

CARDUP NATURE RESERVE AND ADJACENT BUSHLAND CARDUP

Boundary Definition: protected area/bushland (part taken to cadastre) boundary

SECTION 1: LOCATION INFORMATION

Bush Forever Site no. 352

Area (ha): bushland 86.2

Map no. 67, 73

Map sheet series ref. no. 2033-I SE, 2033-II NE

Other Names: Reserve C2457 Mundijong; Location 11 (Keighery, BJ, and Trudgen 1992)

Local Authorities (Suburb): Shire of Serpentine-Jarrahdale (Cardup)

Includes CALM Managed Land: Reserve 2457 (Conservation of Flora and Fauna)

System 6 (1983): M83 area of bushland goes beyond System area boundaries, all bushland described

SECTION 2: REGIONAL INFORMATION

LANDFORMS AND SOILS

Foothills

Colluvial Deposits (Qc: Csg)

Pinjarra Plain

Guildford Formation (Qpa: Cs)

Bassendean Dunes

Bassendean Sands (Qpb: S8)

VEGETATION AND FLORA

Vegetation Complexes

Pinjarra Plain

Guildford Complex

Floristic Community Types

Supergroup 1: Foothills/Pinjarra Plain

3b *Eucalyptus calophylla* — *E. marginata* woodlands on sandy clay soils

Supergroup 2: Seasonal Wetlands

6 Weed dominated wetlands on heavy soils

Supergroup 3: Uplands centred on Bassendean Dunes and Dandaragan Plateau

20b Eastern *Banksia attenuata* and/or *Eucalyptus marginata* woodlands

21a Central *Banksia attenuata* — *Eucalyptus marginata* woodlands

WETLANDS

Wetland Types: palusplain, creek, sumpland (wetland not previously described, Keighery, GJ, and Keighery 1993a)

Natural Wetland Groups

Pinjarra Plain

Keysbrook (P.1)

Wetland Management Objectives: Multiple Use, Conservation (Keighery, GJ, and Keighery 1993a), not assessed

Swan Coastal Plain Lakes EPP: none identified

THREATENED ECOLOGICAL COMMUNITIES

Not assessed, Endangered (floristic community type 20b), Vulnerable (floristic community type 3b)

SECTION 3: SPECIFIC SITE DETAIL

Landscape Features: vegetated upland, vegetated wetland, creek

Vegetation and Flora: limited survey (Gibson *et al.* 1994 (Card 01–13), Keighery, BJ, and Trudgen 1992); detailed survey (part Site — Keighery, GJ, and Keighery 1993a (Cardup Nature Reserve))

Structural Units: mapping (Keighery, GJ, and Keighery 1993a, Keighery, BJ, and Trudgen 1992)

Uplands: Woodlands dominated by *Eucalyptus calophylla* and/or *E. marginata*; *Banksia attenuata*, *B. menziesii* and *B. grandis* Woodland to Open Forest with scattered to co-dominant *Xylomelum occidentale* and *Nuytsia floribunda*; *Allocasuarina humilis*, *Hakea ruscifolia*, *Hibbertia hypericoides* Low Shrubland

Wetlands: *Melaleuca preissiana* Low Woodland; *Mesomelaena tetragona* and *Hypolaena exsulca* Sedgeland

Scattered Native Plants: not assessed

Vegetation Condition: >75% Excellent to Very Good, <25% Good to Degraded, with areas of severe localised disturbance

Total Flora: 253 native taxa, 47 weeds (Keighery, GJ, and Keighery 1993b) (estimated >90% expected flora)

Significant Flora

Eryngium pinnatifidum subsp. *palustre* ms (2), *Lambertia multiflora* var. *darlingensis* (3), *Drosera macrantha* (BJK and NG 228), *Johnsonia pubescens* subsp. *cygnorum* (known from only two other bushland areas),

Dasypogon obliquifolius (most southern record), *Dasypogon obliquifolius*, *D. bromeliifolius* (co-occurrence of these two *Dasypogon* species is not common on the eastern side of the Swan Coastal Plain)

Fauna: structured survey for birds (37 species), native mammals (1 species), reptiles (14 species) and amphibians (4 species) (Harvey *et al.* 1997). Significant bird species: category 1 (1), category 3 (6) and category 4 (6). Significant mammal species: Quenda

Linkage: adjacent canopy to the north and bushland east (Site 350); part of Greenways 61, 106 (Tingay, Alan & Associates 1998a); part of a regionally significant fragmented bushland/wetland linkage (Part A, Map 7)

Other Special Attributes: Threatened or Poorly Reserved Plant Community (EPA 1994 GIS); contains plant communities representative of the eastern side of the Swan Coastal Plain; National Trust of Australia (WA) Classification

SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE

Entered in the Register of the National Estate

SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS

Criteria: Representation of ecological communities, Diversity, Rarity, Scientific or evolutionary importance, General criteria for the protection of wetland, streamline and estuarine fringing vegetation and coastal vegetation

Recommendation: Part A: Sites with Some Existing Protection; the existing purpose, care, control and management of Reserve 2457 is endorsed. Part B: Rural Complementary Mechanism (see Table 3, Volume 1).

CARDUP NATURE RESERVE AND ADJACENT BUSHLAND CARDUP

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SECTION 1: CADASTRAL INFORMATION

(Lots, locations and derived information to be updated in the public submission period)

Bushplan Site no. 352 **Map no.** 83, 90 **Map sheet series ref. no.** 2033-I SE, 2033-II NE
System 6 (1983): M83 area of bushland goes beyond System area boundaries, all bushland described

Other Names

Reserve C2457 Mundijong; Location 11 (Keighery, BJ, and Trudgen 1992)

Local Authorities (Suburb)

Shire of Serpentine-Jarrahdale (Cardup)

Ownership Categories

Private, State Government

Area (ha): total 89.7; bushland 86.2

Zoning

MRS: Parks and Recreation, Rural

TPS: Rural, Special Rural, Landscape

Lot/Location/Reserve numbers (Purpose),

Street name

701, 703, 704, 705, 706, 707, 708 Bushlark Cl; 17, 146, 154 Cardup Siding Rd; 1 Soldiers Rd

Crown Reserve

Reserve 2457 (Conservation of Flora and Fauna)

CALM Managed Land

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Guildford Formation (Qpa: Cs)

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Wetland Management Objectives: Multiple Use, Conservation (Keighery, GJ, and Keighery 1993a), not assessed

Swan Coastal Plain Lakes EPP: none identified

THREATENED ECOLOGICAL COMMUNITIES

Not assessed, Endangered (floristic community type 20b), Vulnerable (floristic community type 3b)

SECTION 3: SPECIFIC SITE DETAIL

Landscape Features: vegetated upland, vegetated wetland, creek

Vegetation and Flora: detailed survey (part Bushplan Site (Cardup Nature Reserve), Keighery, GJ, and Keighery 1993a); limited survey (Gibson *et al.* 1994 (Card 01-13), Keighery, BJ, and Trudgen 1992)

Structural Units: mapping (Keighery, GJ, and Keighery 1993a, Keighery, BJ, and Trudgen 1992)



Uplands: Woodlands dominated by *Eucalyptus calophylla* and/or *E. marginata*; *Banksia attenuata*, *B. menziesii* and *B. grandis* Woodland to Open Forest with scattered to co-dominant *Xylomelum occidentale* and *Nuytsia floribunda*; *Allocasuarina humilis*, *Hakea ruscifolia*, *Hibbertia hypericoides* Low Shrubland

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Total Flora: 253 native taxa, 47 weeds (Keighery, GJ, and Keighery 1993b) (estimated >90% expected flora)

Significant Flora: *Eryngium pinnatifidum* subsp. *palustre* ms (2), *Lambertia multiflora* var. *darlingensis* (3), *Drosera macrantha* (BJK and NG 228), *Johnsonia* aff. *pubescens* (GJK 5249), *Johnsonia* sp. (GJK 5249) (southern limit of distribution, known from only two other bushland areas), *Dasypogon obliquifolius* (most southern record), *Dasypogon obliquifolius*, *D. bromeliifolius* (co-occurrence of these two *Dasypogon* species is not common on the eastern side of the Swan Coastal Plain)

Fauna: multiple and structured survey by Western Australian Museum of Natural Science (Harvey *et al.* 1997) for birds (37), native mammals (1), reptiles (14) and amphibians (4). Significant bird species: category 1 (1), category 3 (6) and category 4 (6). Significant mammal species: Quenda

Linkage: adjacent canopy to the north and bushland east (BS350); part of proposed Greenways 129, 120 (Tingay, Alan & Associates 1997a); part of a regionally significant fragmented bushland/wetland linkage (Volume 2A, Map 8)

Other Special Attributes: Threatened or Poorly Reserved Plant Community (EPA 1994 GIS); contains plant communities representative of the eastern side of the Swan Coastal Plain; National Trust of Australia (WA) Classification

SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE

Interim List of the Register of the National Estate

SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS

Criteria: Representation of ecological communities, Diversity, Rarity, Scientific or evolutionary importance, General criteria for the protection of wetland, streamline and estuarine fringing and coastal vegetation

Opportunities and/or Constraints

Opportunities: Bushplan Site/part Bushplan Site subject to Peel-Harvey Estuary EPP/SPP; location of Scheduled Fauna; under MRS Parks and Recreation Reservation and TPS Landscape Zoning, Crown Reserve

Constraints: private land

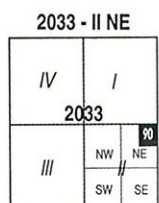
Recommendation: The existing purpose, care, control and management of Reserve 2457 is endorsed. The most appropriate mechanism for the protection of the remainder of this Bushplan Site be considered through the public comment period in consultation with the land owner(s).



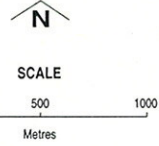
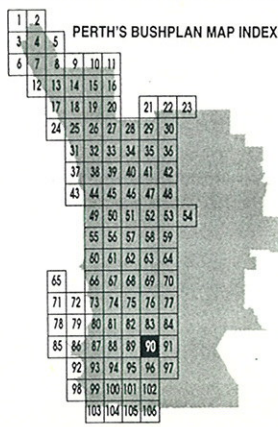


LEGEND

-  Bushplan Sites With Regionally Significant Bushland
-  Other Native Vegetation
-  Conservation Category Wetlands
-  Bushplan Sites With Some Existing Protection
-  Lot Number, Location Number
-  Channel Wetlands
-  Local Government Boundary



1 : 25 000 AMG Reference Grid showing Perth's Bushplan Map Sheet Breakdown

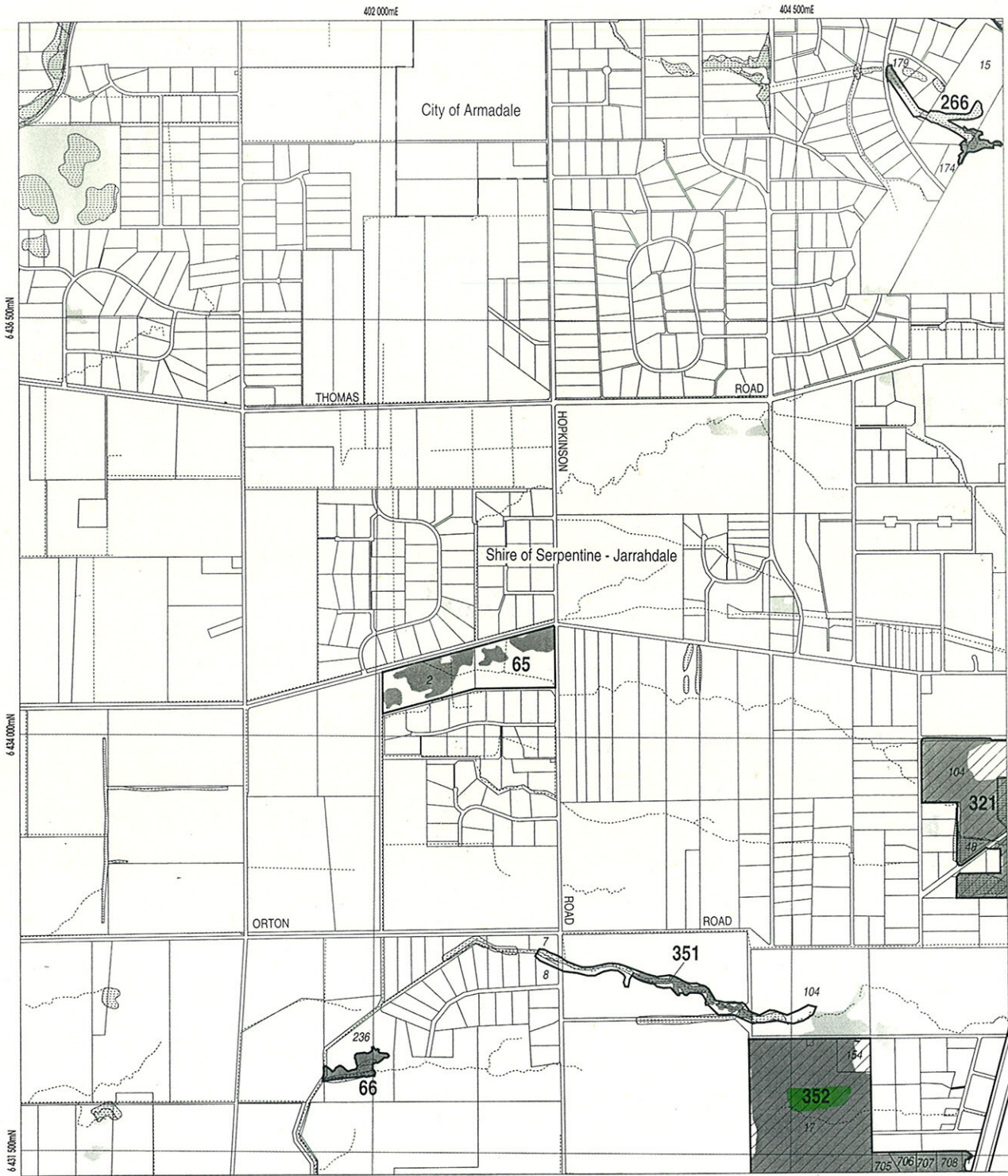


Produced by Project Mapping Section
Land Information Branch, Ministry for
Planning, Perth W.A. November 1998
ntw-map9/environ/bushplan/bushv2_90.dgn

Cadastral Data supplied by Department
of Land Administration, W.A.

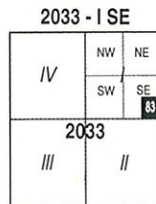
Wetlands Data supplied by
Water and Rivers Commission

Native Vegetation Extent for Study Area
supplied by Agriculture Western Australia

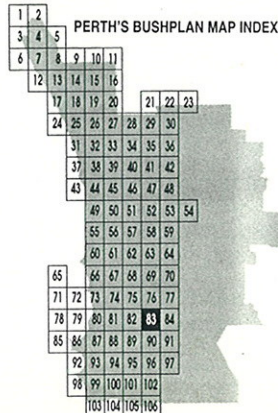


LEGEND

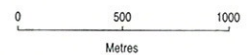
- 472 Bushplan Sites With Regionally Significant Bushland
- Other Native Vegetation
- Conservation Category Wetlands
- Bushplan Sites With Some Existing Protection
- 696 Lot Number, Location Number
- Channel Wetlands
- Local Government Boundary



1 : 25 000 AMG Reference Grid showing Perth's Bushplan Map Sheet Breakdown



SCALE



Produced by Project Mapping Section
 Land Information Branch, Ministry for
 Planning, Perth W.A. November 1998
 ntw-map9/environ/bushplan/bushv2_83.dgn
 Cadastral Data supplied by Department
 of Land Administration, W.A.
 Wetlands Data supplied by
 Water and Rivers Commission
 Native Vegetation Extent for Study Area
 supplied by Agriculture Western Australia

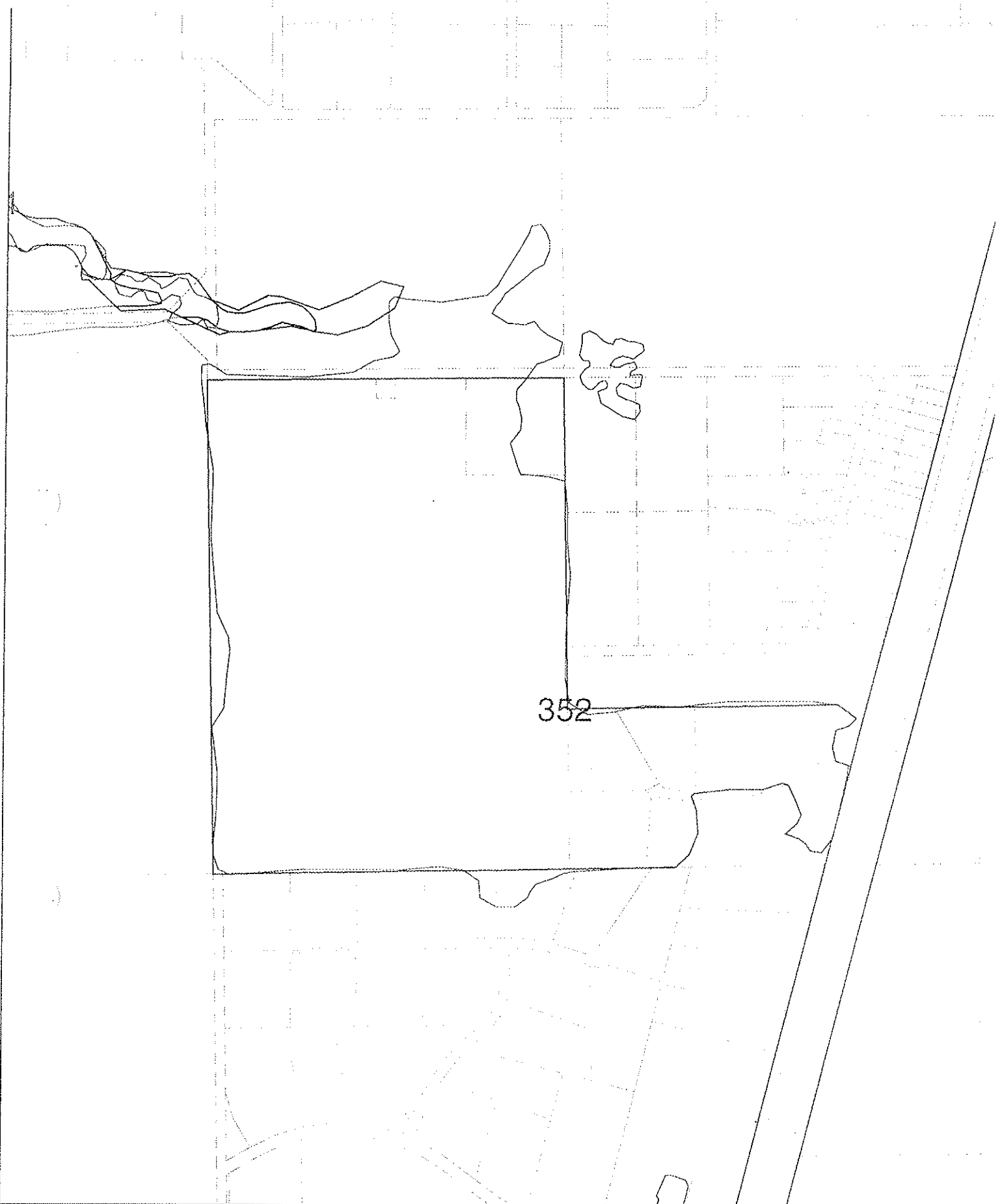


6
30
1/2 2 1/4
1/3 2 1/2

BRICKWOOD

M83

M83
015
15



BUSHPLAN SITES CORRECTED








**WESTERN
AUSTRALIAN
PLANNING
COMMISSION**



L BK 27/10/96

bp site 352

-  AG VEG 1998 BOUNDARY THEME
-  Cadastre
-  Bushplan sites refno 1-500 SCP BOUNDARY
-  cons category wetlands
-  Verified CCWs

Fushyton site follow cadastre

352

MKS Park

AG VEG

Veg

Cadastre

cut de sac Hou cleaned

*exclude lake
lake
Coalongip
lake bed
no veg.
dune
veg
larkhill
area*

REL 514?

*EXISTING
MORNING 2/1/98*

*BR 03/9
this area constitutes
a corridor to
another bushplan
site would
envisage that it
would be covered
by complementary
not intended to
purchase but keep veg*

MFP INTERNAL USE ONLY
Prepared By: Andrea Zappacosta
Prepared For:
Map Ident: plot980602_1
Date: 02 Jun 98
Scale 1: 7850

AREA INFORMATION

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

M83

Conservation Area	
Nature Reserve	mundijong
Reserve No	62457
National Park	
Reserve No	
Local Government	
Reserve No	
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	75.0287	hectares
Completely Degraded		

AREA MAPPED FLORISTIC UNITS

Units	Site (Condition)	Code	CARD	Bound	Area (ha)
6	10 (35)	11 (5)	04 (4)	B	0.5
			- dist. done		
3b	12 (2)	13 (2)		B	4.75
20b	01 (2)	02 (2)	05 (2)	2/3	46.519
	06 (2)	08 (3)	09 (3)		
21a	03 (3)	07 (3)		1/3	23.260

Boundaries determined by use of

aerial photograph	Metro Street Directories Vm13 5167 4/1/91
orthophoto	2033 1 SE Aug 1991
vegetation map	Gibson et al
soil map	

also Backwood

PB16 2

96
1**Bushplan Map 74 - South East Quadrant:-**

Currently there is no bushland recommended for this portion which is on the lower eastern edge of the map between Gaebler Road. Once again its retention under Bushplan may help the long term ambition of preserving the Jandakot groundwater mound. The bush is typical Banksia Woodland.

Bushplan Map 74 - South East Quadrant:-

The more southerly part of the map adjoining the Kwinana Freeway on its eastern side includes some wetlands which are not recommended as a Bushplan site. These extend on to map 81, the bush has some intense thickets of Malalueca and Eucalyptus Rudis. ***I recommend its retention.***

Bushplan Map 74 - Site [REDACTED]

This is situated in the north west quadrant of the map and abuts Fraser and Armadale Roads.

I am aware that some very rare species of orchids are on this site including ***Caladenia Huegelii*** which has been documented by CALM's herbarium. The balance of the land has a great abundance of quite different plants which is often seen in other parts of Jandakot. ***I strongly suggest it be properly surveyed by a botanist during spring to determine its importance.***

Site 390 is subject to a sand mining license and a logical outcome maybe to provide the licensee with another less ecologically important site for sand mining, or by compensation for loss of the site. It is understood that the owner of the land is Homeswest. The sandmining has been in progress and here is an example indicating the need for a moratorium on such activity on Bushplan sites to be implemented as a matter of urgency.

Map 88 - Bushplan Site [REDACTED]

I recommend that this site be extended further to the east to include the bushland just north of Millar Road and south east of the Leda Subdivision. The land is good quality Banksia Woodland.

Bushplan Site [REDACTED]:

I recommend that Cardup Nature Reserve be extended to include Lot 701, 703 to 708 inclusive.

Bushplan Site [REDACTED]

The good quality Tuart Woodland on Lot 1387 Kerosene Lane should be included in the site.

- Reserve – vegetation in good condition, Council has carried out weed control with assistance from federal government grant. Paul Robinson Reserve – managed by Serpentine Bushland Group with support from Shire and Serpentine-Jarrahdale Landcare Centre through federal government grant. Recommendation: Amendment of the purpose of the rail reserve portion to include Conservation is supported. Change of vesting of Bella Cumming Reserve and Paul Robinson Reserves to include Conservation supported in-principle, with funding support from State Government.
- iv. Brickwood Reserve Site [REDACTED] Vol 2 pg 96-98 Reserve currently vested for the purposes of Recreation. Council gives in-principle support to amending the purpose of the reserve to include conservation, or dividing the reserve into two reserves, one for recreation, the other Conservation, subject to funding support from State Government to assist with management. Current management levels low. Weed control and some fencing undertaken with assistance from federal government grant. Would benefit from greater involvement of surrounding landowners in management.
 - v. Cardup Brook Bushland Sites [REDACTED] Vol 2 98-100,; Site 66 – private land, not surveyed by Local authority; Site 271 – protection of the Cardup Brook vegetation has been secured as part of the rezoning process. The remainder of site 271 should be considered for inclusion within the Darling Range Regional Park; Site 351: included in the Rural policy area within Shire's Rural Strategy. Short-medium term protection could be encouraged by supporting the landowner to fence off the creek and mature vegetation. Little understorey present. Where private land is involved, the eo advise land owners of council's submission.
 - vi. Cardup Nature Reserve and adjacent bushland [REDACTED] Vol 2 pg 100-101. Council has proposed to CALM that the vegetated portion of the Local Reserve Lot 154 Cardup Siding Rd be amalgamated into CALM's Nature Reserve. The vegetation in the Bushlark Close subdivision (included in Bushplan site) provides extra habitat for fauna into the Nature Reserve State/Local Government partnership should look at developing a package of incentives/assistance for small block owners who have good bushland on their property.. The package may include written materials and free technical assistance, and make use of existing bushland support staff .
 - vii. Norman Road Bushland Site [REDACTED] & [REDACTED] Vol 2 pg 102, Council strongly supports protection of this bushland site, and opposes mineral sand mining on a number of grounds including the destruction of regionally significant bushland. The north side is under threat of gradual clearing by stock and other means.
 - viii. Jackson Road Bushland Site [REDACTED], Vol 2 pg 103-105, There is an immediate need to assist the landowners to fence this wetland vegetation. Given the number of landowners involved and the high perimeter to area ratio it is important to have the co-operation of landowners. One-to-one consultation with landowners is required.
 - ix. Roman Road Bushland, Whitby St [REDACTED] Vol 2 Pg 105 negotiation between landowners, Ministry and Local Authority in progress. Residential usage may be compatible with bushland conservation, subject to the style of residential use, landowner commitment and practical measures taken to protect bushland.
 - x. Mundijong Road Flora Reserve & Watkins Road Bushland (incl CALM Nature Reserve) [REDACTED], Vol 2 pg 106 – 108. Mundijong Road Flora Reserve – The reserve is currently unvested. Council is prepared to jointly vest with CALM, however CALM are unable to do this under their Act. The Shire is prepared to take on vesting of the land if assistance is forthcoming from CALM. Management of the reserve requires strong community involvement given that there are many adjacent private and public land managers and users. Weed control has been undertaken with the assistance of a Federal government grant. Watkins Road bushland including CALM reserve – no active management is carried out by CALM. No signage or fencing, heavy disturbance caused by rubbish dumping and bike use.
 - xi. Transit Road Bushland [REDACTED] Vol 2 pg 108-109, -Council notes the importance of this vegetation.
 - xii. Rapids Road Bushland [REDACTED] Vol 2 113-114 – Council notes the importance of this vegetation and believes that protection and management of the site's vegetation is best achieved by working directly with the affected landowners. Consideration will be given

CONTACT DR N. GIBSON CALM WOODVALE for further information.

Flora list for M83 Reserve C2457, Mundijong (extracted from Swan Coastal Plain database, Card 1-13, 224 taxa, 9/5/1995).

Department of Environmental Protection System 6 Update: Site Based Flora List M83 Reserve C2457, Mundijong

(extracted from the CALM Swan Coastal Plain database, Card 1-13, 224 taxa, 9/5/95)

Anthericaceae

- Agrostocrinum scabrum
- Amocrinum preissii
- Caesia micrantha
- Chamaescilla corymbosa
- Johnsonia aff. pubescens gjk 5249 scps
- Johnsonia pubescens
- Johnsonia sp. scps
- Laxmannia sessiliflora subsp. australis
- Laxmannia squarrosa
- Sowerbaea laxiflora
- Thysanotus manglesianus
- Thysanotus multiflorus
- Thysanotus patersonii
- Thysanotus sparteus
- Thysanotus thyrsoides
- Thysanotus triandrus
- Tricoryne elatior

Apiaceae

- Eryngium pinnatifidum subsp. "palustre" scps map
- Homalosciadium homalocarpum
- Pentapeltis peltigera
- Trachymene pilosa
- Xanthosia huegelii

Asteraceae

- Hyalosperma cotula
- * Hypochaeris glabra
- Lagenifera huegelii
- Pithocarpa sp. scps
- Podolepis gracilis
- Pseudognaphalium luteoalbum
- Quinetia urvillei
- Siloxerus humifusus
- * Ursinia anthemoides
- * Vellereophyton dealbatum

Caesalpiniaceae

- Labichea punctata

Caryophyllaceae

- * Silene gallica

Casuarinaceae

- Allocauarina humilis
- Allocauarina thuyoides

Centrolepidaceae

- Centrolepis aristata
- Centrolepis drummondiana

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Colchicaceae

Burchardia umbellata

Crassulaceae

Crassula colorata

* *Crassula decumbens*

Crassula peduncularis

Cyperaceae

Cyathochaeta avenacea

Isolepis cernua

Isolepis oldfieldiana

Lepidosperma angustatum

Lepidosperma costale

Lepidosperma eastern terete scps (BJK&NG 232)

Mesomelaena pseudostygia

Mesomelaena tetragona

Schoenus brevisetis

Schoenus caespititius

Schoenus clandestinus

Schoenus subflavus

Tetraria octandra

Dasyogonaceae

Calectasia cyanea

Dasyogon bromeliifolius

Dasyogon obliquifolius

Kingia australis

Lomandra caespitosa

Lomandra hermaphrodita

Lomandra nigricans

Lomandra preissii

Lomandra purpurea

Lomandra sericea

Dilleniaceae

Hibbertia acerosa

Hibbertia huegelii

Hibbertia hypericoides

Hibbertia sp. scps

Hibbertia vaginata

Droseraceae

Drosera erythrorhiza

Drosera gigantea

Drosera glanduligera

Drosera macrantha

Drosera macrantha "scp" scps (BJK&NG 228)

Drosera menziesii

Drosera paleacea scps subsp. *paleacea*

Drosera stolonifera

Epacridaceae

Andersonia lehmanniana

Astroloma pallidum

Astroloma stomarrhena

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Conostephium pendulum
Conostephium preissii
Lysinema ciliatum
Styphelia tenuiflora

Euphorbiaceae

Monotaxis grandiflora
Monotaxis occidentalis
Poranthera microphylla
Stachystemon vermicularis

Geraniaceae

* Erodium botrys
Erodium cygnorum

Goodeniaceae

Dampiera linearis
Lechenaultia biloba
Scaevola repens var. repens

Haemodoraceae

Anigozanthos humilis
Anigozanthos manglesii
Conostylis aculeata
Conostylis aurea
Conostylis juncea
Conostylis setigera
Conostylis setosa
Haemodorum laxum
Haemodorum sp. scps
Haemodorum sparsiflorum
Haemodorum spicatum
Phlebocarya ciliata
Phlebocarya filifolia

Haloragaceae

Gonocarpus pithyoides

Iridaceae

Patersonia juncea
Patersonia occidentalis
* Romulea rosea

Juncaceae

Juncus pallidus

Lauraceae

Cassytha flava
Cassytha glabella

Lobeliaceae

Isotoma sp. scps

Loganiaceae

Logania serpyllifolia

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Loranthaceae

Nuytsia floribunda

Mimosaceae

Acacia sessilis

Acacia stenoptera

Acacia willdenowiana

Myrtaceae

Baeckea camphorosmae

Calytrix angulata

Calytrix flavescens

Eremaea pauciflora subsp. *pauciflora* scps

Eucalyptus calophylla

Eucalyptus marginata

Hypocalymma robustum

Melaleuca acerosa

Melaleuca preissiana

Melaleuca thymoides

Scholtzia involucrata

Orchidaceae

Caladenia discoidea

Caladenia flava

Caladenia reptans

Caladenia sp. scps

Diuris longifolia

Diuris sp. scps

Eriochilus dilatatus

Leporella fimbriata

Lyperanthus nigricans

* *Monadenia bracteata*

Prasophyllum parvifolium

Pterostylis recurva

Pterostylis vittata

Thelymitra crinita

Thelymitra sp. scps

Papilionaceae

Aotus procumbens

Bossiaea eriocarpa

Bossiaea ornata

Chorizema rhombeum

Daviesia decurrens

Daviesia physodes

Daviesia triflora

Gompholobium confertum

Gompholobium knightianum

Gompholobium marginatum

Gompholobium preissii

Gompholobium tomentosum

Hovea trisperma var. *trisperma*

Jacksonia sternbergiana

Kennedia prostrata

* *Lotus angustissimus*

Nemcia reticulata



M83 Reserve C2457, Mundijong
Cardup Nature Reserve

Friends Advocate Management

Other Names:

Specific Study/studies Miscellaneous studies

Flora

Vegetation Map	<u>1</u>	2	3	
Flora list	<u>1</u>	2	3	4
Significant Taxa		<u>done</u>	suitable / doubtful	

Fauna

Mammals		1	2	
Birds		1	2	<u>RAOU</u>
Reptiles and Amphibia		1	2	
Invertebrates		1	2	

Vegetation Condition Map Sites Comment

Disturbance Factors Comment Management

Swan Coastal Plain Floristic Survey

AHC: National Estate- Listed / Interim / Nominated / Notified NT (WA): Heritage Classification

Notes

M83 Reserve C2457, Mundijong Cardup Nature Reserve		
M83.1 Purpose of Reserve C2457 be amended to Conservation of Flora and Fauna, and Reserve be vested in NPNC.	Implemented	Area is now a nature reserve for Conservation of Flora and Fauna and is vested in NPNC. The area is being considered as part of the Darling Range Regional Park study.

GH - Dieback Hygiene Plan
 - mapped (Torrakdale / Kelmscott)
 interpretation / sampling

LM Management Plan Reserves
 in Torrak

Please circle the appropriate response or respond in the space provided.

Area M83 Name	<u>Cardup Nature Reserve</u>		
Title	<u>Floristics of Three Bushland Areas on the Eastern Side of the Swan Coastal Plain. PART VII</u> <u>Floristics of the Cardup Nature Reserve</u>		
Published/Unpublished	<input checked="" type="checkbox"/> Published	<input type="checkbox"/> Unpublished	Date <u>June 1993</u>
Author/s	<u>G.J. Keighery & B.J. Keighery</u>		
Location of Publication	<u>CALM (Woodvale), ERA</u>		
Purpose (why was the report prepared?)	<u>Flora Survey</u>		
Government	<u>CALM, Heritage Commission</u>		
Corporate			
Community Group	<u>Wildflower Society</u>		
Management Plan			

Soils	<u>each site has soil descriptions</u>		
Units	<input type="checkbox"/> mapped	<input checked="" type="checkbox"/> described	<input checked="" type="checkbox"/> referenced

Landscape	<u>each site has landscape description</u>		
Features	<input checked="" type="checkbox"/> described	<input type="checkbox"/> referenced	

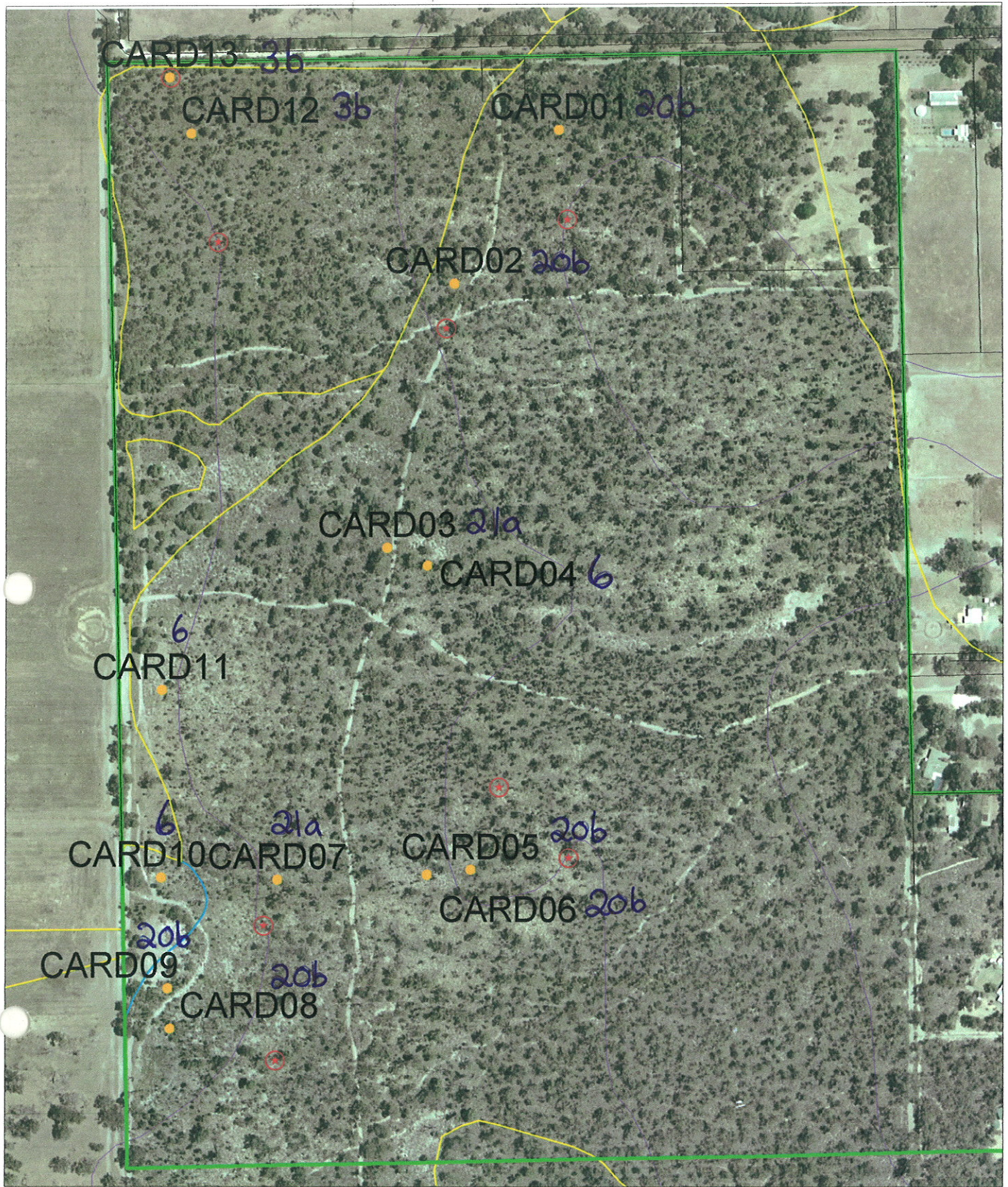
Flora			
Vegetation Map			
Units	<u>Aplin 1979, described</u>	Site based (no)	<u>10x10m (13)</u>
Mapped	<u>6 communities mapped</u>		
Veg Units	<u>Comparable Heddle et al</u>	Compared Heddle et al.	Unit not mapped by Heddle et al.
Flora list	<u>ordered in mapped communities</u>		
Timing	% completion <u>95%</u>	<input checked="" type="checkbox"/> Significant Taxa	
<u>2yrs</u>	<input checked="" type="checkbox"/> Trees	<input checked="" type="checkbox"/> Shrubs	<input checked="" type="checkbox"/> Herbs
	<input checked="" type="checkbox"/> Sedges	<input type="checkbox"/> Weeds	<input type="checkbox"/> DRF
			<input type="checkbox"/> CALM Priority
			<input type="checkbox"/> Other

Fauna			
Timing	% completion	Significant Taxa	
	Mammals	Birds	Sched1 Sched2 Other
	Reptiles	Invertebrates	

Vegetation Condition <u>general statement</u>			
<input checked="" type="checkbox"/> Site based	<input type="checkbox"/> Mapped	Units	<u>Tudgens</u>

Disturbance Factors			
Phytophthora	<input checked="" type="checkbox"/> observed	Other	<input checked="" type="checkbox"/> incidental
	tested		itemised

Notes			



Bush Forever Site 352: Cardup Nature Reserve and Adjacent Bushland, Cardup

- █ Bush Forever Sites
- █ Local Government Authority Boundaries
- Geomorphic Wetlands Feb04 by Evaluation
- ▭ Conservation
- ▭ Resource Enhancement
- ▭ Multiple Use
- Floristic Survey Sites of the Southern Swan Coastal Plain
- GJKENV (Keighery 1996)
- GRIFFIN (Griffen 1994)
- SCP (Gibson et al 1994)
- SYS6ENV (DEP 1996 and Trudgen & Keighery 1995)
- SYS6ENV2 (DEP 1996 and Trudgen & Keighery 1995)
- ★ CALM Threatened Ecological Communities 2002
- Roads - Perth Metropolitan

0 100 200 300 400 Meters



1:5000



Data Sources:
Cadastral DLI
Aerial Photography : Skyview DLI

Datum: GDA - Projection: MGA Zone 50

CARDUP NATURE RES.

73 5/16
14
A-205

CARDUP JUNIOR

11

12

13

14

15

16

17

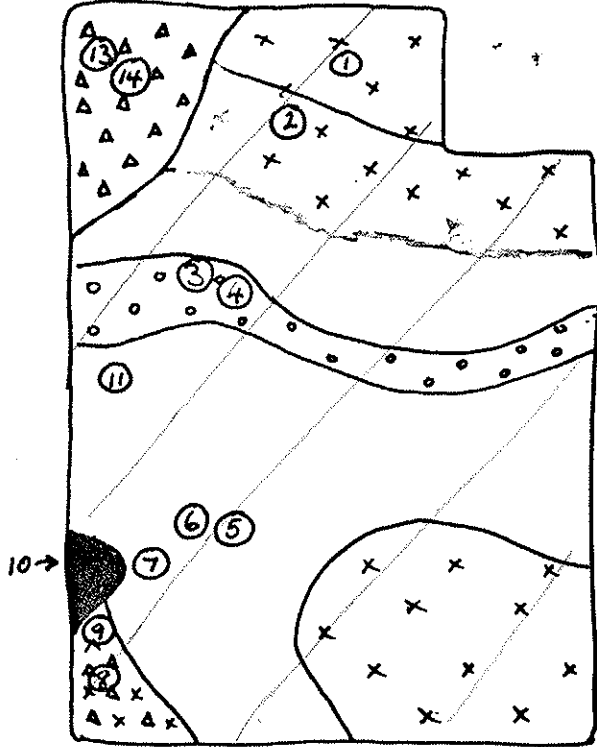
18

19

20

21

Cardup Siding Rd




- ▲ Marri Woodland 3b
- ▲ x ▲ Jarrah and Marri Open Woodland 20b
- x x Jarrah Woodland 20b
- ○ Drainage Line (Marri Open Woodland)
- Wetland
- Banksia Low Woodland

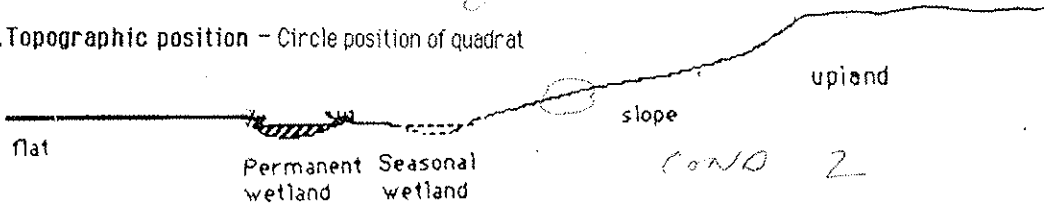
||| Bank Wood.
 $\frac{1}{3}$ 21a
 $\frac{2}{3}$ 20b.

Swan Coastal Plain Survey - SURVEY RECORDING SHEET

QUADRAT No. CPRD 1 VEGETATION TYPE Jarrah Woodland
 DATE TRIP 23/6/91 x 8/9/91 BOTANIST Paoline Farrell
 VOLUNTEERS Meg Evans, Deanne, Libby, Pauline, Farrell

1. LOCATION of the QUADRAT

- a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet. 
- b. Photograph Photographer's name 1
- c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
Adapted from Griffin and Keighery, 1989
MOORE RIVER to JURRIEN SANDPLAIN
SURVEY. WILDFLOWER SOCIETY of WA

CARO

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW




% Bare ground 10 Drainage well mod poor Wet All year winter/spring





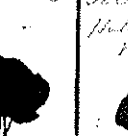
Litter (% cover) 40 Surface soil grey sand Sub-surface soil yellow sand



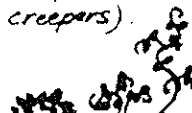


3. VEGETATION STRUCTURE AND COVER. Record appropriate cover class

Environ Reul SB

Cover Class - percentage classes

LIFE FORM	TREES	MALLEES	
	 or > 15m 5-15m	 Under 5m	 MALLEE SHRUB less than 8m
COVER CLASS (%)	> 15m 5-15m 10%	10%	—

LIFE FORM	SHRUBS				SHRUBS
	 over 2m	 2.0-1.5m	 1.5-1.0m <i>Jack Sheen</i> <i>Halen</i> <i>Russell</i>	 1.0m - .5m	 under 5m <i>Webb top</i> <i>Fris spon</i> <i>Bos ando</i>
COVER CLASS (%)	under 2%	3	5	10	30-30%

LIFE FORM	MAT PLANTS	BUNCH GRASSES	HERBS	SEDGES	
	 under 10cm	 under .5m	 under .5m (except creepers).	 over .5m	 under .5m <i>Moss plant</i>
COVER CLASS (%)	under 2%	under 2%	30-30%	10-20%	20%-30%

Swan Coastal Plain Survey - SURVEY RECORDING SHEET

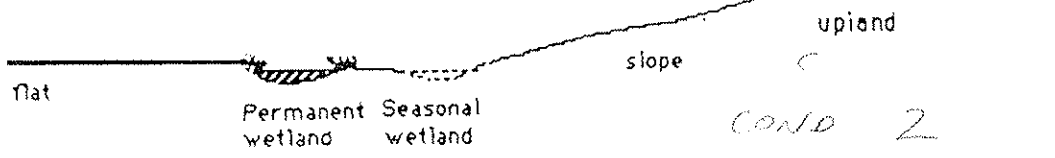
QUADRAT No. CARD 21 VEGETATION TYPE Banksia Woodland and emergent Tamarisks
 DATE TRIP 22. 5. 91 BOTANIST J. Griffin
 VOLUNTEERS Dr. D. A. S. ...

1. LOCATION of the QUADRAT

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet → 8/9/91

b. Photograph Photographer's name Ging

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
Adapted from Griffin and Keighery, 1989
MOORE RIVER to JURIE SANDPLAIN
SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground 2 Drainage well mod poor Wet All year winter/spring

Litter (% cover) 2 Surface soil light Sub-surface soil hard

3. VEGETATION STRUCTURE AND COVER Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES: <u>Banksia, Gmelina, B. grandis</u>		MALLEES		Height (metres)
	50-70%	LIFE FORM: <u>2-15m or 5-15m</u>	<u>Under 5m</u>	MALLEE SHRUBS: <u>less than 8m</u>	MALLEE TREE: <u>8m or more</u>	
	30-50%	COVER CLASS (%): <u>2-15m</u> <u>5-15m</u>	<u>2-15%</u>			
20-30%	SHRUBS		SHRUBS			
10-20%	LIFE FORM: <u>over 2m</u>	<u>2.0-1.5m</u>	<u>1.5-1.0m</u>	<u>1.0m - .5m</u>	<u>under 5m</u>	Height (metres)
2-10%						
0%	COVER CLASS (%):	<u>2-10%</u>	<u>2-10%</u>	<u>2-10%</u>	<u>10-20%</u>	
under 2%	MAT PLANTS		BUNCH GRASSES	HERBS	SEDGES	
0%	LIFE FORM: <u>under 10cm</u>	<u>under .5m</u>	<u>under .5m (except creepers)</u>	<u>over .5m</u>	<u>under .5m</u>	Height (metres)
	COVER CLASS (%): <u>0%</u>	<u>under 2%</u>	<u>under 2%</u>	<u>under 2%</u>	<u>10-20%</u>	

CARD 2

CARD 4

Cardinal's ...

14

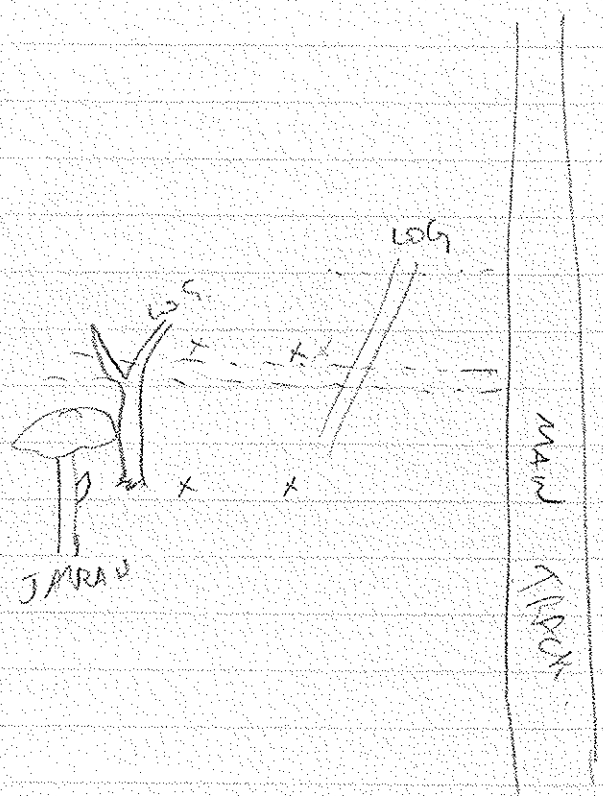
14

73) both 2 & 4
quadrants

16/5/96

CARD 2.

AN



Swan Coastal Plain Survey - SURVEY RECORDING SHEET

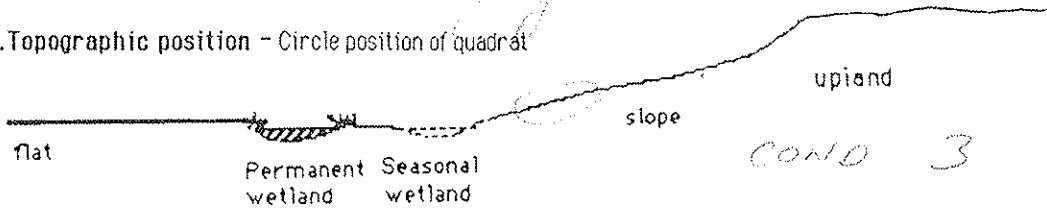
CARD 3
 QUADRAT No. _____ VEGETATION TYPE _____
 DATE TRIP _____ BOTANIST _____
 VOLUNTEERS _____

1. LOCATION of the QUADRAT

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet →

b. Photograph Photographer's name _____

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
 Adapted from Griffin and Keighery, 1989
 MOORE RIVER to JURRIEN SANDPLAIN
 SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground _____ Drainage (well mod poor Wet All year winter/spring

Litter (% cover) _____ Surface soil _____ Sub-surface soil _____

3. VEGETATION STRUCTURE AND COVER. Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES				MALLEES				15m 10m 5m
	50-70%	LIFE FORM	or > 15m 5-15m 	Under 5m 	MALLEE SHRUB less than 8m 	MALLEE TREE 8m or more 				
	30-50%	COVER CLASS (%)	> 15m 5-15m	100						
	20-30%	SHRUBS				SHRUBS				3m 2m 1m
	10-20%	LIFE FORM	over 2m 	2.0-1.5m 	1.5-1.0m 	1.0m - .5m Yard grass Sp. fat lvs. brown 	under 5m Redden me thick lvs 			
	2-10%	COVER CLASS (%)								
	0% under 2%	MAT PLANTS		BUNCH GRASSES		HERBS		SEDGES		2.0m 1.5m 1.0m .5m
	LIFE FORM	under 10cm 	under .5m 	under .5m (except creepers) 	over .5m 	under .5m 				
	COVER CLASS (%)									

Swan Coastal Plain Survey - SURVEY RECORDING SHEET.

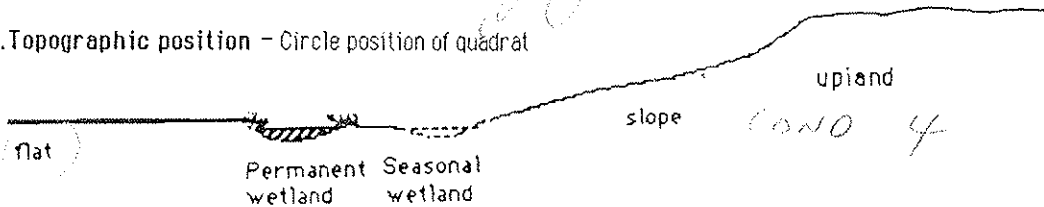
QUADRAT No. 10 VEGETATION TYPE Moore River Sandplain
 DATE TRIP 10/10/10 BCTANIST [Signature]
 VOLUNTEERS [Names]

1. LOCATION of the QUADRAT

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet →

b. Photograph Photographer's name [Signature]

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
Adapted from Griffin and Keighery, 1989
MOORE RIVER to JURIE SANDPLAIN
SURVEY. WILDFLOWER SOCIETY of W.A.

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground 15% Drainage well mod poor Wet All year winter/spring

Litter (% cover) 2% Surface soil 2% Sub-surface soil 2%

3. VEGETATION STRUCTURE AND COVER Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES <u>None</u>				MALLEES <u>None</u>				Height (metres)	
	50-70%	LIFE FORM or > 15m 5-15m 	Under 5m 	MALLEE SHRUB less than 8m 	MALLEE TREE 8m or more 	15m 10m 5m					
	30-50%	COVER CLASS (%) 2-15m 5-15m									
	20-30%	SHRUBS				SHRUBS					
	10-20%	LIFE FORM over 2m 	2.0-1.5m 	1.5-1.0m 	1.0m - .5m 	under .5m 	3m 2m 1m				
	2-10%	COVER CLASS (%)	1%	10-20%	15%	15%	15%				
	0%	MAT PLANTS				BUNCH GRASSES		HERBS		SEDGES	
		LIFE FORM under 10cm 	under .5m 	under .5m (except creepers) 	over .5m 	under .5m 2-10% 	1.0m 1.5m 1.0m .5m				
		COVER CLASS (%)	2-3%	1%	2-10%	0-2%	0-2%				

Swan Coastal Plain Survey - SURVEY RECORDING SHEET

QUADRAT No. 5 VEGETATION TYPE North
 DATE TRIP 23-6-91 BOTANIST Neil
 VOLUNTEERS ALICE ELAINE STALL, MIKE, KATE, JOY, FRANK, JENNIFER

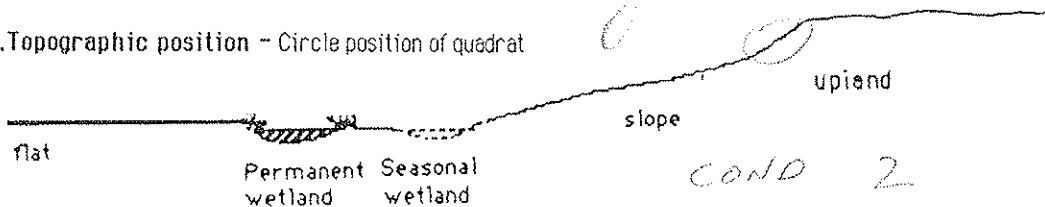
1. LOCATION of the QUADRAT

8/9/91 BSP. NW. 23K.

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet. →

b. Photograph Photographer's name MIKE / 12m

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
 Adapted from Griffin and Keighery, 1989
 MOORE RIVER to JURIE SANDPLAIN
 SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground 15 Drainage well mod poor Wet All year winter/spring

Litter (% cover) 5 Surface soil SAND Sub-surface soil SAND

3. VEGETATION STRUCTURE AND COVER Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES <u>Yellow OAC</u>		MALLEES		Height		
	50-70%	LIFE FORM	15m or 5-15m 	Under 5m 	MALLEE SHRUB less than 8m 		MALLEE TREE 8m or more 	
	30-50%	COVER CLASS (%)	>15m 5-15m	<u>UNDER 2%</u>				
	20-30%	SHRUBS <u>Low shrubs</u>		SHRUBS				
	10-20%	LIFE FORM	over 2m 	2.0-1.5m 	1.5-1.0m 		1.0m - .5m 	under 5m
	2-10%	COVER CLASS (%)			30-50%			
	0%	under 2%	MAT PLANTS		BUNCH GRASSES		HERBS	SEDGES
	LIFE FORM	under 10cm 	under .5m 	under .5m (except creepers) 	over .5m 		under .5m 	
	COVER CLASS (%)			10-20%			10-20%	

CAKES

355 gms
D

OPEN
CASH

0

WINDY...

Swan Coastal Plain Survey - SURVEY RECORDING SHEET

QUADRAT NO. 6 VEGETATION TYPE BANKSIA WOODLAND
 DATE TRIP 23-6-91 BOTANIST NEVL
 VOLUNTEERS ALICE, CLARE, STAN, MIKE, KATIE, JOY, FRISTY, JENNIFER

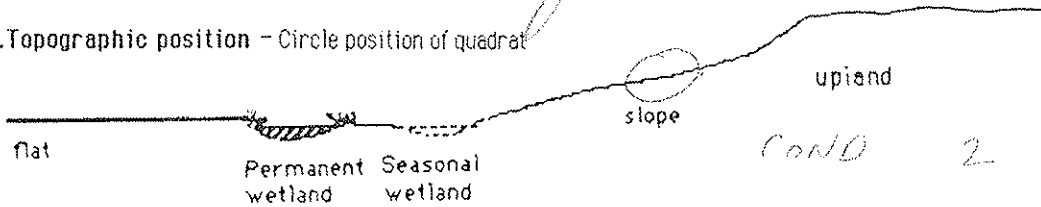
1. LOCATION of the QUADRAT

8/9/91 BJR NS CRK

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet →

b. Photograph Photographer's name Neil

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
Adapted from Griffin and Keighery, 1989
MOORE RIVER to JURIE SANDPLAIN
SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground 24 Drainage well mod poor Wet All year winter/spring

Litter (% cover) 25 Surface soil SAND Sub-surface soil CLAY

3. VEGETATION STRUCTURE AND COVER Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES		MALLEES		Height (metres)	
	50-70%	3 <i>ATREISIA</i> <i>W. MENZIESII</i> <i>XYLOSAELUM acuminatum</i> or > 15m 5-15m 		Under 5m 	MALLEE SHRUB less than 8m 		MALLEE TREE 8m or more
	30-50%	COVER CLASS (%) 2-15m 5-15m 50-70%					
20-30%	SHRUBS						
10-20%	over 2m 		2.0-1.5m 	1.5-1.0m 	1.0m - .5m 	under 5m 	
2-10%	COVER CLASS (%) 10-20						
0%	MAT PLANTS		BUNCH GRASSES	HERBS	SEDGES		
	under 10cm 		under .5m 	under .5m (except creepers) 	over .5m 	under .5m 70+ 	
	COVER CLASS (%)						

3107
BISSE TAMPON



3108
BISSE TAMPON



3109



SPECIES PRESENCE

- work systematically through the vegetation, start with the canopy stratum, i.e. trees
- within each stratum try to record the most common species first and the most uncommon last
- as each species is collected label it with a numbered tag and use this number on your recording sheet
- indicate if the species is in flower

Keighery and Keighery, 1990
Adapted from Griffin and Keighery, 1989
MOORE RIVER to JURIE SANDPLAIN
SURVEY. WILDFLOWER SOCIETY of WA

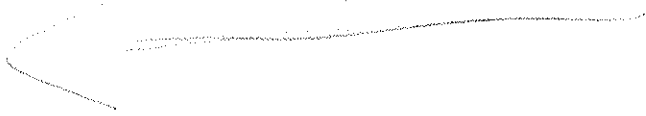
QUADRAT No.
3/1/6

Trees		No	Fl			No	Fl		
BANKIA ATENUATA	✓	1	✓						
BANKIA MENZIESII	✓	2	✓						
XYLOMELUM OCCIDENTALE	✓	3	✓						
Mallees									
SHRUBS									
ALBICORONILLA RUTILIS	✓	4	✓						
— " — thymoides VSP	✓	5	✓						
EREMOPHILA POLYCHAETA	✓	6	✓						
STYLIDIA SPINOSA	✓	7	✓						
LYCIA LINDSAYI	✓	8	✓						
STYLIDIA SPINOSA	✓	9	✓						
CAMPYLUS FLAVESCENS	✓	10	✓						
EREMOPHILA POLYCHAETA	✓	11	✓						
DAVIDSONIA DECURRENS	✓	12	✓						
ASTILOMA STAMATIENSIS	✓	13	✓						
DRYANVIA NIVEA	✓	14	✓						
BAKED STIMOCARPA	✓	15	✓						
CONOSTELIUM TENAXIUM	✓	16	✓						
BOSSIAEA FRIGIDA	✓	17	✓						
Stachys sp	✓	18	✓						
Stachys sp	✓	19	✓						
Stachys sp	✓	20	✓						
Stachys sp	✓	21	✓						
Stachys sp	✓	22	✓						
Stachys sp	✓	23	✓						
Stachys sp	✓	24	✓						
Stachys sp	✓	25	✓						
Stachys sp	✓	26	✓						
Stachys sp	✓	27	✓						
Stachys sp	✓	28	✓						
Stachys sp	✓	29	✓						
Stachys sp	✓	30	✓						
Mat Plants									
Bunch Grasses									
Herbs									

		No	Fl
XERANTHA NIGRICA	✓	21	✓
XSTYLIDIUM BILBERGII	✓	22	✓
XDORAEA SYDNEYENSIS	✓	23	✓
X P. MAMMILLATA	✓	24	✓
XERANTHA NIGRICA	✓	25	✓
XERANTHA NIGRICA	✓	26	✓
XERANTHA NIGRICA	✓	27	✓
XERANTHA NIGRICA	✓	28	✓
XERANTHA NIGRICA	✓	29	✓
XERANTHA NIGRICA	✓	30	✓
XERANTHA NIGRICA	✓	31	✓
XERANTHA NIGRICA	✓	32	✓
XERANTHA NIGRICA	✓	33	✓
XERANTHA NIGRICA	✓	34	✓
XERANTHA NIGRICA	✓	35	✓
XERANTHA NIGRICA	✓	36	✓
XERANTHA NIGRICA	✓	37	✓
XERANTHA NIGRICA	✓	38	✓
XERANTHA NIGRICA	✓	39	✓
XERANTHA NIGRICA	✓	40	✓
XERANTHA NIGRICA	✓	41	✓
XERANTHA NIGRICA	✓	42	✓
XERANTHA NIGRICA	✓	43	✓
XERANTHA NIGRICA	✓	44	✓
XERANTHA NIGRICA	✓	45	✓
XERANTHA NIGRICA	✓	46	✓
XERANTHA NIGRICA	✓	47	✓
XERANTHA NIGRICA	✓	48	✓
XERANTHA NIGRICA	✓	49	✓
XERANTHA NIGRICA	✓	50	✓
XERANTHA NIGRICA	✓	51	✓
XERANTHA NIGRICA	✓	52	✓
XERANTHA NIGRICA	✓	53	✓
XERANTHA NIGRICA	✓	54	✓
XERANTHA NIGRICA	✓	55	✓
XERANTHA NIGRICA	✓	56	✓
XERANTHA NIGRICA	✓	57	✓
XERANTHA NIGRICA	✓	58	✓
XERANTHA NIGRICA	✓	59	✓
XERANTHA NIGRICA	✓	60	✓
XERANTHA NIGRICA	✓	61	✓
XERANTHA NIGRICA	✓	62	✓
XERANTHA NIGRICA	✓	63	✓
XERANTHA NIGRICA	✓	64	✓
XERANTHA NIGRICA	✓	65	✓
XERANTHA NIGRICA	✓	66	✓
XERANTHA NIGRICA	✓	67	✓
XERANTHA NIGRICA	✓	68	✓
XERANTHA NIGRICA	✓	69	✓
XERANTHA NIGRICA	✓	70	✓
XERANTHA NIGRICA	✓	71	✓
XERANTHA NIGRICA	✓	72	✓
XERANTHA NIGRICA	✓	73	✓
XERANTHA NIGRICA	✓	74	✓
XERANTHA NIGRICA	✓	75	✓
XERANTHA NIGRICA	✓	76	✓
XERANTHA NIGRICA	✓	77	✓
XERANTHA NIGRICA	✓	78	✓
XERANTHA NIGRICA	✓	79	✓
XERANTHA NIGRICA	✓	80	✓
XERANTHA NIGRICA	✓	81	✓
XERANTHA NIGRICA	✓	82	✓
XERANTHA NIGRICA	✓	83	✓
XERANTHA NIGRICA	✓	84	✓
XERANTHA NIGRICA	✓	85	✓
XERANTHA NIGRICA	✓	86	✓
XERANTHA NIGRICA	✓	87	✓
XERANTHA NIGRICA	✓	88	✓
XERANTHA NIGRICA	✓	89	✓
XERANTHA NIGRICA	✓	90	✓
XERANTHA NIGRICA	✓	91	✓
XERANTHA NIGRICA	✓	92	✓
XERANTHA NIGRICA	✓	93	✓
XERANTHA NIGRICA	✓	94	✓
XERANTHA NIGRICA	✓	95	✓
XERANTHA NIGRICA	✓	96	✓
XERANTHA NIGRICA	✓	97	✓
XERANTHA NIGRICA	✓	98	✓
XERANTHA NIGRICA	✓	99	✓
XERANTHA NIGRICA	✓	100	✓

CARD 7

N



* B. ...

B. ...

(1)

T/A. ...

B. ...

* B

B. ...

* B. ...

B. ...

Camp TRIF



FTLAND

Swan Coastal Plain Survey - SURVEY RECORDING SHEET

QUADRAT No. _____ VEGETATION TYPE _____
 DATE TRIP _____ BOTANIST _____
 VOLUNTEERS _____

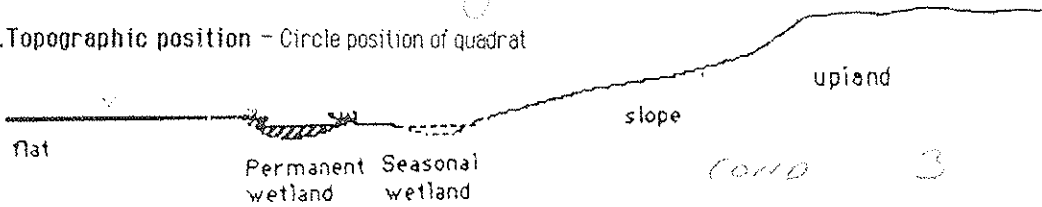
1. LOCATION of the QUADRAT

8/9/91 No. 122, G32

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet. →

b. Photograph Photographer's name _____

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
 Adapted from Griffin and Keighery, 1989
 MOORE RIVER to JURIE SANDPLAIN
 SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground _____ Drainage well mod (poor) Wet All year winter/spring

Litter (% cover) _____ Surface soil _____ Sub-surface soil _____

3. VEGETATION STRUCTURE AND COVER Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES		MALLEES		Height (metres) 15m 10m 5m		
		LIFE FORM	or > 15m 5-15m	Under 5m	MALLEE SHRUB less than 8m		MALLEE TREE 8m or more	
			COVER CLASS (%)		> 15m 5-15m			
		50-70%	SHRUBS		SHRUBS		3m 2m 1m	
	LIFE FORM		over 2m	2.0-1.5m	1.5-1.0m <i>Hand top Keighery</i>	1.0m - 1.5m <i>Not only Spartan</i>		under 5m
			COVER CLASS (%)					
	30-50%		MAT PLANTS		BUNCH GRASSES	HERBS		SEDGES
		LIFE FORM	under 10cm	under .5m	under .5m (except creepers)	over .5m	under .5m	
			COVER CLASS (%)					
		20-30%	MAT PLANTS		BUNCH GRASSES	HERBS	SEDGES	1.0m 0.5m
	LIFE FORM		under 10cm	under .5m	under .5m (except creepers)	over .5m	under .5m	
			COVER CLASS (%)					
10-20%	MAT PLANTS		BUNCH GRASSES	HERBS	SEDGES	0.5m		
	LIFE FORM	under 10cm	under .5m	under .5m (except creepers)	over .5m		under .5m	
		COVER CLASS (%)						
	2-10%	MAT PLANTS		BUNCH GRASSES	HERBS		SEDGES	0.5m
LIFE FORM		under 10cm	under .5m	under .5m (except creepers)	over .5m	under .5m		
		COVER CLASS (%)						
0% under 2%		MAT PLANTS		BUNCH GRASSES	HERBS	SEDGES	0.5m	
	LIFE FORM	under 10cm	under .5m	under .5m (except creepers)	over .5m	under .5m		
		COVER CLASS (%)						

Case 8

100
100

100

100

0-100
100-200
200-300

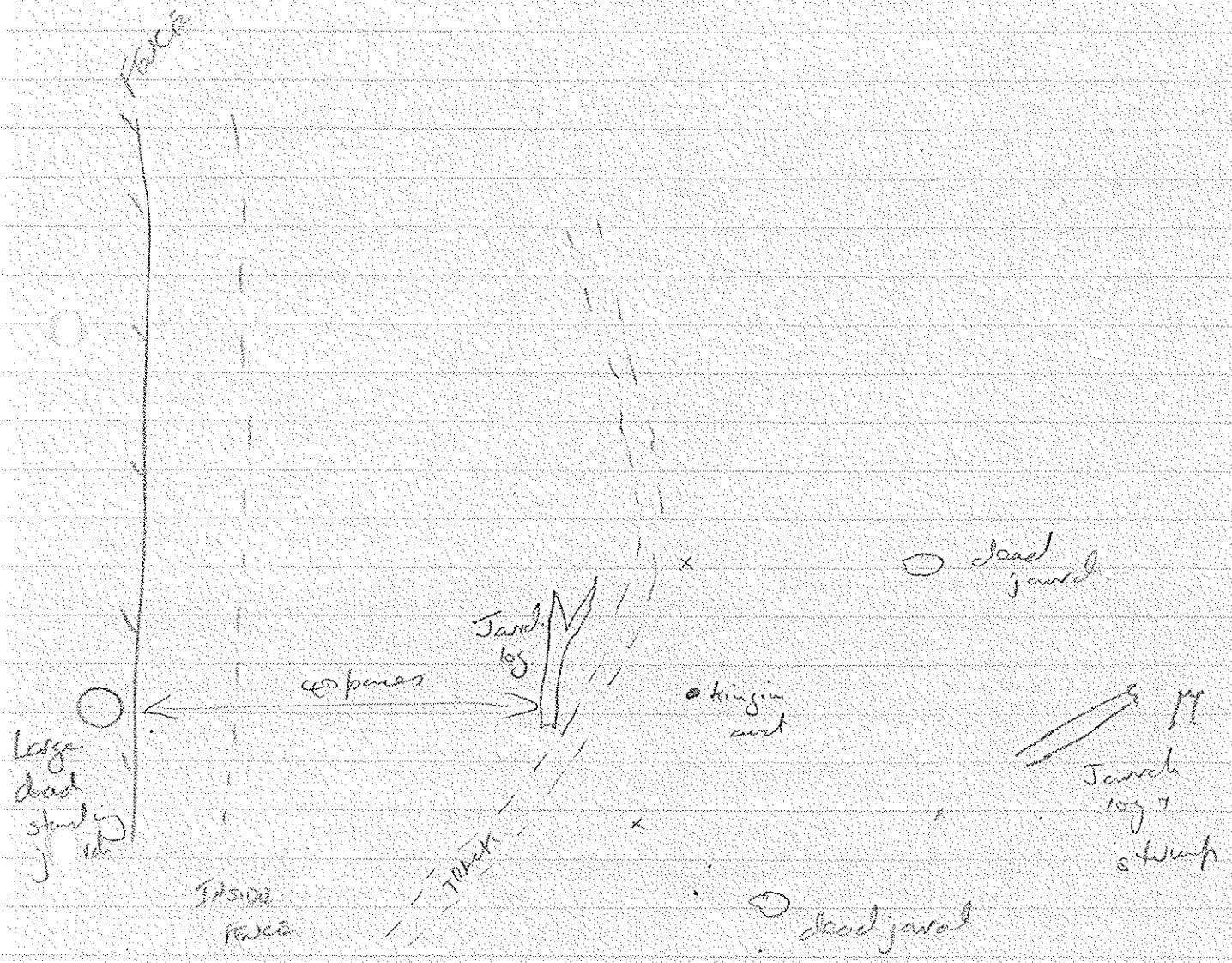
100-200

200-300

300-400

100

100



Swan Coastal Plain Survey - SURVEY RECORDING SHEET

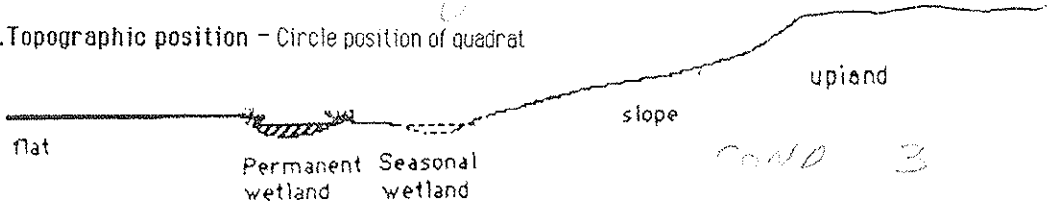
QUADRAT No. 9 VEGETATION TYPE MANICARIA LOOKING PLAIN
 DATE TRIP 23.6.91 BOTANIST R. G. ...
 VOLUNTEERS R. G. ...

1. LOCATION of the QUADRAT

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet →

b. Photograph Photographer's name ...

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
Adapted from Griffin and Keighery, 1989
MOORE RIVER to JURIE SANDPLAIN
SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground 0.2 Drainage well mod poor Wet All year winter/spring

Litter (% cover) 2030 Surface soil SAND Sub-surface soil SAND

3. VEGETATION STRUCTURE AND COVER. Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES <i>Dead and fresh</i>		MALLEES				Height (metres)		
	70-50%	LIFE FORM		LIFE FORM		LIFE FORM				
	50-30%	COVER CLASS (%)		COVER CLASS (%)		COVER CLASS (%)				
	30-20%	SHRUBS <i>Shrubbed canopy to 70m</i>		SHRUBS						
	20-10%	LIFE FORM		LIFE FORM		LIFE FORM				
	10-2%	COVER CLASS (%)		COVER CLASS (%)		COVER CLASS (%)				
	under 2%	MAT PLANTS		BUNCH GRASSES		HERBS			SEDGES	
	0%	LIFE FORM		LIFE FORM		LIFE FORM			LIFE FORM	
	COVER CLASS (%)		COVER CLASS (%)		COVER CLASS (%)		COVER CLASS (%)			

APR 9

These
pages
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by Mori all
Mori work
1/10/11

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Swan Coastal Plain Survey - SURVEY RECORDING SHEET

Moore and Melaleuca

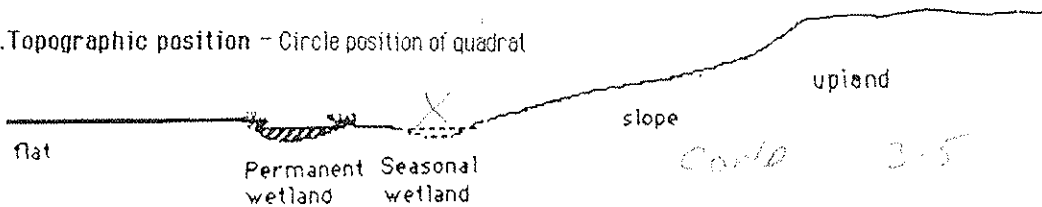
QUADRAT No. 10 VEGETATION TYPE precissii woodland
 DATE TRIP 2/10/89 BOTANIST Keighery
 VOLUNTEERS Das, ...

1. LOCATION of the QUADRAT

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet →

b. Photograph Photographer's name _____

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
 Adapted from Griffin and Keighery, 1989
 MOORE RIVER to JURRIEN SANDPLAIN
 SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat (gentle) steep Aspect N NE E SE S SW W NW

% Bare ground 2-10 Drainage well mod poor Wet All year winter/spring

Litter (% cover) 25-50 Surface soil grey sand Sub-surface soil GREY SANDY CLAY

3. VEGETATION STRUCTURE AND COVER. Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES: <u>MARRI & MIDDONIA</u>				MALLEES		Height (metres)	
	50-70%	LIFE FORM	> 15m or 5-15m 	under 5m 	MALLEE SHRUB less than 8m 	MALLEE TREE 8m or more 	15m		
	30-50%	COVER CLASS (%)	7-15m 5-15m 30-50	0%	0%	0%	10m		
	20-30%	SHRUBS				SHRUBS			5m
	10-20%	LIFE FORM	over 2m 		2.0-1.5m 	1.5-1.0m 	1.0m - .5m 		3m
	2-10%	COVER CLASS (%)	2%		0-2	%	%		2m
	0%	MAT PLANTS				BUNCH GRASSES	HERBS		SEDGES
	under 2%	LIFE FORM	under 10cm <u>Stylidium repens?</u> 	under .5m 	under .5m (except creepers) 	over .5m 	under .5m 		1.0m
	0%	COVER CLASS (%)	10-20	%	%	2-10	10-20		.5m

FIELD 10



Poplar
Medony

Poplar
Medony

Maple

Maple

Track

Swan Coastal Plain Survey - SURVEY RECORDING SHEET

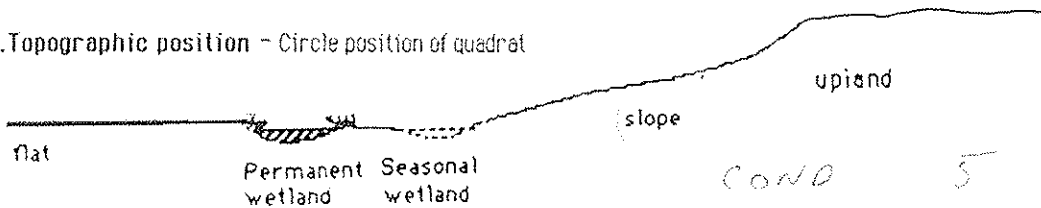
QUADRAT No. _____ VEGETATION TYPE Woodland
 DATE TRIP _____ BOTANIST _____
 VOLUNTEERS SG, W

1. LOCATION of the QUADRAT

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet →

b. Photograph Photographer's name _____

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
 Adapted from Griffin and Keighery, 1989
 MOORE RIVER to JURIE SANDPLAIN
 SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground Drainage well mod poor Wet All year winter/spring

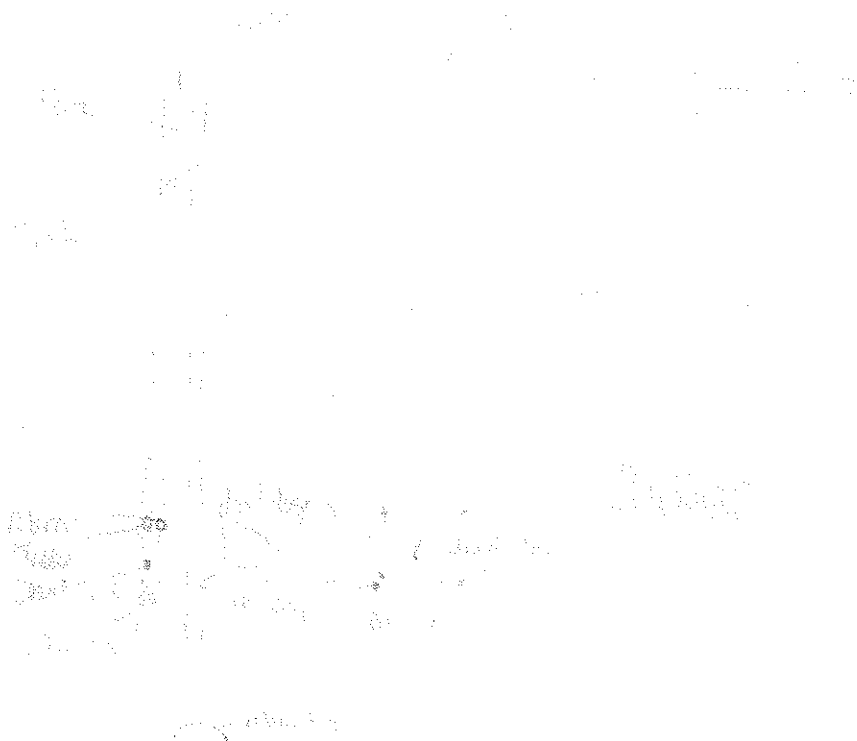
Litter (% cover) Surface soil _____ Sub-surface soil _____

3. VEGETATION STRUCTURE AND COVER. Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES: <u>Back plain</u>				MALLEES		Height (metres)	
	50-70%	LIFE FORM	<u>or <math>2-15m</math> <math>5-15m</math></u> 	<u>Under 5m</u> 	MALLEE SHRUB <u>less than 8m</u> 	MALLEE TREE <u>8m or more</u> 	15m 10m 5m		
	30-50%	COVER CLASS (%)	<u>>15m</u> <u>5-15m</u>						
	20-30%	SHRUBS:				SHRUBS		Height (metres)	
	10-20%	LIFE FORM	<u>over 2m</u> 	<u>2.0-1.5m</u> 	<u>1.5-1.0m</u> 	<u>1.0m-.5m</u> 	<u>under .5m</u> 		3m 2m 1m
	2-10%	COVER CLASS (%)							
	0%	MAT PLANTS		BUNCH GRASSES	HERBS	SEDGES		Height (metres)	
	under 2%	LIFE FORM	<u>under 10cm</u> 	<u>under .5m</u> <u>Velvet Grass</u> 	<u>under .5m</u> (except creepers) 	<u>over .5m</u> 	<u>under .5m</u> 		2.0m 1.5m 1.0m .5m
	0%	COVER CLASS (%)			<u>12-10%</u>				

CAMEL 11

1
10



SPECIES PRESENCE

- work systematically through the vegetation starting with the tallest stratum (the trees)
- within each stratum try to record the most common species first and the most uncommon last
- as each species is collected label it with a numbered tag and use this number on your recording sheet
- indicate if the species is in flower

Keighery and Keighery, 1990
 Adapted from Griffin and Keighery, 1989
 MOORE RIVER to JURIEAN SANDPLAIN
 SURVEY. WILDFLOWER SOCIETY of WA

QUADRAT No.
 SAND 11
 23/8/01 2/9/01

Trees		No	Fl			No	Fl			No	Fl
Mallee											
SHRUBS											
Mat Plants											
Bunch Grasses											
Herbs											
Sedges											

Acacia dealbata

Acacia dealbata

Scholtzia imrayana
Dryandra nivea
Conostephium pendulum
Conostephium pallidum

Ehrharta calycina
Ehrharta
Briza maxima

Prohaya
Dasyphora bromeliifolia
Burchardia umbellata

Styphelia
~~*Styphelia*~~
~~*Styphelia*~~
~~*Styphelia*~~
Lomandra
Lomandra
**Monodena*
prastrata
Drosera macrantha
Romulea
~~*Romulea*~~
~~*Romulea*~~

Cladonia
Cladonia
Mesomelaena
 NO *M. Stygia* here in CAROL

Swan Coastal Plain Survey - SURVEY RECORDING SHEET

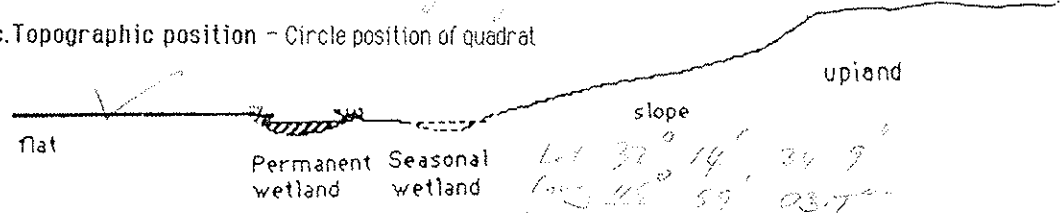
QUADRAT No. 014 VEGETATION TYPE Maritima
 DATE TRIP 24/11/91 BOTANIST A. Keighery
 VOLUNTEERS Sue Wilson, Peter, Sam

1. LOCATION of the QUADRAT 9/9/92 GFR, BJK

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet →

b. Photograph Photographer's name John K COND 2

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
Adapted from Griffin and Keighery, 1989
MOORE RIVER to JURIE SANDPLAIN
SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response
 Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground 0 Drainage well mod poor Wet All year winter/spring

Litter (% cover) 40-50 Surface soil loamy clay Sub-surface soil clay

3. VEGETATION STRUCTURE AND COVER. Record appropriate cover class

Cover Class - percentage classes

LIFE FORM	TREES	MALLEES		
	 2-15m or 5-15m 7-15m 5-15m 30-50	 Under 5m	 MALLEE SHRUB less than 8m	 MALLEE TREE 8m or more
COVER CLASS (%)	30-50%			

LIFE FORM	SHRUBS	SHRUBS			
	 Kingia over 2m 2-10%	 over 2m 2.0-1.5m	 1.5-1.0m	 1.0m-0.5m	 under 5m 10-20%
COVER CLASS (%)	20-30%				

LIFE FORM	MAT PLANTS	BUNCH GRASSES	HERBS	SEDGES	
	 under 10cm	 under .5m	 under .5m (except creepers) 2-10%	 over .5m	 under .5m
COVER CLASS (%)	0%				

Swan Coastal Plain Survey - SURVEY RECORDING SHEET

QUADRAT No. 015 VEGETATION TYPE Wetland
 DATE TRIP 25-11-91 BOTANIST G.K.
 VOLUNTEERS See John ...

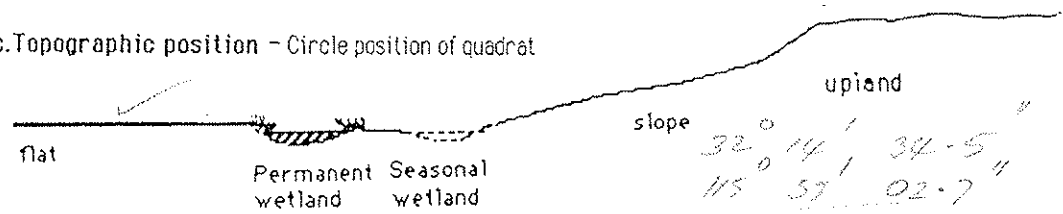
1. LOCATION of the QUADRAT

9/9/92 212E, BJK

a. Mud Map Draw a sketch of the location of the quadrat the back of this sheet. →

b. Photograph Photographer's name G.K. COND-2

c. Topographic position - Circle position of quadrat



Keighery and Keighery, 1990
 Adapted from Griffin and Keighery, 1989
 MOORE RIVER to JURIEIN SANDPLAIN
 SURVEY. WILDFLOWER SOCIETY of WA

2. SITE DATA - Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

% Bare ground 10-20 Drainage well mod poor Wet All year winter/spring

Litter (% cover) 2-5 Surface soil 3-5 Sub-surface soil 1-2

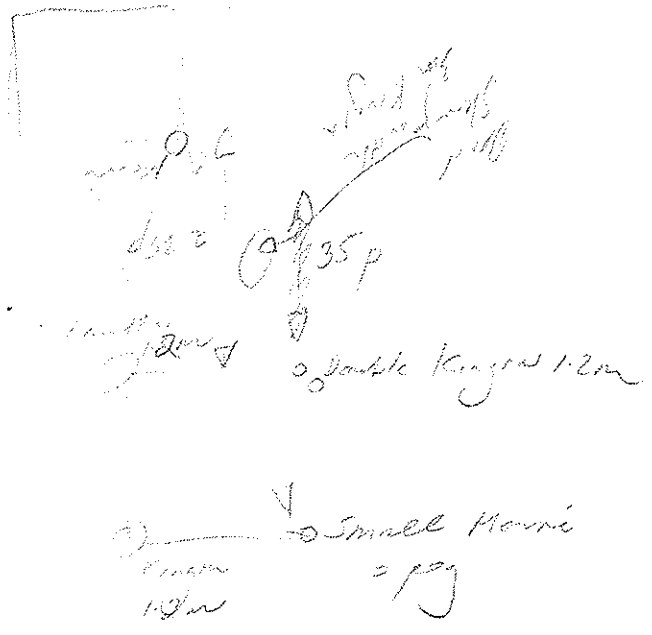
3. VEGETATION STRUCTURE AND COVER. Record appropriate cover class

Cover Class - percentage classes	over 70%	TREES		MALLEES		Height (metres)
	50-70%	LIFE FORM or > 15m 5-15m 	Under 5m (small) (Mallee) 	MALLEE SHRUB less than 8m 	MALLEE TREE 8m or more 	
	30-50%	COVER CLASS (%) 2-15m 5-15m	↳ M	○	○	
	20-30%	SHRUBS		SHRUBS		
10-20%	LIFE FORM	over 2m	2.0-1.5m	1.5-1.0m	1.0m - .5m	under 5m
2-10%	COVER CLASS (%)					
0%	MAT PLANTS		BUNCH GRASSES	HERBS	SEDGES	
LIFE FORM	under 10cm	under .5m	under .5m (except creepers)	Moss etc	over .5m	under .5m
COVER CLASS (%)						30-50%

CARD 13

PN

NW Corner

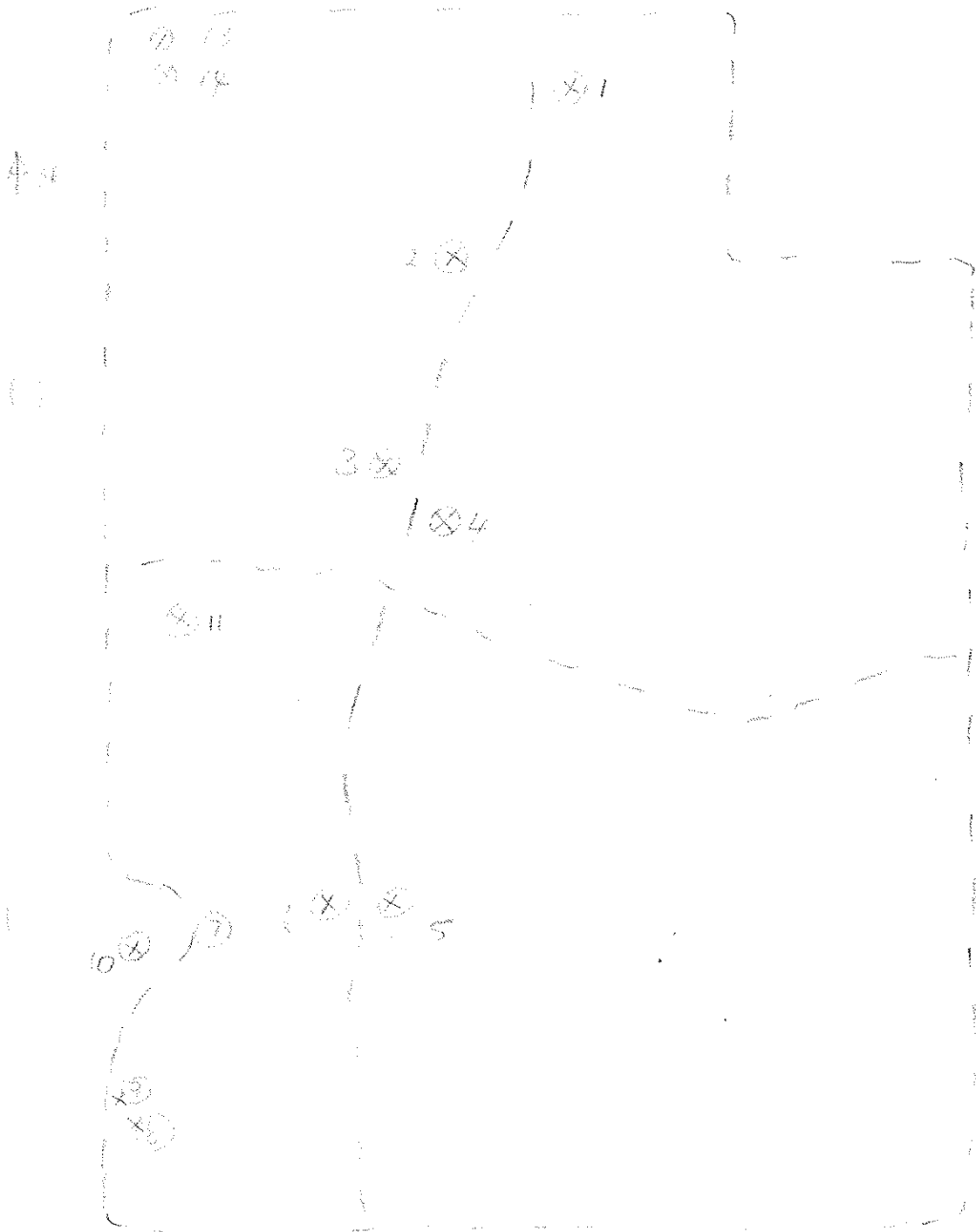


16/5/96

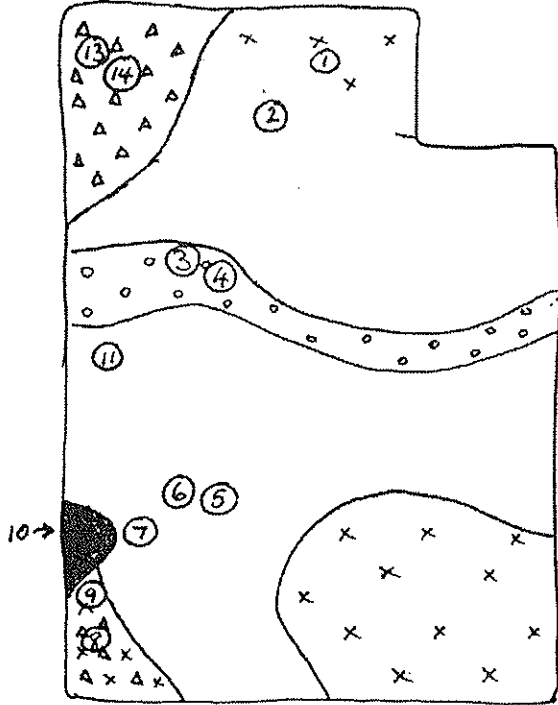
CARD	1	Pegs gone	located air photo	collected soil
	2	Peg present	map corrected	collected soils
	3	Pegs gone	located air photo	collected soil
	4	Pegs gone	located air photo	collected soil
	5	Pegs gone	located air photo + map	collected soil
	6	Pegs present		
	7	Pegs gone	located air photo + maps (corrected)	collected soil
	8	Pegs gone	located air photo + map	collected soil
	9	Pegs gone	located air photo + map	collected soils
	10	2 Pegs remaining		" "
	11	Peg gone, located	air photo + map	collected soils
	12	Pegs present		
	13	Pegs present		

* cards 2, 6, 12, 13 only ones not badly affected by dust

GPS position corrected, where necessary.



Cardup Siding Rd



- △△ Marri Woodland
- △x
x△ Jarrah and Marri Open Woodland
- xx
x Jarrah Woodland
- ○ Drainage Line
(Marri Open Woodland)
- Wetland
- Banksia Low Woodland

Run on 14-SEP-98 DEPARTMENT OF PLANNING AND URBAN DEVELOPMENT
APPLICATION DETAILS REPORT

FILE NUMBER 91761 - (This File Is Currently Marked To - Records)

Status : APPROVED
Type : SUBDIVISION

Application Date : 18-NOV-93
Receipt Date : 22-NOV-93
Planning Officer : R Dixon
Local Authority : Shire Of Serpentine-Jarrahdale

Applicant(s) : Brook & Marsh Licensed Surveyors P O Box
91, GOSNELLS WA 6110

Officer(s) : D, S & M Franconi C/- J Trewin & Co Solicitors
3/939 Wanneroo Road, WANNEROO WA 6065

Sketch Date : 22-NOV-93 Grid : P135 42/63 CCD : 60302
Subject : SUBDIVISION OF APPROXIMATELY 16HA INTO EIGHT 2HA
LOTS

Location : SOLDIERS ROAD, CARDUP
Purpose : SPECIAL RURAL
LA Recommendation : CONDITIONAL APPROVAL
LA Zone Text : SPECIAL RURAL
LA Zone Code :
MRS Zone Text : RURAL
MRS Zone Code :

Land Description : Lots : Pt 1 loc No : Aa Lot 116 Diagram :
Diagram: 6007 C/T : 1041/776
Related Files : 77896
Division : APPROVED- DAUT Date : 09-MAR-94
Allocate To Agenda : NOT ALLOCATED
Map Reference : PEEL 21.32 (2000)
Carto Office Date :

CONSULTANTS

BUSH FIRES BOARD Area : STATE Ref : RZ110-7
Date Sent : 25-NOV-93 Date Reply : 21-JAN-94

HEALTH DEPT OF W A Area : STATE Ref : -
Date Sent : 25-NOV-93 Date Reply : 18-JAN-94

WESTERN POWER Area : SOUTH Ref : -
Date Sent : 25-NOV-93 Date Reply : 11-JAN-94

TELSTRA Area : STATE Ref : DEV 2017 PPC 1441
Date Sent : 25-NOV-93 Date Reply : 09-DEC-93

WATER CORPORATION Area : STATE Ref : C77881

The subdivider shall provide calculations to demonstrate that stormwater runoff from this proposal will not increase the discharge to the Water Authority's drainage system.

RECOMMENDATIONS

The Committee for Statutory Procedures acting for and on behalf of the Commission under delegated power has considered the application relating to the above described land and is prepared to approve a Diagram or Plan of Survey in accordance with the plan submitted provided that the conditions set out below are fulfilled within three years from the date of this advice.

In accordance with established procedures, all conditions must be complied with before submission of survey documents for endorsement. Surveyors should attach certificates clearing conditions to the survey documents when they are submitted.

CONDITIONS

1. Those lots not fronting an existing road being provided with frontage to a constructed subdivisional road connected by a constructed subdivisional road(s) to the local road system and such subdivisional road(s) being constructed and drained at the subdivider's cost to the specifications and satisfaction of the Local Authority. As an alternative, the Committee is prepared to accept the subdivider paying to the Local Authority the cost of such works as estimated by the Local Authority subject to the Local Authority giving an assurance to the Committee that the works will be completed within a reasonable period acceptable to the Committee. (LA)
2. The cul-de-sac heads being designed to the satisfaction and specifications of the Local Authority. (LA)
3. Satisfactory arrangements being made with the Local Authority for the upgrading of Soldiers Road. (LA)
4. Street corners within the subdivision being truncated to the standard truncation of 8.5 metres.
5. The land being graded and stabilised at the subdivider's cost to the specification and satisfaction of the Local Authority. (LA)
6. The land being filled and/or drained at the subdivider's cost to the satisfaction and specifications of the Local Authority, and any easements and/or reserves necessary for the implementation thereof, being provided free of cost to the Council and in accordance with its requirements. (LA)
7. The land being provided with an adequate outlet drainage system at the subdivider's cost to the satisfaction of the Local Authority. (LA)
8. Those easements required by this approval being shown on the Diagram or Plan of Survey in accordance with the Town Planning and Development (Easement) Regulations, 1983.
9. The subdivider making arrangements satisfactory to the Water Authority to ensure that the prospective purchasers and

- successors in title in the transfer of the lots acknowledge in writing that they are aware that the lots are located within the Serpentine Groundwater Area where there is a need to obtain a licence before a bore or well can be constructed. The licence will contain a number of conditions including the quantity of water that can be pumped each year. (WA)
10. A fire control facility reserve to be identified on the Plan or Diagram of Survey as a separate lot and transferred to the Local Authority free of cost. The location of the reserve shall be to the satisfaction of the Council and the Bush Fires Board. (LA) (BFB)
 11. An on-site static water supply facility shall be constructed within the reserve the subject of Condition 10 to the specifications and satisfaction of the Bush Fires Board and Local Authority. (LA) (BFB)
 12. The applicant providing fire breaks within the subject land to the specifications and satisfaction of the Local Authority and Bush Fires Board. (LA) (BFB)
 13. All buildings and effluent disposal systems, having the necessary clearance from the new boundaries as required under the relevant legislation. (LA)
 14. Certification from the State Energy Commission that financial and other requirements have been satisfied for the provision of overhead electricity to the lots approved under this application. (SEC)
 15. The applicant complying with the terms and conditions of the Shire of Serpentine/Jarrahdale Town Planning Scheme No 2. (LA)
 16. The subdivider making arrangements satisfactory to Council to ensure that prospective purchasers and successors in title of the lots created will be advised of those provisions of the Local Authority's Town Planning Scheme which relate to the use and management of the land. (LA)
 17. Building envelopes and effluent disposal areas for each lot to be identified by survey in accordance with the approved "Subdivisional Guide Plan".
 18. Measures being taken to the satisfaction of the Local Authority to ensure identification and protection of any vegetation on the site which Council considers worthy of retention prior to commencement of site works. (LA)

PRELIMINARY APPROVAL STATISTICS

Approval Date : 09-MAR-94 Original Lots : 1
 Owner Type : PRIVATE
 Decision Type : DELEGATED AUTHORITY

Lot Size	Zone	Lots Produced
2 HA - 5 HA	SPECIAL RURAL ZONE	8
sum	*****	8

FINAL APPROVAL STATISTICS

Approval Date : 20-DEC-94 Original Lots : 1
Owner Type : PRIVATE
Decision Type : DELEGATED AUTHORITY

Lot Size	Zone	No Of Lots

2 HA - 5 HA	SPECIAL RURAL ZONE	8
*****		-----
		8

=== E N D O F R E P O R T ===

Karen Clarke

FLORISTICS of
RESERVES and BUSHLAND AREAS
of the PERTH REGION (SYSTEM 6)

Parts V - IX

**Full document
available
on request**

G.J. Keighery and B.J. Keighery

The Wildflower Society of Western Australia has published these papers, parts of a continuing series, in the interest of the conservation of our unique flora. The Society considers it essential that decision makers and managers have available the necessary flora information before making irreversible land use decisions.

The Floristic Survey of the Swan Coastal Plain, of which the surveys of the flora of these areas was part, was carried out with the assistance of funds made available by the Commonwealth of Australia under the National Estate Grants Programme, and by the Australian Heritage Commission.

Wildflower Society of Western Australia (Inc.)
PO Box 64 Nedlands WA 6009

ISBN 0 9595443 8 0

REMNANT VEGETATION

on the

ALLUVIAL SOILS

of the

EASTERN SIDE

of the

SWAN COASTAL PLAIN

LIBRARY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTRALIA SQUARE
141 ST. GEORGES TERRACE, PERTH

**Full document
available
on request**

Prepared by

Bronwen Keighery and Malcolm Trudgen

for the Department of Conservation and Land Management. This project was funded under the National Estate Program, a Commonwealth-financed grants scheme administered by the Australian Heritage Commission (Federal Government) and the Heritage Council of Western Australia (formerly the Western Australian Heritage Committee) (State Government).

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BPS 352

Bronwen & Greg
Keighery.

**Evaluation of the National Estate value of remnant
bushland on the Swan Coastal Plain between Moore River
and Mandurah**

CARDUP BUSHLAND

System 6 area M83 and adjacent bushland

Prepared by Mary Gray

For the Wildflower Society of WA (Inc.)

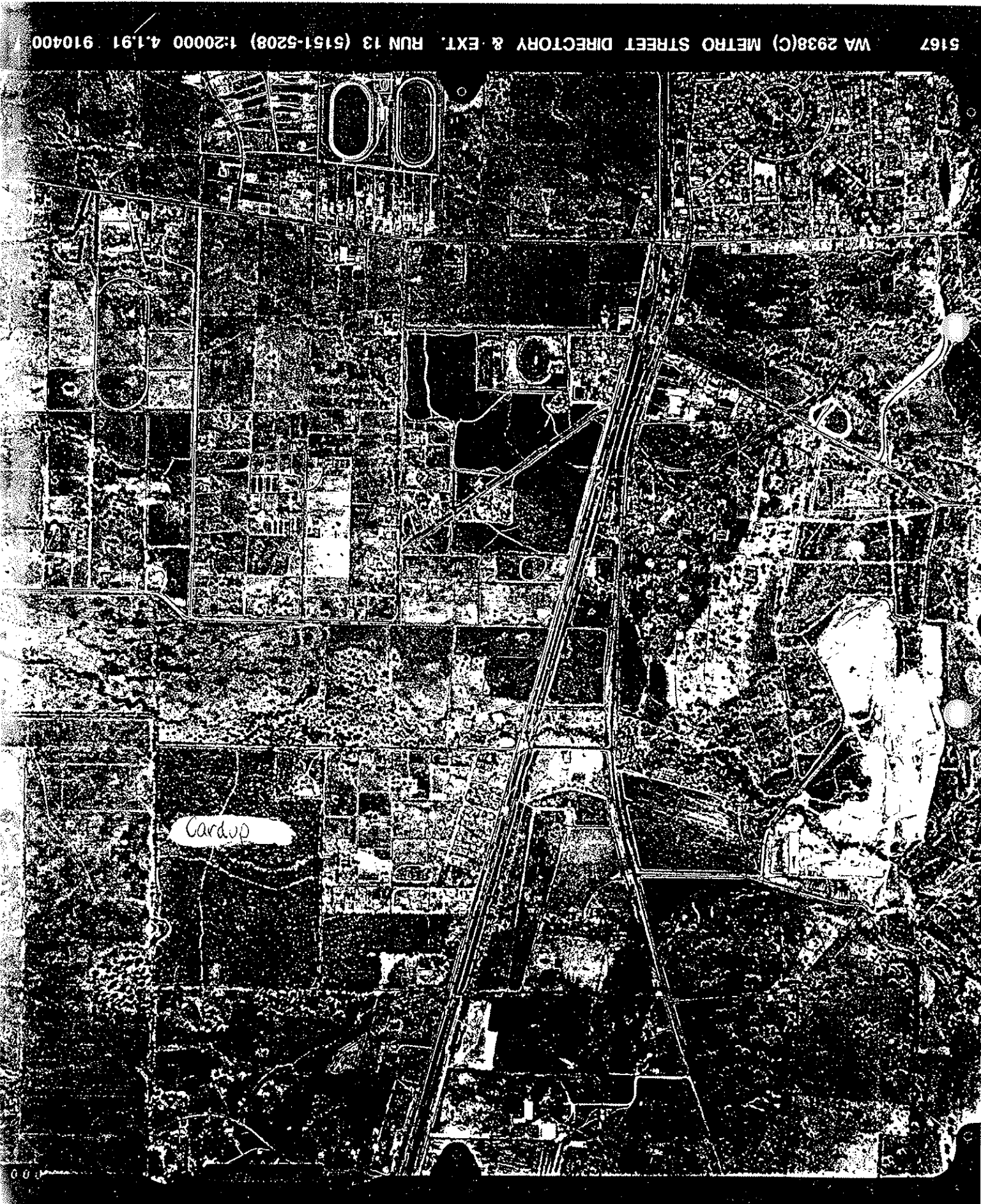
February 1994

This project was funded under the National Estate Program, a Commonwealth financed grants scheme administered by the Australian Heritage Commission (Federal Government) and the Heritage Council of WA (State Government).

Photocopy of Airphoto showing location of
Cardup Bushland. (1:20 000, 1991)

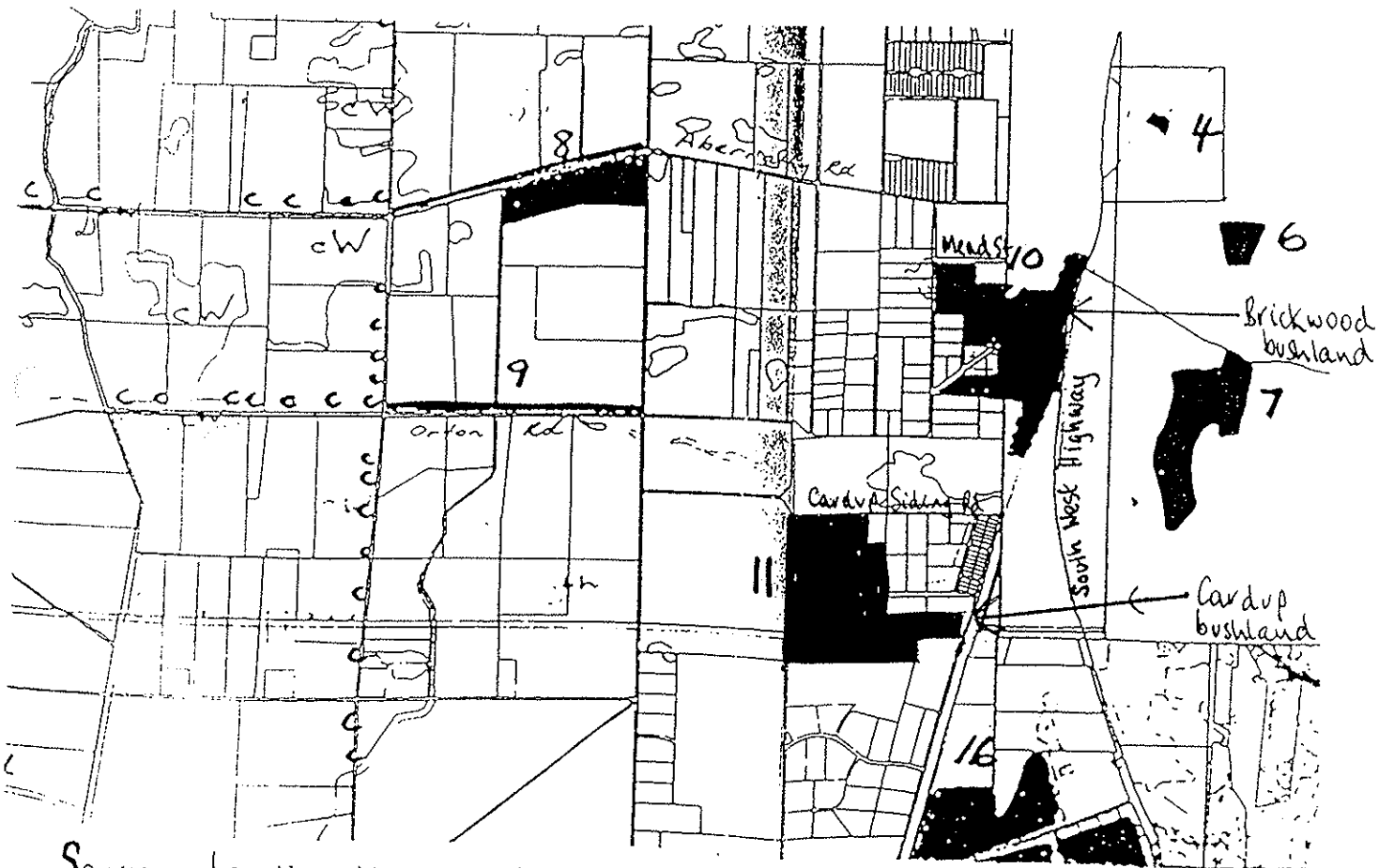
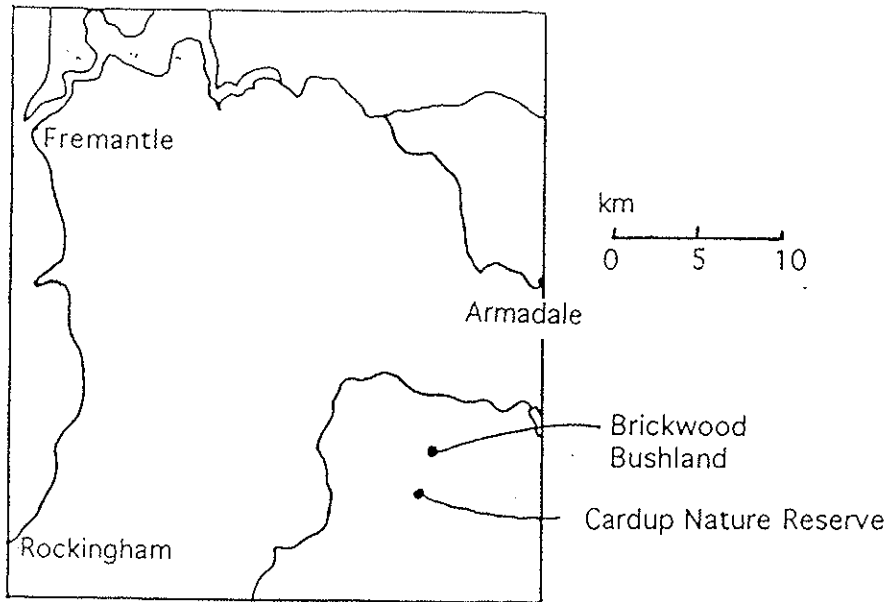


5167 WA 2938(C) METRO STREET DIRECTORY & EXT. RUN 13 (5151-5208) 1:20000 4.1.91 910400



Cardup

Location Maps



Source: Location Map 11, Keighery & Trudgen 1992.
Scale 1:50,000

Natural Environment Nomination for the Register of the National Estate

CARDUP BUSHLAND

1. NAME OF PLACE Cardup bushland

Computer file name: Cardup

2. LOCATION/BOUNDARIES

Cardup bushland is located approximately 35 km south east of Perth, between the townships of Byford and Mundijong about 3 km south of Byford. Its northern boundary adjoins Cardup Siding Road. The area is on the eastern side of the Swan Coastal Plain close to the Darling Scarp, and is within 2 km south of Brickwood Bushland. The area includes Cardup Nature Reserve A2457 which was the subject of System 6 Recommendation number M83, and part of Reserve 19156 in the north east corner of the area which is vested for Recreation and is used as an archery range. An area of freehold land, Part I and Lot 116 Soldiers Road, adjoining the Nature Reserve and extending east to Soldiers Road is also included.

Administrative area

State: WA

Local Government area: Shire of Serpentine-Jarrahdale

Area

Reserve 2457:	70.6991 ha
part of Reserve 19156	~ 1.3 ha
parts of Pt 1 and Lot 116 Soldiers Road	~14 ha
Total	~86 ha

Property details

1. Reserve 2457 is an A class Reserve vested in the National Parks and Nature Conservation Authority (NPNCA) for the purpose of conservation of flora and fauna and is managed by the Department of Conservation and Land Management (CALM).
2. Reserve 19156 is vested in the Shire of Serpentine-Jarrahdale for the purpose of Recreation. It is currently leased to the Archery Club. Only the western third of the Reserve is included.
3. Part I Soldiers Road and Lot 116 Soldiers Road are blocks of privately owned freehold land adjoining Cardup Nature Reserve.

3. NOMINATOR

Nomination prepared by Mary Gray, Consulting Environmental Scientist.

Organisation: Wildflower Society of WA (Inc.), PO Box 64 Nedlands 6009 WA. Telephone 09 383 7979.

Details of organisation may be released on request.

Signature of nominator *Mary Gray* Date *10 February 1994*
for Wildflower Society of WA (Inc.)

4. PREVIOUS ASSESSMENTS

1. The System 6 Report (Department of Conservation and Environment 1983) identified the area as Reserve C2457 Mundijong, specific recommendation M83. It identified the area as containing alluvial soils, little of which was represented in conservation reserves, and this being the largest of its type available for reservation on the Coastal Plain. Low open forest of jarrah, woody pear, slender banksia, and bull banksia over an understorey of diverse species that are not common on the Coastal Plain such as *Astrolooma stomarrhena*, *Gompholobium knightianum*, *Pronaya elegans* were described.


The Report recommended the purpose of the Reserve be amended from Parklands and Recreation to Conservation of Flora and Fauna and that it be vested in the WA Wildlife Authority (now the NPNCA, and managed by CALM).

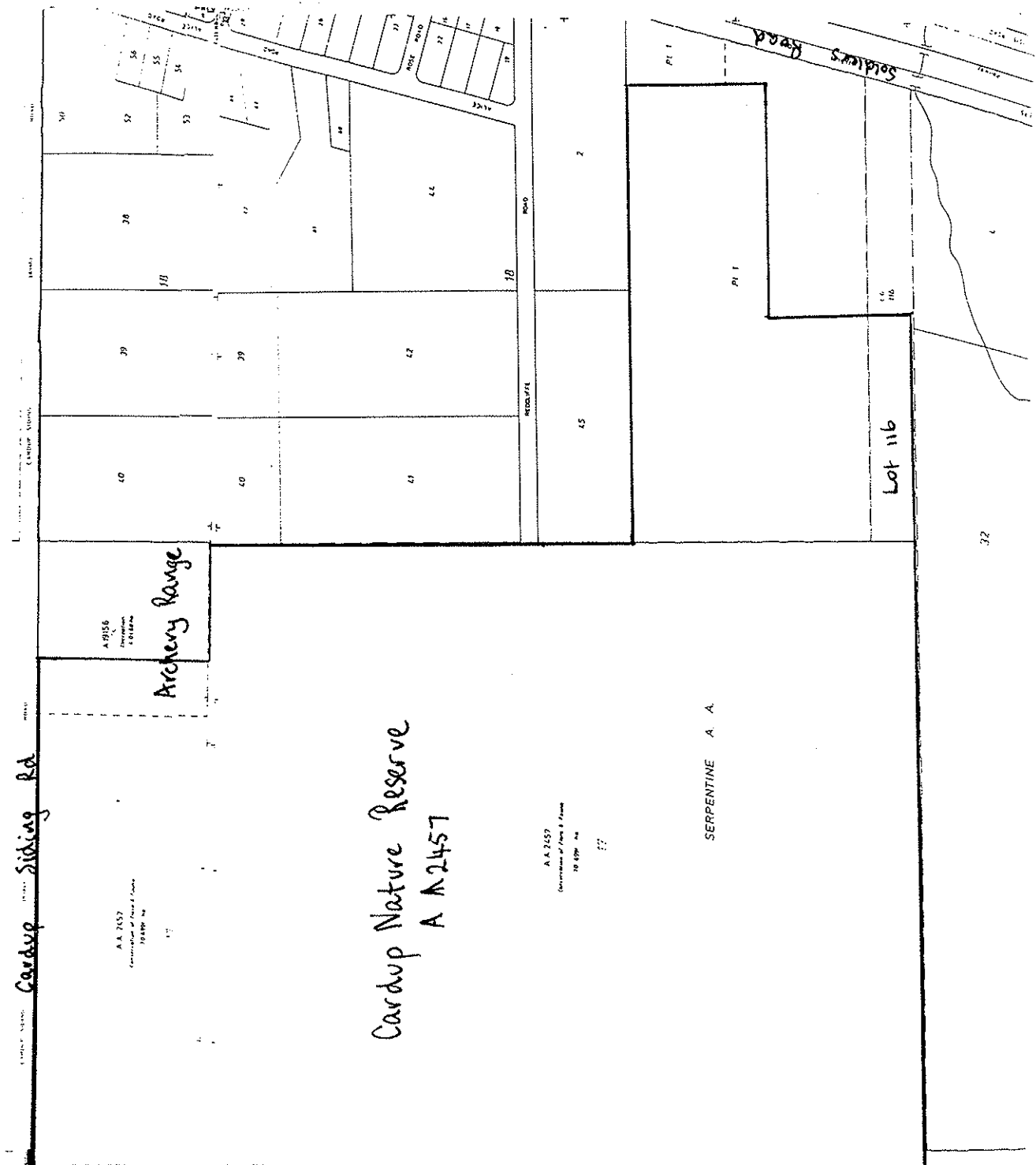
Notably however the following reports further established its importance but as a remnant of woodland predominantly on sandy soils, and not as a remnant on heavy alluvial Pinjarra soils as indicated in the System 6 report.

Map of Cardup Bushland

Source: Shire of Serpentine-Jarrahdale 1:2000 tax maps

Photoreduced

Key  boundary of area nominated



2. The area was identified as Cardup Nature Reserve and adjacent bushland, Location 11, by Keighery and Trudgen (1992) in the Survey of Remnant Vegetation on the Alluvial Soils of the Eastern Side of the Swan Coastal Plain. Their report assessed the area as having very high conservation value, and recommended further studies be carried out.

3. Cardup Nature Reserve was studied in detail at 13 sites during the Swan Coastal Plain Survey conducted by the Wildflower Society of WA (Inc.). The results are published by the Wildflower Society in Part VII of 'Floristics of Reserves and Bushland areas of the Perth Region (System 6) Parts V-IX' by G.J. Keighery and B.J. Keighery 1993. Their report found that Cardup Nature Reserve was an important area predominantly on Bassendean sands which complemented the Brickwood Bushland (mostly on Pinjarra Plain soils) and Talbot Road Reserve (on Ridge Hill Shelf) in containing most of the communities considered characteristic of the eastern side of the Swan Coastal Plain. All three areas illustrate the high level of diversity found on the eastern side of the Plain. Most of the area was found to be in very good condition and the report concluded that the area has very high conservation value. Vesting of the area as an 'A' class Nature Reserve was supported.

5. DESCRIPTION

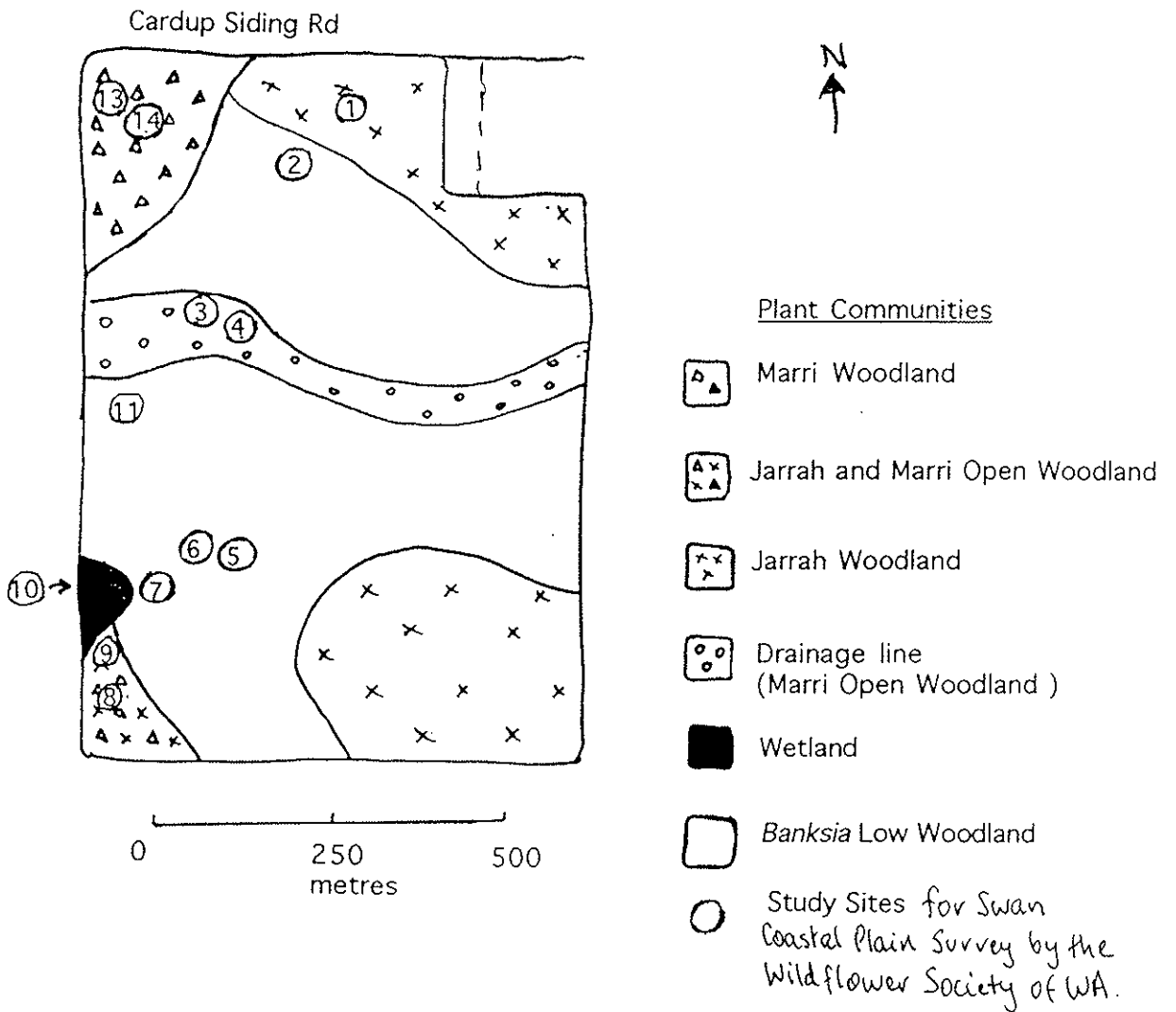
The area lies close to the foot of the Darling Scarp on the eastern side of the Swan Coastal Plain. The western margin is typical of the Pinjarra Plain landform and is low lying and waterlogged in winter with alluvium consisting of sandy clay soils. Most of the area is on Bassendean sands comprising well drained low sandy dunes. A shallow valley runs east to west through the centre of the area collecting water but not sufficiently to form a creek or wetland. The north eastern corner of the area lies on the Ridge Hill Shelf landform with colluvium consisting of gravelly sandy clays.

The vegetation present reflects the landforms and soil types. There are 6 principal vegetation communities of various woodlands. Most of the area consists of Bassendean sands where there are *Banksia* Woodlands and Jarrah Woodlands with typical species such as Firewood banksia *Banksia menziesii*, Candlestick banksia *B. attenuata*, Bull banksia *B. grandis*, Jarrah *Eucalyptus marginata*, Woody Pear *Xylomelum occidentale*, *Scholtzia involucreta*, Shrub sheoak *Allocasuarina humilis*, *Hakea ruscifolia*, *Dryandra nivea*, Smokebush *Conospermum stoechadis*, *Hibbertia hypericoides*, *Eremaea pauciflora*, Blueboy *Stirlingia latifolia*, and sedges *Lyginia barbata* and *Mesomelaena pseudostygia*.

On the small area of soils of the Ridge Hill Shelf there is Jarrah Woodland containing many species typical of the Darling Plateau and of the eastern side of the Plain such as *Lambertia multiflora*, *Grevillea quercifolia*, *G. wilsonii*, and *G. bipinnatifida*.

The small area of Pinjarra Plain soils support Marri Woodland and Marri-Jarrah Woodland on the poorly drained alluvial clay flats; and Low Paperbark (*Melaleuca preissiana*) Woodland on the very poorly drained clayey sands. Plants common in the Marri Woodland include Marri *Eucalyptus calophylla*, *Kingia australis*, *Xanthorrhoea preissii*, *Hibbertia hypericoides*, *Baeckea cumphorosmae*, *Sphaerolobium vimineum*, and mixed sedges *Mesomelaena tetragona* and *Hypolaena exculsa*. Plants common in the Marri-Jarrah Woodland include Marri, Jarrah, *Kingia australis*, *Banksia menziesii*, *Xylomelum occidentale*, *Stirlingia latifolia*, *Eremaea pauciflora*, *Xanthorrhoea preissii*, *Daviesia physoides*, *Adenanthos meisneri*, *Hibbertia hypericoides*, and sedges *Lyginia barbata*, *Hypolaena exculsa*, and *Mesolamaena tetragona*. The paperbark woodland also contains Marri, herblands of *Stylidium repens*, and sedgeland of *Lepyrodia muirii*, and *Hypolaena exculsa*.

Map of Plant Communities of the Cardup Nature Reserve



Source: G.J. Keighery & B.J. Keighery 1993, p.21

"Floristics of Reserves and bushland areas of the Perth Region (System 6), Parts V-IX."
Wildflower Society of WA (Inc.).

Key to Landforms and Soils

Source: van Gool 1990. (Relevant parts only.)
* Soils found at Cardup bushland.

The geomorphic elements described by McArthur & Bettensy (1960) provide the broad framework for the mapping units. These units have generalized soil and landform characteristics which are relevant to land use and provide a base for the land capability assessment using the methods described by Wells and King (1989). The distinguishing features of the mapping units are shown below. Wherever possible the terminology of the Australian Soil and Land Survey Field Handbook (McDonald et al., 1984) has been used. Some of the terms are quantified at the foot of the legend.



Ridge Hill Shelf (Foothills): - Lateritized, low relief, foothills of the Darling Scarp comprising fossil shoreline bench sediments, Holocene colluvium and narrow bands of alluvial deposits. Slopes are very gently to gently inclined and soils are moderately well to well drained.

Note that the bracketed slopes in the descriptions indicate a more specific range applicable to this survey

- F1c Gently inclined slopes (5 to 8%) with well drained deep uniform yellowish brown sands which are generally free of laterite or gravel
- * F2 Very gently to gently inclined lower slopes (1 to 5%) with:
 - a. shallow to moderately deep, very gravelly acidic yellow duplex soils and common laterite
 - * b. moderately deep to deep, gravelly acidic yellow duplex soils and rare laterite
 - c. soils similar to F1c
- F3 Very gently inclined (1 to 3%) lower slopes with deep, imperfectly drained yellow and, less commonly, acidic gley duplex soils
- F4 Incised stream channels with deep acidic yellow duplex soils and sandy alluvial gradational brown earths
- F5 Poorly defined stream channels on lowest slopes and with soils similar to F4.



Pinjarra Plain: - Broad low relief plain west of the foothills, comprising predominantly Pleistocene fluvial sediments and some Holocene alluvium associated with major current drainage systems. Major soils are naturally poorly drained and many swamps occur.

- * P1 Flat to very gently undulating plain with deep acidic mottled yellow duplex (or "effective duplex") soils comprising:
 - a. shallow pale sand to sandy loam over clay; imperfect to poorly drained and generally not susceptible to salinity
 - b. moderately deep pale sand to sandy loam over clay; imperfectly drained and moderately susceptible to salinity in limited areas
 - c. deep pale brown to yellowish sand to sandy loam over clay; imperfectly drained and moderately susceptible to salinity in limited areas
 - * d. as for P1a, but moderately susceptible to salinity

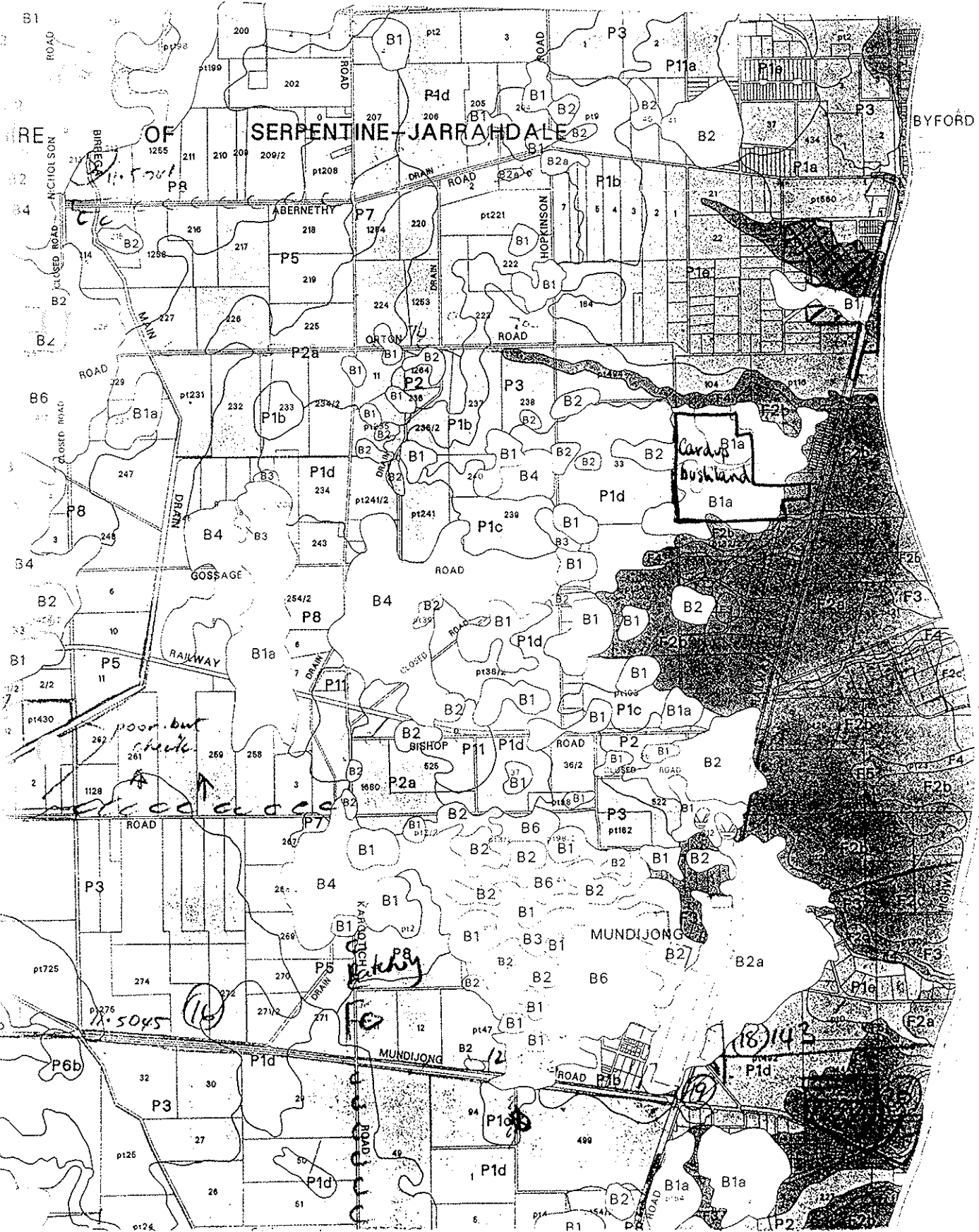


Bassendean Dune and Sandplain System: - Very low relief, leached, grey siliceous Pleistocene sand dunes, intervening sandy and clayey swamps and gently undulating plains. These occur immediately west of, and partly overlie, the Pinjarra Plain. Topography becomes more subdued from west to east.

- B1 Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 metres; banksia dominant
- * B1a As for B1, but with a more intensely coloured yellow B horizon occurring within 1 metre of the surface; marri and jarrah dominant (redgum rises)
- B2 Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron organic hardpan at 1-2 metres
- B2a As for B2, but with a more intensely coloured yellow E horizon usually well within 1 metre of the surface
- B3 Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay at generally less than 1 metre depth; surfaces are dark grey sand or sandy loam

Landforms and Soils

Source: van Gool, 1990



6. SIGNIFICANCE AGAINST REGISTER CRITERIA

- A1. Importance in the evolution of Australian flora, fauna, landscapes or climate.**
- Endemic taxa**
There are 3 taxa endemic to the eastern side of the Swan Coastal Plain in the area: *Johnsonia* GJK 5249, *Eryngium pinnatifidum* ssp 'palustre' ms, and *Drosera macrantha* 'robust' (Keighery and Keighery 1992). **high**
- Limit of range**
Dasypogon obliquifolius and *Johnsonia pubescens* are at the southern limit of their range in Cardup Nature Reserve (Keighery and Keighery 1992) **medium**
- Atypical location**
Three species not recorded in Marchant et al (1987) as occurring on the Swan Coastal Plain were found in the Swan Coastal Plain Survey of the area by the Wildflower Society: *Aristida contorta*, *Conostylis setosa*, *Hakea cyclocarpa*. These species are normally associated with the Darling Plateau (Keighery and Keighery 1992).
There are 2 atypical woodland communities recorded on Pinjarra Plain soils in the area: *Melaleuca preissiana* Low Woodland and Marri-Jarra Woodland. They are more usually associated with the Pinjarra Plain-Bassendean transition zone further to the west (Keighery and Keighery 1992). **high**
- A3. Importance in exhibiting unusual richness or diversity of flora, fauna, landscapes or cultural features.**
- The outstanding diversity of plant communities and flora on the eastern side of the Swan Coastal Plain is exhibited in the flora of this area of mostly sandy soils. In terms of diversity, this site complements Brickwood Bushland and Talbot Road Reserve which are in similar positions and at similar altitudes relative to the Darling Scarp, but which contain different suites of plant communities due to the different soil types (Keighery and Keighery 1992).
Cardup contains a diverse flora of over 294 native plant taxa in an area of 86 ha. The high species diversity compares with 312 taxa at Forrestdale Lake in an area three times larger (G. J. Keighery 1992); and 228 taxa at Bold Park (Mitchell, McCotter and Ecoscape 1993) in an area ten times the size and also with three landforms. The most species diverse families are: Anthericaceae (17 taxa), Asteraceae (15 taxa), Cyperaceae (17 taxa), Dasypogonaceae (13 taxa), Fabaceae (28 taxa), Haemodoraceae (12 taxa), Myrtaceae (17 taxa), Orchidaceae (19 taxa), Poaceae (14 taxa), Proteaceae (28 taxa), Restionaceae (10 taxa), and Stylidiaceae (9 taxa). These groups are the main components of the dense shrub, herb and sedge strata which represent nearly two-thirds of species present. The shrub flora is especially rich in species of Fabaceae, Proteaceae and Myrtaceae (Keighery and Keighery 1992). **very high**
- B1. Importance for rare, endangered or uncommon flora, fauna, communities, ecosystems, natural landscapes or phenomena, or as a wilderness.**
- Rare remnant bushland**
As a result of human activities, little native vegetation remains on the eastern side of the Swan Coastal Plain. The Woodlands and Open Forests are almost extinct, having been reduced by clearing to a few small isolated pockets (Keighery and Trudgen 1992). 97% of the land has been cleared (CALM 1990), and Beard noted in 1990 that there was 'no virgin vegetation left' in the area (Beard 1990). All woodlands on Ridge Hill Shelf, Pinjarra Plain and associated Bassendean landforms are now considered rare plant communities. Cardup is an outstanding remnant of 86 ha of various woodland communities: on Bassendean sands Jarrah Woodland and *Banksia* Woodland; on Ridge Hill Shelf Jarrah Woodland; and on Pinjarra Plain Marri Woodland and uncommon communities of *Melaleuca preissiana* Low Woodland and Marri-Jarra Woodland (Keighery and Keighery 1992; Keighery and Keighery 1992a). **very high**

Endangered plant species

There are 4 endangered plant species listed as Priority taxa by the Department of Conservation and Land Management (Atkins 1992): *Eryngium pinnatifidum* ssp 'palustre' ms, *Gonocarpus pithyoides*, *Lambertia multiflora* var 'darlingensis' ms, and *Daviesia physoides*. The population of *Lambertia multiflora* is small and is confined to Jarrah Woodland on Ridge Hill Shelf. The other 2 taxa are more widely distributed on sands in the area (Keighery and Keighery 1992).

high

New taxa

Johnsonia GJK 5249 is an undescribed taxon of particular interest as it is closely related to *Johnsonia pubescens* which is also present in the area. *Johnsonia* GJK 5249 is only known from 3 sites on Bassendean sands at Brickwood, Lowlands and Cardup.

high

C1. Importance for information contributing to a wider understanding of Australian natural history, by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.

The area is an important site contributing to understanding of the patterns of floral diversity on the eastern side of the Swan Coastal Plain. Patterns of diversity relate to the various combinations of aeolian sands, colluvial sands, sandy alluvial deposits and heavy alluvial deposits at depth that have contributed to unique understoreys. Studies of Cardup together with other sites have contributed to the understanding of the relationship of flora present to that found on the Darling Plateau (Keighery and Trudgen 1992). There are 11 study sites in Cardup (out of more than 500 sites on the Swan Coastal Plain) which are part of the GinGin to Busselton Survey funded by NEGP being conducted jointly by CALM and the Conservation Council of WA (B.J.Keighery 1994 pers. comm.). The relationship between plant communities of the Ridge Hill Shelf, Pinjarra Plain, and Darling Plateau is of particular interest at this site and in comparison with nearby remnants at Brickwood Bushland and Talbot Road Bushland. Of the flora found at Cardup, 47% (139 taxa) is also present at the other two sites, 64% (187 taxa) is shared with Talbot Road, and 60% (179 taxa) is shared with Brickwood. Also 16% (or 48 taxa) found at Cardup also occur on the Plateau (Keighery and Keighery 1992).

very high

There is an unusually high number of 58 taxa of flora of scientific significance present (Keighery and Keighery 1992). These include taxa endemic to the eastern side of the Swan Coastal Plain as listed in Criterion A1; endangered species classed as Priority species by the Department of Conservation and Land Management (Atkins 1992) and as listed in Criterion B1; uncommon or restricted taxa; poorly known taxa such as new taxa; sandy soil taxa typical of the Northern sandplains; taxa typical of coastal limestone; and taxa common to both the eastern side of the Plain and to the Darling Plateau (Keighery and Keighery 1992).

high

D1. Importance in demonstrating the principal characteristics of the range of landscapes, environments or ecosystems, the attributes of which identify them as being characteristic of their class.

The area has outstanding value as a representative of elements of the highly diverse flora of the eastern side of the Swan Coastal Plain. Flora of aeolian sands of Bassendean landforms are especially well represented. Typical sandy species include *Astroloma stomarrhena*, *Hypocalymma robustum*, *Daviesia nudiflora*, *Petrophile macrostachya*, *Persoonia saccata*, and *Thysanotus sparteus*. The area complements Brickwood Bushland and Talbot Road in representing the flora of the eastern side of the Plain (Keighery and Keighery 1992).

very high

7. STATEMENT OF SIGNIFICANCE

Cardup has outstanding importance as a remnant of woodlands on the eastern side of the Swan Coastal Plain and which are now almost extinct.

Cardup is situated on a mix of landforms: most is on Bassendean sands, and the remainder is on the Pinjarra Plain and Ridge Hill Shelf. The resulting combination of soils has resulted in excellent representation of the unusually diverse array of plant communities and plant species. Plants of the aeolian (windborn) sands of Bassendean soils are especially well represented.

Cardup is also of outstanding importance as a complementary area to other comparable bushland sites at Brickwood and at Talbot Road. Together the three sites represent the range of plants and plant communities of this region. It is the dense shrub, herb and sedge layers which contribute nearly two thirds of the unusually high diversity of plants in this area.

Botanical studies at Cardup have enabled an improved understanding of the patterns of diversity of plants and the relationships with other areas such as the Darling Plateau, the Northern Sandplains, and coastal limestone areas. Studies at Cardup, Brickwood and Talbot Road bushland sites have enabled an understanding of the distribution of plants on the three different landforms: Bassendean dunes, Pinjarra Plain and Ridge Hill Shelf and their inter-relationships. Of plants found at Cardup, 47% are also found at Brickwood Bushland and at Talbot Road; and 16% are also found on the Darling Plateau.

An unusually high number of 58 species of plants found in the area are of special scientific interest for various reasons. There are 3 plants which are only found (this means they are endemic) on the eastern side of the Swan Coastal Plain: a newly recorded plant not yet botanically named, *Johnsonia* GJK 5249, *Eryngium pinnatifidum* ssp 'palustre', and *Drosera macrantha* 'robust'. There are 4 endangered species listed as Priority species by the Department of Conservation and Land Management in WA: *Eryngium pinnatifidum* ssp 'palustre' ms, *Gonocarpus pithyoides*, *Lambertia multiflora* var 'darlingensis' ms, and *Daviesia physoides*. Many species are of interest to botanists because their natural distribution is restricted to, for example, the Eastern side of the Plain and to the Darling Plateau. Many plants of the area are very poorly known and some have unusual or restricted distributions. Some plants are of interest because they are indicative of sandy soil habitats, for example *Astroloma stomarrhena*, *Hypocalymma robustum*, *Daviesia nudiflora*, *Petrophile macrostachya*, *Persoonia saccata* and *Thysanotus sparteus*. Two plants are of special interest at Cardup as they are at the southern limit of their natural range: *Dasyopogon obliquifolius*, and *Johnsonia pubescens*.

8. CONDITION

Most of the area is in very good condition with all vegetation strata intact and only a few non-aggressive weed species present. They include *Ursinia anthemoides*, *Hypochaeris glabra*, and *Romulea rosea*. The dense ground covering plants do not allow establishment of weeds unless the area is disturbed. Significant disturbance is present on the western margins of the Banksia Woodlands where the weeds *Ehrharta calycina* (Veld grass) and *E. longiflora* have formed a grassland. Dieback has had an impact on trees in patches and several weeds present in low numbers are a potential problem: *Eragrostis curvula*, *Homeria flaccida*, and *Acacia longifolia*.

9. RATIONALE FOR PROPOSED BOUNDARIES

Boundaries are based on the extent of remnant bushland as there is so little bush left in the area. Cardup is on sandy soils of Bassendean Sands and is generally in very good condition. Boundaries include the whole of Reserve 2457, the western part of Reserve 19156 (archery range) which has not been cleared and is still structurally intact and adjoining bushland on freehold land on part I and Lot 116 Soldiers Road. Although this latter section was not included in the Swan Coastal Plain Survey, its National Estate values are considered similar to those of the Nature Reserve.

10. PERSONAL CONTACTS

1. Bronwen Keighery, Consulting Botanist, Swan Coastal Plain Survey, 224 Hamersley Rd., Subiaco. Telephone 09 381 4062.
2. Greg Keighery, Department of Conservation and Land Management (CALM), Woodvale Research Centre, Ocean Reef Rd., Woodvale. Telephone 09 405 5100.
3. Neil Gibson, CALM, Woodvale Research Station, Ocean Reef Rd., Woodvale. Telephone 09 405 5100.
4. Ken Atkins, CALM, Rare and endangered species of flora. Hayman Road Como, telephone 09 334 0333.

11. BIBLIOGRAPHY

- Atkins, K.J. (1992). Declared Rare Flora and Priority Species List for Western Australia 21-11-1992. Dept. of CALM, WA.
- Beard, J.S. (1990). Plant Life of Western Australia. Kangaroo Press, Kenthurst NSW.
- CALM (1990). Data on the conservation of vegetation associations on the Swan Coastal Plain. Unpublished report, CALM, WA.
- Department of Conservation and Environment (1983). Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority - 1983: The Darling System - System 6, Report 13 October 1983, DCE, WA.
- Keighery, B.J., Keighery, G.J. (1992). Floristics of Reserves and Bushland Areas of the Perth Region (System 6) Parts V - IX. Wildflower Society of Western Australia (Inc.).
- Keighery, B.J., Keighery, G.J. (1992a). Plant Communities of the Northern Swan Coastal Plain, with special reference to uncommon and potentially rare plant communities. In Bushland in our Backyard, (eds) N. Gibson and B.J. Keighery. Wildflower Society of WA, Perth.
- Keighery, B.J., Trudgen, M.E. (1992). Remnant Vegetation on the Alluvial Soils of the Eastern Side of the Swan Coastal Plain. NEGP Report for the Dept. of CALM, WA.
- Keighery, G.J. (1992). Proposed Jandakot Botanic Park; Overview of Botanical Communities and their significance: I Anstey Road Wetlands. Unpublished report, Dept. of CALM, WA.
- Marchant, N.G., Wheeler, J.R., Rye, B.L., Bennett, E.M., Lander, N.S., MacFarlane, T.D. Flora of the Perth Region Parts I and II. Western Australian Herbarium Perth.
- Trudgen, M.E. (1990). Vegetation Condition Scale. Unpublished, as used by Keighery and Keighery 1992.
- van Gool, D. (1990). Land Resources in the Northern Section of the Peel-Harvey Catchment, Swan Coastal Plain, Western Australia. (Detailed soil map at 1:50,000 and Land use capability assessment.) WA Dept. of Agriculture.

12. ATTACHMENTS

Appendix Flora of Cardup Nature Reserve

Appendix Flora of Cardup Nature Reserve

Records from quadrat data and opportunistic collecting, 1989-93. Families in alphabetical order and names after Marchant et al. (1987) unless indicated.

Key

- # opportunistic record
- + weed

Plant Communities (see Map 2C, p 21)

- Wet Wetland (Site 10)
- Dr Drainage line (Site 4)
- b W *Banksia* Low Woodland (Sites, 2, 5, 6, 7 & 11)
- m W Marri Woodland (Sites 14 & 15)
- mj W Jarrah/Marri Woodland (Sites 8 & 9)
- j W Jarrah Woodland (Sites 1 & 3)
- Tr Tracks

Taxon	Wet	Dr	bW	mW	mjW	jW	Tr
-------	-----	----	----	----	-----	----	----

Gymnosperms

- Zamiaceae
- #*Macrozamia riedlei*

Angiosperms

- Aizoaceae
- #*Macarthuria australis*
- Amaranthaceae
- #*Ptilotus declinatus*
- #*Ptilotus drummondii*
- Ptilotus manglesii*
- #*Ptilotus stirlingii*
- Anthericaceae
- Agrostocrinum scabrum*
- Arnocrinum preissii*
- #*Arthropodium capillipes*
- #*Borya sphaerocephala*
- Caesia micrantha*
- Chamaescilla corymbosa*
- Johnsonia pubescens*
- Johnsonia* sp. GJK 5249
- Laxmannia sessiliflora*
- Laxmannia squarrosa*
- Sowerbaea laxiflora*
- Thysanotus manglesianus*
- Thysanotus multiflorus*
- Thysanotus patersonii*
- Thysanotus sparteus*
- Thysanotus thyrsoides*
- Thysanotus triandrus*
- Tricoryne elatior*

Flora of Cardup Nature Reserve (cont.)

Taxon	Wet	Dr	bW	mW	mjW	jW	Tr
Apiaceae							
<i>Eryngium pinnatifidum</i> ssp 'palustre' ms					+		
<i>Homalosciadium homalocarpum</i>			+	+			
# <i>Hydrocotyle alata</i>				+			
# <i>Hydrocotyle pilifera</i>							+
<i>Pentapeltis peltigera</i>							+
# <i>Platysace juncea</i>				+			
<i>Trachymene pilosa</i>			+		+	+	
<i>Xanthosia huegelii</i>			+	+		+	
Asteraceae							
#* <i>Arctotheca calendula</i>							+
<i>Asteridia pulverulenta</i>			+				
* <i>Hypochaeris glabra</i>	+	+	+	+	+		
# <i>Hyalospermum cotula</i>					+	+	
<i>Lagenifera huegelii</i>					+	+	
# <i>Millotia myosotidifolia</i>			+				
# <i>Olearia elaeophila</i>			+				
# <i>Olearia paucidentata</i>							+
<i>Podolepis gracilis</i>					+		
# <i>Pseudognaphalium luteoalbum</i>	+						
<i>Quinetia urvillei</i>	+		+				+
<i>Pithocarpa</i> sp			+				
<i>Siloxeris ?filifolius</i>							
<i>Siloxeris humifusus</i>	+						
* <i>Sonchus oleraceus</i>					+		
* <i>Ursinia anthemoides</i>	+	+	+	+	+	+	
* <i>Vellereophyton dealbatum</i>	+						
# <i>Waitzia paniculata</i>			+				
<i>Waitzia suaveolens</i>			+				+
Caesalpiniaceae							
<i>Labichea punctata</i>			+		+	+	
Campanulaceae							
<i>Wahlenbergia preissii</i>			+	+			
Caryophyllaceae							
* <i>Silene gallica</i>			+				
Casuarinaceae							
# <i>Casuarina obesa</i>	+				+		
<i>Allocasuarina humilis</i>			+	+			+
<i>Allocasuarina thuyoides</i>			+				
Centrolepidaceae							
<i>Centrolepis aristata</i>	+						
# <i>Centrolepis drummondiana</i>			+		+		
Colchicaceae							
# <i>Burchardia multiflora</i>				+			
<i>Burchardia unguiculata</i>			+	+	+	+	
# <i>Wurmbea dioica</i>				+			

Flora of Cardup Nature Reserve (cont.)

Taxon	Wet	Dr	bW	mW	mjW	jW	Tr
Crassulaceae							
Crassula colorata	+	+	+		+		
Crassula decumbens	+			+			
Crassula peduncularis			+			+	
Cyperaceae							
Cyathochaeta avenacea			+	+	+		
#*Cyperus tenellus				+			
Isolepis cernua	+						
Isolepis oldfieldiana	+						
Lepidosperma angustatum			+	+	+	+	
#Lepidosperma leptostachyum					+		
Lepidosperma ?tenue			+	+			
Mesomelaena pseudostygia			+	+		+	
Mesomelaena tetragona			+	+	+	+	
Schoenus brevisetis			+		+		
Schoenus caespitius			+			+	
Schoenus clandestinus					+		
#Schoenus curvifolius			+				
Schoenus subbulbosus			+			+	
Schoenus subflavus			+		+	+	
Tetraria octandra			+	+	+	+	
#Tricostularia neesii			+				
Dasypogonaceae							
Calectasia cyanea			+			+	
Dasypogon bromeliifolius		+	+	+	+	+	
Dasypogon obliquifolius			+		+		
Kingia australis				+	+		
#Lomandra britttanii						+	
Lomandra caespitosa			+		+	+	
Lomandra hermaphrodita			+		+	+	
Lomandra nigricans			+		+	+	
Lomandra odora					+		
Lomandra preissii			+		+	+	
Lomandra purpurea				+			
Lomandra sericea			+		+		
#Lomandra suaveolens					+		
Dilleniaceae							
#Hibbertia acerosa			+		+		
Hibbertia huegelii			+		+	+	
Hibbertia hypericoides	+		+	+	+	+	
Hibbertia vaginata			+		+	+	
Droseraceae							
Drosera erythrorhiza			+	+	+	+	
Drosera gigantea	+			+			
Drosera glanduligera	+		+	+	+	+	
Drosera palacea ssp palacea	+		+			+	
Drosera macrantha			+		+	+	
Drosera macrantha 'robust' ¹				+			
Drosera menziesii ssp penicillaris						+	

Flora of Carrup Nature Reserve (cont.)

Taxon	Wet	Dr	bW	mW	mjW	jW	Tr
#Drosera palacea			+		+	+	
Drosera stolonifera			+	+	+	+	
Epacridaceae							
Andersonia lehmanniana ssp lehmanniana				+		+	
Astroloma pallidum			+			+	
Astroloma stomarrhena			+				
Conostephium pendulum			+			+	
Conostephium preissii			+				
Lysinema ciliatum			+				
Styphelia tenuiflora			+			+	
Euphorbiaceae							
Monotaxis grandiflora						+	
#Poranthera huegelii						+	
Poranthera microphylla						+	
Stachystemon vermicularis			+			+	
Fabaceae (Papilionaceae)							
Aotus procumbens	+						
Bossiaea eriocarpa			+		+	+	
Bossiaea ornata			+	+		+	
Daviesia decurrens			+	+			
Daviesia physodes			+		+	+	
Daviesia triflora			+		+		
#Daviesia nudiflora					+		
Gompholobium confertum			+			+	
Gompholobium knightianum						+	
Gompholobium marginatum				+			
#Gompholobium preissii						+	
#Gompholobium polymorphum						+	
Gompholobium tomentosum		+	+		+	+	
#Hovea chorizemifolia					+		
Hovea trisperma			+	+	+		
#Isotropis cuneifolia					+		
Jacksonia sternbergiana		+			+	+	
#Kennedia coccinea					+		
Kennedia prostrata			+		+		
#*Lupinus angustifolius							+
Nemcia reticulata					+		
*Ornithopus compressus	+		+				
Sphaerolobium vimineum				+		+	
Templetonia biloba				+		+	
*Trifolium arvense		+					
#*Trifolium dubium							
Geraniaceae							
*Erodium botrys		+					
Gentianaceae							
#*Cicendia filiformis	+						

Flora of Cardup Nature Reserve (cont.)							
Taxon	Wet	Dr	bW	mW	miW	jW	Tr
Goodeniaceae							
Dampiera linearis				+	+		
#Goodenia caerulea						+	
Lechenaultia biloba			+	+		+	
Scaevola phlebopetala				+			
Scaevola repens						+	
Haemodoraceae							
Anigozanthos humilis			+				
Anigozanthos manglesii				+		+	
Anigozanthos humilis X manglesii			+			+	
Conostylis aculeata			+	+		+	
Conostylis aurea			+				
Conostylis juncea			+	+	+	+	
Conostylis setigera			+		+		
Conostylis setosa			+			+	
Haemodorum laxum			+		+	+	
#Haemodorum paniculatum			+			+	
Haemodorum sparsiflorum			+				
Haemodorum spicatum			+			+	
Phlebocarya ciliata					+		
Phlebocarya filifolia			+		+	+	
Haloragaceae							
#Gonocarpus pithyoides			+			+	
Hypoxidaceae							
#Hypoxis occidentalis				+			
Iridaceae							
#*Homeria flaccida			+				+
Patersonia juncea	+		+	+		+	
Patersonia occidentalis			+				
*Romulea rosea	+	+	+	+			
Juncaceae							
#*Juncus bufonius	+						
#Juncus capitatus	+						
Juncus pallidus	+						
#Juncus polyanthemus	+						
Juncaginaceae							
#Triglochin centrocarpum	+						
Lauraceae							
Cassytha flava				+			
Cassytha glabella						+	
Cassytha racemosa				+			
Lentibulariaceae							
#Polypompholyx multifida				+			

Flora of Cardup Nature Reserve (cont.)							
Taxon	Wet	Dr	bW	mW	mjW	jW	Tr
Lobeliaceae							
Isotoma hypocrateriformis				+		+	
#Lobelia tenuior						+	
Loranthaceae							
Nuytsia floribunda						+	
Loganiaceae							
#Mitrasacme paradoxa	+						
Logania serpyllifolia			+				
Mimosaceae							
#Acacia barbinervis			+			+	
#Acacia drewiana					+		
#Acacia huegelii			+				
#*Acacia longifolia							+
#Acacia pulchella						+	
#Acacia saligna				+			
Acacia sessilis			+			+	
Acacia stenoptera				+		+	
Acacia willdenowiana			+	+	+	+	
Myrtaceae							
Baeckea camphorosmae		+	+	+		+	
Calytrix angulata			+				
#Calytrix flavescens		+	+			+	
Eremaea pauciflora			+		+	+	
Eremaea aff. brevifolia D.Coates M1175			+				
Eucalyptus calophylla	+	+	+	+	+		
Eucalyptus marginata			+	+	+	+	
Hypocalymma angustifolium				+			
Hypocalymma robustum			+		+	+	
#Kunzea micrantha				+			
#Kunzea recurva				+			
Melaleuca acerosa			+				
Melaleuca preissiana	+						
Melaleuca thymoides					+		
#Melaleuca viminea	+						
#Pericalymma ellipticum				+			
Scholtzia involucreta 'prostrate'			+		+	+	
Orobanchaceae							
#Orobanche minor				+			
Orchidaceae							
#Caladenia deformis						+	
Caladenia discoidea			+				
Caladenia flava			+	+		+	
#Caladenia marginata						+	
Caladenia reptans			+			+	
Diuris aff. longifolia				+	+		
#Diuris magnifica D.Jong				+			
#Drakea glyptodon			+				

Flora of Cardup Nature Reserve (cont.)

Taxon	Wet	Dr	bW	mW	miW	jW	Tr
#Elythranthera brunonis						+	
Eriochilus dilatatus			+			+	
Leporella fimbriata			+	+	+	+	
Lyperanthus nigricans	+		+	+		+	
#Lyperanthus serratus				+			
#Microtis media						+	
*Monadenia bracteata	+	+	+	+	+	+	
Prasophyllum parviflorum				+			
#Pterostylis recurva						+	
Pterostylis vittata			+	+		+	
Thelymitra crinita				+		+	
Thelymitra sp						+	
Phormicaceae							
Agrostocrinum scabrum				+		+	
Pittosporaceae							
Pronaya fraseri			+	+		+	
Poaceae							
#*Aira cupaniana						+	
#Aristida contorta						+	
Amphipogon turbinatus				+	+	+	+
*Avena barbata							
*Briza maxima		+	+	+		+	
*Briza minor				+		+	
#Bromus diandrus							
#Danthonia ?occidentalis			+			+	+
*Ehrharta calycina		+	+				
*Ehrharta longiflora		+	+	+			
*Eragrostis curvula					+		
Eragrostis elongata	+						
Neurachne alopecuroidea				+		+	
#*Pentachistis thunbergii							+
#Poa drummondiana			+		+		
Poa sp	+						
#Stipa elegantissima				+			
#Stipa compressa			+		+		
Stipa ?pycnostachya				+		+	
#Stipa aff. trichophylla	+						
#*Vulpia myuros			+				+
Polygalaceae							
#Comesperma calymega			+				
Comesperma virgatum			+				
Primulaceae							
*Anagallis arvensis	+		+				
Proteaceae							
Adenanthos meisneri					+	+	
Banksia attenuata			+		+	+	
Banksia grandis			+				

Flora of Cardup Nature Reserve (cont.)

Taxon	Wet	Dr	bW	mW	miW	jW	Tr
Banksia menziesii			+		+	+	
#Conospermum stoechadis			+			+	
#Dryandra bipinnatifida						+	
Dryandra nivea		+	+	+	+	+	
#Dryandra sessilis						+	
Grevillea bipinnatifida				+			
Grevillea pilulifera			+	+		+	
#Grevillea quercifolia						+	
#Grevillea wilsonii						+	
Hakea cyclocarpa				+		+	
Hakea lissocarpha						+	
#Hakea prostrata				+			
Hakea ruscifolia			+			+	
#Hakea stenocarpa			+			+	
#Hakea trifurcata						+	
#Isopogon asper				+			
#Lambertia multiflora var. darlingensis ms						+	
#Persoonia elliptica						+	
#Persoonia saccata						+	
Petrophile linearis			+		+	+	
Petrophile macrostachya			+				
Petrophile striata			+				
Stirlingia latifolia		+	+	+	+	+	
#Synaphea petiolaris						+	
Xylomelum occidentale			+		+	+	
Restionaceae							
Hypolaena exsulca		+	+	+	+	+	
Lepidobolus chaetocephalus						+	
#Leptocarpus co-angustatus	+						
Lepyrodia macra/muirii	+						
#Loxocarya cinerea			+				
Loxocarya fasciculata		+	+	+	+	+	
Loxocarya flexuosa			+			+	
Lyginia barbata			+	+	+	+	
Restio leptocarpoides	+						
#Restio 'sinuosus' ms			+			+	
Rubiaceae							
#Opercularia vaginata						+	
Rutaceae							
#Boronia spathulata				+		+	
Eriostemon spicatus			+	+		+	
Schrophulariaceae							
*Dischisma capitatum		+					
Stackhousiaceae							
Stackhousia pubescens			+	+			
Tripterococcus brunonis			+			+	

Flora of Cardup Nature Reserve (cont.)

Taxon	Wet	Dr	bW	mW	mjW	jW	Tr
Stylidiaceae							
Levenhookia pusilla				+		+	
Stylidium brunonianum			+		+	+	
#Stylidium bulbiferum				+			
Stylidium calcaratum			+	+		+	
Stylidium dichotomum				+			
#Stylidium junceum							+
Stylidium piliferum			+			+	
Stylidium repens			+	+			
#Stylidium schoenoides			+				
Thymelaeaceae							
Pimelea imbricata var piligera				+			
Pimelea suaveolens			+				
Pimelea sulphurea							+
Tremandraceae							
#Tetratheca hirsuta			+				
#Tetratheca setigera							+
Violaceae							
#Hybanthus calycinus							+
Xanthorrhoeaceae							
Xanthorrhoea preissii	+	+	+	+	+	+	

1 A robust form of *Drosera macrantha* confined to the Swan Coastal Plain (A. Lowrie, pers. comm.)

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