System 6 Update - Floristic Community Type Mapping Information **DRAFT ONLY**

AREA INFORMATION

System 6 Area (C or M) or Update Area (Update) AMBERGATE

Conservation Area	
Nature Reserve	
Reserve No	
National Park	
Reserve No	
Local Government	Shire of Busselton
Reserve No	22614 (Flora & Fauna)
Other	
Proposed Conservation Areas	
Local Government	
Reserve No	
Other	

Conservation Area

Nature Reserve	
Reserve No	
National Park	
Reserve No	
Local Government	
Reserve No	
Other	

TOTAL AREA

Bushland Area	75.9375	hectares
Completely Degraded	6.375 ha	

AREA MAPPED FLORISTIC UNITS

Units	Site (Condition)	Code G : AMBR	Bound	Area (ha)
1b	Ø1	Ø4(2) Ø6(1)	B	49.875
	Ø9 (1 5			
2	Ø2	Ø5(2) Ø7	B	19.3125
3/4	Ø3		B	0.375

Boundaries determined by use of

aerial photograph	Swan Coastal Plain run 6 5167 28/11/90
orthophoto	1930 1 SW Dec 1991
vegetation map	
soil map	

CALM map Busselton


AMBERGATE
total 75.9375 ha
1b 49.875
2 19.3125
3 0.375 ha
degraded 0.375
1b
1b
1b
1b
1b
3
= 2
= Degraded
orthophoto 1930 15W Dec 1991

CONTACT DR N. GIBSON CALM WOODVALE for further information.
Flora list for Ambergate (extracted from Swan Coastal Plain database, Ambr 1-9, 242 taxa, 4/5/1995).

Department of Environmental Protection System 6 Update: Site Based Flora List Ambergate
(extracted from the CALM Swan Coastal Plain database, Ambr 1-9, 242 taxa, 4/5/95)

Anthericaceae
- Agrostocrinum scabrum
- Caesia micrantha
- Chamaescilla corymbosa
- Johnsonia lupulina
- Sowerbaea laxiflora
- Thysanotus multiflorus
- Thysanotus patersonii
- Thysanotus sp. manglesianus/patersonii scps
- Thysanotus sp. scps
- Thysanotus thyrsoideus
- Tricoryne elatior
- Tricoryne humilis

Apiaceae
- Hydrocotyle callicarpa
- Platysace compressa
- Schoenolaena juncea
- Xanthosia candida
- Xanthosia huegelii

Araceae
- * Zantedeschia aethiopica

Asteraceae
- * Arctotheca calendula
- Gnaphalium sphaericum
- Hyalosperma pusillum
- * Hypochaeris glabra
- Lagenifera huegelii
- Podolepis sp. scps
- Pseudognaphalium luteoalbum
- Siloxerus humifusus
- * Sonchus asper
- Waitzia citrina

Casuarinaceae
- Allocasuarina humilis

Centrolepidaceae
- Aphelia cyperoides
- Centrolepis aristata

Colchicaceae
- Burchardia multiflora
- Burchardia umbellata

Cyperaceae
- Anartheria sp. scps
- Baumea juncea
- Baumea vaginalis
- Cyathochaeta avenacea
- Cyathochaeta clandestina

Lepidosperma angustatum
Lepidosperma carphoides
Mesomelaena graciliceps
Mesomelaena tetragona
Schoenus bifidus
Schoenus brevisetis
Schoenus clandestinus
Schoenus rodwayanus
Schoenus sp. "brown bracts" scps
Schoenus spp. scps
Schoenus subbarbatus
Schoenus subbulbosus
Tetraria capillaris
Tetraria octandra

Dasypogonaceae
Baxteria australis
Dasypogon bromeliifolius
Kingia australis
Lomandra brittanii
Lomandra caespitosa
Lomandra hermaphrodita
Lomandra nigricans
Lomandra preissii
Lomandra purpurea
Lomandra sericea
Lomandra sonderi

Dilleniaceae
Hibbertia cunninghamii
Hibbertia hypericoides
Hibbertia rhadinopoda
Hibbertia subvaginata

Droseraceae
Drosera huegelii
Drosera marchantii subsp. marchantii
Drosera menziesii subsp. penicillaris
Drosera neesii
Drosera nitidula subsp. nitidula
Drosera pallida
Drosera pulchella
Drosera sp. scps

Epacridaceae
Andersonia involucrata
Astroloma pallidum
Leucopogon australis
Leucopogon gracillimus
Leucopogon pendulus
Lysinema ciliatum

Euphorbiaceae
Amperea ericoides
Phyllanthus calycinus

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Goodeniaceae
- Dampiera alata
- Dampiera linearis
- Scaevola calliptera
- Scaevola striata
- Velleia trinervis

Haemodoraceae
- Conostylis aculeata
- Conostylis laxiflora
- Conostylis setigera
- Haemodorum laxum
- Haemodorum sparsiflorum
- Phlebocarya ciliata
- Tribonanthes sp. scps

Iridaceae
- * Gladiolus sp. scps
- Patersonia juncea
- Patersonia umbrosa var. xanthina

Lauraceae
- Cassytha glabella
- Cassytha micrantha

Lindsaeaceae
- Lindsaea linearis

Lobeliaceae
- Lobelia tenuior

Loganiaceae
- Logania serpyllifolia

Loranthaceae
- Nuytsia floribunda

Menyanthaceae
- Villarsia parnassifolia
- Villarsia sp. scps

Mimosaceae
- Acacia "applanata" scps map
- Acacia extensa
- Acacia flagelliformis
- Acacia incurva
- Acacia pulchella
- Acacia stenoptera

Myrtaceae
- Agonis flexuosa
- Agonis parviceps
- Astartea aff. fascicularis sthcst
- Calothamnus lateralis
- Calothamnus sanguineus
- Darwinia oederoides

Eucalyptus calophylla
Eucalyptus marginata
Hypocalymma angustifolium
Kunzea aff. micrantha "purple" scps (BJK&NG 040)
Melaleuca incana
Melaleuca preissiana
Melaleuca thymoides
Pericalymma ellipticum

Orchidaceae
Caladenia marginata
Caladenia sp. scps
Eriochilus dilatatus
Lyperanthus nigricans
Lyperanthus serratus
Prasophyllum elatum
Prasophyllum sp. scps
Pterostylis vittata
Thelymitra aff. holmesii scps
Thelymitra canaliculata
Thelymitra crinita
Thelymitra nuda
Thelymitra sp. scps

Oxalidaceae
* Oxalis pes-caprae

Papilionaceae
Daviesia comutata scps
Daviesia incrassata
Daviesia physodes
Daviesia preissii
Daviesia rhombifolia
Euchilopsis linearis
Eutaxia virgata
Gompholobium capitatum
Gompholobium confertum
Gompholobium knightianum
Gompholobium ovatum
Gompholobium polymorphum
Gompholobium tomentosum
Hovea trisperma var. trisperma
Isotropis cuneifolia
Jacksonia sp.Busselton(G.J.Keighery 4482) PN
Kennedia carinata
Kennedia coccinea
Kennedia prostrata
* Lotus angustissimus
Nemcia capitata
* Ornithopus compressus
Pultenaea reticulata
Sphaerolobium aff. macranthum FPR
Sphaerolobium medium
* Trifolium dubium
* Trifolium glomeratum

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Phormiaceae
Stypandra glauca

Pittosporaceae
Billardiera variifolia

Poaceae
* Aira cupaniana
* Aira sp. scps
Amphipogon amphipogonoides
* Anthoxanthum odoratum
* Briza maxima
* Briza minor
Danthonia setacea
Danthonia sp. scps
* Holcus setiger
Neurachne alopecuroidea
Neurachne amphipogonoides scps
Stipa campylachne
Stipa semibarbata group scps
Tetrarrhena laevis

Polygalaceae
Comesperma virgatum
Comesperma volubile

Proteaceae
Adenanthos meisneri
Adenanthos obovatus
Banksia attenuata
Banksia grandis
Conospermum "pedunculatum" ms scps
Dryandra nivea
Grevillea brachystylis subsp. brachystylis
Grevillea quercifolia
Hakea ceratophylla
Hakea ruscifolia
Hakea sulcata
Hakea varia
Isopogon scaber
Persoonia elliptica
Persoonia longifolia
Petrophile linearis
Petrophile media scps var. juncifolius ms
Stirlingia latifolia
Strangea stenocarpoides
Synaphea petiolaris
Xylomelum occidentale

Restionaceae
Anarthria gracilis
Anarthria laevis
Anarthria prolifera
Chaetanthus leptocarpoides
Hypolaena exsulca
Leptocarpus tenax
Lepyrodia drummondiana

Lepyrodia macra
Lepyrodia muirii
Lepyrodia sp. scps
Loxocarya fasciculata
Loxocarya flexuosa
Loxocarya pubescens
Lyginia barbata

Rubiaceae
Opercularia apiciflora
Opercularia sp. scps

Rutaceae
Boronia spathulata
Eriostemon spicatus

Santalaceae
Leptomeria ericoides
Leptomeria scrobiculata

Stackhousiaceae
Stackhousia monogyna
Tripterococcus brunonis

Stylidiaceae
Levenhookia pusilla
Stylidium brunonianum
Stylidium brunonianum subsp. minor
Stylidium calcaratum
Stylidium crassifolium
Stylidium junceum
Stylidium piliferum
Stylidium repens
Stylidium schoenoides

Thymelaeaceae
Pimelea preissii

Tremandraceae
Platytheca galioides
Tetratheca hirsuta
Tetratheca hirsuta "glabrous" scps

Xanthorrhoeaceae
Xanthorrhoea preissii

Map 1: Ambergate Reserve Location.

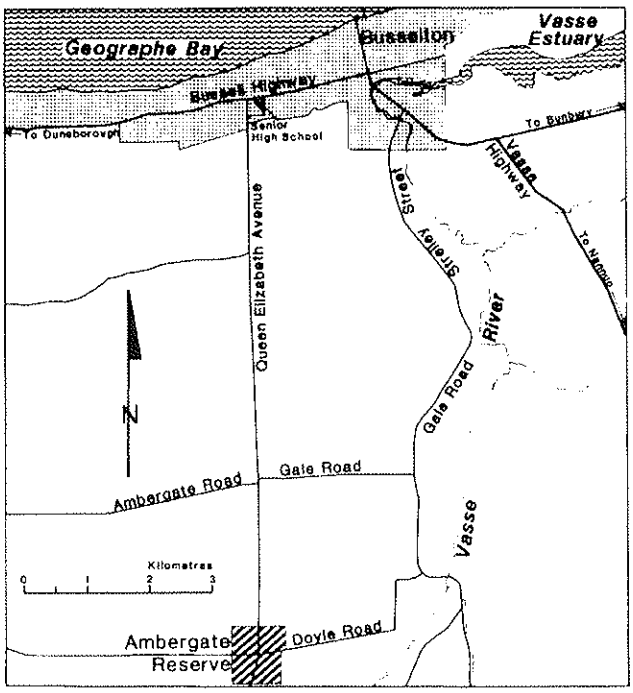
Key

Busselton urban area

Areas of bushland identified by the Department of Environmental Protection (1994 - ongoing) as being "..threatened and poorly reserved community types requiring interim protection.."

Drainage lines

Major and secondary roads



Map 2: Vegetation

Key

Bushland

D degraded areas (road sides, track edges, transmission line)

plant community boundary

④ Site location (see Appendix 1)

jbW = Jarrah and *Banksia* Woodland

mW = Marri Woodland

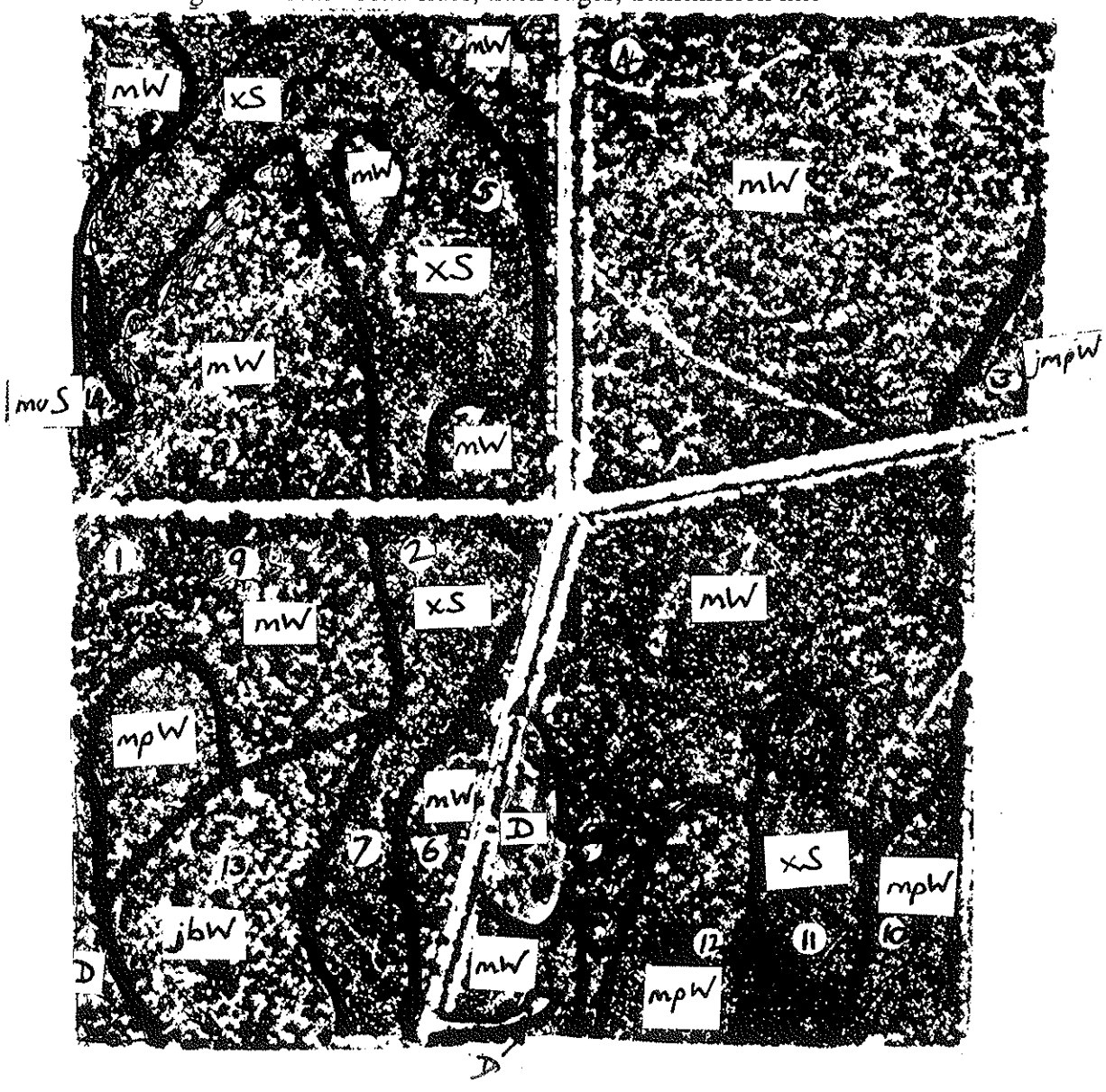
Wetland Mosaic

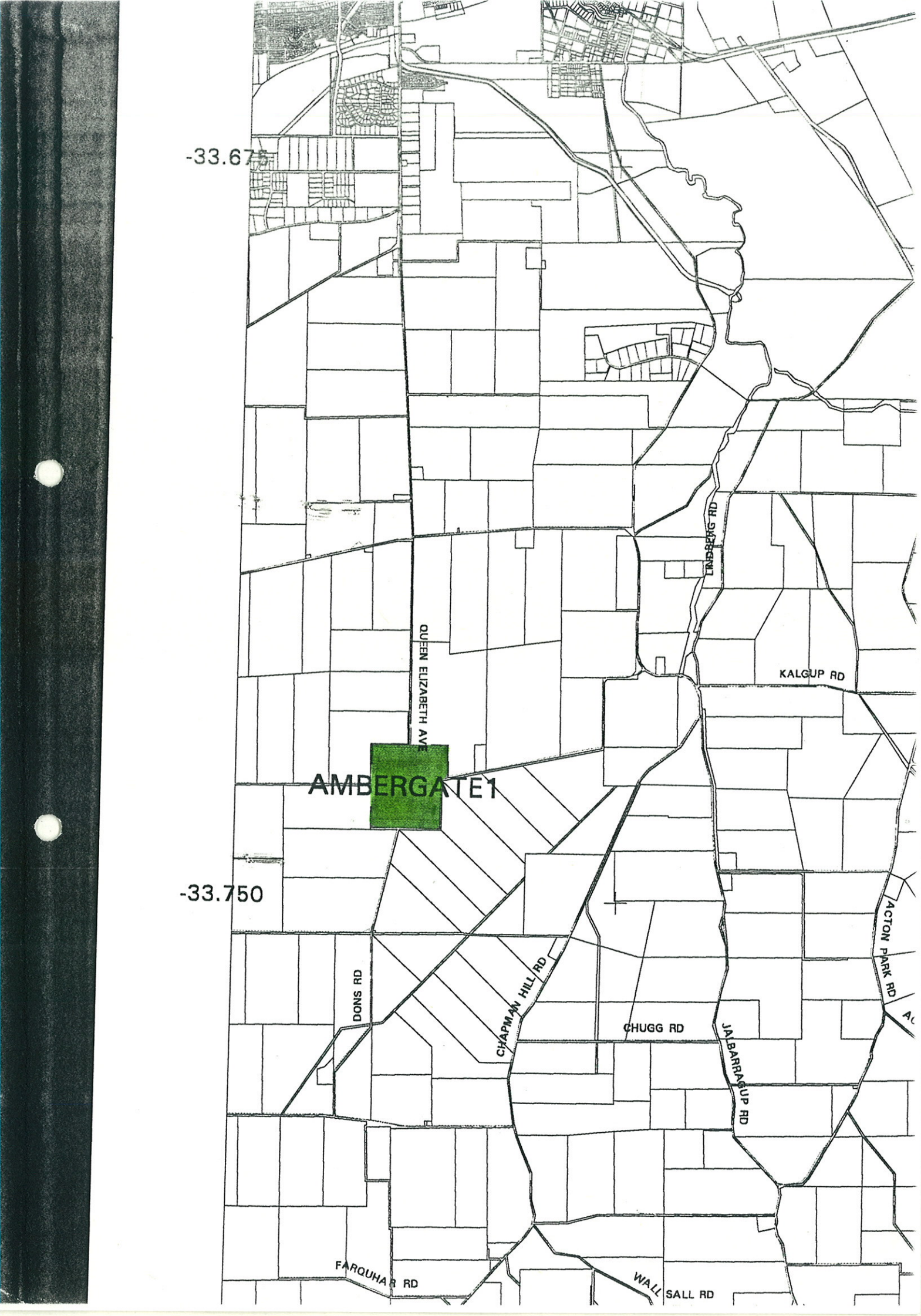
mpW = *Melaleuca preissiana* Low Woodland

xS = Mixed Shrublands/Heaths

muS = *Melelaeuca uncinnata* Tall Shrubland

D = degraded areas - road sides, track edges, transmission line




-33.675
-33.750
QUEEN ELIZABETH AVE
LINDBERG RD
KALGUP RD
AMBERGATE1
DONS RD
CHAPMAN HILL RD
CHUGG RD
JALBARRAGUP RD
ACTON PARK RD
FARQUHAR RD
WALLSALL RD

FLORISTICS OF RESERVES AND BUSHLAND AREAS IN THE BUSSELTON REGION (SYSTEM 1) PART II: FLORISTICS OF THE AMBERGATE RESERVE.

B.J. Keighery, G.J. Keighery and N. Gibson.

May 1996

INTRODUCTION

Ambergate Reserve is a well known bushland reserve in the Shire of Busselton (Map 1) managed for the Shire of Busselton by the Busselton Naturalists' Club. A comprehensive series of brochures have been produced by the Club on the Reserve's walk trail and the plants and animals of the four seasons. The bochures refer to the Reserve as '.....a 75 hectare remnant of the once widespread coastal plain woodland now much cleared. The Reserve is rich in plants and wildlife, and of outstanding conservation value." (Wykes and Masters undated)

In 1992 as part of the Swan Coastal Plain Survey (Keighery 1995) a group of volunteers from the Perth area, the Busselton Naturalists' Club and the Busselton Wildflower Group visited the Reserve to establish a series of study sites to be used in a regional survey of the Swan Coastal Plain (Gibson *et al.* 1994) and begin a site based survey of the flora of the Reserve (Keighery 1994).

SURVEY METHOD

Survey work at the Ambergate reserve was performed over four years and four spring flowering seasons from April 1992 to May 1996.

Fourteen sites were located and described in the Reserve (Map 2, Appendix 1) to sample the range of plant communities identified using aerial photographs and field interpretation. Of these sites nine $100m^2$ study sites were permanently located using four steel pegs (Appendix 1). Groups of conservation volunteers from the Swan Coastal Plain Survey group, each led by a botanist, recorded information in a set format on physical location, vegetation structure and density and the total flora of the permanent study sites (Keighery, Keighery and Gibson 1995). The sites were sampled on at least two occasions.

The nine permanent sites were included in a detailed floristic survey of the Swan Coastal Plain (Gibson *et al.* 1994).

Opportunistic plant collections, that is collections from outside the sites, were made during foot transects of the bushland areas at various times of the year over the four years of survey. Identification of plant collections was made by the volunteers and the coordinators and verified at the W.A. Herbarium. A field herbarium has been prepared for the area. Herbarium records were also checked for additional records for the Reserve (April 1996). It is considered that approximately 90% of the flora has been documented.

The results of the survey have been compiled by the coordinators of the Swan Coastal Plain Survey group.

GEOMORPHOLOGY AND SOILS

The Ambergate Reserve is located on the Swan Coastal Plain where the Pinjarra Plain is the predominant land surface. The Pinjarra Plain is a "flat to very gently undulating plain comprising predominantly Pleistocene fluviatile sediments and some Holocene alluvium" (Van Gool 1990). Substantial areas of the Pinjarra Plain are overlain by shallow Bassendean sands and in some areas low Bassendean Dunes occur as deeper sands. While the area is mapped as deeper Bassendean Dunes (Belford 1987) the sands are associated with varying proportions of clay (Appendix 1). Also there are areas of ironstone exposed in the north west firebreak and adjacent paddock, indicating the presence of an impeding layer at varying depths in the area of the Reserve. This relationship between the sands, ironstone and underlying Pinjarra Plain appears to be the basis for the occurrence of extensive palusplain and limited damplands (after Semeniuk 1987) throughout the Reserve. The soils have also been mapped by Tille and Lantzke (1990) who map flats and low rises on the uplands and winter wet flats and slight depressions on the seasonally inundated areas, all with sandy grey brown duplex and gradational soils.

VEGETATION

The Vegetation Map

The vegetation map (Map 2) shows the distribution of the principal plant communities. The distribution of the communities is based on the structural units described in the Reserve (Appendix 1). Three principal plant communities are mapped: Jarrah (*Eucalyptus marginata*) and *Banksia* Woodland, Marri (*Eucalyptus calophylla*) Woodland and Wetland Mosaic.

Jarrah and *Banksia* Woodland

On the sandiest soils Jarrah and *Banksia attenuata* Woodland is found (mapped as jbW, Map 2). Scattered Marri is also associated with this community as well as *Allocasuarina fraseriana* and *Agonis flexuosa*. *Jacksonia* sp. Busselton, *Acacia extensa*, *Stirlingia latifolia*, *Adenanthos meiseneri*, *Melaleuca thymoides*, *Hibbertia hypericoides*, *Phlebocaryia ciliata* and *Cyathochaeta clandestina* are characteristic of the understorey.

Marri Woodlands

Marri Woodlands are characteristic of the better drained sands and sandy clays (mapped as mW, Map 2). Jarrah is associated with these woodlands and is scattered through some areas. *Persoonia longifolia*, *Persoonia elliptica*, *Xylomelum occidentale*, *Agonis flexuosa* and *Banksia grandis* are found in some areas. These woodlands have a diverse and dense understory of shrubs, herbs and sedges. Characteristic species of the understorey are: *Kingia australis*, *Stirlingia latifolia*, *Xanthorrhoea preissii*, *Hibbertia hypericoides*, *Acacia extensa* and *Mesomelaena tetragona*. These Marri Woodlands grade into the communities described below as a Wetland Mosaic.

Wetland Mosaic

A series of communities can be distinguished in the seasonally inundated areas. These range from Marri Open Woodland through *Melaleuca preissiana* Low Open Woodland, mixed Heaths and Shrublands, often dominated by *Pericalymma*, to Sedgelands and Herblands. These units occur individually or most commonly in combination with some of the other units (Appendix 1) and, as a consequence are best termed a Wetland Mosaic. Three units are mapped and distinguished (Map 2, Appendix 1 & 2) but, except for the the *Melaleuca uncinata* Tall Shrubland these units occur elsewhere in other mapped units but are present at such a scale it would be very difficult to map. The mosaic nature of these plant communities is a feature of the heavy soil wetlands on the Swan Coastal Plain (Keighery and Trudgen 1992; Gibson *et al.* 1994; Keighery, Keighery and Gibson 1996). The presence of the different communities is related to the surface and subsurface soils and the degree and duration of winter inundation.

On the areas of dampland (seasonally waterlogged depressions, Semeniuk 1987) associated with the soils with the highest percentage of clay and the longest period of waterlogging, *Melaleuca uncinata* and *Melaleuca rhaphiophylla* are found. While the plant community in which *Melaleuca rhaphiophylla* occurs is similar floristically to that on the wetflats (see below), *Melaleuca uncinata* is associated with a distinctive community (mapped as muS, Map 2). The *Melaleuca uncinata* Tall Shrublands are characterised by areas of Herbland rather than a dense shrub and sedge layer.

On the wet flats or palusplain (seasonally waterlogged flats, Semeniuk 1987) *Melaleuca preissiana* Low Open Woodland (mapped as mpW and jmpW, Map 2), mixed Heaths and Shrublands, often dominated by *Pericalymma* over Sedgelands and Herblands are found (mapped collectively as xS, Map 2). The shrubs and sedges characteristically form a dense understorey. *Kingia australis, Xanthorrhoea preissii, Hakea ceratophylla, Acacia extensa, Pericalymma ellipticum, Isopogon formosus* subsp. *dasylepis, Hypocalymma angustifolium* and *Grevillea brachystylis* are characteristic of the shrublands while *Leptocarpus co-angustatus, L. tenax, Tetraria octandra, Mesomelaena tetragona* and *Hypolaena exsulca* are characteristic sedges. *Baxteria australis* is generally associated with the herb layer. On the soils with the highest percentage of sand Jarrah is found as well as *Melaleuca thymoides* (Site 3, Appendix1).

On the drier areas of palusplain (Semeniuk 1987) Open Marri Woodland occurs and the understorey ranges from that characteristic of the wetflats to that of the better drained Marri areas (mapped within mW, Map 2).

Floristic Community Types

The regional study of the floristic variation of the Swan Coastal Plain by Gibson *et al.* (1994) identified three floristic community types in the Ambergate Reserve (Table 1): type 1b (Southern Marri woodlands on heavy soils), type 2 (Southern wet shrublands) and type, 4 (*Melaleuca preissiana* damplands). Two other floristic community types: type 21b (Southern *Banksia attenuata* woodlands) and type 7 (Herb rich saline shrublands in clay flats) are also considered to be present as indicated by the the floristics of the areas (Table 1, Appendix 1 & 2).

Table 1: Floristic Community Types in the Study Area.
The relationship between the structural units used for mapping and the floristic units determined in the regional survey (Gibson *et al.* 1994). An * indicates the floristic community type is inferred.

Vegetation Mapping Unit	Bushland area	Floristic Community Type
Marri Woodland	Sites 1, 4, 6, 8 & 9	1b (Southern Marri woodlands on heavy soils)
Banksia Woodland	Site 13*	21b* (Southern *Banksia attenuata* woodlands)
Wetland Mosaic *Melaleuca preissiana* Low Open Woodland	Sites 10*, 12*	2 (Southern wet shrublands)
Mixed Shrublands	Sites 2, 5, 7, 11*,	2 (Southern wet shrublands)
Jarrah and *Melaleuca preissiana* Low Open Woodland	Site 3	4 (*Melaleuca preissiana* damplands)
Melaleuca uncinata Tall Shrubland	Site 14*, 15*	7* (Herb rich saline shrublands in clay flats)

FLORA

The bushland contains a vascular flora of 361 taxa (Appendix 2). Of these 326 are natives and 35 weeds. Four of these taxa are non-flowering vascular plants, 147 are monocotyledons (136 natives and 11 weeds) and 210 are dicotyledons (187 native and 23 weeds). The Myrtaceae (22 taxa), Cyperaceae (30 taxa including 1 weed), Poaceae (16 taxa, 5 weeds), Asteraceae (16 taxa, 8 weeds), Anthericaceae (15 taxa), Orchidaceae (26 taxa), Papilionaceae (34 taxa, 4 weeds), Proteaceae (27 taxa), Stylideaceae (18 taxa), Dasypogonaceae (13 taxa), Droseraceae (12 taxa), Haemodoraceae (12 taxa) and the Restionaceae (15 taxa) are the most species diverse families.

Twenty four taxa present in the Ambergate reserve (Appendix 2) are characteristic of the heavier soils of the southern side (or eastern side of the Plain north of Capel) of the Swan Coastal Plain. There are also at least ten taxa (Appendix 2) that are only recorded on the Plain to the south of Capel.

Significant Flora

Two species of Declared Rare Flora are recorded for Ambergate, the sedge *Tetraria australiensis* and the featherflower *Verticordia plumosa* var. *anaeotes*. Both species were considered to be extinct until their recent re-discoveries. *Tetraria australiensis* was rediscovered near Murdijong in 1993, while *Verticordia plumosa* var. *anaeotes*.was rediscovered in Ambergate Reserve in 1991.

Tetraria australiensis is a perennial sedge and is difficult to locate in bushland until the first summer after a fire when it flowers en masse. It is present at other times but is relatively inconspicuous. The sedge was located at Ambergate in summer after a fire in the previous year.

Verticordia plumosa var. *anaeotes* is a pink flowered featherflower which is difficult to locate in the dense shrub layer on the wet flats unless it is flowering.

Nine rare taxa are also present in the Ambergate Reserve (Atkins 1995, Appendix 2). Four of these taxa are endemic to the Swan Coastal Plain and restricted to the southern side of the Plain (or eastern side of the Plain north of Capel).

Other Taxa of Interest

Baxteria australis

This rather unusual plant with its stiff leaves and prickly flowers is often overlooked or thought to be a sedge. However it is relatively common in the damplands around Busselton extending north to

Capel.

Chorizandra cymbaria
This wetland sedge is found in the *Melaleuca rhaphiophylla* area in the north western block. This is the second record of the species on the Plain and the most northerly occurrence of this species.

Conospermum flexuosum subsp. *laevigatum*
This distinctive pale blue flowered *Conospermum* is a recently recognised subspecies (Bennett 1995). It is found from Capel to Busselton on the Plain and east to Nannup with isolated occurrences to the north along the Scarp and Plateau (Waroona and Jarrahdale area).

Daviesia rhombifolia
This is the only known record of this species from a Reserve on the Swan Coastal Plain. This species is of particular interest as it is the host of the endoparasite (only visible part of the plant is the flowers on the stem of the host plant) *Pilostyles hamiltonii.* While there is no definite record for the Ambergate Reserve of *Pilostyles hamiltonii* there is a collection for the Ambergate area in 1951. It is highly likely that this species does occur in the Reserve.

Drosera huegelii
This species is at the northern limit of its range at Ambergate and is the only record of this species on the Swan Coastal Plain.

Drosera myriantha
This species is at the northern limit of its range at Ambergate and is the only record of this species on the Swan Coastal Plain.

Gompholobium ovatum
This member of the pea family with distinctive ovate leaves has not previously been recorded on the Swan Coastal Plain.

Hibbertia ferruginea
This is a poorly collected species that is often overlooked or mistaken for *Hibbertia huegelii.*

Hibbertia stellaris
This *Hibbertia* found growing in damplands and sumplands has two forms with yellow or orange flowers. On the Swan Coastal Plain the yellow colour form is generally found north of Perth and the orange colour form to the south of Perth. However at Ambergate both colour forms occur in separate

pure populations. The yellow flowered form is found associated with the *Melaleuca uncinata* Tall Shrubland (Site 14).

Hodgsoniola junciformis

Found from Capel to the Scott Coastal Plain this attractive mauve lily grows in seasonally waterlogged areas. It is uncommon on the Swan Coastal Plain the few records coming from seasonally inundated or waterlogged areas from Capel to Busselton.

Johnsonia lupulina

This striking plant with its large drooping flower heads is another species that is uncommon on the Swan Coastal Plain and is found from Capel southward in Marri Woodlands on the southern side of the Plain.

Leptomeria ericoides

Only three collections have been made of this species. The Ambergate record is the most northerly occurrence presently known. This is a rare species (Priority 1).

Lepidosperma carphoides

This is another uncommon species on the Plain recorded for Ambergate.

Lomandra brittanii

Lomandra species are generally poorly collected as they have often have inconspicuous flowers and grass-like leaves. This *Lomandra* is apparently uncommon as it is rarely collected but this may well be because it is rarely observed.

Podocarpus drouyianus

This taxon is common on the Plateau but only occurs on the Plain in the Busselton area. While it has previously been recorded from the area this is the only recent collection.

Podolepis gracilis (Swamp form)

A robust glabrous form of this species with large pink or white flowers from the seasonally inundated heavy soils of the Pinjarra Plain from Gingin to Busselton. Further studies on this form are required to establish if it can be distinguished taxonomically.

Tribonanthes

Two species of *Tribonanthes* are recorded for Ambergate, *Tribonanthes australis* and *T. brachypetala*. *Tribonanthes brachypetala* occurs sporadically on the Swan Coastal Plain and often forms hybrids

with *Tribonanthes australis* when they co-occurr. Such hybrids have been observed at Ambergate.

Weeds

Thirty five weeds, most of which are annual species, are recorded for the Ambergate Reserve (Appendix 2). Most of these species are confined to and/or occur in significant densities on the edges of the tracks and drains or are found in areas which have been partially cleared and/or grossly disturbed by grazing in the past. Most of the species recorded are not known to become established in significant densities in intact bushland (Dixon and Keighery 1995). However several species, Love Grass (*Eragrostis curvula*) and Arum Lily (*Zantedeschia aethiopica*), can be invasive. While not recorded for the bushland the bulbous weed *Sparaxis bulbifera*, was found in the car park. This and any other bulbous weeds have the potential to become established if not controlled and their eradication is recommended when the numbers are low.

Vegetation Condition

The vegetation of the Ambergate Reserve is generally in excellent to very good condition with much of the area considered to be in "pristine" condition by visitors to the Reserve. With just thirty five weeds recorded for the bushland, less than 2% of the flora, and the general restriction of these weeds to disturbed areas weed invasion is low.

Disturbance of the bushland is associated with past clearing, grazing by livestock and too frequent fires, tracks, drains dieback and past timber collection. Unlike many remnant bushland areas on the Plain the Ambergate Reserve does not show evidence of present timber cutting and rubbish dumping. This is undoubtedly the result of management by the Busselton Naturalists Club. This management is also responsible for preventing clearing, grazing by livestock and too frequent fires which have occurred in the past.

Past timber collection and too frequent fires are evident in the absence of the expected number of mature Jarrah and Marri trees and the presence of many young Marri trees on the wetflats. Control of timber getting and frequent fires should enable these trees to reach maturity.

The areas that have been cleared and/or grazed are regenerating and it would be expected that if weeds are controlled in these areas regeneration will occur naturally from the adjacent intact vegetation. Often such areas are initially species poor, such as the south western corner where Bracken (*Pteridium esculentum*) forms the principle understory species in what, before clearing and grazing, would have been a *Melaleuca preissiana* Low Open Woodland.

One area that has been cleared, the gravel and sand mine on the western boundary of the south eastern block, is being assisted to regenerate by controlling weeds and planting. The species observed to be planted in this area are: *Eucalyptus rudis, Agonis flexuosa, Calothamnus quadrifidus, Acacia myrtifolia* (a form of non-local origin), *Melaleuca ?viminea, Casuarina obesa* and *Banksia grandis*. Of these species *Agonis flexuosa* and *Banksia grandis* are recorded for the bushland at Ambergate (Appendix 2).

DISCUSSION

Vegetation

All remaining natural vegetation on the southern (and eastern side north of Busselton) of the Swan Coastal Plain has conservation value (Keighery and Trudgen 1992, Gibson *et al.* 1994, Keighery, Keighery and Gibson 1995). The regional floristic survey of the Plain (Gibson *et al.* 1994) recommended that:

"As a consequence of the small amount of remnant vegetation on the eastern side* of the plain, all such remnants in the study area with the basic vegetation intact or able to be regenerated are of high conservation value."
*includes the southern side, south of Busselton .

That is the location, condition and size of the Ambergate Reserve identifies the area as being of regional conservation value. Also one of the three floristic community types, type 1b, was identified as being "vulnerable" (Table 2). Indicating that the community type is likely to move into the endangered category in the near future if factors leading to the loss of this community type continue to operate.

In response to this regional study and as part of the update of the System 6 recommendations (Department of Conservation and Environment 1983) the Department of Environmental Protection identified the Ambergate Reserve as being a "Threatened and Poorly Reserved Community in need of interim protection" (Department of Environmental Protection 1994, Map 1).

Consideration of the the plant communities present in the Ambergate Reserve further defines the conservation value of the remnant.

Table 2:
Regional Conservation Status of the Floristic Community Types from Gibson *et al.* 1994.

Floristic Community Type	Reservation Status#	Conservation Status
Marri Woodland		
1b Southern Marri woodlands on heavy soils	Present in two or more Cons. Reserves	Vulnerable
Banksia Woodland		
21b* Southern *Banksia attenuata* woodlands	Present in two or more Cons. Reserves	Susceptible
Wetland Mosaic		
Mixed Shrublands/ *Melaleuca preissiana* Low Open Woodland 2 Southern wet shrublands	Present in one Cons. Reserves	Vulnerable
Jarrah and *Melaleuca preissiana* Low Open Woodland		
4 *Melaleuca preissiana* damplands	Present in two or more Cons. Reserves	Low Risk
Melaleuca uncinata Tall Shrubland		
7* (Herb rich saline shrublands in clay flats)	Present in two or more Cons. Reserves	Vulnerable

* floristic community type inferred.
# Conservation Reserves are National Parks or Nature Reserves

Marri Woodland

The flora of these Marri Woodlands indicates a close association with the Whicher Plateau and the south coast as a series of the species commonly thought to be absent from the Plain are present in the Ambergate Reserve. At least ten of these taxa are present in the Reserve (Appendix 1), some examples are: *Baxteria australis*, *Johnsonia lupulina*, *Acidonia microcarpa*, *Stylidium scandens*, *Strangea stenocaroides* and *Podocarpus drouyianus*. This southern element contributes to the nature of floristic community type 1b which is restricted to the area of the Plain south of Capel.

Banksia Woodlands

The *Banksia* Woodland is from floristic community type 21b and is restricted to sand sheets at the base of the Whicher Scarp, the sand sheets on elevated ridges or the sand plain south of Bunbury. Again a series of southern taxa such as *Acacia extensa* and *Jacksonia* sp. Busselton help to identify this group.

Wetland Mosaic

The series of plant communities identified as the wetland mosaic, Marri Open Woodland through *Melaleuca preissiana* Low Open Woodland, *Melaleuca uncinata* Tall Shrubland, mixed Heaths and Shrublands, often dominated by *Pericalymma*, to Sedgelands and Herblands, are charcteristic of the heavy soil wetlands on the Swan Coastal Plain (Keighery and Trudgen 1992; Gibson *et al.* 1994; Keighery, Keighery and Gibson 1996). A series of communities are confined to these wetlands, at Ambergate these being floristic community type 7 and 2. Floristic community type 2 is confined to

the southern area of the Plain south of Busselton. Ambergate Reserve contains the largest known area of floristic community type 2.

Flora

The flora of the of the Ambergate Reserve shows a high level of species diversity (Appendix 2). The Marri Woodlands and the mixed Shrublands/Heaths contain a particularly diverse shrub, sedge and herb flora. Regionally community type 1b has the highest mean species richness recorded on the Swan Coastal Plain having a mean species richness 67.8 species per $100m^2$ quadrat.

The *Banksia* Woodlands were not as diverse as the Marri Woodlands but with 61.3 taxa per $100m^2$ quadrat their diversity was also high.

The wetland community types with mean species richness per $100m^2$ quadrat ranging through 51 (community type 2), 36.9 (community type 4) and 46.4 (community type 7) are grouped with the more species rich wetland community types associated with the heavy soils on the Swan Coastal Plain. The sites at Ambergate were typical of these ranges having from 50 to over 70 taxa per $100m^2$ quadrat.

The diversity of the flora of these woodlands and the presence of the substantial wetland areas contribute to the areas diversity of flora. Associated with this diverse flora area are a series of declared rare, rare and restricted taxa that contribute to the area's significance.

CONCLUSION

The Ambergate Reserve is the largest remaining areas of the southern Marri and *Banksia* Woodlands and wetlands of the southern side of the Plain in the Busselton area and is one of the largest such areas on the Plain. The Reserve contains a series of plant communities, and their associated flora, that are now rare on the Plain. The Reserve well deserves to be described as being "rich in plants" and "of outstanding conservation value" (Ambergate brochure).

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Appendix 1: Vegetation Descriptions and Condition

General Information

Broad mapping units are used for the vegetation mapping (Map 2). The determination of these units is based on vegetation descriptions from the sites. The actual location of the sites is indicated on the map. The vegetation descriptions for each of the mapped units are from the areas considered to best illustrate these units, being 'typical' and in the best condition.

Sites are grouped on the basis of the mapping units and the floristic community type. An * indicates that the floristic community type for the unit and/or site has been inferred from the floristics.

Keys to the terminology used for the vegetation descriptions and specific condition ratings are given in the first paper in this series Keighery, Keighery and Gibson (1996), in this volume.

Mapping Unit - mW - Marri Woodlands
Floristic Community Type 1b

Site 1 (Quadrat AMBR 1 Gibson *et al.* 1994)
Marri Open Forest over *Kingia australis*, *Xanthorrhoea preissii* and *Acacia extensa* Shrubland over *Hibbertia hypericoides* Open Low Heath over *Tetraria octandra* Very Open Sedgeland.
CONDITION
Rating Excellent
Soil: brown/grey loamy sand over grey clay (S8, Belford 1987; A, Tille and Lantzke 1990)
Drainage: moderate to poor Aspect: gentle to the south west

Site 4 (Quadrat AMBR 4 Gibson *et al.* 1994)
Marri Open Forest over *Kingia australis* and *Xanthorrhoea preissii* Shrubland over *Hakea ceratophylla* and *Isopogon formosus* subsp. *dasylepis* Shrubland over*Pericalymma ellipticum* and *Stirlingia latifolia* Closed Low Heath over mixed Very Open Herbland and *Mesomelaena tetragona* and *Hypolaena exsulca* Sedgeland.
CONDITION
Rating Excellent
Soil: pale grey sandy clay (S8, Belford 1987; A, Tille and Lantzke 1990)
Drainage: poor, waterlogged Aspect: flat

Site 6 (Quadrat AMBR 6 Gibson *et al.* 1994)
Marri, Jarrah and *Banksia grandis* Open Forest over *Adenanthos meisneri*, *Stirlingia latifolia* and *Hibbertia hypericoides* Low Shrubland over *Patersonia xanthina* and *Phlebocarya ciliata* Herbland and *Cyathochaeta clandestina*, *Tetraria octandra* and *Anarthria prolifera* Open Sedgeland.
CONDITION
Rating Excellent
Soil: grey clayey sandy (S8 Belford 1987, Aw Tille and Lantzke 1990)
Drainage: well Aspect: flat

Site 8 (Quadrat AMBRAL 1 Gibson *et al.* 1994)
Marri Open Woodland over *Banksia grandis* and *Persoonia longifolia* Low Open Woodland *Xanthorrhoea preissii* Shrubland over *Hibbertia hypericoides* Open Low Heath over *Patersonia umbrosa* Herbland over *Mesomelaena tetragona* Very Open Sedgeland.
CONDITION
Rating Excellent
Soil: black sand (S8, Belford 1987; A, Tille and Lantzke 1990)
Drainage: well Aspect: flat

Site 9 (Quadrat AMBR 9 Gibson *et al.* 1994)
Marri Open Forest over *Banksia grandis* and *Persoonia elliptica* Low Open Woodland *Xanthorrhoea preissii*, *Acacia extensa* and *Melaleuca thymoides* Shrubland over *Hibbertia hypericoides* and

Stirlingia latifolia Low Heath over mixed Open Herbland and *Cyathochaeta avenacea* Sedgeland.
CONDITION
Rating Excellent
Soil: grey sand (S8 Belford 1987, Aw Tille and Lantzke 1990)
Drainage: poor, waterlogged Aspect: flat

Mapping Unit - jbW - Jarrah and *Banksia* Woodland
Floristic Community Type 21b*

Site 13
Scattered emergent Jarrah to Open Woodland over *Banksia attenuata* Low Woodland over *Agonis parviceps* and *Melaleuca thymoides* Open Heath over *Adenanthos meissener, Persoonia saccata* and *Stirlingia latifolia* Low Shrubland over *Cyathochaeta clandestina* and *Anarthria prolifera* Sedgeland and *Phlebocarya ciliata* and *Patersonia xanthia* Herbland.
CONDITION
Rating Excellent
Soil: pale grey sand, (S8, Belford 1987; A, Tille and Lantzke 1990)
Drainage: well drained Aspect: flat

Wetland Mosaic

Floristic Community Type 2

Mapping Unit - mpW - *Melaleuca preissiana* Low Open Woodland
Sites 10*
Scattered Jarrah and Marri over scattered *Melaleuca preissiana* over scattered *Kingia australis* and *Xanthorrhoea preissii* over *Hakea ceratophylla* and *Acacia extensa* Shrubland over *Pericalymma ellipticum, Hypocalymma angustifolium* and *Grevillea brachystylis* Closed Low Heath over *Baxteria australis* Very Open Herbland and *Leptocarpus co-angustatus* and *Tetraria octandra* Sedgeland.

Comments : The density of the *Melaleuca preissiana, Kingia australis* and *Xanthorrhoea preissii* varies and they form a Low Woodland and Shrubland in places. There are also scattered clumps of *Viminaria juncea* in the area.
CONDITION
Rating Excellent
Soil: grey sandy clay over clay (S8, Belford 1987; Aw, Tille and Lantzke 1990)
Drainage: poor Aspect: flat

Site 12*
Scattered Jarrah and Marri over scattered *Melaleuca preissiana* over scattered patches of *Agonis parviceps* and *Melaleuca thymoides* Open Heath over *Leucopogon gracillimus, Pericalymma ellipticum* and *Hypocalymma angustifolium* Open Low Heath over Very Open Herbland and *Restio leptocarpoides, Lygina barbata* and *Hypolaena exsulca* Sedgeland.
CONDITION
Rating Excellent
Soil: grey sandy clay over clay (S8, Belford 1987; A, Tille and Lantzke 1990)
Drainage: poor Aspect: flat

Mapping Unit - xS - Mixed Shrublands
General Comments
Melaleuca preissiana is scattered throughout the area of this unit it does not from a layer. *Melelaueca rhaphiophylla* is also scattered through the unit or forms Tall Open Shrubland in the wetter areas of this unit. In the north western block of the Reserve on the northern boundary *M. rhaphiophylla* is

quite common.

Site 2 (Quadrat AMBR 2 Gibson *et al.* 1994)
Scattered *Melaleuca preissiana* over scattered *Kingia australis* to Tall Open Shrubland over *Xanthorrhoea preissii, Hakea ceratophylla* and *Isopogon formosus* subsp. *dasylepis* Shrubland over *Pericalymma ellipticum* and *Stirlingia latifolia* Closed Low Heath over mixed Very Open Herbland and *Mesomelaena tetragona* and *Hypolaena exsulca* Sedgeland.
CONDITION
Rating Excellent
Soil: pale grey sandy clay (S8, Belford 1987; Aw, Tille and Lantzke 1990)
Drainage: poor, waterlogged Aspect: flat

Site 5 (Quadrat AMBR 5 Gibson *et al.* 1994)
Scattered *Xanthorrhoea preissii* and *Kingia australis* over *Pericalymma ellipticum* Open Low Heath over mixed Open Herbland and over *Mesomelaena tetragona* and *Tetraria octandra* Sedgeland.
CONDITION
Rating Excellent
Soil: grey sand over grey sandy clay (S8, Belford 1987; Aw, Tille and Lantzke 1990)
Drainage: moderate Aspect: flat

Site 7 (Quadrat AMBR 7 Gibson *et al.* 1994)
Kingia australis and *Acacia extensa* Tall Open Shrubland over *Hakea sulcata, Hakea ceratophylla* and *Isopogon formosus* subsp. *dasylepis* Closed Low Heath over mixed Very Open Herbland and *Leptocarpus tenax, Anarthria prolifera* and *Hypolaena exsulca* Sedgeland.
CONDITION
Rating Excellent
Soil: grey sandy clay (S8, Belford 1987; Aw, Tille and Lantzke 1990)
Drainage: poor, waterlogged Aspect: flat

Site 11*
Scattered *Kingia australis* over*Hakea ceratophylla* and *Kunzea* aff. *micrantha* and *Pericalymma ellipticum* Open Shrubland over over mixed Very Open Herbland and *Leptocarpus tenax, Lygina barbata* and *Hypolaena exsulca* Sedgeland.
CONDITION
Rating Excellent
Soil: grey sandy clay (S8, Belford 1987; Aw, Tille and Lantzke 1990)
Drainage: poor, waterlogged Aspect: flat

Mapping Unit - muS (*Melaleuca uncinata* Tall Shrubland).
Site 14*
Melaleuca preissiana Low Open Woodland over *Melaleuca uncinata* and *Viminaria juncea* Tall Open Shrubland over *Kunzea* aff. *micrantha* Low Shrubland over *Borya shaerocephala* Herbland and mixed Sedgeland.
CONDITION
Rating Excellent
Comment: A ?1994/5 summer fire in the area has reduced the cover of all layers, regeneration is occurring.
Soil: brown clay loam over ironstone, there is exposed ironstone in the adjacent paddock (S8, Belford 1987; Aw' Tille and Lantzke 1990)
Drainage: poor, waterlogged Aspect: flat

Mapping Unit - jmpW
Floristic Community Type 4
Site 3 (Quadrat AMBR 3 Gibson *et al.* 1994)

Jarrah Wodland over *Melaleuca preissiana* Low Woodland over scattered *Xanthorrhoea preissii*, and *Melaleuca thymoides* Shrubland over*Hypocalymma angustifolium* and *Andersonia micrantha* Low Shrubland over mixed Very Open Herbland and *Anarthria prolifera* Very Open Sedgeland.

CONDITION

Rating	Excellent tp pristine		
Soil:	grey sandy over clay (S8, Belford 1987; Aw, Tille and Lantzke 1990)		
Drainage:	moderate to poor	Aspect:	flat

* Floristic community type inferred from the species present.

Appendix 2: Flora List

Key

Column 1 Family, Conservation Status (Atkins 1995) and Regional distributions
Conservation and Land Management Declared Rare Flora and Priority Taxa (Atkins 1995)
R = Declared Rare Flora
1 = Priority 1: Poorly Known Taxa
2 = Priority 2: Poorly Known Taxa
3 = Priority 3: Poorly Known Taxa
4 = Priority 4: Rare Taxa

Regional ecological preferences
H = taxa characteristic of sandy clay soils on the southern side (eastern side north of Capel) of the Swan Coastal Plain
Hs = taxa characteristic of sandy soils on the southern side (eastern side north of Capel) of the Swan Coastal Plain

Geographical Location (range ends)
cE = taxa endemic to the eastern/southern side of the Swan Coastal Plain
n = population at the northern limit of their known geographic range
s = population at the southern limit of their known geographic range
d = populations disjunct from their known geographic range
S = taxa with predominantly southern distributions

Column 2 Taxon
Names follow Gibson *et al.* (1994). A * preceeding the name indicates a weed.

Columns 3 - 8

m = Marri Woodland (mapping unit Map 2 **mW**)

mp = *Melaleuca preissiana* Low Very OpenWoodland (mapping unit Map 2 **mpW, jmpW**)

x = Mixed Shrublands/Heaths (mapping unit Map 2 **xS**)

mu = *Melelaeuca uncinnata* Tall Shrubland (mapping unit Map 2 **muS**)

jb = Jarrah and *Banksia* Woodland (mapping unit Map 2 **jbW**)

D = degraded areas - road sides, track edges, transmission line (mapping unit Map 2 **D**)

Amaranthaceae								
	Ptilotus manglesii		•					
Anthericaceae								
H	Agrostocrinum scabrum	•		•		•		
H	Borya scirpoidea	•		•	•			
	Caesia micrantha				•			
	Caesia occidentalis		•	•				
	Chamaescilla corymbosa	•						
S	Hodgsoniola junciformis			•				
S	Johnsonia lupulina	•						
	Laxmania sessiliflora subsp. australis	•	•					
	Sowerbaea laxiflora	•	•					
	Thysanotus multiflorus					•		
	Thysanotus patersonii	•				•		
	Thysanotus thyrsoideus	•		•				
	Thysanotus triandrus	•						
	Tricoryne elatior	•				•		
	Tricoryne humilis	•						
Apiaceae								
	Hydrocotyle alata			•				
	Hydrocotyle callicarpa	•		•				
	Platysace compressa	•						
	Schoenolaena juncea			•				
	Trachymene pilosa					•		
	Xanthosia candida	•						
	Xanthosia ciliata					•		
	Xanthosia huegelii					•		
Araceae								
*	Zantedeschia aethiopica	•					•	
Asteraceae								
*	Arctotheca calendula	•						
*	Dittrichia graveolens						•	
	Gnaphalium sphaericum	•						
	Hyalosperma cotula			•				
	Hyalosperma pusillum		•					
*	Hypochaeris glabra	•	•	•				
	Lagenifera huegelii	•						
*	Leontodon saxitale						•	
	Podolepis gracilis			•				
*	Pseudognaphalium luteoalbum			•				
	Senecio minimus			•				
	Siloxerus humifusus	•						
*	Sonchus asper	•					•	
*	Ursinia anthemoides	•						
	Waitzia citrina					•		
*	Vellereophyton dealbatum						•	
Caryophyllaceae								

	*	Moenchia erecta					•
	*	Petrhagia velutina					•
Campanulaceae							
		Wahlenbergia preissii	•			•	
Casuarinaceae							
		Allocasuarina humilis	•				
Centrolepidaceae							
		Aphelia cyperoides	•		•		
		Centrolepis aristata			•		
		Centrolepis drummondii				•	
		Centrolepis mutica			•		
Colchicaceae							
		Burchardia multiflora				•	
		Burchardia congesta [1]	•			•	
Crassulaceae							
		Crassula colorata				•	
		Crassula pedicellosa		•			
Cuscutaceae							
	*	Cuscuta epithymum					•
Cyperaceae							
		Baumea juncea		•	•		
		Baumea vaginalis	•				
H		Chorizandra enodis		•			
		Chorizandra cymbaria		•			
H		Cyathochaeta avenacea	•		•		
Hs		Cyathochaeta clandestina	•			•	
	*	Cyperus tenellus			•		
		Lepidosperma angustatum	•			•	
		Lepidosperma carphoides	•	•			
		Lepidosperma leptostachyum	•				
		Mesomelaena graciliceps	•		•		
Hs		Mesomelaena stygia	•			•	
		Mesomelaena tetragona	•			•	
		Schoenus asperocarpus	•				
3H		Schoenus benthamii	•				
		Schoenus bifidus			•		
		Schoenus brevisetis			•		
		Schoenus efoliatus	•				
H		Schoenus elegans		•	•		
		Schoenus laevigatus	•				
		Schoenus obtusifolius	•				
		Schoenus odontocarpus				•	
		Schoenus rigens			•		
		Schoenus rodwayanus		•			
		Schoenus subbarbatus	•				

	Schoenus subbulbosus		•					
RHs/eE	Tetraria australiensis	•						
	Tetraria capillaris	•						
	Tetraria octandra	•			•			
	Tricostularia neesii			•				
Dasypogonaceae								
S	Baxteria australis	•		•				
	Dasypogon bromeliifolius	•			•			
	Kingia australis	•		•	•			
	Lomandra brittanii	•						
	Lomandra caespitosa	•						
	Lomandra hermaphrodita				•			
	Lomandra integra	•						
	Lomandra nigricans	•			•			
	Lomandra preissii	•						
	Lomandra purpurea	•						
	Lomandra sericea				•			
	Lomandra sonderi	•	•					
	Lomandra suaveolens			•				
Dennstaeditaceae								
	Pteridium esculentum							•
Dilleniaceae								
	Hibbertia amplexicaulis		•					
	Hibbertia cunninghamii	•						
	Hibbertia ferruginea	•						
	Hibbertia hypericoides	•			•			
	Hibbertia rhadinopoda			•				
	Hibbertia stellaris							
	"yellow flowered form"					•		
	"orange flowered form"		•	•				
	Hibbertia subvaginata				•			
Droseraceae								
	Drosera gigantea			•		•		
	Drosera glanduligera		•	•				
nS	Drosera huegelii	•						
4	Drosera marchantii							
	subsp.marchantii	•						
	Drosera menziesii							
	subsp. penicillaris	•						
nS	Drosera myriantha			•				
	Drosera neesii		•					
	Drosera nitidula							
	subsp. nitidula			•				
	Drosera pallida	•						
	Drosera pulchella			•				
	Drosera rosulata					•		
H/eE	Drosera tubaestylis					•		
Epacridaceae								
	Andersonia depressa (GJK 13498)	•						

	Andersonia micrantha		•					
	Andersonia involucrata							
	Astroloma ciliatum	•						
	Astroloma pallidum	•			•			
	Leucopogon australis		•					
	Leucopogon conostephioides				•			
	Leucopogon gracillimus				•			
	Leucopogon parviflorus	•						
	Leucopogon pendulus		•					
	Lysinema ciliatum			•				
Euphorbiaceae								
	Amperea ericoides	•						
	Phyllanthus calycinus	•						
Gentianaceae								
*	Centaurium erythraea						•	
Goodeniaceae								
	Dampiera alata	•						
	Dampiera linearis	•						
	Goodenia micrantha			•				
	Goodenia pulchella			•				
	Scaevola calliptera	•						
	Scaevola striata	•						
	Velleia trinervis "hairy orange form"	•						
Haemodoraceae								
	Anigozanthos humilis	•						
H	Anigozanthos viridis			•				
	Conostylis aculeata	•						
	Conostylis laxiflora	•		•				
	Conostylis setigera	•						
	Haemodorum laxum	•						
H	Haemodorum simplex	•						
	Haemodorum sparsiflorum		•	•				
	Haemodorum spicatum			•	•			
	Phlebocarya ciliata				•			
	Tribonanthes australis		•		•			
	Tribonanthes brachypetala	•						
Hypoxidaceae								
	Hypoxis occidentalis			•				
Iridaceae								
*	Gladiolus undulatus	•			•		•	
	Patersonia juncea	•			•			
	Patersonia occidentalis				•			
	Patersonia xanthina	•			•			
Juncaceae								
*	Juncus bufonius		•	•		•		
*	Juncus capitatus		•	•				

	Juncus holoschoenus					•	
	Juncus pallidus					•	
Lauraceae							
	Cassytha glabella	•		•			
	Cassytha micrantha			•			
Lindsaeaceae							
H	Lindsaea linearis	•					
Lobeliaceae							
	Isotoma hypocrateriformis	•					
F	Lobelia rhytidosperma	•					
	Lobelia tenuior	•			•		
*	Monopsis debilis			•			
Loganiaceae							
	Logania campanulata	•					
	Logania serpyllifolia	•					
	Mitrasacme paradoxa		•	•			
Loranthaceae							
	Nuytsia floribunda	•			•		
Lythraceae							
*	Lythrum hyssopifolia					•	
Menyanthaceae							
	Villarsia parnassifolia			•			
Mimosaceae							
	Acacia applanata				•		
	Acacia extensa	•			•		
4Hs	Acacia flagelliformis	•	•				
	Acacia incurva		•	•			
	Acacia pulchella	•					
	Acacia stenoptera	•					
	Acacia tetragonacarpa	•					
Myrtaceae							
	Agonis flexuosa		•				
	Agonis parviceps		•		•		
	Astartea aff. fascicularis			•			
	Calothamnus lateralis			•			
	Calothamnus sanguineus				•		
	Darwinia oederoides			•			
	Eucalyptus calophylla	•					
	Eucalyptus marginata	•			•		
	Hypocalymma angustifolium			•			
S	Hypocalymma ericifolium			•			
S	Kunzea aff. micrantha (BJK & NG 040)		•	•			
	Kunzea recurva			•			
	Melaleuca incana			•			

	Melaleuca preissiana		•		•			
	Melaleuca rhaphiophylla		•	•				
	Melaleuca thymoides		•			•		
	Melaleuca uncinata			•				
	Pericalymma ellipticum			•				
	Regelia ciliata			•				
	Verticordia densiflora var. caespitosa	•	•					
4S	Verticordia lehmanni		•					
RS/eE	Verticordia plumosa var. anaeotes		•					
Orchidaceae								
	Caladenia deformis	•						
	Caladenia flava	•						
	Caladenia latifolia					•		
	Caladenia marginata	•	•	•				
	Caladenia paludosa ms	•						
	Caladenia sericea	•						
	Diuris longifolia					•		
	Drakaea glyptodon					•		
	Elythranthera brunonis	•						
	Eriochilus dilatatus						•	
	Eriochilus tenuis				•			
	Lyperanthus nigricans					•		
	Lyperanthus serratus	•						
	Microtis atrata		•	•				
	Microtis media			•				
	Prasophyllum aff. parvifolium	•						
	Prasophyllum elatum		•					
	Prasophyllum fimbria	•						
	Prasophyllum plumaeforme	•	•					
	Pterostylis aff. vittata		•					
	Pterostylis recurva		•			•		
	Thelymitra aff. holmesii							
	Thelymitra canaliculata				•			
	Thelymitra crinita	•		•				
	Thelymitra nuda	•						
	Thelymitra pauciflora	•						
Oxalidaceae								
*	Oxalis pes-caprae	•					•	
Papilionaceae								
S	Daviesia costata					•		
	Daviesia incrassata	•						
	Daviesia physodes	•						
	Daviesia podophylla	•						
	Daviesia preissii					•		
Hs	Daviesia rhombifolia	•						
	Euchilopsis linearis			•				
	Eutaxia virgata			•				
	Gompholobium aristatum	•						

	Gompholobium capitatum	•						
	Gompholobium confertum	•						
	Gompholobium knightianum	•						
	Gompholobium marginatum	•						
	Gompholobium ovatum	•		•				
	Gompholobium polymorphum	•						
	Gompholobium tomentosum	•						
	Hovea trisperma var. trisperma	•				•		
Hs	Hovea trisperma var. grandiflora	•						
	Isotropis cuneifolia	•						
	Jacksonia aff. furcellata		•	•				
	Jacksonia sp. Busselton (GJK 4482)					•		
	Kennedia carinata	•	•					
	Kennedia coccinea	•				•		
	Kennedia prostrata					•		
	Latrobea tenella		•					
*	Lotus angustissimus		•				•	
	Nemcia capitata			•				
*	Ornithopus compressus					•		
	Pultenaea reticulata					•		
	Sphaerolobium scabriusculum					•		
	Sphaerolobium medium	•		•				
*	Trifolium dubium					•		
*	Trifolium glomeratum	•						
	Viminaria juncea			•	•			
Philydraceae								
	Philydrella pygmaea				•			
Phormiaceae								
	Stypandra glauca	•	•					
Phytolaccaceae								
*	Phytolacca octandra						•	
Pittosporaceae								
	Billardiera variifolia	•						
	Pronaya fraseri	•						
Poaceae								
*	Aira caryophyllea	•		•		•		
	Amphipogon amphipogonoides	•						
	Amphipogon turbinatus	•						
*	Anthoxanthum odoratum	•				•	•	
*	Briza maxima	•						
	Danthonia caespitosa	•						
	Danthonia setacea	•						
	Deyeuxia quadriseta	•						
*	Holcus lanatus						•	
*	Holcus setiger		•				•	
	Microlaena stipoides	•						
	Neurachne alopecuroidea	•						

	*	Polypogon monospeliensis					•	
H		Polypogon tenellus		•		•		
		Stipa campylachne	•		•		•	
		Stipa compressa	•					
		Tetrarrhena laevis	•					
Podocarpaceae								
Hs		Podocarpus drouynianus					•	
Polygalaceae								
		Comesperma ciliatum			•			
		Comesperma virgatum	•		•			
		Persicaria prostrata						•
	*	Rumex crispis						•
Proteaceae								
S		Acidonia microcarpa[2]			•			
		Adenanthos meisneri	•				•	
		Adenanthos obovatus			•		•	
		Banksia attenuata					•	
		Banksia grandis	•				•	
		Banksia ilicifolia			•		•	
		Banksia littoralis		•				
		Conospermum caeruleum subsp. marginatum	•	•				
HS		Conospermum flexuosum subsp. laevigatum [3]			•			
		Dryandra nivea	•					
S		Grevillea brachystylis			•			
		Grevillea quercifolia	•					
		Hakea ceratophylla			•			
		Hakea prostrata			•			
		Hakea ruscifolia	•		•			
		Hakea sulcata			•			
		Hakea varia			•			
		Isopogon formosus subsp. dasylepis[4]			•			
		Persoonia elliptica	•					
		Persoonia longifolia					•	
		Petrophile linearis					•	
		Petrophile saccata					•	
H		Petrophile media var. juncifolius			•			
		Stirlingia latifolia	•		•		•	
Hs/S		Strangea stenocarpoides	•				•	
		Synaphea petiolaris subsp. triloba	•		•			
		Xylomelum occidentale					•	
Restionaceae								
H		Anarthria gracilis			•			
H		Anarthria laevis			•			
		Anarthria prolifera	•	•	•		•	

	Chaetanthus leptocarpoides			•				
	Hypolaena exsulca	•		•		•		
	Leptocarpus aristatus			•				
	Leptocarpus tenax			•				
	Leptocarpus coangustatus		•	•				
	Lepyrodia drummondiana		•					
	Lepyrodia macra			•				
	Lepyrodia muirii		•					
	Loxocarya fasciculata	•				•		
	Loxocarya flexuosa	•						
	Loxocarya pubescens			•				
	Lyginia barbata	•		•		•		
	Restio leptocarpoides		•	•				
Rubiaceae								
	Opercularia apiciflora	•						
Rutaceae								
	Boronia dichotoma		•					
	Boronia spathulata	•						
	Eriostemon spicatus	•		•				
Santalaceae								
1n	Leptomeria ericoides		•					
n	Leptomeria scrobiculata			•				
Scrophulariaceae								
*	Parentucellia latifolia			•		•		
Selaginellaceae								
	Selaginella gracillima				•			
Solanaceae								
*	Solanum nigrum	•					•	
Stackhousiaceae								
	Stackhousia pubescens	•						
	Tripterococcus brunonis	•		•				
1 eE	Tripterococcus sp Cannington (A.S. George 16201)		•	•				
Stylidiaceae								
	Levenhookia pusilla	•		•				
	Stylidium aff. bulbiferum BJK & NG 706	•						
	Stylidium brunonianum subsp. minor			•				
	Stylidium calcaratum	•						
	Stylidium carnosum	•						
	Stylidium crassifolium	•						
	Stylidium guttatum			•				
	Stylidium junceum		•					
1H	Stylidium mimeticum		•					
	Stylidium perpusillum			•				

	Stylidium piliferum					•	
	Stylidium pulchellum		•	•			
	Stylidium repens		•			•	
	Stylidium roseonanum		•	•			
S	Stylidium scandens			•		•	
	Stylidium schoenoides	•				•	
	Stylidium striatum	•					
	Stylidium utricularioides						•
Thymelaeaceae							
	Pimelea hispida			•			
	Pimelea preissii	•					
	Pimelea imbricata var. piligera	•					
Tremandraceae							
	Platytheca galioides					•	
	Tetratheca hirsuta	•					
Xanthorrhoeaceae							
	Xanthorrhoea preissii	•				•	

Note:

1 Burchardia umbellata in Gibson *et al.*

2 Acidonia microcarpa, see Weston 1995

3 Conopsermum paniculatum in Gibson *et al.*

4 Isopogon scaber in Gibson *et al.*