

## II VEGETATION OF MARCHAGEE NATURE RESERVE

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### General

Marchagee Nature Reserve lies within the Irwin district of the South Western Botanical Province of Gardner and Bennetts (1956). Vegetation of the Marchagee Vegetation System has been discussed by Beard (1976a,b). Beard maps the vegetation of Marchagee Reserve as 'scrub heath on sandplain' with a belt of 'teatree thicket and samphire' on its north-eastern side.

Abbreviated vegetation descriptions are presented in **Appendix 1** and sample locations are illustrated on **Map 1**. Full descriptions of the vegetation following the format presented in Muir (1977) are available on request from the Librarian. Species found at some locations are listed in **Appendix 2** and families of plants in **Appendix 3**.

### Methodology

The vegetation of Marchagee Nature Reserve was mapped at Level 1 on the reliability scale set out in Muir (*ibid*). Each vegetation formation discernible on the air photographs was examined on the ground; at least one location was described in detail within each major association using the classification shown in **Table 1** and discussed in detail in Muir (*ibid*); and a soil profile was described for each major association.

Level 1 locations shown on **Map 1** represent 'sample areas' where the vegetation was examined in detail. The following prefix numbers of the locations represent basic formation types.

- 2. = Mallee formations
- 3. = Shrubland formations
- 4. = Heath formations
- 7. = Salt complex
- 8. = Other

The methods used in classifying formations, coding vegetation, preparing plant lists, classifying litter and describing soils are those of Muir (*ibid*). In addition to the soil characteristics dealt with on other reserves, total soluble salts were also measured on Marchagee Reserve. Samples were prepared by mixing 20 grams of sieved soil (less than 2 mm) with 50 c.c. deionised water and shaking periodically for 30 mins. Conductivity readings were taken on a Philips PW9504 Conductivity Meter fitted with a PW9510 electrode. Readings were then converted to total soluble salts by comparison to a standard seawater curve.

**TABLE 1: VEGETATION CLASSIFICATION TO BE USED IN WHEATBLET SURVEY**

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

## DISCUSSION

### Formation and distribution

All the major wheatbelt formations, except woodlands, breakaway complex and lithic complex, are found on Marchagee Reserve. Distribution of the formations present result from soil characteristics. Highest portions of the Reserve have deep yellow sands with *Banksia* or *Actinostrobus* shrubland associations, lower land has salt pans and flats with *Arthrocnemum* or heaths. In some areas, particularly at loc. 2.1, are dunes of calcareous, argillaceous material resembling marl. This material is probably the result of wind piling of fine debris on the edge of salt pans and develops pinkish sandy soils supporting mallee.

The majority of the Reserve is salt complex and heath mosaic and to a lesser extent shrubland. The other formations are poorly represented (Table 2).

TABLE 2  
Area of each formation and its percentage of the Reserve.

Formation	Area of formation (ha)	% of Reserve
Mallee	8	2
Shrubland	146	29
Heath	40	8
Salt complex	28	6
Heath/Salt mosaic	269	54
Others (sedgeland)	4	1

### Associations

'Associations' as used here includes associations, associates and consociations according to the definitions of Beadle and Costin (1952) and Polunin (1960).

#### MALLEE

*Eucalyptus dongarraensis* - *E. brachycorys*

*E. foecunda*

#### SHRUBLAND

*Actinostrobus arenarius*

*Banksia attenuata* - *Adenanthos stictus* - *Xylomelum angustifolium*

*Jacksonia eremodendron*

*Xylomelum angustifolium*

#### HEATH

*Melaleuca acuminata*

Mixed (no particular dominant)

*Thryptomene proliferata*

#### SALT COMPLEX

*Arthrocnemum halocnemoides*

*A. sp. 1 - A. bidens*  
*Melaleuca cordata*  
*M. uncinata*

SEDGELAND

*Ecdeiocolea monostachya*

Formation	Number of Associations
Mallee	2
Shrubland	4
Heath	3
Salt complex	4
Sedgeland	1
Total	14

Compared with other reserves so far examined in the wheatbelt, Marchagee Reserve has a fairly low number of associations (14) compared to the average number of 21. Expressed as number of associations in relation to area of Reserve, Marchagee has about the average number of 2.3km<sup>2</sup>.

**Floristics**

The vegetation of Marchagee Reserve is complex and mosaic, particularly in the heath/salt complex areas. In the other formations plant distribution tended to be fairly homogenous and so probably the majority of larger perennials and annual species were collected. The number of plant species recorded was 143 and from previous experience the total number of common perennials and larger ephemerals is probably about 220 species. In terms of number of plant species recorded per area Marchagee Reserve has about 29/km<sup>2</sup>. This is comparable to figures obtained from other reserves of similar size.

Thirty-three families were recorded, dominated by Myrtaceae, and Proteaceae amongst the Dicotyledons and Cyperaceae amongst the monocotyledons (**Appendix 3**).

**TABLE 3**  
 Comparison between floristic richness of each formation.

Formation	No. of species	Spp/ha
Mallee	47	5.9
Shrubland	61	0.4
Heath*	50	1.3
Salt complex*	24	0.1
Other (sedgeland)	28	7.0

\*Salt/heath mosaics were divided as well as possible.

Figures (Table 3) indicate that mallee, shrubland and heath contained the most species, but in terms of richness per given area the sedgeland was particularly diverse and the salt complex least diverse.

TABLE 4

The number of species recorded *only* in a single formation (restricted species).

Formation	No. of species	Spp/ha
Mallee	23	2.9
Shrubland	34	0.2
Heath	20	0.5
Salt complex	14	0.05
Other (sedgeland)	8	2.0

Although the majority of restricted species were found in shrubland (Table 4) and to a lesser extent mallee and heath, by far the most restricted species per area were found in mallee. Ninety-nine species, or 69% of the species recorded, were restricted to single formation types.

A synthesis of all ecological and floristic data for the Reserve will be included in the final wheatbelt study to be presented later.

## APPENDIX 1

### VEGETATION DESCRIPTIONS OF MARCHAGEE RESERVE

#### MALLEE

##### Loc. 2.1

Situated on crest of low rise. Northern side of crest has *Eucalyptus* affin. *dongarraensis* and *E. brachycorys* shrub mallees, 0-2 m tall, 2-10% canopy cover. Area has been disturbed and is regrowth. Soil is moderately pedal, sandy, poorly coherent, unbleached, very calcareous, pH 8.0, light brown, 7.5 YR 6/4, clay loam. Soluble salts 220 ppm.

Top of crest is *E. affin. dongarraensis* and *E. brachycorys* shrub mallee, 7-10 m tall, 2-10% canopy cover over mixed shrubs, no particular dominant, 0-2 m tall, 1-4% canopy cover. Soil is highly pedal, sandy, coherent, unbleached, highly calcareous, pH 8.2, reddish yellow, 7.5 YR 6/6, sandy loam. Soluble salts 160 ppm. Soil layer originally *ca* 2 m deep over calcareous, argillaceous, marl-like material derived from the salt lake. Now 0.2-0.5 m deep due to removal of sand for roadworks. Well drained. Vegetation is *ca* 28 years old except where disturbed.

South side of crest has extremely variable mosaic of 4 associations, one of the commonest being mallee dominated. The associations are *E. brachycorys* and *E. affin. dongarraensis* shrub mallee, 3-5 m tall, 10-30% canopy cover over mixed shrubs, 0-1 m tall, 2-10% canopy cover *OR Acacia coolgardiensis* shrubs 0-3 m tall. *ca* 2% canopy cover over mixed shrubs 1.0 m tall, 10-30% canopy cover *OR Melaleuca*

*uncinata* shrubs 3-6 m tall, 70-100% (no understory) OR *Casuarina obesa* 3-6 m tall, 10-30% over *Arthrocnemum halocnemoides* shrubs 0.5 m tall, 10-30% canopy cover. Litter was mostly abundant, broadleaves, terete leaves, twigs and large debris, clumped to 2 cm deep, clumps 2-4 m apart. Soil highly variable, mostly as described for north side of crest.

#### Loc. 2.2

Stratum 1: *Eucalyptus foecunda* shrub mallee, mature, stratum 8-10 m tall, ca 2-3% canopy cover. Stratum 2: *Actinostrobos arenarius* and *Melaleuca acuminata* shrubs, mature, stratum 2-4 m tall. 2-10% canopy cover. Stratum 3: *Acacia saligna* and several other species of shrubs, immature 0.5-1.5m tall, 2-10% canopy cover. Some areas with *Lepidosperma tenue* 0.4 m tall, 70-100% canopy cover. No evidence of fire. Vegetation is 28 years old. Litter: abundant. Soil: pinkish grey sandy loam. Soluble salts 140 ppm. Well drained with some pooling.

#### Loc. 2.3

Small area of *Eucalyptus foecunda* shrub mallee similar to loc. 2.1. Heavily disturbed.

### SHRUBLAND

#### Loc. 3.1

*Actinostrobos arenarius* shrubland similar to loc. 3.5 passing into *Banksia prionotes* shrubland similar to loc. 3.14 closer to loc. 3.2. Transition has *Acacia lasiocalyx* trees prominent.

#### Loc. 3.2

Stratum 1: *Banksia prionotes* shrubs, mature, stratum 2-4 m tall. 2-10% canopy cover. Stratum 2: *Casuarina campestris* and several other species of shrubs, mature to senescent, stratum 1-1.5 m tall, ca 3% canopy cover. Stratum 3: *Ecdeiocolea monostachya* and *Mesomelaena uncinata* sedges with scattered shrubs, mature, stratum 0.5 m tall, 10-30% canopy cover. Numerous species regenerating from seed. No evidence of fire. Vegetation is 21 years old. Litter: very abundant. Soil: reddish yellow fine sandy loam. Well to excessively drained.

#### Loc. 3.3

Basically as for loc. 3.2 but *Banksia prionotes* stratum 10-30% canopy cover and understory thins out slightly. *Xylomelum angustifolium* common.

#### Loc. 3.4

Mosaic of *Xylomelum angustifolium*, *Adenanthos stictus* and *Banksia prionotes* shrublands similar to locs 3.10 and 3.14.

#### Loc. 3.5 (Trapline 9)

Stratum 1: *Actinostrobos arenarius* shrubs, immature, stratum 0-2.5 m tall, 10-30% canopy cover. Stratum 2: *Mesomelaena uncinata* and *Ecdeiocolea monostachya* sedges, immature, stratum 0-1 m tall, 10-30% canopy cover. Some *A. arenarius* emergent to 4 m tall. Seedlings or young plants of most species present. Evidence of old fire scars. Vegetation is 21 years old. Litter: moderately abundant. Soil: reddish yellow sandy loam. Excessively drained.

#### Loc. 3.6

Mosaic of *Banksia prionotes* and *Adenanthos stictus* shrublands similar to locs 3.10 and 3.14.

**Loc. 3.7**

*Actinostrobus arenarius* shrubland similar to loc. 3.5 but drops below 2 m tall on border of loc. 4.5.

**Loc. 3.8**

*Banksia prionotes* shrubland similar to loc. 3.2 and with scattered *Xylomelum angustifolium* trees present.

**Loc. 3.9**

Mosaic of associations similar to locs 3.2 and 3.14.

**Loc. 3.10**

As for loc. 3.2 but dominant is *Banksia attenuata* with abundant *Adenanthos stictus* and *Xylomelum angustifolium*. Soil is highly pedal, sandy, poorly coherent, unbleached, non-calcareous, pH 6.9, yellow, 10 YR 7/6, sandy loam. Excessively well drained. Soluble salts 80 ppm.

**Loc. 3.11**

Mosaic similar to locs 3.2, 3.12, 3.14.

**Loc. 3.12 (Trapline 6)**

Stratum 1: *Jacksonia eremodendron* shrubs, mature, stratum 2-2.5 m tall, 2-10% canopy cover. Stratum 2: mixed shrubs, no particular dominant, mature, stratum 1.0 m tall, 10-30% canopy cover. Evidence of old fire scars. Vegetation is 23 years old. Litter: moderately abundant. Soil: yellow sandy loam. Well drained.

**Loc. 3.13**

As for loc. 3.5 on northern edge of loc., becoming mixed with *Banksia prionotes* to the south.

**Loc. 3.14 (Trapline 10)**

Stratum 1: *Banksia prionotes* shrubs, immature, stratum 2-5 m tall, 10-30% canopy cover (locally up to 50%). Stratum 2: *Melaleuca subtrigona* and numerous other species of shrubs, mature, stratum 1.0 m tall, 30-70% canopy cover. Seedlings or young plants. No evidence of fire. Vegetation is greater than 30 years old. Litter: abundant. Soil: yellow fine sandy loam. Soluble salts 90 ppm. Excessively drained.

**Loc. 3.15**

Western part of this loc. near track is as for loc. 3.14 but to the east *Banksia attenuata* much more abundant than *B. prionotes*, and *Adenanthos stictus* and *Xylomelum angustifolium* abundant. *Ecdiocollea monostachya* partially replaces *Melaleuca subtrigona* in the understory.

**Loc. 3.16**

Mostly *Xylomelum angustifolium* shrubs, 2-4 m tall, 30-70% canopy cover over mixed shrubs 1.0 m tall, 30-70% canopy cover. Soil as for loc. 3.2.

**Loc. 3.17 (Trapline 4)**

As for loc. 3.14 with *Actinostrobus arenarius* and *Xylomelum angustifolium* common. Scattered *A. arenarius* are emergent to 8.5 m tall.

**Loc. 3.18 (Trapline 3)**

As for loc. 3.17. Trapline follows very narrow band of shrubland on sandy ridge between salt complexes.

## HEATH

### Loc. 4.1

As for locs 4.2 and 4.5.

### Loc. 4.2 (Trapline 8)

Stratum 1: *Melaleuca acuminata* shrubs, senescent, stratum 0.5-1.5 m tall, 10-30% canopy cover. Stratum 2: *Hibbertia uncinata* shrubs, immature, stratum 0.3 m tall. 2-10% canopy cover. Stratum 3: *Scaevola arenaria*, *Conospermum* affin. *triplinervum* herbs, immature, stratum 0-3 cm tall, 30-70% canopy cover. Abundant weed seedlings, evidence of very old fire scars. Vegetation is ca 21 years old. Litter: virtually absent. Soil: pink fine sandy loam. Poorly drained.

### Loc. 4.3

Mosaic of heaths similar to locs 4.2 and scattered *Eucalyptus oraria* shrub mallee present. Salt pan is surrounded by *Casuarina obesa* trees 3-5 m tall. This pan is the first to contain water after the winter rains begin.

### Loc. 4.4

Mixed shrubs, no particular dominant, 0.4 m tall, 2-10% canopy cover over *Harperia lateriflora* sedge, 0.2 m tall, 10-30% canopy cover. Slightly higher ground has *Melaleuca acuminata* and/or *Casuarina campestris* shrubs to 2 m tall, 2-10% canopy cover. Scattered *Actinostrobus arenarius* and *Eucalyptus oraria* to 3 m present. Soil as for loc. 3.2.

### Loc. 4.5

Depression surrounded by *Banksia prionotes* shrubland. Deepest part of depression has *Thryptomene prolifera* shrubs 0.4 m tall, 10-30% canopy cover. Soil is highly pedal, sandy, strongly coherent, unbleached, non-calcareous, pH 5.6, pink, 7.5 YR 7/4, clayey sand.

On the sides of the depression (1-3 m above deepest part) the association is comprised of mixed shrubs (no particular dominant) up to 1 m tall, 30-70% canopy cover. Soil here (middle of slope) is as above but yellow, 10 YR 7/6. Neither area has soluble salts greater than 30 ppm. The sides are well drained, the bottom of the depression poorly drained.

### Loc. 4.6

As for loc. 3.2 but with the *Banksia prionotes* absent.

### Loc. 4.7

Mosaic of associations similar to locs 4.4, 4.5 and some patches similar to loc. 8.1. Northern boundary of loc. with some *Actinostrobus arenarius*.

### Loc. 4.8

Mostly mixed shrubs 0-0.5 m tall (some to 1.0 m) 30-70% canopy cover with some shrubs emergent to 2-5 m. Structure remains fairly similar over whole area but dominants change. Clumps of *Plectrachne danthonioides* and *Triodia scariosa* present. Soil is highly pedal, sandy, coherent, unbleached, non-calcareous, pH 5.9, yellow, 10 YR 7/6, sandy loam.

## SALT COMPLEX

### Loc. 7.1 (Trapline 1)

Unstratified *Arthrocnemum halocnemoides* shrubs, senescent, 0.5 m tall, varying from 10-70% canopy cover. Weeds abundant in some areas, mostly *Arctotheca calendula*. No evidence of fire and may not



have been burnt since the area became salt. Vegetation is greater than 30 years old. Litter: virtually absent but living and recently dead *Arthrocnemum* shrubs provide dense cover. Shrubs are ca 1-2 m apart. Soil: as for loc. 7.4.

#### Loc. 7.2. (Trapline 2)

Stratum 1: *Melaleuca uncinata* shrubs, mature, stratum 4-5 m tall, 30-70% canopy cover. Stratum 2: *Melaleuca hamulosa* shrubs, immature, stratum 2 m tall, 2-10% canopy cover. Stratum 3: *Arctotheca calendula*, *Ursinia anthemoides* herbs, 0.5 m tall, 2-10% canopy cover. Weeds abundant. Many thin poles of *M. uncinata* (4-12 cm diameter) have been removed from the area, leaving stumps up to 1 m tall. Evidence of very old fire scars. Vegetation is older than 30 years. Litter: moderately abundant.

Soil:

0-2 cm cracking clay.

2-3 cm greenish grey (5 GY 6/1) clay.

3 cm onwards highly pedal, coherent peaty nature when dry, slimy when wet, slightly calcareous, pH 5.8, mostly dark greyish brown, 2.5 YR 4/2 with peaty lumps of black, 2.5Y N2 material. Overall texture of heavy clay. Soluble salts 140 ppm.

#### Loc. 7.3

Mosaic of *Arthrocnemum halocnemoides* stands similar to loc. 7.1 with areas of heath similar to loc. 4.7. Small stands of *Casuarina obesa* trees 2-4 m tall, 2-10% canopy cover are present. Scattered or clumped stands of *Hakea preissii*, *Melaleuca uncinata* and *M. hamulosa* are present.

#### Loc. 7.4

Salt pan with *Arthrocnemum halocnemoides* shrubs, 0.3-0.4 m tall. 10-30% canopy cover over the majority of its area. Soil profile in the centre of the salt pan is:

0-2 cm cracking clay.

2-10 cm highly pedal, sandy and extremely coherent when dry, slimy and flocculent when wet with small speckled bleached areas. Highly calcareous with conspicuous gypsum crystals when dry, pH 8.2, light brownish grey, 10 YR 6/2, with the texture of heavy clay. Soluble salts 20400 ppm.

10-ca20 cm highly pedal, earthy and extremely coherent when dry, fluffy flocculent nature when wet. Slightly calcareous, pH 7.8, pinkish white, 7.5 YR 8/2, with the texture of heavy clay. Soluble salts 14000 ppm.

ca 20-24 cm matrix as for 10-20 cm horizon with disc shaped 'hardpan' structures, 2-5 cm thick and ca 10 cm diameter, the narrow axis being vertical, the individual structures being 2-3 cm apart. The structures are highly pedal, earthy when dry, flocculent when wet, extremely coherent when either wet or dry, very calcareous, pH 7.4. The structures are internally speckled, being brown, 7.5 YR 5/2 and white, 5 YR 8/1, and have the texture of heavy clay. Soluble salts 2200 ppm. 24-50 cm as described for 10-ca 20 cm horizon.

#### Loc. 7.5

Central area as described for loc. 7.4 with borders as described in loc. 2.1.

#### Loc. 7.6 (Trapline 5)

Stratum 1: *Melaleuca cordata* and several other species of shrubs, immature, stratum 0.5 m tall. 30-70% canopy cover. Stratum 2: *Daviesia brevifolia* shrubs and *Amphipogon debilis* bunch grass, immature, stratum 0.2 m tall, 30-70% canopy cover at sample point. Raised area on salt flats. Patches of *Arthrocnemum halocnemoides* present. Evidence of very old fire scars. Vegetation is ca 28 years old. Litter: sparse. Soil: as for loc. 8.1 with *Arthrocnemum* patches with soil similar to loc. 7.4.

#### Loc. 7.7

As for loc. 7.6.

#### Loc. 7.8

Mosaic of heaths similar to locs 4.4, 4.5, *Actinostrobos arenarius* similar to loc. 3.5 and *Arthrocnemum halocnemoides* stands similar to loc. 7.1.

#### Loc. 7.9

Central area of salt pan has *Arthrocnemum* sp. 1 and *A. bidens* shrubs 0-0.3 m tall, 2-10% cover. Soil in centre of pan is highly pedal, sandy and strongly coherent when dry, fluffy flocculent when wet, speckled bleached, very calcareous, pH 8.0, greyish brown, 10 YR 5/2, with texture of heavy clay. Soluble salts 19000 ppm.

Surrounding the salt pan is a thicket of *Melaleuca uncinata* and *M. hamulosa* 0.5-3 m tall, 30-70% canopy cover.

### OTHER FORMATIONS

#### Loc. 8.1 (sedgeland)

Unstratified *Ecdeiocolea monostachya* and some *Mesomelaena uncinata* sedges, mature, 0.7 m tall, 10-30% canopy cover. *Daviesia brevifolia* and scattered other shrubs to 0.3 m tall and *Casuarina campestris* and *Calothamnus* affin. *oldfieldii* to 2 m tall. Evidence of very old fire scars. Vegetation is older than 30 years. Litter: moderately abundant. Soil: yellow light sandy clay loam. Soluble salts 40 ppm. Poorly drained.

#### Loc. 8.2 (sedgeland)

As for loc. 8.1 with scattered *Banksia prionotes* present and some *Actinostrobos arenarius* closer to loc. 3.2. *Mesomelaena uncinata* becomes much more prominent than *Ecdeiocolea monostachya*.

#### Loc. 8.3 (freshwater swamp - not on reserve)

Swamp ca 150 m by 80 m with a dense stand of *Typha orientalis* at the southern end. This stand is 2 m tall, 100% canopy cover and is about 80 m by 80 m in size. The eastern border has *Juncus* affin. *pallidus*, *Cyperus vaginatus* and scattered *Melaleuca hamulosa* shrubs and *Eucalyptus camaldulensis* trees. The remainder of the swamp has open water for part of the year. The smaller freshwater swamp to the south-west of loc. 8.3 has been cleaned out since the October 1976 survey, and is now a pool of water ca 40-60 m in diameter with no vegetation.

### UNCLEARED LAND ADJACENT TO RESERVE

#### S1

*Banksia prionotes* shrubland similar to locs 3.14, 3.15 and 3.16.

#### S2, S3, S4, S5

As for S1 often with *Adenanthos stictus* and *Xylomelum angustifolium* prominent. Patches of *Actinostrobos arenarius* shrubland present.

#### S6

As for loc. 3.14, 3.15.

## H1

As for loc. 4.8.

## H2

Area of scrub-rolled and burnt vegetation regrown to heath proportions. *Grevillea excelsior* shrubs 1.5 m tall, 30-70% canopy cover over *Jacksonia aculeata* 0.5 m tall, 10-30% canopy cover.

Freshwater swamp - see loc. 8.3.

## APPENDIX 2 PLANT SPECIES LISTS FOR VARIOUS LOCATIONS

### Loc. 2.2

<i>Acacia ligulata</i>	<i>Eucalyptus foecunda</i>
<i>A. saligna</i>	<i>Lepidosperma tenue</i>
<i>Actinostrobos arenarius</i>	<i>Melaleuca acuminata</i>
<i>Bassia</i> affin. <i>diacantha</i>	<i>M.</i> affin. <i>cymbifolia</i>
<i>Calothamnus</i> affin. <i>oldfieldii</i>	<i>Rhagodia nutans</i>
<i>C. quadrifidus</i>	<i>Verticordia drummondii</i>

### Loc. 3.2

<i>Acacia blakelyi</i>	<i>Melaleuca cordata</i>
<i>A. colletioides</i>	<i>M. subtrigona</i>
<i>Actinostrobos arenarius</i>	<i>Mesomelaena uncinata</i>
<i>Banksia prionotes</i>	<i>Patersonia</i> affin. <i>occidentalis</i>
<i>Calytrix empetrioides</i>	<i>Pileanthus peduncularis</i>
<i>Casuarina campestris</i>	<i>Scaevola spinescens</i>
<i>Ecdeiocolea monostachya</i>	<i>Solanum lasiophyllum</i>
<i>Enneapogon caeruleus</i>	<i>Synaphaea polymorpha</i>
<i>Eucalyptus pyriformis</i>	<i>Triodia scariosa</i>
<i>Grevillea excelsior</i>	<i>Verticordia brownii</i>
<i>Jacksonia eremodendron</i>	<i>V. insignis</i>

### Loc. 3.5

<i>Actinostrobos arenarius</i>	<i>Jacksonia macrocalyx</i>
<i>Astroloma serratifolium</i>	<i>Leucopogon hamulosus</i>
<i>Banksia prionotes</i>	<i>Melaleuca</i> affin. <i>scapigera</i>
<i>Cassytha glabella</i>	<i>M. spicigera</i>
<i>Conospermum</i> affin. <i>stoechadis</i>	<i>M. subtrigona</i>
<i>Conostephium preissii</i>	<i>Mesomelaena uncinata</i>
<i>Cryptandra glabriiflora</i>	<i>Mirbelia spinosa</i>
<i>Ecdeiocolea monostachya</i>	<i>Petrophile ericifolia</i>
<i>Grevillea excelsior</i>	<i>Spyridium complicatum</i>
<i>Hakea circumalata</i>	<i>Verticordia chrysanthera</i>
<i>Harperia lateriflora</i>	<i>V. grandis</i>

**Loc. 3.12**

*Acacia blakelyi*  
*Calytrix empetrioides*  
*Cryptandra leucophracta*  
*Ecdeiocolea monostachya*  
*Harperia lateriflora*  
*Isopogon drummondii*  
*Jacksonia eremodendron*  
*Leptospermum erubescens*

*Leucopogon hamulosus*  
*Melaleuca cordata*  
*M. subtrigona*  
*Mesomelaena uncinata*  
*Mirbelia spinosa*  
*Pileanthus peduncularis*  
*Verticordia brownii*

**Loc. 3.14**

*Banksia attenuata*  
*B. prionotes*  
*Casuarina campestris*  
*Eremaea affin. beaufortioides*

*Isopogon drummondii*  
*Jacksonia eremodendron*  
*Melaleuca subtrigona*  
*Pileanthus peduncularis*

**Loc. 4.2**

*Adenanthos stictus*  
*Eucalyptus brachycorys*  
*E. foecunda*  
*E. oraria*  
*Hakea ceratophylla*

*Hibbertia uncinata*  
*Melaleuca acuminata*  
*Plectrachne danthonioides*  
*Scaevola arenaria*

**Loc. 7.1**

*Acacia ermaea*  
*Arctotheca calendula*  
*Arthrocnemum halocnemoides*

**Loc. 7.2**

*Melaleuca hamulosa*  
*M. pauperiflora*

*M. uncinata*  
*Ursinia anthemiodes*

**Loc. 7.6**

*Acacia stereophylla*  
*Arthrocnemum holocnemoides*  
*Balaustion microphyllum*  
*Choretrum pritzellii*  
*Daviesia brevifolia*

*Hakea scoparia*  
*Melaleuca cordata*  
*M. subtrigona*  
*Petrophile seminuda*

**Loc. 8.1**

*Acacia colletioides*  
*A. ulicina*  
*Acanthocarpus preissii*  
*Astroloma serratifolium*  
*Calothamnus affin. oldfieldii*  
*C. quadrifidus*  
*Cassytha pubescens*

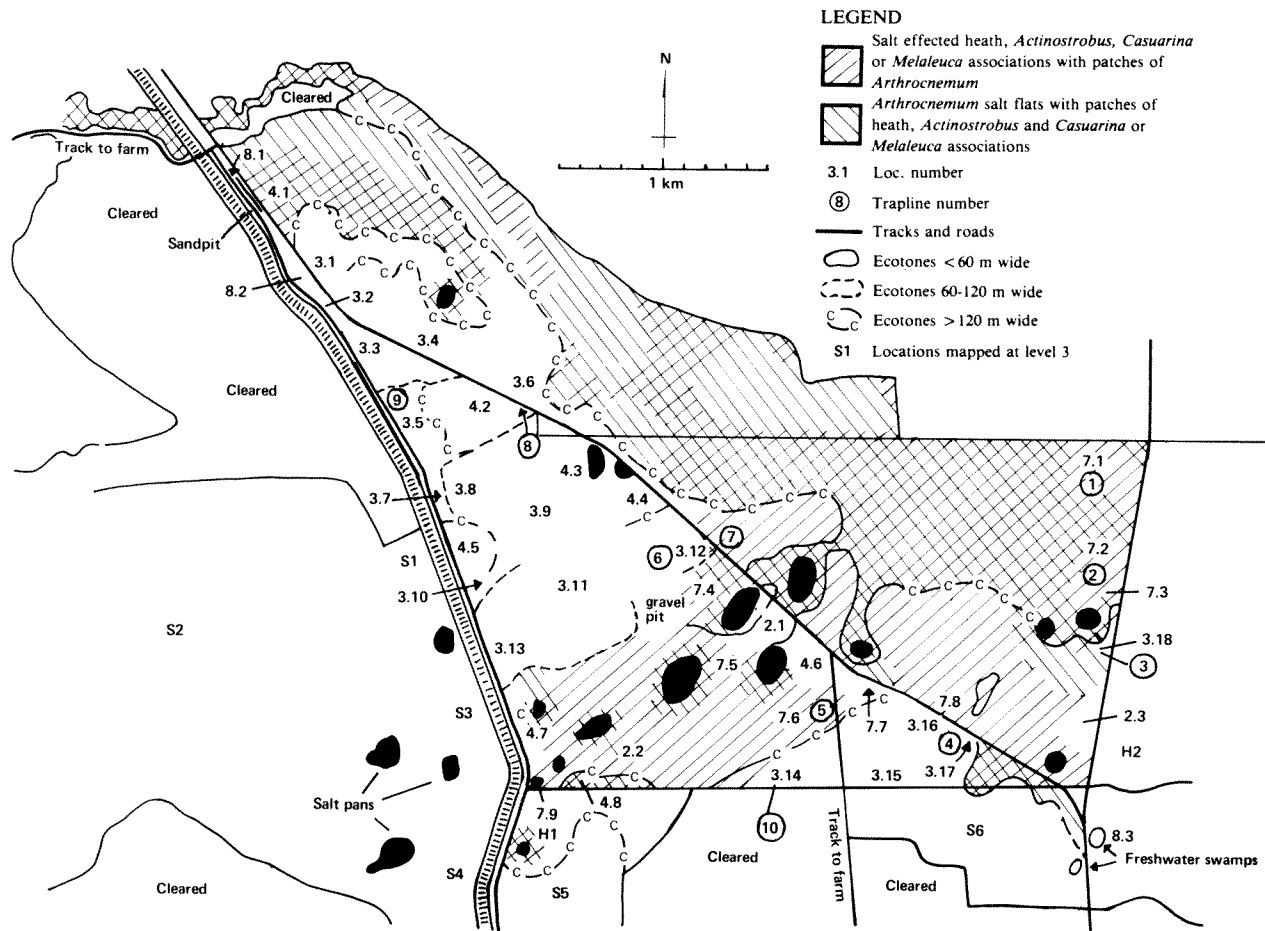
*Casuarina campestris*  
*Conostylis aculeata*  
*Daviesia brevifolia*  
*Ecdeiocolea monostachya*  
*Jacksonia eremodendron*  
*Lepidosperma affin. resinosum*  
*Loxocarya fasciculata*

*Melaleuca scabra*  
*M. subtrigona*  
*M. uncinata*  
*Mesomelaena uncinata*

*Petrophile seminuda*  
*Plectrachne danthonioides*  
*Santalum acuminatum*  
*Stylobasium australe*

**APPENDIX 3**  
**PLANT FAMILIES RECORDED**  
**ON MARCHAGEE RESERVE**

Family	No. species
Aizoaceae . . . . .	1
Apocynaceae . . . . .	1
Asteraceae . . . . .	4
Boraginaceae . . . . .	1
Casuarinaceae . . . . .	2
Chenopodiaceae . . . . .	7
Cupressaceae . . . . .	1
Cyperaceae . . . . .	7
Dilleniaceae . . . . .	1
Epacridaceae . . . . .	3
Fabaceae . . . . .	8
Goodeniaceae . . . . .	4
Haemodoraceae . . . . .	1
Iridaceae . . . . .	1
Juncaceae . . . . .	1
Lauraceae . . . . .	2
Liliaceae . . . . .	2
Mimosaceae . . . . .	13
Myrtaceae . . . . .	37
Poaceae . . . . .	3
Polygalaceae . . . . .	1
Polygonaceae . . . . .	1
Proteaceae . . . . .	23
Restionaceae . . . . .	4
Rhamnaceae . . . . .	3
Rubiaceae . . . . .	1
Santalaceae . . . . .	2
Sapindaceae . . . . .	1
Solanaceae . . . . .	1
Sterculiaceae . . . . .	3
Stylobasiaceae . . . . .	1
Typhaceae . . . . .	1
Xanthorrhoeaceae . . . . .	1



**MAP 1: Relative proportions of salt complex**