

Records of the Western Australian Museum
Supplement No. 5

**BIOLOGICAL SURVEY
OF THE
WESTERN AUSTRALIAN WHEATBELT**

**PART 4: VEGETATION OF
WEST BENDERING NATURE RESERVE**

B.G. MUIR

PERTH 1977

EDITOR:
A.F. LOVELL

World List Abbreviation:
Rec. West. Aust. Mus. Suppl. no. 5

ISSN 0313-122X

Printed and published at the Western Australian Museum,
Francis Street, Perth, Western Australia 6000. 328 4411.

CONTENTS

	Page
Abstract	5
Introduction	5
Acknowledgements	12
References	12
Appendix 1	
Abbreviated vegetation descriptions	14
Appendix 2	
List of plant species recorded at various locations	24
Appendix 3	
Plant family and genus distribution of West Bending Reserve flora	31

ABSTRACT

The vegetation of West Bendering Reserve conforms to that found throughout the Avon Botanical District. It has all the major vegetation formation types of the wheatbelt represented, except salt complex. This reserve has the major formations much more equitably distributed (in terms of area) than does the neighbouring Bendering Reserve even though the latter is about 3 to 4 times larger. It has 27 distinct associations, averaging 1.69 associations per square km. One hundred and eighty-seven species of plants were recorded including *Santalum spicatum* (sandalwood) a species now scarce in the wheatbelt. A contrived index of abundance of senescent trees is presented. Data from West Bendering Reserve is compared with and contrasted to that of Bendering Reserve.

INTRODUCTION

West Bendering Nature Reserve (WBR) lies within the Avon district of the South-western Botanical Province of Gardner and Bennetts (1956). Its location, history, physiography, basic geology, fire history, isolation and climate are dealt with in Muir (1977b). In this report WBR is compared with and contrasted to Bendering Reserve (BR) which is situated 10 km further east. The vegetation of Bendering Reserve has already been detailed in Muir (1977a).

Some records of the vegetation of WBR prior to the Western Australian Museum surveys are available from Forests Department files. These are mostly dealt with in Muir (1977b). 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 (1977a) have been lodged in the Archives of Western Australian Museum; details are available on request from the Librarian. Species found at some locations are listed in **Appendix 2** and family distribution of plant species in **Appendix 3**.

Methodology

The vegetation of West Bendering Reserve was mapped at Level 1 of the reliability scale set out in Muir (1977a). 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 (1977a); and a soil profile was described for each major association.

Uncleared land contiguous to the reserve but not included within it was mapped directly from air photographs at formation Level 3.

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:

- 1 = woodland formations
- 2 = mallee formations
- 3 = shrubland formations
- 4 = heath formations
- 5 = lithic complexes
- 6 = breakaway complexes

Level 3 locations shown on the map are prefixed by:

- M = mallee formations
- H = heath formations
- L = lithic complexes

The methods used in classifying formations, coding vegetation, preparing plant lists, classifying litter and describing soils are those of Muir (1977a).

Observations and Discussion

(a) Formations and Distribution

All the major vegetation formations in the wheatbelt, except salt complex, are represented on WBR (and BR). Most woodlands on WBR tend to occur on low lying ground near watercourses or on flat areas which arise from outwash of lithic complexes. The A horizon soils of woodlands tend to be fairly sandy but the B horizons usually constitute clays, decayed granite or laterite. Where woodland A horizon soils are not sandy they often have characteristic associations, e.g. loc. 1.2 with *Eucalyptus wandoo* on silty clay loam and loc. 1.14 with *E. salubris-E. flocktoniae* association on heavy clay. Woodlands on BR show a similar distribution relationship to soils (Muir 1977a).

Mallee, shrublands, heaths and lithic complex tend, on both WBR and BR to occur on soils of intermediate texture group, e.g. sandy loams and loams.

Stratification and canopy cover characteristics generally conform to those of BR (Muir 1977a). Formation area and proportion of the reserves are set out for both WBR and BR in the table below. WBR has the major formations much more equitably distributed than BR.

TABLE 1

LIFE FORM/HEIGHT CLASS		DENSITY CLASS (CANOPY COVER)			
		Dense d 70-100%	Mid-dense c 30-70%	Sparse i 10-30%	Very Sparse r 2-10%
T	Trees > 30 m	Dense Tall Forest	Tall Forest	Tall Woodland	Open Tall Woodland
M	Trees 15-30 m	Dense Forest	Forest	Woodland	Open Woodland
LA	Trees 5-15 m	Dense Low Forest A	Low Forest A	Low Woodland A	Open Low Woodland A
LB	Trees < 5 m	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 > 2 m	Dense Thicket	Thicket	Scrub	Open Scrub
SA	Shrubs 1.5-2.0 m	Dense Heath A	Heath A	Low Scrub A	Open Low Scrub A
SB	Shrubs 1.0-1.5 m	Dense Heath B	Heath B	Low Scrub B	Open Low Scrub B
SC	Shrubs 0.5-1.0 m	Dense Low Heath C	Low Heath C	Dwarf Scrub C	Open Dwarf Scrub C
SD	Shrubs 0.0-0.5 m	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 > 0.5 m	Dense Tall Grass	Tall Grass	Open Tall Grass	Very Open Tall Grass
GL	Bunch grass < 0.5 m	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 > 0.5 m	Dense Tall Sedges	Tall Sedges	Open Tall Sedges	Very Open Tall Sedges
VL	Sedges < 0.5 m	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

Formation	West Bending Reserve		Bending Reserve	
	Area of formation	% of reserve	Area of formation	% of reserve
	(ha)		(ha)	
Woodland	316	20	154	3
Mallee	286	18	4146	81
Shrubland	265	17	205	4
Heath	440	27	410	8
Lithic	295	18	102	2
Breakaway	1	-	102	2

Uncleared land contiguous with WBR, although smaller in area, also has the formations more equitably distributed than on BR. The land adjacent to BR does, however, contain some areas of the formations poorly represented on that reserve.

Area of formation (ha) adjacent to and contiguous with the reserve

Formation	West Bending Reserve	Bending Reserve
	Woodland	20	168
Mallee	246	1344
Shrubland	-	176
Heath	86	128
Lithic	48	40
Breakaway	-	48

(a) Associations

'Associations' as used here include associations, associates and consociations according to the definitions of Beadle and Costin (1952) and Polunin (1960). Associations found on WBR are listed below, and those found on BR are listed in Muir (1977a).

WOODLAND

Eucalyptus salmonophloia-*E. loxophleba*

E. loxophleba

E. gardneri

E. gardneri-E. falcata-E. flocktoniae
E. astringens
E. wandoo
E. salubris
E. salubris-E. flocktoniae
Acacia lasiocalyx-E. loxophleba
A. acuminata

MALLEE

Eucalyptus loxophleba
E. redunca-E. foecunda
E. eremophila-E. pileata-E. calycogona
E. eremophila
E. redunca-E. eremophila-E. cylindriflora
E. redunca-E. eremophila
E. redunca

SHRUBLAND

Casuarina acutivalvis
C. campestris
C. campestris-C. acutivalvis
Acacia signata
Melaleuca uncinata

HEATH

Casuarina acutivalvis-Calothamnus asper
C. campestris-Melaleuca uncinata-Hakea falcata
C. campestris-H. falcata
C. acutivalvis-Petrophile seminuda
Dryandra cirsioides

Formation	Number of Associations	
	WBR	BR
Woodland	10	8
Mallee	7	25
Shrubland	5	5
Heath	5	7
Total	27	45

There are roughly equal numbers of associations within each formation on both reserves, except mallee associations which are about three times more abundant on BR. This is partly due to the presence of *E. burracoppinensis* associations on BR, these being virtually absent on WBR. BR has about 50% more associations than WBR but when examined in relation to reserve area, WBR has 1.69 associations per square km and BR only 0.25 associations per square km. One can then postulate that WBR is about 6 times more diverse.

Senescent Trees

Dell (1977) has observed differences in the avifauna found on WBR and BR. Some of this difference is attributable to the greater abundance of species known to utilise hollow limbs and tree trunks on WBR. For this reason a measure of the relative numbers of senescent trees on the two reserves was required. As the data collected did not contain actual counts of senescent trees, an artificially contrived index of abundance was produced. On WBR there are about 214 ha of woodland dominated by large *E. loxophleba*, *E. salmonophloia* or *E. wandoo* trees. These woodlands average 16.5% canopy cover and have a total of about 35 ha of actual canopy. About 30% of these trees are senescent. An index of the abundance of senescent trees can be derived by multiplying the area of canopy by the percentage of senescent trees present. On WBR this index is 10.6.

On BR there are about 33 ha of woodland dominated by large *E. salmonophloia* trees. These woodlands average 6% canopy cover and thus there is about 2 ha of actual canopy. Of the trees, about 55% are senescent. The index thus obtained is 1.1. In consequence, one can speculate that there is about 18 times the total area of tree canopy and about 10 times the number of large senescent trees on WBR than is present on BR.

We hope that the relationship between the avifauna of other reserves and estimates of the amount of senescent woodland will show the value of this index.

Floristics

The extremely complex vegetation mosaics on WBR make it difficult to collect all plant species present. BR, in contrast, has fairly well defined associations. Floristically the two reserves are dissimilar. Combined total of

plant species recorded on the two reserves was 350 species, 187 being found on WBR and 288 at BR. Species common to both reserves totalled 117 (about 30%). Based on previous experience, the total number of common perennials and ephemerals is probably about 250 on WBR and 300 on BR. In terms of number of plant species recorded per area, WBR has more (15.6 spp./km²) than BR (5.9 spp./km²).

Thirty-two families were recorded, dominated by Myrtaceae, Proteaceae and Mimosaceae amongst the dicotyledons and Cyperaceae amongst the monocotyledons. Four species of particular interest are: *Santalum spicatum*, uncommon elsewhere in the wheatbelt, but well represented on WBR; *Cryptandra niliaris*, known mainly from the original collection, *Cryptandra polyclada*, thought to be endangered, with only small colonies remaining; and *Santalum acuminatum*, of geographic importance due to its disjunct distribution. The latter three are listed by Specht *et al.* (1974) as rare or endangered. The table below compares a measure of floristic diversity between formations.

	West Bending	Bending
Woodland	100 (0.22 spp./ha)	97 (0.65 spp./ha)
Mallee	74 (0.22 spp./ha)	138 (0.04 spp./ha)
Shrubland	50 (0.10 spp./ha)	78 (0.35 spp./ha)
Heath	82 (0.18 spp./ha)	94 (0.23 spp./ha)

The number of species recorded *only* in a single type of formation (restricted species) are shown below. WBR and BR both have the greatest number of restricted species per ha in the woodland and heath formations.

	West Bending	Bending
Woodland	38 (0.09 spp./ha)	17 (0.11 spp./ha)
Mallee	13 (0.04 spp./ha)	30 (0.01 spp./ha)
Shrubland	11 (0.04 spp./ha)	3 (0.01 spp./ha)
Heath	42 (0.09 spp./ha)	22 (0.05 spp./ha)

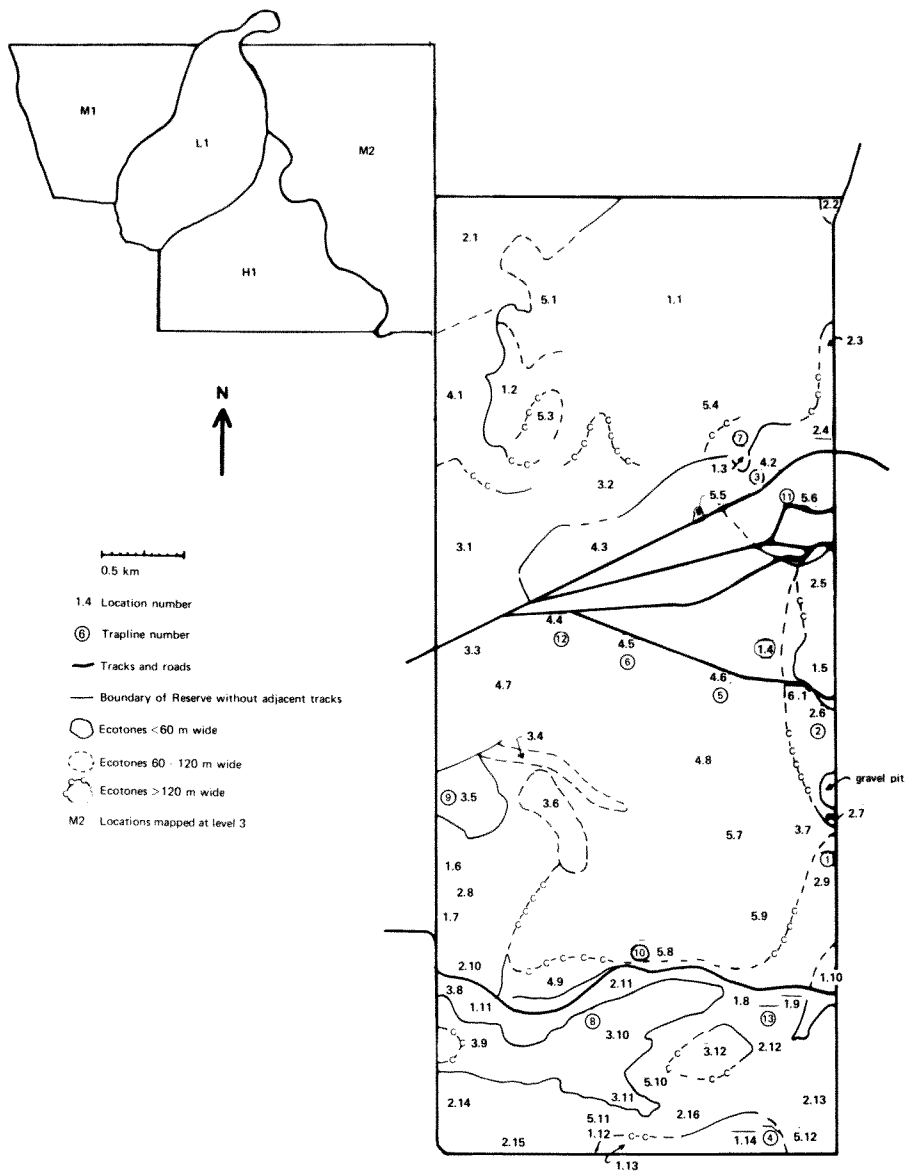
A synthesis of all ecological and floristic data for the reserve will be included in the final wheatbelt study to be presented at a later date.

ACKNOWLEDGEMENTS

This vegetation study was wholly supported by an Australian Biological Resources Study Interim Council Grant to D.J. Kitchener. Staff of the Western Australian Herbarium assisted with identification of some of the plants.

REFERENCES

- BEADLE, N.C.W. & COSTIN, A.B. (1952)—Ecological classification and nomenclature. *Proc. Linn. Soc. N.S.W.* 77: 61-82.
- BEARD, J.S. (1970)—*Descriptive catalogue of West Australian plants*. 2nd ed. Perth: Society for Growing Australian Plants.
- DELL, J. (1977)—Birds of Bending and West Bending Nature Reserves. In: Biological Survey of the Western Australian wheatbelt. Pt 3. *Rec. West. Aust. Mus. Suppl.* no. 5.
- GARDNER, C.A. & BENNETTS, H.W. (1956)—*The toxic plants of Western Australia*. Perth: West. Australian Newspapers.
- MUIR, B.G. (1977a)—Vegetation and habitat of Bending Reserve. Biological survey of the Western Australian wheatbelt. Pt 2. *Rec. West. Aust. Mus. Suppl.* no. 3.
- MUIR, B.G. (1977b)—Introduction to West Bending Nature Reserve. In: Biological survey of the Western Australian wheatbelt. Pt 3. *Rec. West. Aust. Mus. Suppl.* no. 5.
- NORTHCOTE, K.H., BETTENAY, E., CHURCHWARD, H.M. & McARTHUR, W.M. (1967)—*Atlas of Australian Soils*: Sheet 5, Perth-Albany-Esperance Area. Melbourne: C.S.I.R.O.
- POLUNIN, N. (1960)—*Introduction to plant geography*. London: Longman.
- SPECHT, R.L., ROE, E.M. & BOUGHTON, V.H. (1974)—Conservation of major plant communities in Australia and New Guinea. *Aust. J. Bot. Suppl.* no. 7.



Map 1: West Bending Reserve showing vegetation areas, sample locations, trapline positions and major roads and tracks.

APPENDIX 1

ABBREVIATED VEGETATION DESCRIPTIONS*

WOODLAND FORMATIONS

● Loc. 1.1

This woodland lies on colluvial and alluvial soils derived from the lithic complexes surrounding it. The region has highly variable structural and plant species composition. Sub-units within the formation are not large enough or discrete enough to be mappable.

The dominant stratum is *Eucalyptus salmonophloia* trees, 5-15 m tall, 2-30% canopy cover, with varying proportions of *Eucalyptus loxophleba*.

Stratum 2, where it occurs, is usually *Acacia acuminata*, *Casuarina acutivalvis*, *C. campestris*, *Melaleuca acuminata* or *M. uncinata* shrubs, greater than 2 m tall and less than 10% canopy cover. *Santalum spicatum* trees are sometimes present.

Stratum 3, where it occurs, is usually *Acacia graffiana*, *Lomandra effusa*, or *Olearia revoluta*.

Stratum 4, where it occurs, is usually *Borya nitida* or *Wilsonia humilis*. Litter: Varies with canopy density and species composition but is usually fairly abundant and more or less evenly dispersed. Soils: Generally grey or brown loams. Drainage is moderate to poor. Profile details are generally similar to either loc. 1.3 or loc. 1.9.

● Loc. 1.2

Stratum 1: *Eucalyptus wandoo* trees, mature, stratum 6-10 m tall, 10-30% canopy cover. Stratum 2: *Gastrolobium crassifolium* shrubs, mature, stratum 0-1 m tall, 2-10% canopy cover. Some *E. wandoo* trees emergent to 12 m tall. Some evidence of weeds and grasses. No evidence of fire. Understory about 19 years old. Borders a lithic complex of bare granite and woodland similar to loc. 5.8. Litter: Moderately abundant. Soil: Reddish grey, silty clay loam.

● Loc. 1.3 (Trapline 7)

Stratum 1: *Eucalyptus salmonophloia* trees and *E. loxophleba* trees and tree mallees, both immature, stratum 9-15 m tall, 10-30% canopy cover. Stratum 2: *Casuarina campestris*, *Melaleuca scabra*, *M. namulosa* shrubs and *Santalum spicatum* trees. All shrubs mature, *S. spicatum* senescent. Stratum 2-3 m tall, 2-10% canopy cover. Stratum 3: *Olearia revoluta* and occasional *Grevillea huegelii*, immature, stratum 0-0.5 m tall, 2-10% canopy cover. Some emergent, senescent, *E. salmonophloia* trees, 16-20 m tall. No evidence of fire. Stand is about 19 years old. Litter: Abundant. Soil: Brown, clayey sand.

● Loc. 1.4

Small area of *Eucalyptus gardneri* with some *E. falcata* and *E. flocktoniae* trees,

* Full descriptions of the vegetation following the format presented in Muir (1977a) have been lodged in the Archives of Western Australian Museum; details are available on request from the Librarian.

mostly 5-8 m tall. Canopy cover varies from 2-70% depending on soil depth. Soil contains greater than 60% gravel and probably is the remains of a much degraded breakaway. Matrix soil is strong brown, 7.5YR 5/6, sandy clay loam. Stand is about 25 years old.

● Loc. 1.5

Stratum 1: *Eucalyptus gardneri* trees, immature, stratum 4-7 m tall, 10-30% canopy cover. Stratum 2: *Eucalyptus pileata* shrub mallee, mature, stratum 3-4 m tall, 2-10% canopy cover. Stratum 3: *Melaleuca uncinata*, *Hakea lissocarpa* shrubs, senescent, stratum 1-2 m tall, 30-70% canopy cover. Stratum 4: *Loxocarya* sp. 1. (S.C.) sedge, mature, stratum 0-0.4 m tall, 2-10% canopy cover. Scattered weeds and grasses present. Seedlings of most species present. Some trees have been removed. No evidence of fire. Stand is about 25 years old. Litter: Abundant. Soil: Very pale brown, clayey sand.

● Loc. 1.6

Small stand of *Eucalyptus salubris* trees, immature, stratum 6-7 m tall, 30-70% canopy cover over *Melaleuca acuminata* shrubs, 1-1.5 m tall, 10-30% canopy cover.

● Loc. 1.7

Small stand *Eucalyptus salubris* trees as loc. 1.6 with scattered *E. redunca* shrub mallee.

● Loc. 1.8

As for loc. 1.9.

● Loc. 1.9

Stratum 1: *Eucalyptus salmonophloia* trees and *E. loxophleba* trees and tree mallee, mature to senescent, stratum 6-10 m tall, 10-30% canopy cover. Stratum 2: *Lomandra effusa* sedge-like herbs and *Lepidosperma* affin. *tenuis* sedge, mature, stratum 0-0.5 m tall, 2-10% canopy cover. Some *E. salmonophloia* trees emergent to 20-26 m tall. Scattered *Santalum spicatum*, *Melaleuca uncinata*, *M. acuminata* and *Acacia acuminata* 2-3 m tall between strata 1 and 2, but not dense enough to constitute another stratum. Scattered weeds and grasses present. No evidence of fire in recent times. Stand is about 25 years old. Litter: Abundant. Soil: Pinkish grey, clayey sand.

● Loc. 1.10

Stratum 1: *Eucalyptus loxophleba* trees and some tree mallee, all senescent, stratum 12-15 m tall, 2-10% canopy cover. Stratum 2: *Acacia acuminata* and *Santalum spicatum* trees, the *A. acuminata* immature, the *S. spicatum* senescent. Stratum 2-5 m tall, 10-30% canopy cover. Scattered *Lomandra effusa* sedge-like clumps are scattered throughout the area, but do not constitute a distinct stratum. There is a 70-100% canopy cover of grasses and *Waitzia acuminata* herbs during winter. Some timber has been removed from the area. No evidence of fire. This woodland is situated on granite derived soils with occasional small outcrops of granite boulders. The formation has been classified as woodland rather than lithic complex because none of the other lithic characters (large areas of bare rock, characteristic lithic plant species, etc.) are present. Stand is about 25 years old. Litter: Very abundant. Soil: Pink, clayey sand. The southwest extremity merges into an *Acacia acuminata* association. This association is: *Acacia acuminata* trees, 4-6 m tall, 2-10%

canopy cover; *Leptospermum erubescens*, *Casuarina campestris* shrubs, 1-3 m tall, 10-30% canopy cover; *Lepidosperma drummondii* sedges and *Calytrix fraseri* shrubs, 1 m tall, 2-10% canopy cover; *Borya nitida* herbs, 0.2 m tall, 2-10% canopy cover. Soil is strong brown, 7.5YR 5/6, clayey sand, pH 5.2.

● Loc. 1.11

Small stand *Eucalyptus salubris* similar to loc. 1.14 with scattered *E. salmonophloia* trees and slightly denser lower strata.

● Loc. 1.12

Small area ca 100 m in east-west axis by 50 m north-south axis *Eucalyptus astringens* trees, 8-10 m tall, 30-70% canopy cover. This stand is in a small outwash zone from a decayed granite exposure. *Melaleuca cuticularis* shrubs form an understory ca 1 m tall of variable density. Soil is pH 4.1, pinkish grey, 7.5YR 7/3, heavy clay.

● Loc. 1.13

This area is a continuation of loc. 1.14 with *Eucalyptus flocktoniae* trees also present. Understory species are largely dissimilar to loc. 1.14, being dominated by *Melaleuca acuminata*, *M. pauperiflora* and *Grevillea huegelii*. Stand is about 25 years old. Soil: Light yellowish brown, sandy clay.

● Loc. 1.14

Stratum 1: *Eucalyptus salubris* trees, immature, stratum 8-10 m tall, 30-70% canopy cover. Stratum 2: *Acacia erinacea*, *Templetonia sulcata* shrubs, mature, stratum 0.5-1.5 m tall, 2-10% canopy cover. Stratum 3: *Wilsonia humilis* mat plants, mature, stratum 0-0.1 m tall, 2-10% canopy cover. Scattered emergent *Eucalyptus salmonophloia* trees, 20-22 m tall. Some timber removed from area. No evidence of fire. Stand is about 25 years old. Litter: Abundant. Soil: Dark reddish brown, heavy clay.

MALLEE FORMATIONS

● Loc. 2.1

Very variable area composed of a complex mosaic of shrub mallee associations similar to locs 2.5 and 2.6. Some *Eucalyptus pileata* and heath species in the more open areas and some *Casuarina acutivalvis* and *C. campestris* in shallow watercourses or on gravelly rises.

● Loc. 2.2

Very small area of shrub mallee bordering a lithic complex. Basically a vague mosaic of *Eucalyptus redunca* and *E. eremophila* mallee associations similar to locs 2.5 and 2.6.

● Loc. 2.3

Stratum 1: *Eucalyptus loxophleba* tree mallee, mature, stratum 4-8 m tall, 2-10% canopy cover. Stratum 2: *Melaleuca acuminata* shrubs, mature to senescent, stratum 2-3.5 m tall, 10-30% canopy cover. Occasional emergent *E. loxophleba* to 9 m. Weeds and grasses present. No evidence of fire. Stand is about 19 years old. Litter: Moderately abundant. Soil: Light brown, fine sandy loam.

● Loc. 2.4

Stratum 1: *Eucalyptus loxophleba* shrub mallee, senescent, stratum 5-7 m tall, ca 3% canopy cover. Stratum 2: *Melaleuca uncinata* shrubs, mature, stratum 1-2 m tall, 30-70% canopy cover. Stratum 3: Several species of shrubs, mostly mature, stratum 0.5-1 m tall, 10-30% canopy cover. No evidence of fire. Stand is about 19 years old. Soil: Light yellowish brown, light sandy clay loam.

● Loc. 2.5

Stratum 1: *Eucalyptus redunca* and occasional *E. foecunda* shrub mallee, all mature, stratum 3.5-6 m tall, 10-30% canopy cover. Stratum 2: *Melaleuca uncinata*, *Casuarina acutivalvis* shrubs, many other species present, all mature, stratum 1-2 m tall, 10-30% canopy cover. Stratum 3: *Melaleuca spicigera* and *M. laxiflora* shrubs, many other species present, all mature, stratum 0.5-1 m tall, 30-70% canopy cover. Stratum 4: *Phebalium tuberosum* shrubs, many other species present, all mature, stratum 0.5-1 m tall, 2-10% canopy cover. Occasional emergent *E. redunca* to 7 m tall. Weeds and grasses present. No evidence of fire in recent times. Some scattered *Eucalyptus loxophleba* present. Stand is about 25 years old. Litter: Abundant. Soil: Very pale brown, sandy loam.

● Loc. 2.6 (Trapline 2)

Stratum 1: *Eucalyptus eremophila*, *E. pileata* and *E. calycogona* shrub mallee, immature, stratum 4-6 m tall, 30-70% canopy cover. Stratum 2: *Melaleuca hamulosa* shrubs, immature, stratum 1-2 m tall, 2-10% canopy cover. Stratum 3: *Olearia muelleri*, *Templetonia sulcata* shrubs, mature, stratum 0-0.5 m tall, 2-10% canopy cover. *Eucalyptus salmonophloia* trees 15-20 m tall scattered throughout the formation but well under 2% canopy cover. No evidence of fire in recent times. *E. pileata* flowering prolifically during March faunal survey. Stand is about 25 years old. Litter: Moderately abundant. Soil: Light reddish brown, fine sandy loam.

● Loc. 2.7

Small tongue of loc. 2.6 which passes between loc. 3.7 and a gravel pit. *Eucalyptus redunca* shrub mallee 4-6 m tall, 10-30% canopy cover forms an overstorey above *Melaleuca acuminata* 2 m tall, 30-70% canopy cover.

● Loc. 2.8

Very variable area of predominantly *Eucalyptus eremophila* shrub mallee with some *E. redunca* and patches of woodland (locs 1.6, 1.7). Where the mallee thins out to less than 2% canopy cover the understory remains as a heath. The heath is commonly *Melaleuca uncinata* dominated, 1-1.5 m tall, 30-100% canopy cover, with scattered *E. redunca* to 6 m tall. The *E. redunca* dominated areas generally resemble loc. 2.5. The *E. eremophila* dominated areas are described below: Stratum 1: *Eucalyptus eremophila* shrub mallee, mature, stratum 4-5 m tall, 30-70% canopy cover. Stratum 2: *Melaleuca acuminata*, *M. uncinata* and *M. hamulosa* shrubs, mature, stratum 0.5-2 m tall, 2-10% canopy cover. No weeds or grasses present. No evidence of fire in recent times. Stand is about 25 years old. Litter: Moderately abundant. Soil: Light brownish grey, sandy clay loam.

● Loc. 2.9 (Trapline 1)

Stratum 1: *Eucalyptus loxophleba* shrub mallee, immature, stratum 6-9 m tall, 10-30% canopy cover. Stratum 2: *Casuarina campestris*, *Leptospermum erubescens* shrubs, immature, stratum 1.5-2.5 m tall, 2-10% canopy cover. Stratum 3: *Spartochloa scirpoidea* bunch grass, mature, stratum 0-1 m tall, 10-30% canopy cover. Scattered *Acacia acuminata* and *Santalum spicatum* trees present between strata 1 and 2. Some *E. loxophleba* reach tree mallee dimensions. Scattered patches with *Casuarina campestris* shrubs 10-30% and *Acacia acuminata* trees to 9 m tall. Stand is about 25 years old. Litter: Sparse. Soil: Light grey, loamy sand.

● Loc. 2.10

As for loc. 2.8. An area of shrubland (loc. 3.8) and woodland (loc. 1.11) exist within the matrix of loc. 2.10. These are several hectares in extent and are therefore described separately.

● Loc. 2.11

Stratum 1: *Eucalyptus loxophleba* tree mallee, mature, stratum 4-10 m tall, 10-30% canopy cover. Stratum 2: *Spartochloa scirpoidea* bunch grass, mature, stratum 0-1 m tall, 2-10% canopy cover. Weeds and grasses present. No evidence of fire in recent times. Stand is about 25 years old. Litter: Moderately abundant. Soil: Very pale brown, fine sandy loam.

● Loc. 2.12

Stratum 1: *Eucalyptus redunca*, *E. eremophila* and *E. cylindriflora* shrub mallee, mature, stratum 4-6 m tall, 10-30% canopy cover. Stratum 2: *Acacia erinacea* and *Olearia muelleri* shrubs, mature, stratum 0-1 m tall, 2-10% canopy cover. No third stratum is present but there are scattered clumps of *Wilsonia humilis* mat plants. Scattered *E. salomonophloia* trees, senescent, emergent to 12-16 m tall. No evidence of fire in recent times. Stand is about 25 years old. Litter: Moderately abundant. Soil: Brown, sandy clay.

● Loc. 2.13

As for loc. 2.12 with the eastern and southern portions of the area resembling locs 2.5, 2.6.

● Loc. 2.14

Vague mosaic of associations resembling locs 2.5 and 2.6 with small scattered patches of shrubland similar to loc. 3.8 where the mallee becomes less dense. An overall description for the area is below: Stratum 1: *Eucalyptus redunca*, *E. eremophila* shrub mallee with scattered *E. pileata* and *E. cylindriflora* shrub mallee present, all mature, stratum 6-8 m tall, 30-70% canopy cover. Stratum 2: *Acacia acuminata* shrubs, several other species present, all mature, stratum 2-3 m tall, 2-10% canopy cover. Stratum 3: *Grevillea huegelii* and *Melaleuca acuminata* shrubs. Several other species present, all mature, stratum 0-1 m tall, 2-10% canopy cover. No evidence of fire in recent times. Stand is about 25 years old. Litter: Abundant. Soil: Reddish yellow, sandy loam.

● Loc. 2.15

As for loc. 2.14.

● Loc. 2.16

As for loc. 2.14 with scattered patches of mallee similar to locs 2.5 and 2.6.

SHRUBLAND FORMATIONS

● Loc. 3.1

Stratum 1: *Casuarina acutivalvis* shrubs, mature, stratum 2-3 m tall, 70-100% canopy cover. Stratum 2: *Melaleuca pungens*, *Petrophile seminuda* shrubs. Numerous other species present, all mature, stratum 0-1 m tall, 2-10% canopy cover. Where the *C. acutivalvis* thins out, the understory becomes denser, forming a heath of the same composition as stratum 2 above. The heath is 30-70% canopy cover. Some *C. acutivalvis* shrubs emergent to 4 m tall. No weeds or grasses. No evidence of fire. Stand is about 25 years old. Litter: Sparse. Soil: Very pale brown, sandy loam.

● Loc. 3.2

As for loc. 3.1 with *Casuarina campestris* and some lithic complex components. Stand is about 19 years old.

● Loc. 3.3

Vague mosaic of loc. 3.1 association with loc. 4.5 type heath areas. Stand is about 25 years old.

● Loc. 3.4

As for loc. 3.10.

● Loc. 3.5

Stratum 1: *Acacia signata* shrubs, mature, stratum 2-3 m tall, 70-100% canopy cover. Stratum 2: *Melaleuca spathulata*, *M. cordata* and *Micromyrtus imbricata* shrubs, mature, stratum 0-0.5 m tall, 2-10% canopy cover. No evidence of fire in recent times. Stand is about 25 years old. Litter: Abundant. Soil: Very pale brown, sandy clay loam.

● Loc. 3.6

As for loc. 3.5 with *Casuarina acutivalvis* and some *C. campestris* shrubs.

● Loc. 3.7

Stratum 1: *Casuarina campestris* shrubs, mature, stratum 1.5-2.5 m tall, 70-100% canopy cover. Stratum 2: *Spartochloa scirpoidea* bunch grass, mature, stratum 0-1 m tall, 30-70% canopy cover. Scattered *Eucalyptus loxophleba* shrub mallee 3-4 m tall. No evidence of fire in recent times. Stand is about 25 years old. Litter: Moderately abundant. Soil: Light yellowish brown, fine sandy loam.

● Loc. 3.8

Stratum 1: *Melaleuca uncinata* shrubs, mature, stratum 2-3 m tall, 70-100% canopy cover. Stratum 2: *M. eleutherostachya* and *M. lateriflora* shrubs, immature, stratum 0.5-1 m tall, 10-30% canopy cover. Scattered *Eucalyptus redunca* shrub mallee 4-5 m tall. No weeds or grasses present. No evidence of fire in recent times. Stand is about 25 years old. Litter: Moderately abundant. Soil: Pink, sandy loam.

● Loc. 3.9

As for loc. 3.10 with scattered *Eucalyptus eremophila* shrub mallee.

● Loc. 3.10

Stratum 1: *Casuarina campestris*, *C. acutivalvis* shrubs, mature to senescent, stratum 1.5-5 m tall, 70-100% canopy cover. Stratum 2: *Spartochloa scirpoidea* bunch grass and scattered *Phebalium filifolium* shrubs, mature to senescent, stratum 0-0.5 m tall, 10-30% canopy cover. Scattered *Eucalyptus loxophleba* shrub mallee, mostly to 4-5 m tall. No evidence of fire. Stand is about 25 years old. Litter: Moderately abundant. Soil: Yellowish red, sandy clay loam.

● Loc. 3.11

Similar to loc. 3.10 with slightly less *Casuarina acutivalvis* and with scattered *Acacia signata* shrubs. The stratum is 4-6 m tall, 70-100% canopy cover. Understory is mixed species, 0-1 m tall, 2-10% canopy cover.

● Loc. 3.12

As for loc. 3.10 but mostly 2-3 m tall.

HEATH FORMATIONS

● Loc. 4.1

Unstratified association of *Casuarina acutivalvis*, *Calothamnus* affin. *asper* shrubs, numerous other species present. All immature, stratum 0-1 m tall, 70-100% canopy cover. Proportions of *Casuarina acutivalvis* to *Calothamnus* affin. *asper* vary in different portions of the loc. Occasional *Santalum spicatum* shrubs emergent to 2 m. Evidence of old fire. Stand is about 19 years old. Litter: Sparse. Soil: Very pale brown, sandy clay loam.

● Loc. 4.2

Stratum 1: *Casuarina campestris*, *Melaleuca uncinata* and *Hakea falcata* shrubs, immature to mature, stratum 1-2 m tall, 10-30% canopy cover. Stratum 2: *Calothamnus* affin. *asper*, *Dryandra cirsioides*, mature, stratum 0.2-1 m, 30-70% canopy cover. Association is almost unstratified. Scattered *Borya nitida* herbs and Cyperaceae sp. 1 mat plants below stratum 2. No evidence of fire. Stand is about 19 years old. Litter: Sparse. Soil: Yellow, light sandy clay loam.

● Loc. 4.3

Unstratified *Casuarina acutivalvis* and *Petrophile seminuda* shrubs. Numerous other species present. Immature, stratum 0-1 m tall 70-100% canopy cover at sample point. Some emergent *Casuarina acutivalvis* to 2 m tall. Whole heath is regrowth following fire. Remains of burnt *C. acutivalvis* shrubs scattered throughout area. Stand is about 19 years old. Litter: Sparse. Soil: Very pale brown, sandy loam.

● Loc. 4.4 (Trapline 12)

Basically as for loc. 4.6 but with scattered *Dryandra cirsioides* not forming a distinct upper stratum. The heath is 0-1 m tall compared to loc. 4.6 which is 0.5 m tall. Code x SCc/KSL.

● Loc. 4.5 (Trapline 6)

Stratum 1: *Casuarina campestris* and *Hakea falcata* shrubs, immature, stratum 1-2 m tall, 2-10% canopy cover. Stratum 2: *Melaleuca cordata*, *Hakea incrassata* and *M. uncinata* shrubs, mature, stratum 0.5-1 m tall, 10-30% canopy cover. Stratum 3: *Borya nitida* herbs and some Cyperaceae sp. 1 mat plants, mature stratum 0-0.2 m tall, 10-30% canopy cover. Some emergent *Casuarina acutivalvis*, *Callitris verrucosa* and *Acacia desertorum* shrubs to 3 m tall. No evidence of fire. Stand is about 19 years old. Litter: Sparse. Soil: Light yellowish brown, fine sandy loam.

● Loc. 4.6 (Trapline 5)

Stratum 1: *Dryandra cirsioides* shrubs, mature, stratum 0-1 m tall, 2-10% canopy cover. Stratum 2: *Melaleuca pungens*, *Petrophile squamata*, *Banksia sphaerocarpa* and numerous other species; all mature, stratum 0-0.5 m tall, 30-70% canopy cover. Scattered *Eucalyptus pileata* shrub mallee 2-3 m tall. No evidence of fire in recent times. Stand is about 25 years old. Litter: Very sparse. Soil: Very pale brown, sandy loam.

● Loc. 4.7, 4.8

As for loc. 4.5.

● Loc. 4.9

Predominantly *Melaleuca acuminata*, *M. uncinata* shrubs 1-1.5 m tall, 70-100% canopy cover with scattered clumps of *Casuarina campestris* 2-3.5 m tall, 30-70% canopy cover. There is a second stratum of *Spartochloa scirpoidea* 0-1.5 m tall, 10-30% canopy cover. All species mature. Scattered *Eucalyptus redunca* shrub mallee throughout formation. No evidence of fire in recent times. Stand is about 25 years old. Litter moderately abundant. Soil: In *Casuarina* areas yellow, sandy loam. In heath areas very pale brown, fine sandy loam.

LITHIC COMPLEX

● Loc. 5.1

Complex mosaic of bare granite with woodland and shrubland formations similar to that described for locs 5.6 and 5.8. Individual units are not mappable.

● Loc. 5.2

As for loc. 5.1.

● Loc. 5.3

As for loc. 5.1.

● Loc. 5.4

As for loc. 5.1.

● Loc. 5.5

Small area of *Eucalyptus wandoo* trees 10-14 m tall with some *Casuarina acutivalvis*. *Callitris canescens* and *Eucalyptus eremophila* with several species of shrubs in the understory. Soil is yellowish red, 5YR 4/6, clay loam, pH 5.6.

● Loc. 5.6 (Trapline 11)

Very complex mosaic comprising several associations of varying sizes and discreteness.

Bare granite rock with moss (*Grimmia* sp.) and lichens (mostly *Parmelia* spp.) has developed shallow layers of soil supporting *Borya nitida* herbs and some shrubs, predominantly *Leptospermum erubescens*, *Dodonaea attenuata* and *Hibbertia enervia*.

Where soil is deeper, *Acacia lasiocalyx* dominated woodland or *Casuarina campestris* shrubland forms a mosaic of associations.

A mammal trapline (Trapline 11) was placed in loc. 5.6. The trapline association is described below: Stratum 1: *Acacia lasiocalyx*, *Eucalyptus loxophleba* trees, mature to senescent, stratum 8-12 m tall, 10-30% canopy cover. Stratum 2: *Casuarina campestris*, *Melaleuca hamulosa* shrubs, mature to senescent, stratum 2-4 m tall, 30-70% canopy cover. No stratum 3 is present, but in the winter grass and *Waitzia acuminata* herbs form a 70-100% canopy cover layer up to 20 cm tall. No evidence of fire in recent times. Situated in area burnt 19 years ago but stand probably older. Litter: Variable, sparse to abundant. Soil: Mostly dark brown, sandy loam.

● Loc. 5.7

As for loc. 5.6.

● Loc. 5.8 (Trapline 10)

As for loc. 5.6. The main area of lithic complex at this loc. is surrounded by a fairly broad belt (particularly on the southern border) of *Acacia acuminata* woodland. The association contains elements of lithic complex, and is closely associated with broad areas of bare granite rock. It is therefore listed as lithic complex, rather than woodland (cf. loc. 1.10). Comprises *Acacia acuminata* trees, senescent, stratum 5-8 m tall, 30-70% canopy cover. No stratum 2 is present, but in the winter *Waitzia acuminata* and grasses form a 70-100% canopy cover 20 cm tall. There are scattered *Eucalyptus loxophleba* trees and tree mallee 12-15 m tall. There is no evidence of fire in recent times. Stand is about 25 years old. Litter: Very abundant. Soil: Reddish brown, sandy loam.

● Loc. 5.9

As for loc. 5.8. *Eucalyptus loxophleba* becomes a little more frequent in some parts, and may exceed 2% canopy cover over small areas.

● Loc. 5.10

Stratum 1: *Eucalyptus redunca* shrub mallee, senescent, stratum 4-6 m tall, 2-10% canopy cover. Stratum 2: *Casuarina campestris* shrubs, mature, stratum 1-2 m tall, 10-30% canopy cover. Stratum 3: *Spartochloa scirpoidea* bunch grass, mature, stratum 0-1 m tall, 30-70% canopy cover. Stratum 4: *Borya nitida* herbs, mature, stratum 0-0.2 m tall, 30-70% canopy cover. No evidence of fire in recent times. Stand about 25 years old. Litter: Abundant. Soil: Light brown, clay loam.

● Loc. 5.11

This small area of lithic complex lies on the platform of a decayed granite outcrop.

The outcrop is important as it contains a rock hole *ca* 1 m deep and 0.5 m diameter. This hole would contain water long after other nearby natural water sources in the bushland have dried up.

The structure and composition of the vegetation on the granite is typical of numerous other small lithic associations scattered throughout the reserve. They are probably too small to be of much significance to vertebrate fauna, but exemplify a stage of development of some lithic associations.

Deeper soil pockets and the edges of the complex have *Callitris canescens* trees up to 4-5 m tall, either intermingled with *Casuarina campestris* or as a pure stand. Within this border of *Callitris*, *Casuarina campestris* 2-3 m tall is common, with or without an understory of *Spartochloa scirpoidea*. On the shallowest soils *Borya nitida* is often the only perennial present.

● Loc. 5.12

Small area of lithics or granitic soil with pebbles and boulders of granite present. Association resembles loc. 5.11.

BREAKAWAY COMPLEX

● Loc. 6.1

This loc. is part of a breakaway which is of considerable length, but the greater part of which has *Casuarina campestris* shrublands etc. over the whole complex. The platform and scree areas pass more or less imperceptibly into each other, with no obvious visor area. At loc. 6.1, in contrast, the visor is well developed, and thus the habitat provided differs from others on the reserve. The platform has *Casuarina campestris* association 1-2 m tall, 30-70% canopy cover. The visor is 1-2 m high with numerous burrows and crevices which indicate activities of Echidna and Kangaroo. The scree zone is of varying slope, with *Eucalyptus astringens* trees 5-7 m tall, 10-30% canopy cover. Total height of the breakaway from the bottom of the scree to the top of the platform is about 7 m.

UNCLEARED LAND CONTIGUOUS WITH THE RESERVE

M1

Probably similar to loc. 2.1. Area probably older than 19 years.

M2

Continuation of loc. 2.1. Area burnt 1957.

H1

Probably similar to loc. 4.1. Area burnt 1957.

L1

Lithic complex with exposures of bare granite and some woodland. Woodland is probably *Acacia acuminata*. Probably partially or wholly burnt in 1957.

APPENDIX 2
LIST OF PLANT SPECIES
RECORDED AT VARIOUS LOCATIONS

Specimens lodged in the Western Australian Museum Survey Collection are denoted (S.C.). Only locations with ecological data are included in this list.

Loc. 1.2

<i>Acacia erinacea</i>	<i>Gastrolobium crassifolium</i>
<i>A. sulcata</i>	<i>Melaleuca uncinata</i>
<i>Dodonaea caespitosa</i>	<i>Rhagodia preissii</i>
<i>Eremophila</i> affn. <i>brevifolia</i>	<i>Thomasia tenuivesta</i>
<i>Eucalyptus wandoo</i>	

Loc. 1.3

<i>Casuarina campestris</i>	<i>M. Scabra</i>
<i>Eucalyptus loxophleba</i>	<i>Olearia muelleri</i>
<i>E. salmonophloia</i>	<i>O. revoluta</i>
<i>Grevillea huegelii</i>	<i>Santalum spicatum</i>
<i>Melaleuca hamulosa</i>	

Loc. 1.4

<i>Eucalyptus falcata</i>	<i>E. incrassata</i>
<i>E. flocktoniae</i>	<i>Hakea</i> affn. <i>sulcata</i>
<i>E. gardneri</i>	

Loc. 1.5

<i>Acacia dielsii</i>	<i>Harperia lateriflora</i>
<i>Callitris canescens</i>	<i>Leptospermum erubescens</i>
<i>Calytrix brachyphylla</i>	<i>Loxocarya</i> sp. 1 (S.C.)
<i>C. fraseri</i>	<i>Melaleuca acuminata</i>
<i>Casuarina acutivalvis</i>	<i>M. eleutherostachya</i>
<i>Eucalyptus gardneri</i>	<i>M. laxiflora</i>
<i>E. pileata</i>	<i>M. spicigera</i>
<i>Grevillea huegelii</i>	<i>M. uncinata</i>
<i>Hakea adnata</i>	<i>Phebalium filifolium</i>
<i>H. lissocarpha</i>	<i>P. tuberculosum</i>
<i>H. multilineata</i>	<i>Platysace maxwellii</i>

Loc. 1.9

<i>Acacia acuminata</i>	<i>A. microbotrya</i>
<i>A. dermatophylla</i>	<i>Eucalyptus loxophleba</i>
<i>A. graffiana</i>	<i>E. salmonophloia</i>

Lepidosperma affin. *tenuis*
Lomandra effusa
Melaleuca acuminata
M. uncinata
Olearia affin. *adenolasia*

O. muelleri
O. revoluta
Podolepis capillaris
Santalum spicatum
Templetonia sulcata

Loc. 1.10

Acacia acuminata
Avena fatua
Borya nitida
Calytrix fraseri
Casuarina campestris
Dianella revoluta
Eucalyptus loxophleba
Grevillea huegelii
Lepidosperma drummondii
Leptospermum erubescens

Lhotskya violacea
Lomandra effusa
Melaleuca eleutherostachya
M. laxiflora
M. uncinata
Santalum acuminatum
S. spicatum
Spartochloa scirpoidea
Stylidium repens
Waitzia acuminata

Loc. 1.12

Callitris canescens
Eucalyptus astringens
Melaleuca cuticularis

Loc. 1.13

Acacia brachyclada
A. erinacea
A. merrallii
A. sp. 1 (undescribed species, S.C.)
Astroloma epacris
Dodonaea amblyophylla
Eucalyptus calycogona
E. eremophila
E. flocktoniae

E. salubris
Exocarpus aphyllus
Grevillea huegelii
Halgania sp. 1 (S.C.)
Melaleuca acuminata
M. pauperiflora
Olearia muelleri
Templetonia sulcata

Loc. 1.14

Acacia erinacea
A. merrallii
A. sp. 1 (undescribed species, S.C.)
Daviesia brevifolia
Eucalyptus salmonophloia
E. salubris

Grevillea affin. *acuaria*
Melaleuca acuminata
Olearia muelleri
Templetonia sulcata
Wilsonia humilis

Loc. 2.3

Cryptandra miliaris
Eucalyptus loxophleba
Melaleuca acuminata
M. laxiflora

M. spicigera
Olearia revoluta
Santalum acuminatum

Loc. 2.5

Acacia dielsii
Baeckea affin. *muricata*
Beyeria leschenaultii
Casuarina acutivalvis
C. campestris
Cryptandra polyclada
Eucalyptus foecunda
E. loxophleba
E. pileata
E. redunca
Gastrolobium crassifolium
G. spinosum
Hakea adnata

H. lissocarpa
H. scoparia
Leptospermum erubescens
Loxocarya sp. 1 (S.C.)
Melaleuca laxiflora
M. spicigera
M. uncinata
Micromyrtus imbricata
Olearia revoluta
Phebalium tuberculosum
Pimelea sylvestris
Platysace maxwellii

Loc. 2.6

Acacia graffiana
Eucalyptus calycogona
E. eremophila
E. pileata
E. salmonophloia

Melaleuca acuminata
M. hamulosa
Olearia muelleri
Santalum acuminatum
Templetonia sulcata

Loc. 2.8

Acacia dielsii
Callitris canescens
Eucalyptus eremophila
E. loxophleba
E. redunca
Melaleuca acuminata

M. eleutherostachya
M. hamulosa
M. laxiflora
M. uncinata
Phebalium tuberculosum

Loc. 2.9

Acacia acuminata
A. desertorum
Casuarina campestris
Eucalyptus loxophleba

Leptospermum erubescens
Santalum spicatum
Spartochloa scirpoidea

Loc. 2.11

Acacia acuminata
A. fragilis
Brachyloma affin. *concolor*
Calytrix fraseri
Eucalyptus loxophleba
Lasiopetalum indutum

Leptospermum erubescens
Loxocarya sp. 1 (S.C.)
Melaleuca uncinata
Santalum spicatum
Spartochloa scirpoidea
Thryptomene affin. *australis*

Loc. 2.12

Acacia erinacea
Eucalyptus cylindriflora
E. eremophila
E. redunca

E. salmonophloia
Melaleuca sp. indet. (S.C.)
Olearia muelleri
Wilsonia humilis

Loc. 2.14

Acacia acuminata
A. densiflora
Calytrix brachyphylla
Eucalyptus cylindriflora
E. eremophila
E. pileata
E. redunca

E. salmonophloia
Grevillea huegelii
Melaleuca acuminata
Micromyrtus imbricata
Santalum acuminatum
Templetonia sulcata

Loc. 3.1

Acacia acuaria
A. jacksonioides
Banksia sphaerocarpa
Casuarina acutivalvis
Daviesia acanthoclona
Dryandra cirsioides
D. ferruginea
Eucalyptus burracoppinensis
Hakea falcata
H. scoparia
H. lehmanniana
Hibbertia enervia

Leptospermum erubescens
Leucopogon blepharolepis
Lysinema ciliatum
Melaleuca cardiophylla
M. pungens
M. subtrigona
Persoonia striata
Petrophile divaricata
P. ericifolia
P. seminuda
P. shuttleworthiana
Phebalium tuberculosum

Loc. 3.5

Acacia signata
Astroloma serratifolium
Beyeria leschenaultii
Calytrix brachyphylla
Casuarina acutivalvis
C. campestris
Grevillea affin. *filifolia*
Hakea falcata

Lepidosperma effusum
Leucopogon phyllostachys
Melaleuca cordata
M. spathulata
Micromyrtus imbricata
Phebalium tuberculosum
Platysace effusa
P. maxwellii

Loc. 3.7

Casuarina campestris
Eucalyptus loxophleba
Spartochloa scirpoidea

Loc. 3.8

Daviesia brevifolia
Eucalyptus redunca
Exocarpus aphyllus
Melaleuca eleutherostachya

M. lateriflora
M. uncinata
Olearia muelleri
Phebalium tuberculosum

Loc. 3.10

Acacia signata
Astroloma serratifolium
Casuarina acutivalvis
C. campestris
Eucalyptus loxophleba
Hakea scoparia

Lepidosperma effusum
Phebalium filifolium
P. tuberosum
Santalum acuminatum
Spartochloa scirpoidea

Loc. 3.11

Acacia acuminata
A. signata
Astroloma serratifolium
Calothamnus affin. *gilesii*
Casuarina acutivalvis
C. campestris
Hakea multilineata

H. scoparia
Isopogon scabriusculus
Lepidosperma effusum
Leucopogon cuneifolius
Micromyrtus affin. *racemosa*
Persoonia striata
Spartochloa scirpoidea

Loc. 4.1

Acacia assimilis
A. multispicata
Borya nitida
Calothamnus asper
Calytrix brachyphylla
Casuarina acutivalvis
C. campestris
Cyperaceae sp. 1 (undescribed genus S.C.)
Hakea falcata
H. scoparia

Lepidosperma effusum
Leptospermum erubescens
Leucopogon hamulosus
Melaleuca spathulata
Micromyrtus imbricata
Persoonia coriacea
Petrophile seminuda
Santalum spicatum
Xanthorrhoea nana

Loc. 4.2

Acacia assimilis
A. deflexa
A. sulcata
Borya nitida
Calothamnus affin. *asper*
C. affin. *gilsii*
Cassytha sp. B. (S.C.)
Casuarina campestris
Cyperaceae sp. 1 (undescribed genus S.C.)
Daviesia aphylla
Dryandra cirsioides

Eriostemon affin. *gardneri*
Grevillea eriostachya (*excelsior*)
Hakea falcata
H. scoparia
Lepidosperma drummondii
L. effusum
Leucopogon dielsianus
L. phyllostachys
Melaleuca cardiophylla
M. uncinata
Verticordia chrysantha

Loc. 4.3

Acacia spicatum
Beaufortia micrantha
Borya nitida
Casuarina acutivalvis

C. campestris
Cryptandra miliaris
Daviesia brevifolia
Dryandra cirsioides

Gastrolobium hookeri
Hakea crassifolia
H. scoparia
Isopogon scabriuscula
Leucopogon crassifolius
L. dielsianus

Melaleuca platycalyx
M. spathulata
Mesomelaena uncinata
Persoonia coriacea
Petrophile seminuda
Verticordia brownii

Loc. 4.5

Acacia acuaria
A. deflexa
A. desertorum
A. multispicata
Adenanthos argyrea
Astroloma serratifolium
Banksia sphaerocarpa
Beaufortia bracteosa
Borya nitida
Callitris verrucosa
Cassytha glabella
Casuarina acutivalvis
C. campestris
C. microstachya
Choretrum pritzellii
Cryptandra polyclada
Cyperaceae sp. 1 (undescribed genus S.C.)
Dampiera affin. *juncea*
Daviesia aphylla
D. colletioides
Dryandra cirsioides
D. ferruginea
Gastrolobium hookeri

Grevillea pritzellii
Hakea falcata
H. incrassata
H. affin. subsulcata
Harperia lateriflora
Isopogon teretifolius
Leucopogon blepharolepis
L. crassifolius
Loxocarya fasciculata
Lysinema ciliatum
Melaleuca cordata
M. pungens
M. uncinata
Petrophile ericifolia
P. seminuda
P. shuttleworthiana
Pimelea sylvestris
Synaphaea petiolaris
S. polymorpha
Verticordia chrysantha
V. roei
Xanthorrhoea nana

Loc. 4.6

Banksia sphaerocarpa
Calytrix brachyphylla
Dryandra cirsioides
Eucalyptus pileata
Hakea falcata
Hibbertia pungens

Lysinema ciliatum
Melaleuca pungens
M. spathulata
Petrophile squamata
Verticordia chrysantha

Loc. 4.9

Casuarina campestris
Eucalyptus redunca
Leptospermum erubescens
Melaleuca acuminata
M. affin. seriata

M. affin. subtrigona
M. uncinata
Spartochloa scirpoidea
Verticordia roei

Loc. 5.5

Acacia acuminata
Astroloma serratifolium
Bertya cunninghami
Callitris canescens
Casuarina acutivalvis
Daviesia colletioides
Dianella revoluta
Eucalyptus eremophila
E. redunca

E. wandoo
Gastrolobium crassifolium
Grevillea acerosa
Hakea multilinea
Lepidosperma drummondii
L. tenue
Melaleuca acuminata
Phebalium tuberosum
Trymalium ledifolium

Loc. 5.6

Acacia acuminata
A. lasiocalyx
Baeckea crispiflora
Borya nitida
Calothamnus affin. asper.
Casuarina campestris
Dianella revoluta
Dodonaea attenuata
Eucalyptus loxophleba
Glyschrocaryon flavescens
Hibbertia enervia

Keraudrenia integrifolia
Lepidosperma effusum
Leptospermum erubescens
Melaleuca elliptica
M. hamulosa
M. uncinata
Ptilotus sp. indet. (S.C.)
Stackhousia huegelii
Stipa elegantissima
Stylidium repens
Stypandra imbricata

Loc. 5.8

Acacia acuminata
Eucalyptus loxophleba
Waitzia acuminata

Loc. 5.10

Acacia dielsii
Borya nitida
Casuarina campestris
Cryptandra polyclada
Eucalyptus eremophila
E. redunca
Gastrolobium crassifolium
Hakea lissocarpa
H. scoparia
Harperia lateriflora

Lepidosperma drummondii
Leptospermum erubescens
Melaleuca laxiflora
M. spicigera
M. subtrigona
Persoonia striata
Petrophile divaricata
Phebalium tuberosum
Santalum acuminatum
Spartochloa scirpoides

APPENDIX 3

PLANT FAMILY AND GENUS DISTRIBUTION OF WEST BENDERING RESERVE FLORA

Amarantaceae	...	...	...	...	...	...	1
Apiaceae	...	...	...	...	...	...	2
Asteraceae	...	...	...	...	...	...	3
Boraginaceae	...	...	...	...	...	...	1
Casuarinaceae	...	...	...	...	...	...	3
Chenopodiaceae	...	...	...	...	...	...	1
Convolvulaceae	...	...	...	...	...	...	1
Cupressaceae	...	...	...	...	...	...	2
Cyperaceae	...	...	...	...	...	...	6
Dilleniaceae	...	...	...	...	...	...	2
Epacridaceae	...	...	...	...	...	...	10
Euphorbiaceae	...	...	...	...	...	...	2
Fabaceae	...	...	...	...	...	...	8
Goodeniaceae	...	...	...	...	...	...	1
Haloragaceae	...	...	...	...	...	...	1
Lauraceae	...	...	...	...	...	...	2
Liliaceae	...	...	...	...	...	...	3
Mimosaceae	...	...	...	...	...	...	21
Myoporaceae	...	...	...	...	...	...	1
Myrtaceae	...	...	...	...	...	...	51
Poaceae	...	...	...	...	...	...	2
Proteaceae	...	...	...	...	...	...	31
Restionaceae	...	...	...	...	...	...	3
Rhamnaceae	...	...	...	...	...	...	2
Rutaceae	...	...	...	...	...	...	3
Santalaceae	...	...	...	...	...	...	4
Sapindaceae	...	...	...	...	...	...	3
Stackhousiaceae	...	...	...	...	...	...	1
Sterculiaceae	...	...	...	...	...	...	3
Stylidiaceae	...	...	...	...	...	...	1
Thymeliaceae	...	...	...	...	...	...	1
Xanthorrhoeaceae	...	...	...	...	...	...	2