipogon ?strictus</i> , <i>Atriplex stipitata</i> , <i>Dianella revoluta</i> , <i>Melaleuca eleuterostachya</i> , <i>Olearia pimeleoides</i> , <i>Rhagodia preissii</i> , and <i>Stipa elegantissima</i> . A small clump of Shrub Mallee of <i>Eucalyptus hypochlamydea</i> was also recorded.
Open Areas	In open areas adjacent to the Thicket, Herbs to Open Herbs of <i>Borya constricta</i> are found.
Comments	Thicket/ <i>Borya Constricta</i> Herbs are supported by red brown loam soils over granite and cover only a small area of the reserve adjacent to the Merredin-Chandler Road, south of Lake Chandler. The area is mapped as Ang - "heterogeneous, foliated and banded gneiss extensively intruded by leucocratic granite and adamellite" by the Department of Mines W.A.

Photograph 13: Thicket with areas of *Borya constricta* Herbs interspersed at Site

50

Km *Melaleuca* Thicket

Km1 *Melaleuca* Thicket - Type 1

Diagnosis Dense Heath A to Thicket.

Sites 16, 20, 30, 34, 51.

Description

Stratum 1 Dense Heath A to Thicket of *Melaleuca* shrubs to 3 metres with *Melaleuca uncinata* and/or *Melaleuca lateriflora* prominent. Other *Melaleuca* species recorded included *Melaleuca acuminata* ssp. *acuminata* and *Melaleuca eleuterostachya*. Scattered trees of *Callitris glaucophylla* occur in some areas adjacent to lakes or the watercourse. Scattered *Eucalyptus loxophleba* and *Eucalyptus myriadena* emergent to 8 metres were recorded at Site 16.

Stratum 2 Open Low Grass of *Amphipogon ?strictus* occur at Site 16. In most areas shrubs, grasses and herbaceous species are present only as scattered individuals. These include *Grevillea acuaria*, *Disphyma crassifolium*, *Frankenia desertorum*, *Myriocephalus gracilis*, *Olearia exiguifolia* and *Olearia pimeleoides*.

Photograph 14: *Melaleuca uncinata* to 2.5 metres (*Melaleuca* Thicket - type 1) with scattered *Callitris glaucophylla* on the Lake Campion Nature Reserve

Km2 *Melaleuca* Thicket - Type 2

Diagnosis Thicket.

Sites 30.

Description

Stratum 1 Thicket of *Melaleuca uncinata* usually 4-5 metres but occasionally to 7 metres in height. Species occurring as scattered individuals include *Acacia assimilis*, *Gunniopsis intermedia*, *Dodonaea viscosa*, *Enchylaena tomentosa*, *Frankenia desertorum*, *Grevillea acuaria*, *Rhagodia preissii*, *Melaleuca halmaturorum* and *Melaleuca lateriflora*.

Comments *Melaleuca* Thicket Type 1 and 2 form a patchy mosaic at the edge of the water course and over areas covering a low topographic position on the landscape. This includes the margins of some salt lakes and channels, and on rises interspersed. The *Melaleuca* Thickets are interspersed amongst the *Acacia* Scrub but tend to occur where the clay soils are more prominent and were recorded on sand over clay, sandy clay or sandy clay loam in poorly drained areas. Most areas have been mapped as Km indicating that a mosaic of both formations is present. The presence of scattered trees of *Callitris glaucophylla* which may occur in some areas adjacent to the playa lakes or watercourses are indicated by the use of the symbol (c).

**Photograph 15: *Melaleuca uncinata* to 5 metres (*Melaleuca* Thicket - Type 2)
adjacent to the watercourse on the Lake Campion Nature Reserve**

Km3 *Melaleuca* Scrub

Diagnosis Open Scrub to Scrub.

Sites 5, 36.

Description

Stratum 1 Open Scrub to Scrub of *Melaleuca lateriflora* or *Melaleuca halmaturorum* ssp. *cymbifolia* in a discontinuous and patchy strand at the edge of the salt lakes. In some areas only scattered shrubs are present.

Stratum 2 *Halosarcia* Heath occurs in areas adjacent to the *Melaleuca* Scrub occasionally forming a very sparse understorey. Other species recorded include *Atriplex paludosa*, *Atriplex hymenotheca*, *Calocephalus multiflorus*, *Frankenia desertorum* and *Maireana oppositifolia*.

Comments *Melaleuca* Scrub borders the salt lakes and channels in a narrow, patchy strand occurring on saline silty clay on the slightly elevated margins. The boundary of this formation is usually too narrow to map and its presences is therefore indicated by the map unit "Km3" only.

SAMPHIRE

S *Halosarcia* Heath

Diagnosis Open Dwarf Scrub D to Low Heath D.

Sites 6, 21a, 47.

Description Open Dwarf Scrub D to Low Heath D of samphire, mainly of *Halosarcia* species, usually forming a strand at the edge of the salt lakes and channels. In some areas these succulent halophytes occur only as scattered individuals. *Halosarcia* species recorded include *Halosarcia peltata*, *Halosarcia halocnemoides*, *Halosarcia lylei*, *Halosarcia lepidosperma* and *Halosarcia leptoclada*. Other species commonly occurring include *Sclerostegia disarticulata*, *Maireana oppositifolia*, *Atriplex hymenotheca* and *Frankenia desertorum*.

Comments A band of *Halosarcia* Heath usually occurs around the margins of the salt lakes and watercourse, smaller clay pans may be covered. The boundaries of this vegetation association are usually too narrow to map at a scale of 1:25 000 and the presence of samphire is usually indicated by the map unit (S) only.

Appendix 4

NVIS

Vegetation

Descriptions

for

Coates (1990)

Vegetation Associations

Lake Campion Vegetation Associations Coates (1990)

<i>Eucalyptus salicola</i> Woodland – Type 1		Map Unit Ws1	Now <i>Eucalyptus salmonophloia</i> Woodland 2010	
Muir description	Woodland over Scrub over Dwarf Scrub D			
Muir Code	eMi		xSi	xSDi
NVIS structure	U1+^tree\7i	U2^tree mallee\6bi	M1^shrub\4i	G1^shrub\1i
Dominant genus	Eucalyptus		mixed	mixed
Species	^ <i>Eucalyptus salmonophloia</i>	+/- <i>Eucalyptus loxophleba</i>	<i>Acacia tetragonophylla</i>	<i>Atriplex paludosa</i>
	occasional +/- <i>Eucalyptus salubris</i>		<i>Acacia colletioides</i>	<i>Atriplex stipitata</i>
	occasional +/- <i>Eucalyptus yilgarnensis</i>		<i>Exocarpus aphyllus</i>	<i>Olearia muelleri</i>
			<i>Pittosporum phylliraeoides</i>	<i>Rhagodia drummondii</i>
			<i>Santalum acuminatum</i>	<i>Acacia erinacea</i>
U1+^Eucalyptus salmonophloia+/- Eucalyptus salubris+/- Eucalyptus yilgarnensis\Eucalyptus^tree\7i;U2Eucalyptus loxophleba\Eucalyptus^tree mallee\6bi;M1^Acacia tetragonophylla,Acacia colletioides, Exocarpus aphyllus,Pittosporum phylliraeoides, Santalum acuminatum\Acacia^shrub\4i; G1^Atriplex paludosa,Atriplex stipitata,Olearia muelleri,Rhagodia drummondii,Acacia erinacea\Atriplex^chenopod shrub,shrub\1i U+^Eucalyptus salmonophloia+/- Eucalyptus salubris+/- Eucalyptus yilgarnensis\Eucalyptus^tree\7i;M^Acacia tetragonophylla,Acacia colletioides,Exocarpos aphyllus\Acacia^shrub\4i;G^Atriplex paludosa,Atriplex stipitata,Olearia muelleri\Atriplex^chenopod shrub,shrub\1i +Eucalyptus Woodland\Acacia Mixed Tall Open Shrubland\Atriplex Mixed Low Open Chenopod Shrubland				

<i>Eucalyptus salicola</i> Woodland – Type 2		Map Unit Ws2		
Muir description	Low Woodland A over Low Woodland B over Scrub over Dwarf Scrub C			
Muir Code	eLAi	gLBi	xSi	xSCi
NVIS structure	U1+^tree\7i	U2^tree\6i	M1^shrub\4i	G1^shrub\2i
Dominant genus	Eucalyptus	Callitris	mixed	mixed
Species	^ <i>Eucalyptus salicola</i>	^ <i>Callitris columellaris</i>	<i>Melaleuca uncinata</i>	<i>Westringia cephalantha</i>
	occasional +/- <i>Eucalyptus salubris</i>	+/- <i>Callitris preissii</i>	<i>Santalum acuminatum</i>	<i>Westringia dampieri</i>
	occasional +/- <i>Eucalyptus yilgarnensis</i>		<i>Acacia colletioides</i>	<i>Acacia erinacea</i>
			<i>Alyxia buxifolia</i>	<i>Phebalium filifolium</i>
			<i>Leptospermum roei</i>	<i>Grevillea acuaria</i>
U1+^Eucalyptus salicola+/- Eucalyptus salubris+/- Eucalyptus yilgarnensis\Eucalyptus^tree\7i;U2^Callitris columellaris,Callitris preissii\Callitris^tree\6i;M1^Melaleuca uncinata,Santalum acuminatum,Acacia colletioides,Alyxia buxifolia,Leptospermum roei\Melaleuca^shrub\4i;G1^Westringia cephalantha,Westringia dampieri Acacia erinacea,Phebalium filifolium,Grevillea acuaria \Westringia^shrub\2i U+^Eucalyptus salicola+/- Eucalyptus salubris+/- Eucalyptus yilgarnensis\Eucalyptus^tree\7i;M^Melaleuca uncinata,Santalum acuminatum,Acacia colletioides\Melaleuca^shrub\4i;G^Westringia dampieri, Westringia cephalantha,,Acacia erinacea\Westringia^shrub\2i +Eucalyptus Woodland\Melaleuca Mixed Tall Open Shrubland\Westringia Mixed Low Open Shrubland				

<i>Eucalyptus salicola</i> Woodland – Type 2 Map Unit Ws				
Muir description	Open Low Woodland A over Open Low Woodland B over Scrub over Dwarf Scrub C			
Muir Code	eLAr	gLBr	xSi	xSDi
NVIS structure	U1+^tree\7\r	U2\^tree\6\r	M1\^shrub\4 i	G1\shrub\2 i
Dominant genus	Eucalyptus	Callitris	mixed	mixed
Species	^ <i>Eucalyptus salicola</i>	^ <i>Callitris columellaris</i>	Melaleuca uncinata	Westringia cephalantha
	occasional +/- <i>Eucalyptus salubris</i>		Acacia acuminata	Templetonia sulcata
	occasional +/- <i>Eucalyptus yilgarnensis</i>		Acacia colletioides	Scaevola spinescens
			Alyxia buxifolia	Olearia pimeleoides
			Dodonaea viscosa	<i>Westringia dampieri</i>
U1+^Eucalyptus salicola+/- Eucalyptus salubris+/- Eucalyptus yilgarnensis\Eucalyptus\^tree\7 i;U2^Callitris columellaris,Callitris preissii\Callitris\^tree\6 i;M1^Melaleuca uncinata,Acacia acuminata,Acacia colletioides,Alyxia buxifolia,Dodonaea viscosa \Melaleuca\^shrub\4 i;G1^Westringia cephalantha,Templetonia sulcata,Scaevola spinescens,Olearia pimeleoides,Westringia dampieri \Westringia\^shrub\2 i U+^Eucalyptus salicola+/- Eucalyptus salubris+/- Eucalyptus yilgarnensis\Eucalyptus\^tree\7 i;M1^Melaleuca uncinata,Acacia acuminata,Acacia colletioides\Melaleuca\^shrub\4 i;G1^Westringia cephalantha,Templetonia sulcata,Scaevola spinescens \Westringia\^shrub\2 i +Eucalyptus Woodland\Melaleuca Mixed Tall Open Shrubland\Westringia Mixed Low Open Shrubland				
<i>Eucalyptus salicola</i> Woodland – Type 2 Map Unit Ws(c)				
Muir description	Open Low Woodland A over Low Woodland B over Scrub over Dwarf Scrub D			
Muir Code	eLAr	gLBi	xSi	xSDi
NVIS structure	U1\^tree\7\r	U2+^tree\6 i	M1\^shrub\4 i	G1\shrub\2 i
Dominant genus	Eucalyptus	Callitris	mixed	mixed
Species	^ <i>Eucalyptus salicola</i>	^ <i>Callitris columellaris</i>	Melaleuca uncinata	Westringia cephalantha
	occasional +/- <i>Eucalyptus salubris</i>		Acacia acuminata	Templetonia sulcata
	occasional +/- <i>Eucalyptus yilgarnensis</i>		Acacia colletioides	Scaevola spinescens
			Alyxia buxifolia	Olearia pimeleoides
			Dodonaea viscosa	<i>Westringia dampieri</i>
U1^Eucalyptus salicola+/- Eucalyptus salubris+/- Eucalyptus yilgarnensis\Eucalyptus\^tree\7 i;U2+^Callitris columellaris\Callitris\^tree\6 i;M1^Melaleuca uncinata,Acacia acuminata,Acacia colletioides,Alyxia buxifolia,Dodonaea viscosa \Melaleuca\^shrub\4 i;G1^Westringia cephalantha,Templetonia sulcata,Scaevola spinescens,Olearia pimeleoides,Westringia dampieri \Westringia\^shrub\2 i U2+^Callitris columellaris\Callitris\^tree\7 i;M1^Melaleuca uncinata,Acacia acuminata,Acacia colletioides\Melaleuca\^shrub\4 i;G1^Westringia cephalantha,Templetonia sulcata,Scaevola spinescens \Westringia\^shrub\2 i +Callitris Woodland\Melaleuca Mixed Tall Open Shrubland\Westringia Mixed Low Open Shrubland				

Eucalyptus yilgarnensis Woodland		Map Unit Wy		
Muir description	Low Forest A over Scrub over Dwarf Scrub D			
Muir Code	eLAc	xSi	xSDi	
NVIS structure	U1+^tree\7c	M1^shrub\4i	G1^shrub\1i	
Dominant genus	Eucalyptus	mixed	mixed	
Species	^Eucalyptus yilgarnensis	Acacia colletioides	Atriplex paludosa	
	occasional +/- Eucalyptus salubris	Alyxia buxifolia	Atriplex stipitata	
	occasional +/- Eucalyptus salicola	Exocarpos aphyllus	Olearia muelleri	
	occasional +/- Eucalyptus myriadena	Pittosporum phylliraeoides	Rhagodia preissii	
		Santalum acuminatum	Enchylaena tomentosa	
U1+^Eucalyptus yilgarnensis+/-Eucalyptus salubris+/- Eucalyptus salicola+/-Eucalyptus myriadena\Eucalyptus^tree\7c;M1^Acacia colletioides,Alyxia buxifolia,Exocarpos aphyllus,Pittosporum phylliraeoides,Santalum acuminatum\Acacia^shrub\4i;G1^Atriplex paludosa,Atriplex stipitata,Olearia muelleri,Rhagodia preissii,Enchylaena tomentosa\Atriplex^chenopod shrub,shrub\1i; U+^Eucalyptus yilgarnensis+/-Eucalyptus salubris+/- Eucalyptus salicola\Eucalyptus^tree\7c;M^Acacia colletioides,Alyxia buxifolia,Exocarpos aphyllus,Pittosporum angustifolium\Acacia^shrub\4i;G^Atriplex paludosa,Atriplex stipitata,Olearia muelleri\Atriplex^chenopod shrub,shrub\1i; +Eucalyptus Open Forest\Acacia Mixed Tall Open Shrubland\Atriplex Mixed Low Open Chenopod Shrubland				
Eucalyptus salubris Woodland		Map unit Wg		
Muir description	Low Woodland A over Open Low Scrub A over Low Heath C			
Muir Code	eLAi	xSAr	xSCc	
NVIS structure	U1+^tree\7i	M1^shrub\3r	G1^shrub\2c	
Dominant genus	Eucalyptus	mixed	mixed	
Species	^Eucalyptus salubris	Exocarpos aphyllus	Olearia muelleri	
	occasional +/- Eucalyptus yilgarnensis	Acacia colletioides	Atriplex paludosa	
	occasional +/- Eucalyptus salicola	Daviesia benthamii	Atriplex stipitata	
		Santalum acuminatum	Rhagodia preissii	
		Melaleuca lanceolata	Acacia erinacea	
U1+^Eucalyptus salubris,+/-Eucalyptus yilgarnensis,+/- Eucalyptus salicola\Eucalyptus^tree\7i;M1^Exocarpos aphyllus,Acacia colletioides,Daviesia benthamii,Santalum acuminatum,Melaleuca lanceolata \Exocarpos^shrub\3r;G1^ Olearia muelleri,Atriplex paludosa,Atriplex stipitata,Rhagodia preissii,Acacia erinacea\olearia^shrub,chenopod shrub\2c U+^Eucalyptus salubris,+/-Eucalyptus yilgarnensis,+/- Eucalyptus salicola\Eucalyptus^tree\7i;M^Exocarpos aphyllus,Acacia colletioides,Daviesia benthamii\Exocarpos^shrub\3r;G^ Olearia muelleri,Atriplex paludosa,Atriplex stipitata\Olearia^shrub,chenopod shrub\2c +Eucalyptus Woodland\Melaleuca Mixed Sparse Shrubland\Atriplex Mixed Low Chenopod Shrubland				

<i>Eucalyptus longicornis, Eucalyptus melanoxylon</i> Woodland			Map Unit WI	
Muir description	Woodland over Open Low Woodland B over Low Scrub A over Low Heath D			
Muir Code	eMi	mLBr	xSAi	xSDc
NVIS structure	U1+^tree\7i	U2^tree\6r	M1^shrub\3i	G1^shrub\1c
Dominant genus	Eucalyptus	Melaleuca	mixed	mixed
Species	Co-dom ^Eucalyptus longicornis	^Melaleuca lanceolata	Exocarpus aphyllus	Atriplex paludosa
	Co-dom ^Eucalyptus melanoxylon		Santalum acuminatum	Olearia muelleri
	occasional +/-Eucalyptus yilgarnensis		Lycium australe	Westringia dampieri
	occasional +/- Eucalyptus salubris		Pittosporum phylliraeoides	Atriplex stipitata
			Acacia colletioides	Acacia merrallii
U1+^Eucalyptus longicornis,^Eucalyptus melanoxylon,+/-Eucalyptus yilgarnensis,+/- Eucalyptus salubris,\Eucalyptus^tree\7i;U2^Melaleuca lanceolata\Melaleuca^tree\6r;M1^Exocarpus aphyllus,Santalum acuminatum,Lycium australe,Pittosporum phylliraeoides,Acacia colletioides \Exocarpos^shrub\3i;G1^Atriplex paludosa, Olearia muelleri,Westringia dampieri,Atriplex stipitata,Acacia merrallii,\Atriplex^chenopod shrub,shrub\1c U+^Eucalyptus longicornis,^Eucalyptus melanoxylon,+/-Eucalyptus yilgarnensis\Eucalyptus^tree\7i;M^ Exocarpus aphyllus,Santalum acuminatum,Lycium australe \Exocarpos^shrub\3i;G^Atriplex paludosa,Olearia muelleri,Westringia dampieriAtriplex^chenopod shrub,shrub\1c +Eucalyptus Woodland\Exocarpos Mixed Open Shrubland\Atriplex Mixed Low Chenopod Shrubland				
<i>Eucalyptus myriadena, Eucalyptus salubris, Eucalyptus yilgarnensis</i> Woodland			Map Unit Wm	
Muir description	Low Woodland A over Open Low Woodland B over Low Scrub A over Dwarf Scrub D			
Muir Code	eLAi	mLBr	xSAi	xSDi
NVIS structure	U1+^tree\7i	U2^tree\6r	M1^shrub\3i	G1^shrub\1i
Dominant genus	Eucalyptus	Melaleuca	mixed	mixed
Species	Co-dom^Eucalyptus myriadena	^Melaleuca lanceolata	Acacia nyssophylla	Atriplex paludosa
	Co-dom ^Eucalyptus salubris		Acacia colletioides	Atriplex stipitata
	Co-dom ^Eucalyptus yilgarnensis		Cassia nemophila	Olearia muelleri
			Pittosporum phylliraeoides	Acacia merrallii
			Lycium australe	Enchylaena tomentosa
U1+^Eucalyptus myriadena,^Eucalyptus salubris,^Eucalyptus yilgarnensis\Eucalyptus^tree\7i;U2^Melaleuca lanceolata\Melaleuca^tree\6r;M1^Acacia nyssophylla,Acacia colletioides,Cassia nemophila,Pittosporum phylliraeoides,Lycium australe,\Acacia^shrub\3i;G1^Atriplex paludosa,Atriplex stipitata,Olearia muelleri,Acacia merrallii,Enchylaena tomentosaAtriplex^chenopod shrub,shrub\1i U+^Eucalyptus myriadena,Eucalyptus salubris,Eucalyptus yilgarnensis\Eucalyptus^tree\7i;M^Acacia nyssophylla,Acacia colletioides,Cassia nemophila\Acacia^shrub\3i;G^Atriplex paludosa,Atriplex stipitata,Olearia muelleriAtriplex^chenopod shrub,shrub\1i +Eucalyptus Woodland\Acacia Mixed Open Shrubland\Atriplex Mixed Low Open Chenopod Shrubland				

<i>Eucalyptus capillosa</i> Woodland		Map Unit Ww	
Muir description	Low woodland A over Open Dwarf Scrub C		
Muir Code	eLAi	mSCr	
NVIS structure	U1+^tree\7i	G1^shrub\2r	
Dominant genus	Eucalyptus	mixed	
Species	^ <i>Eucalyptus capillosa</i>	<i>Daviesia benthamii</i>	
	occasional +/- <i>Eucalyptus salubris</i>	<i>Eremophila drummondii</i>	
	occasional +/- <i>Eucalyptus salicola</i>	<i>Grevillea acuaria</i>	
		<i>Templetonia sulcata</i>	
		<i>Melaleuca uncinata</i>	
<p>U1+^<i>Eucalyptus capillosa</i>+/- <i>Eucalyptus salubris</i>+/- <i>Eucalyptus salicola</i>\Eucalyptus^tree\7i;G1^<i>Daviesia benthamii</i>,<i>Eremophila drummondii</i>,<i>Grevillea acuaria</i>,<i>Templetonia sulcata</i>,<i>Melaleuca uncinata</i>\<i>Daviesia</i>^shrub\2r</p> <p>U+^<i>Eucalyptus capillosa</i>+/- <i>Eucalyptus salubris</i>+/- <i>Eucalyptus salicola</i>\Eucalyptus^tree\7i;G^<i>Daviesia benthamii</i>,<i>Eremophila drummondii</i>,<i>Grevillea acuaria</i>\<i>Daviesia</i>^shrub\2r</p> <p>+<i>Eucalyptus</i> Woodland\<i>Daviesia</i> Mixed Low Sparse Shrubland</p>			
<i>Callitris columellaris</i> open low Woodland		Map Unit Wc	
Muir description	Open Low Woodland B over Scrub over Dwarf Scrub C		
Muir Code	gLBr	xSi	xSCi
NVIS structure	U1^tree\6r	M1+^shrub\4i	G1^shrub\2i
Dominant genus	Callitris	mixed	mixed
Species	^ <i>Callitris columellaris</i>	<i>Leptospermum roei</i>	<i>Darwinia drummondii</i>
	occasional +/- <i>Callitris preissii</i>	<i>Persoonia ?angustiflora</i>	<i>Conostephium preissii</i>
		<i>Acacia rigens</i>	<i>Leucopogon cuneifolius</i>
	occasional +/- <i>Eucalyptus salicola</i>	<i>Melaleuca uncinata</i>	<i>Jacksonia hakeoides</i>
		<i>Santalum acuminatum</i>	<i>Grevillea apiculoba</i>
<p>U1^<i>Callitris columellaris</i>+/- <i>Callitris preissi</i>+/- <i>Eucalyptus salicola</i>\<i>Callitris</i>^tree\6r;M1+^<i>Leptospermum roei</i>,<i>Persoonia ?angustiflora</i>,<i>Acacia rigens</i>,<i>Melaleuca uncinata</i>,<i>Santalum acuminatum</i>\<i>Leptospermum</i>^shrub\4i;G1^<i>Darwinia drummondii</i>,<i>Conostephium preissii</i>,<i>Leucopogon cuneifolius</i>,<i>Jacksonia hakeoides</i>,<i>Grevillea apiculoba</i>\<i>Darwinia</i>^shrub\2i</p> <p>U^<i>Callitris columellaris</i>+/- <i>Callitris preissii</i>+/- <i>Eucalyptus salicola</i>\<i>Callitris</i>^tree\6r;M1+^ <i>Leptospermum roei</i>,<i>Persoonia ?angustiflora</i>,<i>Acacia rigens</i>\<i>Leptospermum</i>^shrub\4i;G^<i>Darwinia drummondii</i>,<i>Conostephium preissii</i>,<i>Leucopogon cuneifolius</i>\<i>Darwinia</i>^shrub\2i</p> <p><i>Callitris</i> Low Open Woodland\+<i>Leptospermum</i> Mixed Tall Open Shrubland\<i>Darwinia</i> Mixed Low Open Shrubland</p>			

Eucalyptus loxophleba Tree Mallee		Map Unit My		
Muir description	Tree Mallee over Open Low Scrub A over Dwarf Scrub D			
Muir Code	eKTc	xSAr	xSDi	
NVIS structure	U1+\Tree Mallee\6\c	M1\shrub\3\r	G1\shrub\1\i	
Dominant genus	Eucalyptus	mixed	mixed	
Species	^Eucalyptus loxophleba	Acacia acuminata	Olearia muelleri	
		Acacia colletioides	Olearia pimeleoides	
		Alyxia buxifolia	Olearia exiguiifolia	
		Exocarpos aphyllus	Rhagodia drummondii	
		Eremophila oppositifolia	Atriplex stipitata	
<p>U1+^Eucalyptus loxophleba\Eucalyptus\Tree Mallee\6\c;M1^^Acacia acuminata,Acacia colletioides,Alyxia buxifolia,Exocarpos aphyllus,Eremophila oppositifolia\Acacia\shrub\3\r;G1^^Olearia muelleri,Olearia pimeleoides,Olearia exiguiifolia,Rhagodia drummondii,Atriplex stipitat\Olearia\^shrub,chenopod shrub\1\i;</p> <p>U+^Eucalyptus loxophleba\Eucalyptus\Tree Mallee\6\c;M^^Acacia acuminata,Acacia colletioides,Alyxia buxifolia\Acacia\shrub\3\r;G^^ Olearia mueller,Olearia pimeleoides,Olearia exiguiifolia \Olearia\^ shrub, chenopod shrub\1\i;</p> <p>+Eucalyptus Open Mallee Forest\Acacia Mixed Sparse Shrubland\Olearia Mixed Low Open Shrubland</p>				
Eucalyptus leptopoda Open Shrub Mallee over Thicket		Map Unit MI		
Muir description	Very Open Shrub Mallee over Thicket over low Grass			
Muir Code	KSr	Sc	GLc	
NVIS structure	M1\^shrub mallee\5\r	M2+\^shrub\4\c	G1\grass\1\c	
Dominant genus	Eucalyptus	mixed	Amphipogon	
Species	^Eucalyptus leptopoda	Melaleuca uncinata	^ Amphipogon ?strictus	
		Acacia coolgardiensis		
		Hakea minyma		
		Baeckea aff. behrii		
<p>M1^Eucalyptus leptopoda\Eucalyptus\shrub mallee\5\r;M2+^^Melaleuca uncinata,Acacia coolgardiensis,Hakea minyma,Baeckea aff. behrii\Melaleuca\^shrub\4\c;G1^Amphipogon ?strictus\Amphipogon\^tussock grass\1\c;</p> <p>M+^^Melaleuca uncinata,Acacia coolgardiensis,Hakea minyma\Melaleuca\^shrub\4\c;G^Amphipogon ?strictus\Amphipogon\grass\1\c;</p> <p>+Melaleuca Mixed Tall Shrubland\Amphipogon Low Tussock Grassland</p>				

Acacia scrub		Map Unit Ka		
Muir description	Scrub/Thicket over Dwarf Scrub D			
Muir Code	Sc or Si	SDi		
NVIS structure	M1+\'shrub\4\c or M1+\'shrub\4\i	G1\'shrub\1\i		
Dominant genus	Acacia	mixed		
Species	^Acacia assimilis	Atriplex hymenotheca		
	Acacia colletioides	Rhagodia preissii		
	Acacia tetragonophylla	Frankenia desertorum		
	Acacia acuminata	Enchylaena tomentosa		
	Hakea preissii	Grevillea acuaria		
Scrub/Thicket needs to be separated out into mosaic components:				
Acacia scrub				
Scrub over Dwarf Scrub D				
M1+^Acacia assimilis,Acacia colletioides,Acacia tetragonophylla,Acacia acuminata,Hakea preissii,\Acacia\'shrub\4\i;G1^Atriplex hymenotheca,Rhagodia preissii,Frankenia desertorum,Enchylaena tomentose,Grevillea acuaria\Atriplex\'chenopod shrub,shrub\1\i				
M+^Acacia assimilis,Acacia colletioides,Acacia tetragonophylla\Acacia\'shrub\4\i;G^Atriplex hymenotheca,Rhagodia preissii,Frankenia desertorum\Atriplex\'chenopod shrub,shrub\1\i				
+Acacia Tall Open Shrubland\Atriplex Mixed Low Open Chenopod Shrubland				
Or				
Acacia scrub				
Thicket over Dwarf Scrub D				
M1+^Acacia assimilis,Acacia colletioides,Acacia tetragonophylla,Acacia acuminata,Hakea preissii,\Acacia\'shrub\4\c ;G1^Atriplex hymenotheca,Rhagodia preissii,Frankenia desertorum,Enchylaena tomentose,Grevillea acuaria \Atriplex\'chenopod shrub,shrub\1\i				
M+^Acacia assimilis,Acacia colletioides,Acacia tetragonophylla\Acacia\'shrub\4\c ;G^Atriplex hymenotheca,Rhagodia preissii,Frankenia desertorum\Atriplex\'chenopod shrub,shrub\1\i				
+Acacia Tall Shrubland\Atriplex Mixed Low Open Chenopod Shrubland				
Acacia acuminata scrub		Map Unit Ka(j)		
Muir description	Thicket			
Muir Code	Sc	SDi		
NVIS structure	M1+\'shrub\4\c	G1\'shrub\1\bi		
Dominant genus	Acacia	mixed		
Species	^Acacia acuminata	Olearia pimeleoides		
	Acacia tetragonophylla	Rhagodia preissii		
	Hakea recurva	Templetonia sulcata		
	Pittosporum phylliraeoides	Enchylaena tomentosa		
	Dodonaea viscosa	Cassia nemophila		

M1+^Acacia acuminata,Acacia tetragonophylla,Hakea recurva,Pittosporum phylliraeoides,Dodonaea viscosa\Acacia\shrub\4\c ;G1^Olearia pimeleoides,Rhagodia preissii, Templetonia sulcata,Enchylaena tomentose,Cassia nemophila\Olearia\shrub,chenopod shrub\1\bi M+^Acacia acuminata,Acacia tetragonophylla,Hakea recurva\Acacia\shrub\4\c ;G^Olearia pimeleoides, Rhagodia preissii, Templetonia sulcata\Olearia\shrub,chenopod shrub\1\bi +Acacia Tall Shrubland\Olearia Mixed isolated shrubs				
Thicket over <i>Borya constricta</i> Herbs		Map Unit	Kh	
Muir description	Thicket over Open Herbs			
Muir Code	aSc	Ji		
NVIS structure	M1+\shrub\4\c	G1\forb\1\i		
Dominant genus	Acacia	Borya		
Species	^Acacia coolgardiensis	^Borya constricta		
	Acacia colletioides			
	Acacia acuminata			
	Melaleuca eleuterostachya			
M1+^Acacia coolgardiensis,Acacia colletioides,Acacia acuminata,Melaleuca eleuterostachya\Acacia\shrub\4\c;G1^Borya constricta\Borya\forb\1\i M+^Acacia coolgardiensis,Acacia colletioides,Acacia acuminata\Acacia\shrub\4\c;G^Borya constricta\Borya\rush\1\i +Acacia Tall Shrubland\Borya Low Open Rushland				
Melaleuca Thicket – Type 1		Map Unit	Km1	
Muir description	Thicket			
Muir Code	mSc			
NVIS structure	M1+\shrub\4\c	G1\shrub,chenopod shrub\1\bi		
Dominant genus	Melaleuca	mixed		
Species	Co-dom^Melaleuca uncinata	Grevillea acuaria		
	Co-dom ^Melaleuca lateriflora	Disphyma crassifolium		
	Occasional +/-Melaleuca acuminata	Frankenia desertorum		
	Occasional +/-Melaleuca eleuterostachya	Rhagodia preissii		
		Olearia pimeleoides		
M1+^Melaleuca uncinata,^Melaleuca lateriflora,Melaleuca acuminata,Melaleuca eleuterostachya\Melaleuca\shrub\4\c;G1^Grevillea acuaria,Disphyma crassifolium,Frankenia desertorum,Rhagodia preissii,Olearia pimeleoides\Grevillea\shrub,chenopod shrub\1\bi M1+^Melaleuca uncinata,Melaleuca lateriflora,Melaleuca acuminata\Melaleuca\shrub\4\c;G1^Grevillea acuaria,Disphyma crassifolium,Frankenia desertorum\shrub,chenopod shrub\1\bi +Melaleuca Tall Shrubland\Grevillea mixed isolated shrubs				

Melaleuca Thicket – Type 2		Map Unit Km2		
Muir description	Thicket			
Muir Code	mSc			
NVIS structure	M1+\'shrub\'4c	G1\'shrub,chenopod shrub\'1bi		
Dominant genus	Melaleuca	mixed		
Species	^Melaleuca uncinata	Grevillea acuaria		
	occasional +/-Melaleuca halmaturorum	Frankenia desertorum		
	occasional +/-Melaleuca lateriflora	Rhagodia preissii		
		Enchylaena tomentosa		
<p>M1+^Melaleuca uncinata+/-Melaleuca halmaturorum+/-Melaleuca lateriflora\Melaleuca\'shrub\'4c;G1^Grevillea acuaria, Frankenia desertorum,Rhagodia preissii,Enchylaena tomentose\Grevillea\'shrub,chenopod shrub\'1bi</p> <p>M+^Melaleuca uncinata+/-Melaleuca halmaturorum+/-Melaleuca lateriflora\Melaleuca\'shrub\'4c;G1^Grevillea acuaria, Frankenia desertorum,Rhagodia preissii\Grevillea\'shrub,chenopod shrub\'1bi</p> <p>+Melaleuca Tall Shrubland\Grevillea mixed isolated shrubs</p>				
Melaleuca Thicket with scattered trees of Callitris glaucophylla		Map Unit Km(c)		
Muir description	Thicket with scattered Callitris glaucophylla trees			
Muir Code		mSc		
NVIS structure	U1\'tree\'6bi	M1+\'shrub\'4c	G1\'shrub,chenopod shrub\'1bi	
Dominant genus	Callitris	Melaleuca	mixed	
Species	^Callitris glaucophylla	^Melaleuca uncinata	Grevillea acuaria	
		^Melaleuca lateriflora	Frankenia desertorum	
		Occasional +/-Melaleuca halmaturorum	Rhagodia preissii	
		Occasional +/- Melaleuca acuminata	Enchylaena tomentosa	
		Occasional +/- Melaleuca eleuterostachya	Disphyma crassifolium	
<p>U1^Callitris glaucophylla\'tree\'6bi;M1+^Melaleuca uncinata,^Melaleuca lateriflora,+/-Melaleuca halmaturorum,+/-Melaleuca acuminata,+/-Melaleuca eleuterostachya\Melaleuca\'shrub\'4c;G1^Grevillea acuaria, Frankenia desertorum,Rhagodia preissii,Enchylaena tomentose,Disphyma crassifolium\Grevillea\'shrub,chenopod shrub\'1bi</p> <p>M+^Melaleuca uncinata,^Melaleuca lateriflora, +/-Melaleuca halmaturorum\Melaleuca\'shrub\'4c;G1^Grevillea acuaria, Frankenia desertorum,Rhagodia preissii\Grevillea\'shrub,chenopod shrub\'1bi</p> <p>+Melaleuca Tall Shrubland\Grevillea mixed isolated shrubs</p>				

Melaleuca Scrub		Map Unit Km3		
Muir description	Scrub			
Muir Code	mSi			
NVIS structure	M1+^shrub\4i	G1^chenopodshrub,shrub\1bi		
Dominant genus	Melaleuca	mixed		
Species	+/-^Melaleuca lateriflora	Halosarcia halocnemoides		
	+/-^Melaleuca halmaturorum	Atriplex hymenotheca		
		Rhagodia preissii		
		Frankenia desertorum		
		Enchylaena tomentosa		
<p>M1+^Melaleuca lateriflora,^Melaleuca halmaturorum\Melaleuca^shrub\4i;G1^Halosarcia halocnemoides,Atriplex hymenotheca,Rhagodia preissii,Frankenia desertorum,Enchylaena tomentosa^samphire shrub,cenopod shrub,shrub\1bi</p> <p>M+^Melaleuca lateriflora,^Melaleuca halmaturorum\Melaleuca^shrub\4i;G1^Halosarcia halocnemoides,Atriplex hymenotheca,Rhagodia preissii\Halosarcia^samphire shrub,chenopod shrub,shrub\1bi</p> <p>+Melaleuca Tall Open Shrubland\Halosarcia mixed isolated samphire shrubs</p>				
Tecticornia Heath		Map Unit S		
Muir description	Dwarf Scrub D or low Heath D			
Muir Code	SDc or SDi			
NVIS structure	G1+^samphire shrub\1c or G1+^samphire shrub\1c			
Dominant genus	Halosarcia			
Species	+/-^ Halosarcia peltata			
	+/-^ Halosarcia halcnemoides			
	+/-^ Halosarcia lylei			
	+/-^ Halosarcia lepidosperma			
	+/-^ Halosarcia leptoclada			
<p>Dwarf Scrub D</p> <p>G1+^/-Halosarcia peltata,^ +/-Halosarcia halcnemoides,^ +/-Halosarcia lylei,^ +/-Halosarcia lepidosperma,^ +/-Halosarcia leptoclada\ Halosarcia\ ^samphire shrub\1i</p> <p>G+^/-Halosarcia peltata,^ +/-Halosarcia halcnemoides, ^ +/-Halosarcia lylei, ^ +/-Halosarcia lepidosperma, ^ +/-Halosarcia leptoclada\ Halosarcia ^samphire shrub\1i</p> <p>+Halosarcia Low Open Samphire Shrubland</p>				

Or

Low Heath D

G1+^+/-Halosarcia peltata,^ +/-Halosarcia halcnemoides,^ +/-Halosarcia lylei,^ +/-Halosarcia lepidosperma,^ +/-Halosarcia leptoclada\
Halosarcia\ ^samphire shrub\1\c

G+^+/-Halosarcia peltata,^+/-Halosarcia halcnemoides, ^+/-Halosarcia lylei, ^+/-Halosarcia lepidosperma, ^+/-Halosarcia leptoclada\
Halosarcia \^samphire shrub\1\c

+Halosarcia Low Samphire Shrubland

Appendix 5
Ecoscape (2005)
Vegetation
Descriptions

Ecoscape Mapping 323_017 Lake Champion area

- MD05-17-01 Roycea divaricata & Halosarcia pterygosperma subsp. pterygosperma Dense Herbs
- MD05-17-02 Eucalyptus salmonophloia & Eucalyptus salubris Open Woodland over Acacia aestivalis, Dodonaea viscosa subsp. angustissima, Pittosporum angustifolium Open Low Scrub A over Olearia muelleri & Atriplex sp. Open Dwarf Scrub D
U1+^Eucalyptus salmonophloia, Eucalyptus salubris\Eucalyptus\^tree\Eucalyptus\7\r;M1 ^Acacia aestivalis, Dodonaea viscosa subsp. angustissima, Pittosporum angustifolium\Acacia\^shrub\3\r;G1^Olearia muelleri^Atriplex sp. \^shrub,chenopod shrub\1\r
+Eucalyptus Open Woodland\Acacia Mixed Sparse Shrubland\Olearia/Atriplex Low Sparse Shrubland
- MD05-17-03 Eucalyptus salicola Open Low Woodland A over Pittosporum angustifolium & Eremophila oppositifolia subsp. angustifolia Open Low Scrub A over Olearia muelleri & Atriplex sp. Dwarf Scrub C
U1+^Eucalyptus salicola\Eucalyptus\^tree\6\r;M1 ^Pittosporum angustifolium^Eremophila oppositifolia subsp. Angustifolia\Pittosporum\^shrub\3\r;G1^Olearia muelleri^Atriplex sp.\Olearia\^shrub,chenopod shrub\2\r
+Eucalyptus Low Open Woodland\Pittosporum/Eremophila Sparse Shrubland\OleariaAtriplex Low Open Shrubland
- MD05-17-04 Acacia acuminata Dense Thicket over Acacia tetragonophylla & Hakea recurva Low Scrub A
M1+^Acacia acuminata\Acacia\^shrub\4\r;M1^Acacia tetragonophylla^Hakea recurva\Acacia\^shrub\3\r
+Acacia Tall Closed Shrubland\Acacia/Hakea Open Shrubland
- MD05-17-05 Eucalyptus salmonophloia Open Woodland over Eucalyptus loxophleba subsp. lyssophobia Open Shrub Mallee over Acacia tetragonophylla & Westringia cephalantha Open Dwarf Scrub C
U1+"Eucalyptus salmonophloia\Eucalyptus\^tree\7\r;U2Eucalyptus loxophleba subsp. lissophloia\Eucalyptus\mallee shrub\6\r;G 1^Acacia tetragonophylla^Westringia cephalantha\Acacia\^shrub\2\r
+Eucalyptus Open Woodland\Acacia/Westringia Low Sparse Shrubland
- MD05-17-06 Westringia cephalantha & Acacia coolgardiensis subsp. effusa Heath A over Atriplex sp. & Chenopodium sp. Dwarf Scrub D
M1+^Westringia cephalantha^Acacia coolgardiensis subsp. effusa\Westringia\^heath shrub\3\r;G1 ^Atriplex sp.^Chenopodium sp.\Atriplex\^chenopod shrub\1\r
+Westringia/Acacia Heathland\ Atriplex Low Open Chenopod Shrubland
- MD05-17-07 Westringia cephalantha & Acacia coolgardiensis subsp. effusa Dense Heath A (now all dead) over Halosarcia pterygosperma subsp. pterygosperma & Roycea divaricata Dense Herbs
M1^Westringia cephalantha^Acacia coolgardiensis subsp. effusa\Westringia\^heath shrub\3\r;G 1+^Halosarcia pterygosperma subsp. pterygosperma^Roycea divaricata\Halosarcia\^Samphire shrub,chenopod shrub\1\r
Westringia/Acacia Heathland\+Halosarcia\Roycea Low Closed Samphire Shrubland
- MD05-17-08 Melaleuca lateriflora subsp. lateriflora Open Low Scrub A over Roycea divaricata Open Herbs
M1+^Melaleuca lateriflora subsp. lateriflora\Melaleuca\^shrub\3\r;G1 ^Roycea divaricata\Roycea\^chenopod shrub\1\r
+Melaleuca Sparse Shrubland\Roycea Low Open Chenopod Shrubland

- MD05-17-09 E. salmonophloia & E. salubris Woodland over scattered A. tetragonophylla, E. oppositifolia subsp. angustifolia, M. triptera, L. preissiana & S artemisioides subsp. x artemisioides over O. muelleri & Atriplex sp. Low Heath D
 U1"Euca Iyptus salmonophloia, Eucalyptus salubris\Eucalyptus\^tree\7\i; M1^^Acacia tetragonophylla, Eremophila oppositifolia subsp. angustifolia, Melaleuca triptera, Leptomeria preissiana, Senna artemisioides subsp. x artemisioides\Acacia\^shrub\ ?\bi; G1^Olearia
 +Eucalyptus Woodland\Acacia Mixed ?Isolated Shrubs\Olearia/Atriplex Low Heathland
- MD05-17-10 Dense Low Grasses
- MD05-17-11 Melaleuca lateriflora subsp. lateriflora Dense Heath A over Roycea divaricata & Halosarcia pterygosperma subsp. pterygosperma Very Open Herbs
 M1+^Melaleuca lateriflora subsp. lateriflora\Melaleuca\^heath shrub\3\d;G1^Roycea divaricata^Halosarcia pterygosperma subsp. pterygosperma\^samphire shrub,chenopod shrub\1 \r
 +Melaleuca Closed Heathland\Roycea/Halosarcia Low Sparse Samphire Shrubland
- MD05-17-12 Dense Low Grasses
 G1+^?\^tussock grass\1\d
 +? Low Closed tussock Grassland
- MD05-17-13 Callitris glaucophylla Open Low Woodland B over Senna artemisioides subsp. x artemisioides Open Scrub over Roycea divaricata & Halosarcia pterygosperma subsp. pterygosperma Herbs
 U1+^Callitris glaucophylla\Caliitris\^tree\6\i;M1 ^Senna artemisioides subsp. x artemisioides\Senna\^shrub\4\r;G 1^Roycea divaricata^Halosarcia pterygosperma\Roycea\^chenopod shrub,samphire shrub\1\c
 +Callitris Low Woodland\Senna Tall Sparse Shrubland\Roycea/Halosarcia Low Chenopod Shrubland

