THE SPECTACLES

Boundary Definition: protected area boundary

SECTION 1: LOCATION INFORMATION

Bush Forever Site no. 269 **Area (ha):** bushland 349.7 (Site also includes open water.)
Map no. 64, 65 **Map sheet series ref. no.** 2033–I SW
Other Names: Submission Area 6, part of Beeliar Regional Park
Local Authorities (Suburb): Town of Kwinana (The Spectacles)

SECTION 2: REGIONAL INFORMATION

LANDFORMS AND SOILS
Bassendean Dunes
Bassendean Sands (Qpb: S8) (at interface of Bassendean and Spearwood Dunes)
Spearwood Dunes
Sands derived from Tamala Limestone (Qts: S7)
Tamala Limestone (Qtl: LS1)
Wetlands (within the Spearwood/Bassendean Dunes interface)
Holocene Swamp Deposits (Qhw: Ms5)

VEGETATION AND FLORA
Vegetation Complexes
Bassendean Dunes
Bassendean Complex — Central and South (at interface of Bassendean Complex — Central and South and Karrakatta Complex — Central and South)
Spearwood Dunes
Karrakatta Complex — Central and South
Cottesloe Complex — Central and South
Wetlands
Herdsman Complex
Floristic Community Types: *not sampled, types inferred
Supergroup 2: Seasonal Wetlands
*11 Wet forests and woodlands
Supergroup 4: Uplands centred on Spearwood and Quindalup Dunes
*28 Spearwood *Banksia attenuata* or *B. attenuata* — *Eucalyptus* woodlands

WETLANDS
Wetland Types: sumpland, dampland, principal channel
Natural Wetland Groups
Bassendean Dunes
Jandakot (B.3)
Spearwood—Bassendean interface
Bibra (S/B.1)
Wetland Management Objectives: Conservation (166.7ha), Multiple Use
Swan Coastal Plain Lakes EPP: 62.1ha + 14.1ha = 76.2ha (total)

THREATENED ECOLOGICAL COMMUNITIES
Not assessed

SECTION 3: SPECIFIC SITE DETAIL

Landscape Features: open water (fresh), vegetated wetland, vegetated uplands
Vegetation and Flora: limited survey (EPA and WAWA 1990, Glossop 1979, Weston 1993)
Structural Units: mapping (EPA and WAWA 1990, Glossop 1979)
Uplands: *Eucalyptus calophylla* and *Banksia attenuata* Low Woodland
Wetlands: *Eucalyptus rudis* Low Woodland to Low Open Forest; *Melaleuca rhaphiophylla* and *M. teretifolia* Low Closed Forest; *Melaleuca rhaphiophylla* Low Open Forest to Low Closed Forest; *Baumea articulata* Closed Sedgeland; Mixed Sedgeland; *Leptocarpus* Open Sedgeland
Scattered Native Plants: *Melaleuca preissiana* Low Woodland; *Eucalyptus calophylla* and *Banksia attenuata* Low Woodland — regionally significant vegetation recognised as being included in the area of Site in need of protection
Vegetation Condition: >60% Excellent to Very Good, <40% Good to Degraded (Weston 1993)
Total Flora: 104 native taxa, 8 weed taxa (Glossop 1979) (estimated >75% expected flora)
Significant Flora: *Dodonaea hackettiana* (4)

Fauna: multiple survey for birds (RAOU 1996 D), limited survey for birds (AHC 2000 D). Equal highest number of breeding waterfowl (12 species) and equal 14th wetland for highest number of species (33) during RAOU wetland survey 1990-92 (Storey *et al.* 1993); Significant mammal species: Western Brush Wallaby and Quenda (AHC 2000 D); Significant reptile species: Lined Skink *Lerista lineata* (AHC 2000 D)
Linkage: adjacent bushland to the north (Site 268, across road), south (Site 272, across road), east (across freeway) and west; part of Greenways 78, 97 (Tingay, Alan & Associates 1998a); part of a regionally significant contiguous bushland/wetland linkage (Part A, Map 7)
Other Special Attributes: included in Beeliar Regional Park Proposal (DPUD 1992a)

SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE

Entered in the Interim List of the Register of the National Estate; Directory of Important Wetlands in Australia

SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS

Criteria: Representation of ecological communities, Diversity, Rarity, Maintaining ecological processes or natural systems, General criteria for the protection of wetland, streamline and estuarine fringing vegetation and coastal vegetation, Criteria not relevant to determination of regional significance, but which may be applied when evaluating areas having similar values
Recommendation: Site with Some Existing Protection; the care, control and management of this Site for conservation purposes within Beeliar Regional Park is endorsed (see Table 3, Volume 1).

THE SPECTACLES

Boundary Definition: protected area boundary

SECTION 1: CADASTRAL INFORMATION

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

Bushplan Site no. 269 **Map no.** 81

Map sheet series ref. no. 2033–I SW

Other Names
Submission Area 6

Local Authorities (Suburb)
Town of Kwinana (The Spectacles)

Ownership Categories
Private (including commercial organisation), State Government

Area (ha): total 422.4 (includes open water); bushland 349.7

Zoning
MRS: Parks and Recreation, Railways
TPS: Landscape

Lot/Location/Reserve numbers (Purpose), Street name
627, 628, 629, 630, 631, 632, 633, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1162, 1163, 1164, 1165 Mclaughlan Rd; 633, 634 Hope Valley Rd; 77, 78, 79, 80, 1150, 1190, 1191, 1193, 1194, 1195, 1196, 1197, 1198, 1295, 1302 Anketell Rd; 1, 7, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1203 Johnson Rd; 1, 2, 3, 4, 1296, 1297, 1298, 1299 Thomas Rd; 1192 Spectacles Dr
Crown Reserve

SECTION 2: REGIONAL INFORMATION

LANDFORMS AND SOILS

Bassendean Dunes
Bassendean Sands (Qpb: S8) (at interface of Bassendean and Spearwood Dunes)

Spearwood Dunes
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Wetlands (within the Spearwood/Bassendean Dunes interface)
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VEGETATION AND FLORA

Vegetation Complexes

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Bassendean Complex — Central and South (at interface of Bassendean Complex — Central and South and Karrakatta Complex — Central and South)

Spearwood Dunes
Karrakatta Complex — Central and South
Cottesloe Complex — Central and South

Wetlands
Herdsman Complex

Floristic Community Types: *not sampled, types inferred

Supergroup 2: Seasonal Wetlands
*11 Wet forests and woodlands

Supergroup 4: Uplands centred on Spearwood and Quindalup Dunes
*28 Spearwood *Banksia attenuata* or *B. attenuata* — *Eucalyptus* woodlands

WETLANDS

Wetland Types: sumpland, dampland, principal channel

Natural Wetland Groups

Bassendean Dunes
Jandakot (B.3)

Spearwood—Bassendean interface
Bibra (S/B.1)

Wetland Management Objectives: Conservation (166.7ha), Multiple Use

Swan Coastal Plain Lakes EPP: 62.1ha + 14.1ha = 76.2ha (total)

THREATENED ECOLOGICAL COMMUNITIES

Not assessed

SECTION 3: SPECIFIC SITE DETAIL

Landscape Features: open water (fresh), vegetated wetland, vegetated uplands

Vegetation and Flora: limited survey (EPA and WAWA 1990, Glossop 1979, Weston 1993)

Structural Units: mapping (EPA and WAWA 1990, Glossop 1979)
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Wetlands: *Eucalyptus rudis* Low Woodland to Low Open Forest; *Melaleuca rhaphiophylla* and *M. teretifolia* Low Closed Forest; *Melaleuca rhaphiophylla* Low Open Forest to Low Closed Forest; *Baumea articulata* Closed Sedgeland; Mixed Sedgeland; *Leptocarpus* Open Sedgeland
Scattered Native Plants: *Melaleuca preissiana* Low Woodland; *Eucalyptus calophylla* and *Banksia attenuata* Low Woodland - regionally significant vegetation recognised as being included in the area of Bushplan Site in need of protection
Vegetation Condition: >60% Excellent to Very Good, <40% Good to Degraded (Weston 1993)
Total Flora: 104 native taxa, 8 weeds (estimated >75% expected flora) (Glossop 1979)
Significant Flora: *Dodonaea hackettiana* (4)

Fauna: multiple surveys by RAOU (1996 D) for birds. Equal highest number of breeding waterfowl (12 species) and equal 14th wetland for highest number of species (33) during RAOU wetland survey in 1990-92 (Storey *et al.* 1993)

Linkage: adjacent bushland to the north (BS268 across road), south (BS272 across road), east (across Freeway) and west; part of proposed Greenways 93, 100 (Tingay, Alan & Associates 1997a); part of a regionally significant contiguous bushland/wetland linkage (Volume 2A, Map 8)

Other Special Attributes: included in Beeliar Regional Park Proposal (DPUD 1992a)

SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE

Interim List of the Register of the National Estate; Directory of Important Wetlands in Australia

SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS

Criteria: Representation of ecological communities, Diversity, Rarity, Maintaining ecological processes or natural systems, General criteria for the protection of wetland, streamline and estuarine fringing and coastal vegetation, Criteria not relevant to determination of conservation value, but which may be applied when evaluating areas having similar values

Opportunities and/or Constraints
Opportunities: Bushplan Site/part Bushplan Site subject to Swan Coastal Plain Lakes EPP, Peel-Harvey Estuary EPP/SPP; location of conservation category wetlands; under MRS Parks and Recreation Reservation and TPS Landscape Zoning, Crown Reserve
Constraints: private land

Recommendation: The care, control and management of this Bushplan Site for conservation purposes within Beeliar Regional Park is endorsed.

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

2033 - I SW

IV	NW	NE
	SW 81	SE
2033		
III		II

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

PERTH'S BUSHPLAN MAP INDEX

1	2							
3	4	5						
6	7	8	9	10	11			
12	13	14	15	16				
	17	18	19	20		21	22	23
	24	25	26	27	28	29	30	
		31	32	33	34	35	36	
		37	38	39	40	41	42	
		43	44	45	46	47	48	
			49	50	51	52	53	54
			55	56	57	58	59	
			60	61	62	63	64	
65			66	67	68	69	70	
71	72	73	74	75	76	77		
78	79	80	81	82	83	84		
85	86	87	88	89	90	91		
	92	93	94	95	96	97		
	98	99	100	101	102			
		103	104	105	106			

N

SCALE

0 — 500 — 1000

Metres

Produced by Project Mapping Section
Land Information Branch, Ministry for Planning, Perth W.A. November 1998

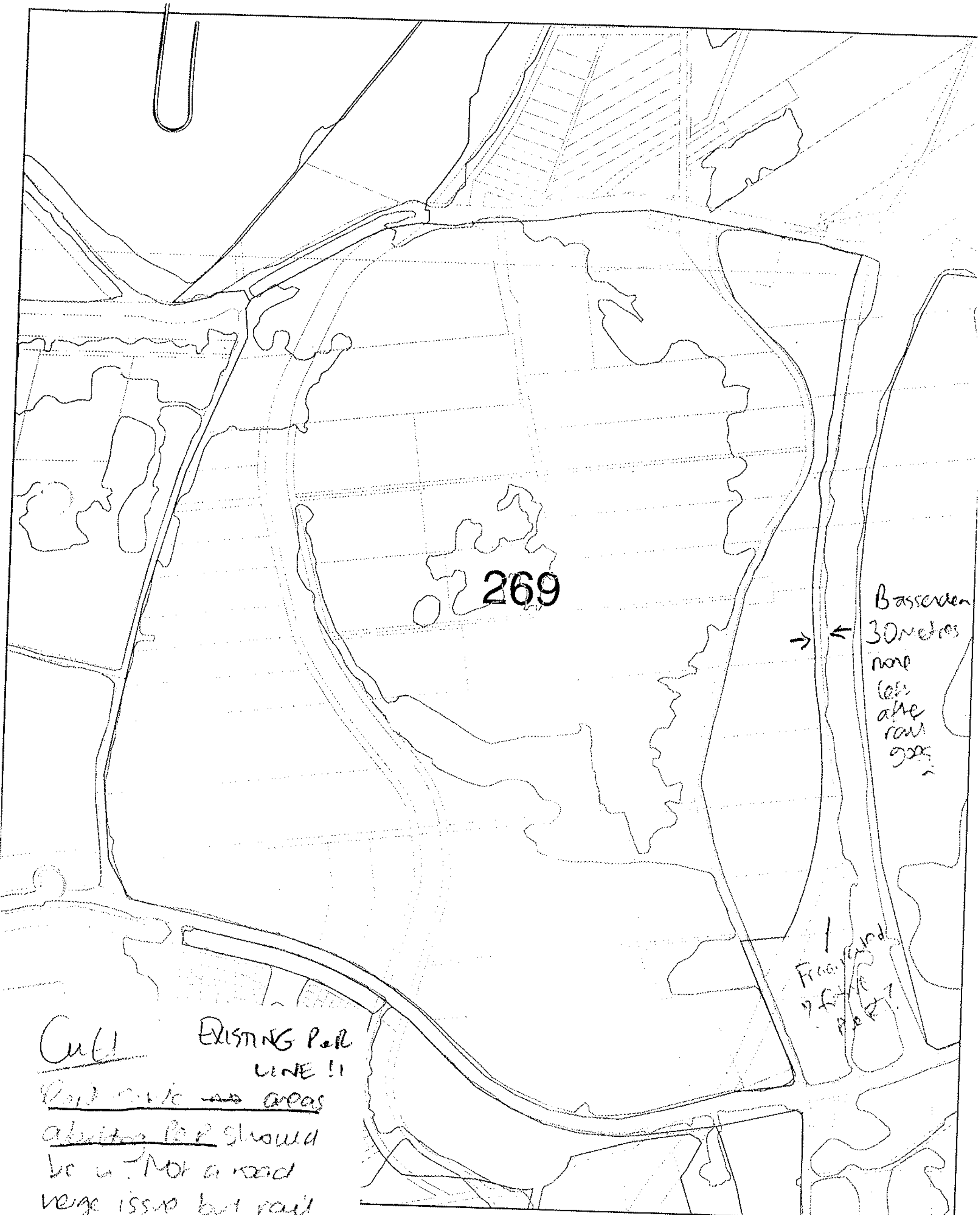
ntw-map9//environ/bushplan//bushv2_81.dgn

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

Bushplan Site Map



Cull! EXISTING P&R LINE !!

[illegible] areas abutting P&R should be in? Not a road verge issue but rail reserve which is completely mapped as vegetated

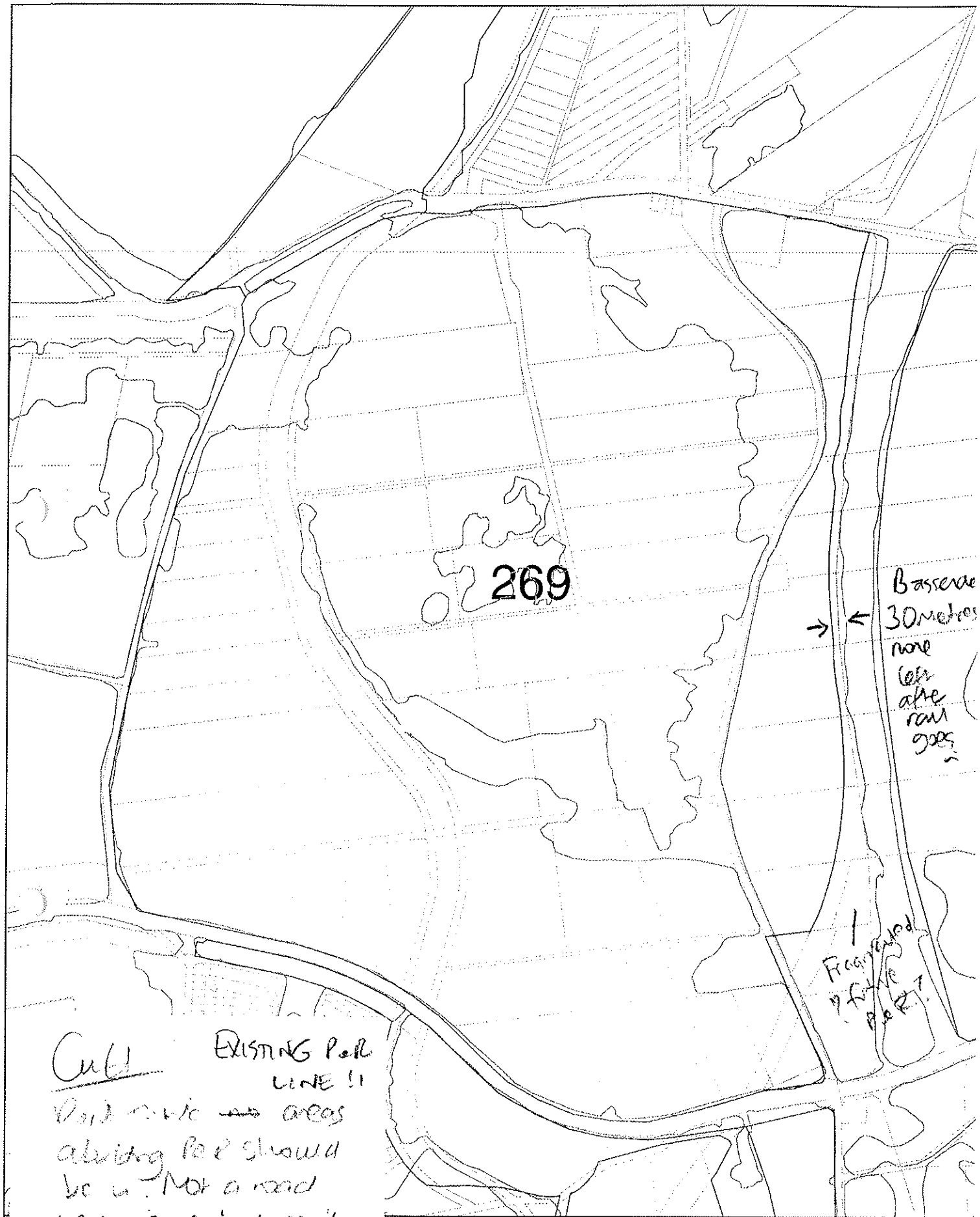
PERM VIEW RAIL RESERVES & ROAD RESERVES

GENERAL TRANSPORT

BUSHPLAN SITES CORRECTED

29/9 NT/AW
Ok

CUSTOMER FOCUS
WESTERN AUSTRALIA

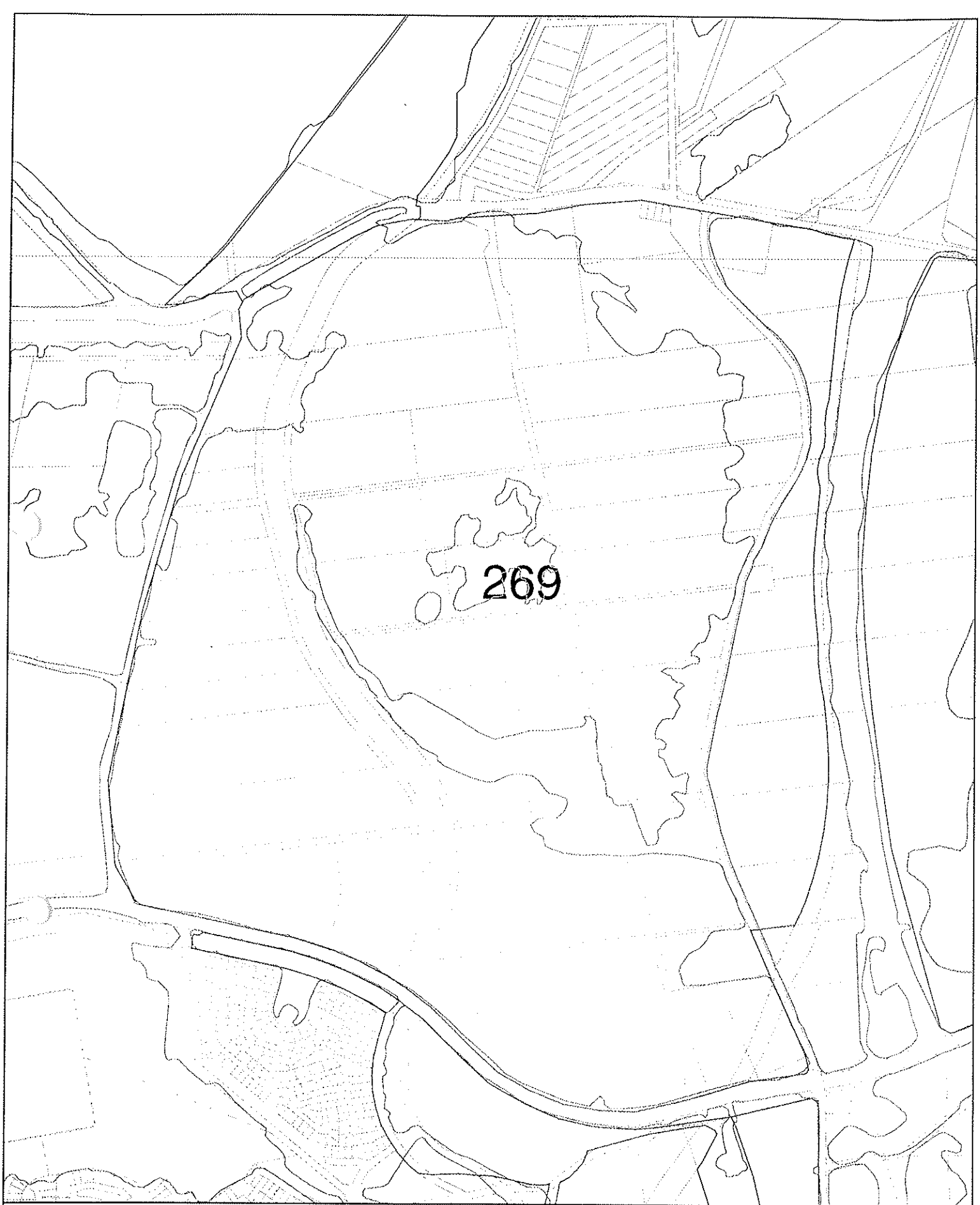


BUSHPLAN SITES CORRECTED

29/9 NT/aw
ok.

CUSTOMER FOCUS
WESTERN AUSTRALIA

N



BUSHPLAN SITES CORRECTED

THE GOVERNMENT OF WESTERN AUSTRALIA

WESTERN AUSTRALIAN PLANNING COMMISSION

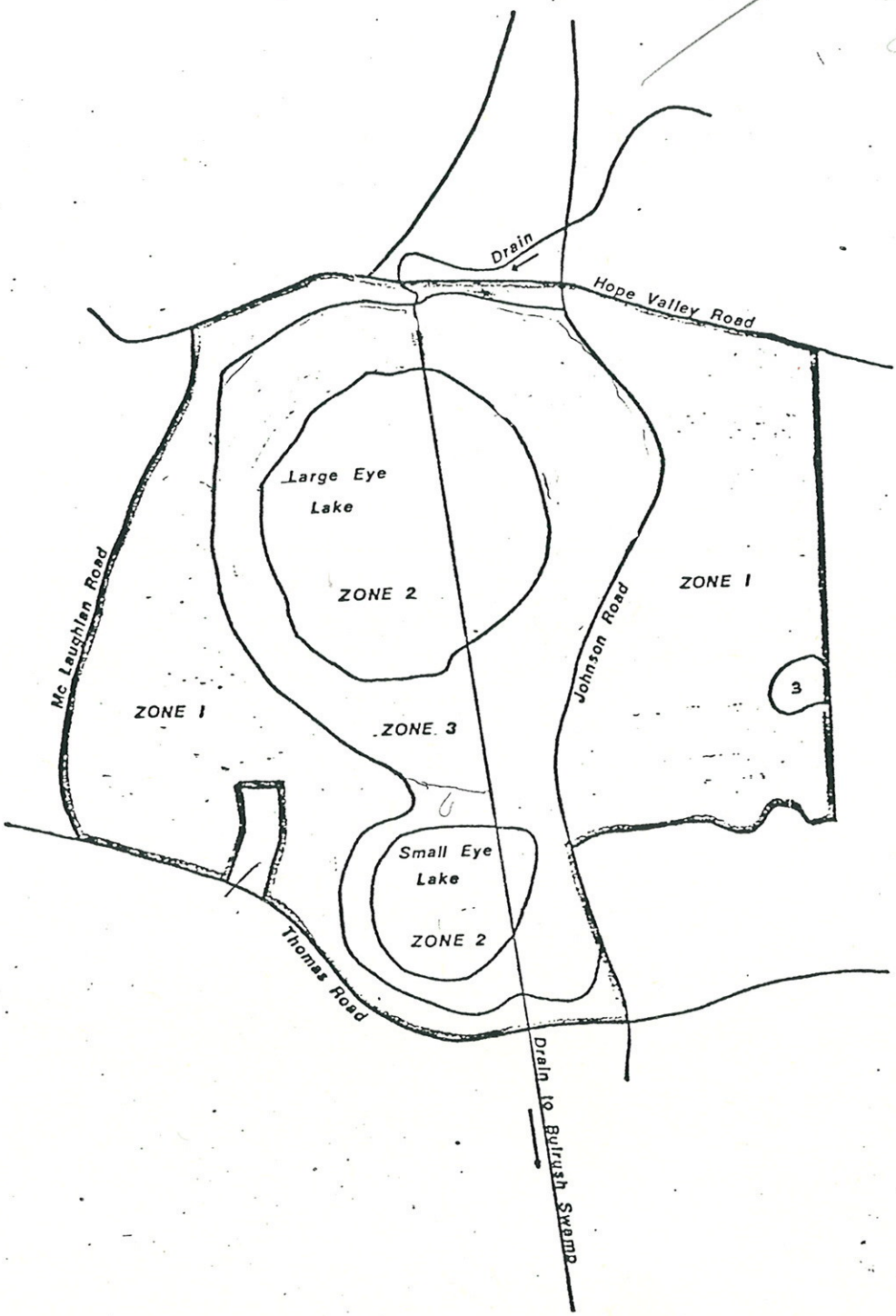
CUSTOMER FOCUS WESTERN AUSTRALIA

N

Glossop B. (1979) Flora + Vegetation Survey The Spectacles
(unpublished Alcoa notes)
BJK 14/10/88

CONF TO BASSENDEANS

BS 269
Spearwood S



——— Boundary of study area

Vegetation Zones:

Zone 1	Jarrah-Banksia Woodland
Zone 2	Melaleuca Wetland
Zone 3	Transition Zone - dominated by *Eucalyptus rudis*

Figure 1. A map showing the boundary of the study area and the

TABLE 1:

Species list for Small Eye Lake, Large Eye Lake and the surrounding woodlands. The distribution of the species within the three vegetation zones (see Fig. 1) have been indicated. The common names are listed after the latin names.

* represents introduced species

	Zone 1 (Mixed Jarrah - Banksia woodland)	Zone 2 (Melaleuca wetland)	Zone 3 (Eucalyptus rudis - transition zone)
PTERIDOPHYTA			
POLYPODIACEA			
Pteridium esculentum (Common Bracken Fern)			*
GYMNOSPERMAE			
ZAMIACEAE			
Macrozamia riedleii (Zamia Palm)	*		*
ANGIOSPERMAE			
MONOCOTYLEDONEAE			
TYPHACEAE			
Typha angustifolia (Bulrush)		*	
POACEAE			
**Ehrharta spp.* (Veldt Grass)	*		*
CYPERACEAE			
Lepidosperma angustatum	*		
Lepidosperma gracile (Slender Sword Sedge)	*		
Lepidosperma longitudinale (Common Sword Sedge)		*	*
Lepidosperma scabrum	*		
Lepidosperma tenue	*		*
Machaerina articulatum (Jointed Twig Rush)		*	
Mesomelaena stygia	*		
Schoenus curvifolius			*
Scirpus nodosus (Knotted Club Rush)			*
RESTIONACEAE			
Loxocarya cinerea	*		
Lyginia barbata	*		*
JUNCACEAE			
Juncus pallidus (Giant Rush)	*		*

	Zone 1	Zone 2	Zone 3
LILIACEAE			
Chamaescilla spiralis	*		*
Corynotheca micrantha	*		*
Dianella revoluta (Spreading Flax Lily)	*		*
Laxmannia sp.	*		
Lomandra sp.	*		*
Sowerbaea laxiflora (Vanilla Lily)	*		*
? *Tricoryne elatior* (Yellow Autumn Lily)	*		*
XANTHORRHOEACEAE			
Calectasia cyanea (Blue Tinsel Lily)	*		
Xanthorrhoea gracilis (Graceful Grass Tree)	*		
Xanthorrhoea preissii (Blackboy)	*		
HAEMODORACEAE			
Anigozanthus humilis (Cat's Paw)	*		*
Anigozanthus manglesii (Kangaroo Paw)	*		
Conostylis aculeata	*		*
IRIDACEAE			
**Romulea rosea* (Guildford Grass)			*
ORCHIDACEAE			
Caladenia deformis (Blue Fairy Orchid)	*		*
Caladenia flava (Cowslip Orchid)	*		*
Diuris longifolia (Donkey Orchid)	*		*
**Gladiolus caryophyllaceus*	*		
Pterostylis vittata (Banded Green-hood Orchid)	*		
Unknown Orchid 1	*		
Unknown Orchid 2	*		*
Unknown Orchid 3	*		
DICOTYLEDONEAE			
CASUARINACEAE			
Casuarina fraseriana	*		
Casuarina humilis (Dwarf Casuarina)	*		

	Zone 1	Zone 2	Zone 3
PROTEACEAE			
Adenanthos abovata (Basket flower)			*
Adenanthos sericea (Woolly Bush)	*		*
Banksia attenuata	*		
Banksia ilicifolia (Holly Leaf Banksia)	*		*
Banksia menziesii	*		
Dryandra nivea	*		
Hakea lissocarpha (Honey Bush)	*		
Persoonia saccata (Pouched Persoonia)	*		*
Petrophile linearis (Narrow-leaved Cone Bush)	*		
Stirlingia latifolia	*		
Synaphaea polymorpha	*		
AIZOACEAE			
**Carpobrotus aequilaterale* (Angular Pig Face)	*		*
Macarthuria australis	*		*
DROSERACEAE			
Drosera? erythrorrhiza (Sundew)	*		
Drosera macrantha	*		
Drosera stolonifera	*		
MIMOSACEAE			
Acacia huegelii	*		*
Acacia pulchella (Prickly Moses)	*		*
Acacia saligna (Orange Wattle)			*
Acacia stenoptera	*		
PAPILIONACEAE			
Bossiaea eriocarpa	*		
Daviesia incrassata			*
Daviesia juncea	*		
Gompholobium tomentosum	*		*
Hardenbergia comptoniana (Native Wistaria)	*		*
Hovea pungens (Devil's Pins)			*
Hovea trisperma (Common Hovea)	*		
Isotropis cuneifolia (Common Lamb Poison)	*		

	Zone 1	Zone 2	Zone 3
PAPILIONACEAE (Cont'd)			
Jacksonia furcellata	*		*
Jacksonia sternbergiana	*		*
Kennedia prostrata (Scarlet Runner)	*		*
**Lupinus angustifolius* (New Zealand Blue Lupin)			*
Oxylobium capitatum (Bacon and Eggs)	*		
Pultenaea reticulata			*
Viminaria juncea (Golden Spray)			*
GERANIACEAE			
Pelagonium australe			*
RUTACEAE			
Eriostemon spicatus (Pepper and Salt)	*		
EUPHORBIACEAE			
Phyllanthus calycinus (False Boronia)	*		
DILLENIACEAE			
Hibbertia hypericoides	*		*
Hibbertia racemosa (Stalked Guinea Flower)	*		
VIOLACEAE			
Hybanthus calycinus (Wild Violet)	*		
THYMELAEACEAE			
Pimelea rosea	*		
MYRTACEAE			
Astartea fascicularis		*	
Baeckea camphorosmae (Camphor Myrtle)	*		
Eucalyptus calophylla (Marri)	*		
Eucalyptus gomphocephala (Tuart)	*		
Eucalyptus marginata (Jarrah)	*		
Eucalyptus rudis (Flooded Gum)			*
Hypocalymma robustum (Swan River Myrtle)	*		
Kunzea vestita			*
Melaleuca incana (Grey Honey-Myrtle)		*	

	Zone 1	Zone 2	Zone 3
MYRTACEAE (Cont'd)			
Melaleuca lateritia (Robin Red-Breast Bush)		*	
Melaleuca preissiana			*
Melaleuca rhaphiophylla (Swamp Paper-Bark)		*	
Melaleuca teretifolia		*	
Scholtzia involucrata	*		*
APIACEAE			
Xanthosia? heugelii	*		
EPACRIDACEAE			
Astroloma pallidum	*		
Conostephium pendulum (Pearl Flower)	*		
Leucopogon propinquus	*		
Leucopogon sp.	*		
Lysinema ciliatum (Curry Flower)	*		
GENTIANACEAE			
Villarsia sp.		*	
RUBIACEAE			
Opercularia vaginata	*		
GOODENIACEAE			
Dampiera linearis (Narrow-leaved Dampiera)	*		
Lechenaultia biloba (Blue Lechenaultia)	*		*
Lechenaultia linarioides	*		
Scaevola canescens			
STYLIDIACEAE			
Stylidium? piliferum (Common Butterfly Trigger Plant)	*		
ASTERACEAE			
**Arctotheca calendula* (Cape Weed)			*
Lagenifera stipitata	*		*
**Ursinia antheomoides*	*		*
UNKNOWNS			
Aquatic plant 1		*	
Aquatic plant 2		*	
TOTAL NUMBER OF SPECIES:	86	11	51.

103 native taxa
+ Dodonaea hackettiana

Fig 3: KEY FOR DETAILED VEGETATION MAP (~~FIGURE 2~~)

NUMBERS ON MAP	CLASSIFICATION
	REED FORMATIONS
1	*Machaerina articulatum*
	FLOODED GUM FORMATIONS
2	*Eucalyptus rudis*
3	*Eucalyptus rudis and Melaleuca preissiana*
4	*Eucalyptus rudis, Kunzea vestita and Acacia saligna*
	WOODLAND FORMATIONS
5	Mixed Jarrah-Banksia Woodland
	MELALEUCA FORMATIONS
6	*Melaleuca teretifolia* Thicket
7	*Melaleuca teretifolia-Melaleuca rhaphiophylla* Thicket
8	*Melaleuca incana - Melaleuca lateritia - Astartea fascicularis* Thicket
	TALL SHRUB FORMATION
9	*Kunzea vestita - Pultenaea reticulata*
	LAND USE CLASSIFICATIONS
10	Cleared Land
	Open Water

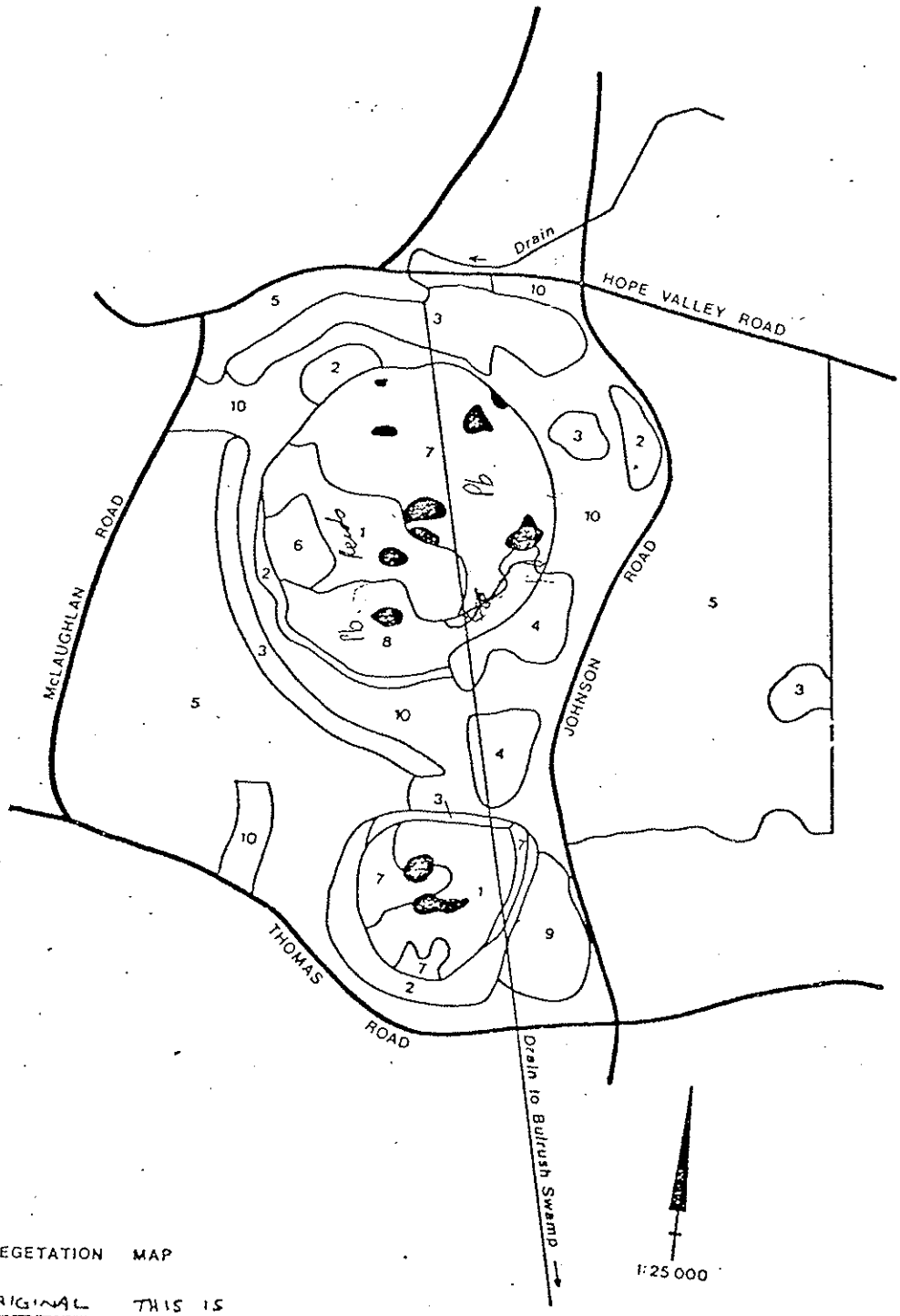


Figure 2. DETAILED VEGETATION MAP

(NB. IN THE ORIGINAL THIS IS AN OVERLAY TO THE PHOTOGRAPH).

The Spodacles

FAUNA SURVEY OF THE "G" AREA

by

E.D. Kabay

September 1979

(unpublished Alcoa notes)

INTRODUCTION

The wetlands of the south west of Western Australia consist of two broad geographical types- inland and coastal. Inland wetlands tend to be saline and dry up during the hot summer drought period. In good winters these wetlands are waterfowl breeding areas. Coastal wetlands are fresh and the deeper ones usually retain water over the summer period. Coastal lakes are mainly summer refuge areas though breeding does also occur in them during winter/spring months.

The coastal wetlands consist of the west and south coastal areas of Western Australia. One of the west coastal wetlands covers the Swan Coastal Plain. The wetlands on the Plain north of Perth are hydrologically distinct from those south of Perth. Within the south Swan Coastal Plain wetlands there are several geographical groups of wetlands. The "G" area is associated with the eastern group of wetlands in the area. This group differs from other groups of wetlands in the area and even within this eastern group individual lakes differ from each other.

The "G" area is 538 hectares and consists of 2 swamps - Large Eye Swamp of 68 hectares and Small Eye Swamp of 38 hectares (the two swamps together are called the Spectacles). The swamps are within that eastern group of swamps that occur on or near the boundary of the Spearwood (Qpc) and Bassendean (Qpb) Dune Systems - the two main geomorphic elements of the Plain area. Other lakes/swamps in this group are North, Bibra, South, Little Rush, Yangebup, Kogalup, Thompson, Banganup, Wattleup, Mandogalup and Bollard Bulrush.

These lakes/swamps consist of either peats or peaty sands (Qrw) and are fairly fertile. Where possible they are or have been in the past cleared, drained and utilized for agricultural purposes. The area around the lakes are leached quartz sands and are very infertile. Without added fertilizer they are unproductive and because of this have not been extensively cleared and used for agricultural purposes. As a result, fairly large areas of this type remain uncleared especially away from the swamps.

The swamps/lakes of this eastern group range from being totally cleared, drained and extensively utilized (Mandogalup) to protected conservation areas (Thompson). Table 1 tabulates the current state and status of each of these lakes.

...../2

METHODS

The study of the "G" area involved:

(i) Where applicable ascertaining the physical, chemical and biological characteristics of the different sub-areas of the G area.

(ii) Comparing the characteristics found with those found for similar areas (the areas described in the introduction).

Studies on the area have been going on progressively since July 1978. They involve systematic trapping (both pit and cage traps), spot lighting, opportunistic collecting, water sampling and detailed observations. Data collection on the other areas involve water sampling, observation of waterfowl and anslysis of the literature on these areas and relevant data in the W.A. Museum and R.A.O.U. "Bird Atlas Scheme".

Where possible data on the "G" areas was separated on the basis of whether it was found in the north or south areas. In regard to fauna Zones 3 and 2 of Glossop (1979) were combined. Thus two fauna areas were considered to exist in the "G" area - wetlands (Zone 1) and Banksia/Jarrah woodlands (Zones 3 and 2).

RESULTS

Physical Disturbance

Disturbance of the G area would have been minimal up until the area was drained during the early 1930's. Only the swamp margins which experienced several months with no surface water would have been cleared and

utilized. With drainage, a greater part of the wetland areas would have been utilized. 1942 aerial photos compared with 1963 and 1978 areas reveal large areas of both swamps were cleared - especially the north one. The woodlands in contrast show no evidence of having been cleared and would have only been used for light grazing purposes.

Since 1942 there has been a general increase in the amount of vegetation in the swamp area - especially in the amounts of closed Melaleuca sp. woodland, reeds and Flooded Gum. This revegetation is particulary apparent in Large Eye (north section). It would seem that after the initial drainage and clearing, very little maintenance clearing has taken place in the swamp itself. Subsequent agricultural activities have confined themselves to the east, south and west boarders of Large Eye. Currently the main physical disturbance of the area are:

(1) Trail bike riding

(2) Unauthorized taking of some peat material.

(3) Fires-mostly in the woodland areas and occasionally in the drier parts of the swamp.

Overall the wooded area is the more disturbed compared to the swamps itself.

Of the lakes in the eastern chain with some vegetation, only Banganup shows minimal disturbance (Table 1) - This lake has a resident ranger and is fenced off. Others suffer from trail bikes, regular fires, grazing or recreational/urban/industrial pressures.

The "G" area has one of the largest wetlands in the eastern chain (Table 1). In addition it has a lower percentage of open water than the rest.

Spectacle Swamps have a maximum depth of about 1.0 - 1.5 m which is similar to the others except North which is about 4 m. The swamp is seasonal drying out by the early autumn.

North Bibra and Thompson usually last through summer, though in a dry winter the latter two also dry up. The others dry up by the same time as Spectacle Swamps.

...../4

Water Quality

The Spectacle Swamps are interconnected by a series of drains to the north Mandogalup Swamp and the southern Bollard Bulrush Swamp. Water flow is from Mandogalup through the Spectacles (Large to Small Eye) to Bollard then into the Serpentine River. This drainage does help to keep solute levels down compared to other lakes of the area (Table 2) but could be a source of polutants from the Mandogalup agricultural area.

E. coli counts suggest that this is so - Large Eye has more bacteria than Small Eye (Table 3). However in comparison with the other lakes of the eastern chain the biological water quality of the Spectacle Swamps is very high. The "G" area swamps seem to be able to "purify" the polutants coming in.

Salmonella sp. were absent from 1 sample (August '79) taken from the Spectacle Swamps. However more samples are required to see if this swamp is one of the few swamps in the Swan Coastal Plain that have very few if any Salmonella sp. in it.

In regard to chemical components the Spectacle Swamps compare favourably with the other swamps (Table 2). Even with the drainage from Mandogalup Phosphorus and Ammonium N levels are lower than that seen in the two conservation lakes, Thompson and Banganup.

Comparison between Large and Small Eye indicate that Phosphorous and Nitrogen polutants from Mandogalup are not effecting Large Eye - levels of these two substances are less in Large Eye than Small Eye. Large Eye tends to have a more favourable water quality index than does Small Eye (Table 2) - it has slightly fresher water in it.

Birds

19 Wetland and 63 Banksia/Jarrah woodland bird species (82 all told, Table 4) have so far been seen in the "G" Area. This compares with a total of 110 found in Thompson (P.Clay pers. comm.) over a period of 3 years. Sedgwick (1973,1977) in a detailed study found 103 bird species in Benger Swamp

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Birds (Cont'd)

(12 km south of Harvey and 320 hectares). In an intensive study over the 3 summer months during 1975/76, 49 species were found at North Lake, 43 at Bibra Lake, 49 at South Lake, 29 at Little Rush Lake, 47 at Yangebup Lake, 66 at Kogolup Lake, 67 at Thompson Lake and 23 at Wattleup Lake. (The Cockburn Wetlands 1976).
The "G" area has one of the highest number of terrestrial bird species. Sedgwick (1973,1977) has recorded 47 terrestrial species at Benger Lake and P. Clay 67 species (pers. comm.) at Thompson. Benger has very little Banksia/Jarrah woodland while Thompson Reserve has 337 hectares of it. The "G" area has 432 hectares of Banksia/Jarrah woodland, some of which has been cleared.

Bird species that haven't been recorded by the R.A.O.U. "Bird Atlas Scheme" for the region around "G" area are:

Rufous Night Heron
Wood Duck
Restless Flycatcher
Marked Woodswallow

Reference to the Scheme showed that recorded breeding sites of the Rufous Night Heron in W.A. are very few (Table 5,6). Even in Australia there are few recorded sites. During the 1978/79 summer breeding season some 19 nests with young in them were found in Large Eye in the closed Melaleuca woodlands. Others in W.A. are near Bunbury (R.A.O.U.), and a small one at Kogalup (Cockburn Wetland Study 1976). Serventy and Whittle (1976) reported that heronries were found at Pinjarra, Waterloo and Wellering Swamp (Gingin). It is not known if they still exist.

Information (Serventy and Whittle 1976) suggest that a heronry lasts until disturbed. At the Perth Zoo a nesting colony lasted from 1914 to 1941 until it was destroyed.

At Large Eye the bird departs when the swamp dries up in late summer, returning there when water is present to roost,feed and breed. The heron is a nocturnal bird roosting in trees during the day and feeding in wet swamps on insects, gilgies and frogs at night.

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Mammals:

10 Mammal species have been identified in the area, 5 of which are introduced.(Table 7) Other species that may be in the area, are 3 species of Bats (Eptesicus pumilus - Little Bat, Chalinolobus gouldii - Gould's Bat, and Nyctophilus timoriensis - Lesser Long-eared Bat Records), Water Rat (Hydromys chrysogaster), Common Wambenger (Phascogale tapoatafa),and Honey Possum (Tarsipies spencerae)(W.A. Museum Records) None of these species are rare and endangered.

Reptiles:

17 Species of reptiles have been found in the "G" area (Table 8). It is estimated that some 50 species of reptiles exist on the Swan Coastal Plain. Of the species found in the "G" area Lerista lineata (Lined Skink) is on the Rare and Endangered list. It has only been found on the Swan Coastal Plain south of Perth. Because of its burrowing habit it is not well represented in the W.A. Museum's collection. Though local in distribution recent work suggests it is fairly common within these restricted localities (Davidge 1979).

In the "G" area it has so far been found only in an area north of Large Eye. A current research program is underway to plot its distribution. within the "G" area and within the Swan Coastal Plain. Unfortunately this animal is not active until the summer months, so data for this study will not be available until early next year.

Frogs:

6 species of frogs have been found out of a possible 8 that can occur in the area. The Moaning, Western Banjo and Turtle Frogs are found in the Banksia/Jarra Woodlands as well. In fact the Turtle Frog does not require free water to breed. The other species are restricted to the wetlands of the "G" area. (Table 9).

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Other Fauna:

Table 10 lists some other fauna that have been found in the "G" area. The restricted number of aquatic snails and fish is most likely due to the fact that the swamp is seasonal.

References

Davidge C. (1979) A census of a community of Small terrestrial vertebrates Aust. J. Ecol. 4 165-170

Glossop B.L. (1979) Vegetation survey of Small Eye and Large Eye Lakes and the surrounding Woodlands - the proposed location of the future mud disposal lake for the Kwinana Refinery ('G' Lake) Alcoa.

Sedgwick E.H. (1973) Birds of the Benger Swamp. W.A. Naturalist 12 147-155

Sedgwick E.H. (1977) Further notes on birds of Benger Swamp. W.A. Naturalist 14 22-24.

Serventy D.L. and Whittell H.M. (1976) Birds of Western Australia. Uni. of W.A. Press: Perth.

The Cockburn Wetlands - An environmental Study 1976 Murdoch University.

Table 1. Characteristics of Lakes and surrounds in the eastern group

	Type of Land	Type of Water	Wetland Vegetation	Woodland Vegetation	Use	Total Area of Wetland (hectares)	Area of open Water (hectares)	% of open water to Total Wetland
North	Crown	Poluted	open water uncleared	mostly cleared	Regional open space	267	26	96
Bibra	Crown/ Private	Poluted	open water uncleared	mostly cleared	Regional open space/ grazing	120	110	92
South	Private	Poluted	uncleared	cleared	Grazing	5	3	60
Little Rush	Private	Poluted	uncleared	cleared	Industrial/Grazing	4	1	25
Yangebup	Crown/ Private	Poluted	little vegetation	part cleared	Industrial/Urban	39	38	97
Kogolup	Private	Poluted	uncleared	part cleared	Grazing	40	11	28
Thompson	Crown	Poluted	little vegetation	uncleared	Conservation	178	175	98
Banganup	Crown	OK	uncleared	uncleared	Conservation	12	1	8
Wattleup	Private	Poluted	Part cleared	cleared	Intensive Agriculture	11	9	82
Mandogalup	Private	Poluted	cleared	partly cleared	Intensive Agriculture	-		
Bollard Bulrush	Private	Poluted	Part cleared	partly cleared	Intensive Agriculture	-		
G Area Large Eye Small Eye	Private	OK	uncleared	uncleared	-	106 68 38	6	6

Table 2 Chemical Analysis of water samples taken August 1979 from several lakes in the eastern group.

Lake	Colour	pH	non-filtered residue	P.Alkalinity mg/l	M.Alkalinity mg/l	Total Hardness mg/l	Total P mg/l	NH_3-N mg/l	Cl^- mg/l	$SO_4^=$ mg/l	Total Diss. Solids Oct'78 mg/l	NO_2-N mg/l	F mg/l	Na mg/l	K mg/l	Ca mg/l	Mg mg/l
Large Eye (North Swamp)	25	6.2	2	0	9	344	0.013	0.027	314	280	691	0.001	<0.1	280	10	75	40
Small Eye (South Swamp)	40	6.1	2	0	13	374	0.038	0.052	267	270	855	<0.001	<0.1	230	10	75	50
North Lake	45	6.9	5	0	48	108	0.035	0.019	156	35	405	<0.001	<0.1	150	8	28	20
South Lake	480	7.00	5	0	54	338	0.063	0.030	201	156	-	<0.001	<0.1	180	10	30	30
Yangebup	400	8.1	5	0	400	210	0.040	0.041	629	36	2090	<0.001	0.1	430	130	40	20
Kogalup	50	7.55	2	0	118	163	0.033	0.020	225	50	2760	<0.001	<0.1	190	38	30	20
Bibra	240	7.40	10	0	149	270	0.166	0.022	516	60	1540	0.011	<0.1	440	28	60	30
Thompson	200	8.40	23	0	151	684	0.103	0.38	554	440	3470	0.021	0.3	860	50	160	90
Bulrush	400	6.40	6	0	33	100	0.088	0.009	84	84	-	0.011	<0.1	120	2	20	20
Banganup (Sample Oct '78)	250	4.7	-	0	4	560	0.048	-	522	524	1670	-	-	380	10	8	7
Wattleup (Sample Oct '78)	250	7.0	-	0	52	202	0.028	-	170	154	598	-	-	87	9	56	18

Table 3 Faecal Coliforms per 100 ml found during winter in lakes of the eastern group.

Lake	Mean Faecal Coliforms per 100 ml	(Number of Samples)	Range
North	32	(5)	0-43
Bibra	20	(5)	4-75
Thompson	4	(5)	0- 9
Yangebup	19	(5)	0-64
South (summer sample)	43	(1)	
Little Rush (summer sample)	93	(1)	
Kogalup (" ")	93	(1)	
Wattleup (" ")	240	(1)	
Large Eye (G Area)	43	(1)	
Small Eye (G Area)	23	(1)	

Table 4 Bird species found in the "G" Area

Wetland Species

Species	Comments
Great Crested Grebe (Podicepts cristatus)	A few
Hoary-headed Grebe (Poliocephalus poliocephalus)	A few
Darter (Anhinga melanogaster)	Rare
Pied Cormorant (Phalacrocorax varius)	Common
Little Black Cormorant (P. sulcirostris)	Common
Little Pied Cormorant (P.melanoleucos)	Common
White Faced Heron (Ardea novaehollandiae)	Rare
Rufous Night Heron (Nycticorax caledonicus)	Common in North Swamp Breeding
Sacred Ibis	Occasionally Common
Black Swan (Cygnus atratus)	Rare
Australian Shelduck (Tadorna tadornoides)	Occasionally Common
Pacific Black Duck (Anas superciliosa)	Common Breeding
Grey Teal (A. gibberifrons)	Common
Maned Duck (Chenonetta juba)	Occasionally Common
Blue-billed Duck (Oxyura australia)	Rare
Musk Duck (Biziura lobata)	Common
Purple Swamp Hen (Porphyrio porphyrio)	Common
Eurasian Coot (Fulica atra)	A few
Banded Lapwing (Vanellus tricolor)	Rare

Banksia/Jarrah Woodland Species

Species	Comments
Black-shouldered Kite (Elanus notatus)	Common
Whistling Kite (Haliastur sphenurus)	Common
Brown Goshawk (Accipiter fasciatus)	Rare
Collared Sparrowhawk (Acciptiter cirrhocephalus)	Common
Brown Falcon (Falco berigora)	Rare
Australian Kestral (F. cechroides)	Rare

Table 4 Bird species found in the "G" Area (Cont'd)

Banksia/Jarrah Woodland Species:

Species	Comments
Painted Button-quail (Turnix varia)	Rare
Feral Pigean (Colomba livia)	Rare, in farmlands
Laughing Turtle-dove (Streptopelia senegalensis)	In farmlands
Common Bronzewing (Phaps chalcoptera)	Common
Brush Bronzewing (P. elegans)	Rare
White-tailed Black Cockatoo (Calyptorhynchus baudinii)	Flying over
Golah (Cacatua roseicapilla)	In adjacent area
Purple-crowned Lorikeet (Glossopsitta porphyrocephala)	Visitor
Red-capped Parrot (Porpureicephalus spurius)	Common
Port Lincoln Ringneck (Barnardius Zenaris)	Common
Shining Bronze-Cuckoo (Chrysococcyx lucidus)	In eastern area
Fan-tailed Cuckoo (Cuculus pyrrhophanus)	In eastern area
Southern Boobook (Ninox novaeseelandiae)	A few
Tawny Frogmouth (Podargus strigoides)	A few
Laughing Kookaburra (Dacelo novaeguineae)	Common
Sacred Kingfisher (Halcyan sancta)	Visitor during summer
Richard's Pipit (Anthus novaeseelandiae)	In farmlands
Welcome Swallow (Hirundo neoxena)	In farmlands
Tree Martin (Cecropis nigricans)	Common
Black-faced Cuckooshrike (Coracina novaehollandiae)	Common
Scarlet Robin (Petroica multicolor)	Breeding, common
Red-capped Robins (P. goodenovii)	Rare
Golden Whistler (Pachycephala pectoralis)	Common
Rufous Whistler (P. rufiventris)	In eastern area
Grey Shrike-thrush (Colluricincla harmonica)	Common
Restless Flycatcher (Myiagra inquieta)	A few
Grey Fantail (Rhipidura fuliginoza)	Common
Willie Wagtail (R. leucophrys)	In farmlands
Splendid Fairy-wren (Malurus splendens)	Common in thickets
White-Browed Scrubwren (Sericornis frontalis)	Common in thickets
Weebill (Smicrornis brevirostris)	Breeding, common
Western Gerygone (Gerygones fusca)	Common
Inland Thornbill (Acanthiza apicalis)	Common
Western Thornbill (A. inornata)	Breeding, common
Yellow-rumped Thornbill (A. chrysorrhoa)	Common

Table 4 Bird species found in the "G" Area (Cont'd)

Banksia/Jarrah Woodland Species

Species	Comments
Varied Sitella (Daphoenositta chrysoptera)	A few
Red Wattlebird (Anthochaera carunculata)	Common
Little Wattlebird (A. chrysoptera)	Common
Yellow-throated Miner (Manorina flavigula)	In adjacent area
Singing Honeyeater (Lichenostomus virescens)	Common
Brown Honeyeater (Lichmera indistincta)	Common
New Holland Honeyeater (Phylidonyris novaehollandiae)	Common
Western Spinebill (Acanthorhynchus superciliosus)	Common
Spotted Pardalote (Pardalotus punctatus)	Rare
Striated Pardolate (P. striatus)	Common
Silvereye (Zosterops lateralis)	Breeding, Common
Australian Magpie-lark (Grallina cyanoleuca)	Common
Masked Woodswallow (Artamus personatus)	Rare
Dusky Woodswallow (A. cyanopterus)	Common
Grey Butcherbird (Cracticus torquatus)	Common
Western Magpie (Gymnorhina tibicen)	Common
Grey Currawong (Strepera versicolor)	Common
Australian Raven (Corvus coronoides)	Common
Little Crow (C. bennetti)	A few

Table 5 10' Locations of sightings and breeding of the Rufous Night Heron in S.W. of W.A.

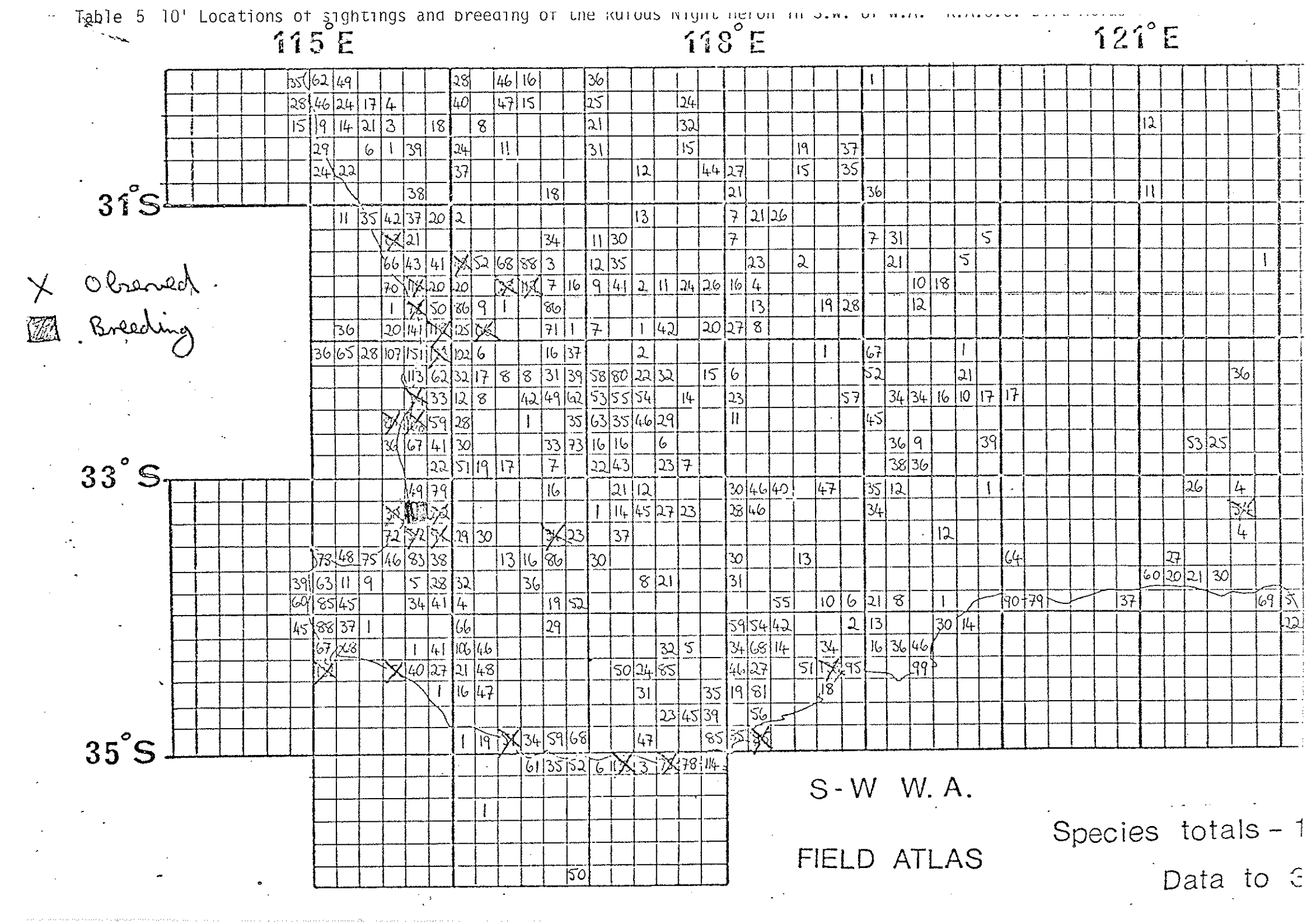


Table 6

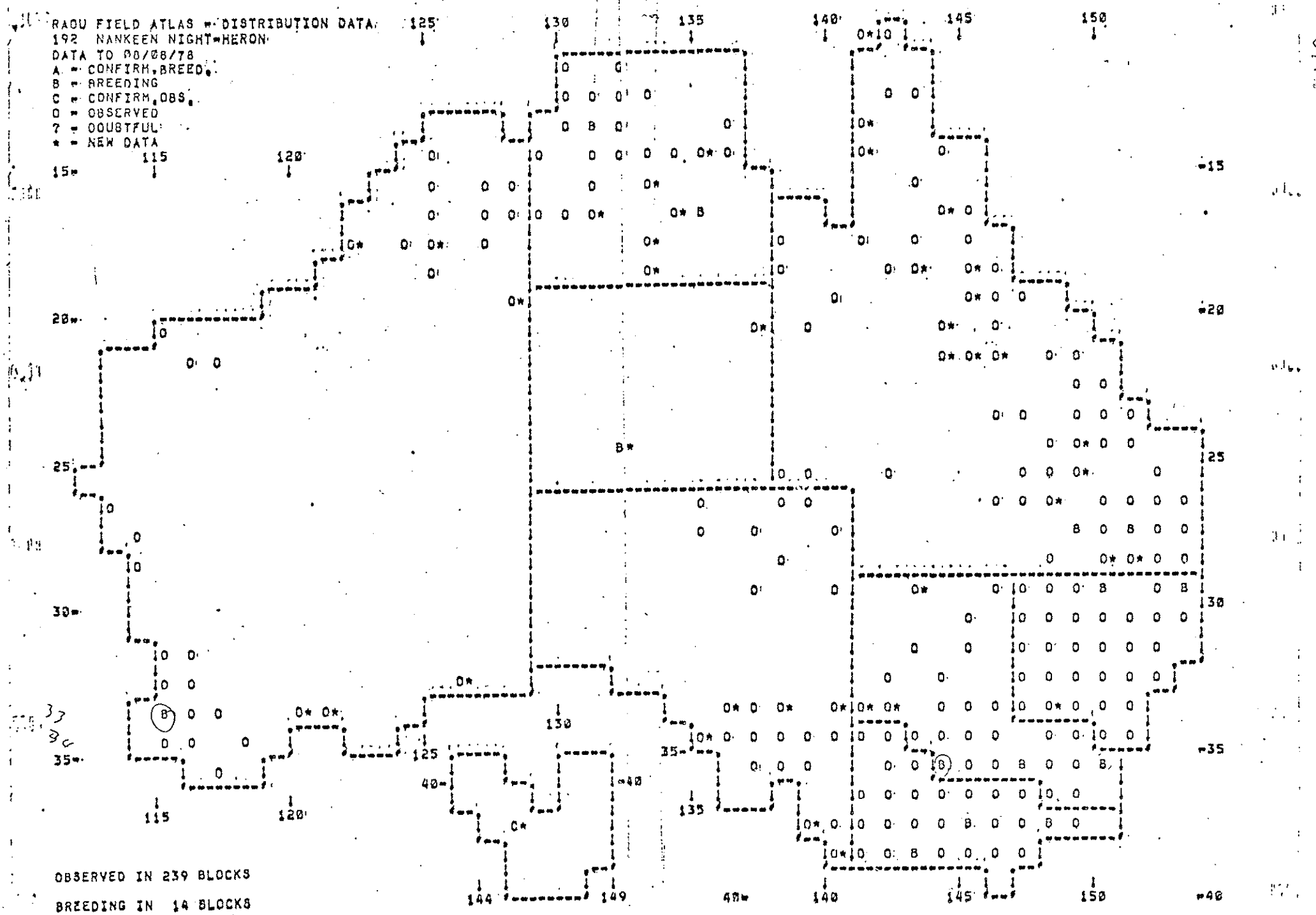

RAOU FIELD ATLAS - DISTRIBUTION DATA
192 NANKEEN NIGHT-HERON
DATA TO 00/00/78
A = CONFIRM.BREED.
B = BREEDING
C = CONFIRM.OBS.
O = OBSERVED
? = DOUBTFUL
* = NEW DATA
OBSERVED IN 239 BLOCKS
BREEDING IN 14 BLOCKS

Table 7 Mammals in the "G" area

Species	Comments
Western Grey (Macropus fuliginosus)	Rare
Western Brush Wallaby (M. irma)	Common
Brush Possum (Trichosurus vulpecula)	Seen dead on Thomas Road and 1 seen in Flooded Gum.
Short-nosed Bandicoot (Isoodon obesulus)	Common in thick vegetation.
Echidna (Tachyglossus aculeatus)	Dead on Road.
* House Mouse (Mus musculus)	Rare
* Black Rat (Rattus rattus)	Common. Especially in farm areas.
* European Rabbit (Oryctolagus cuniculus)	In wetter areas.
* Domestic Cat (Felis catus)	Common
* Fox (Vulpes vulpes)	Common
	Seen in "F" area.
	A few.

* Introduced

Table 8 Reptiles in "G" area.

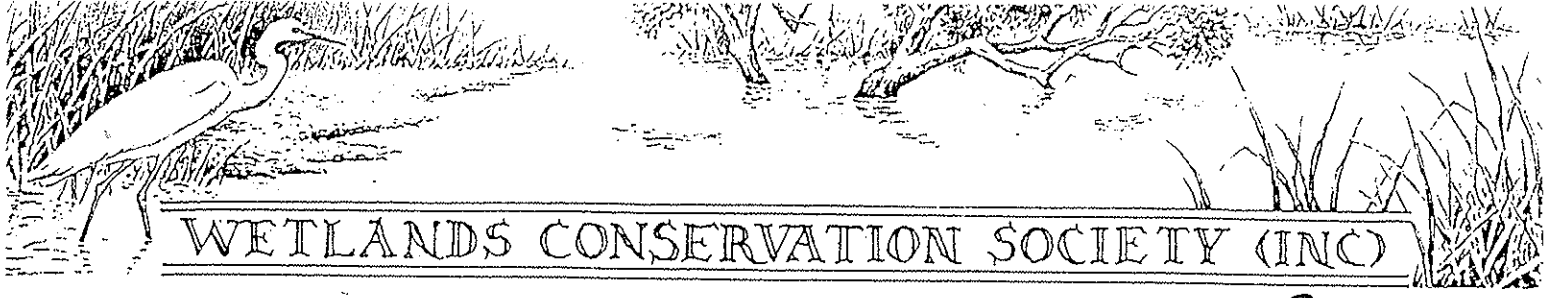
Species	Comments
Chelidae	
Long-necked Tortoise (Chelodina oblonga)	Common. Especially in Large Eye
Agamidae	
Sandhill Dragon (Amphibolurus adelaidensis)	Very Young animals found
Dwarf Bearded Dragon (A. minor)	Found in adjacent area.
Gekkonidae (Gecko)	
Marbled Gecko (Phyllodactylus marmoratus)	
Scincidae (Skinks)	
Wall Lizard (Chryptobepharus plagiocephálus)	Common
Ctenotus impar	Common
C. leseurii	Common
Lerista lineata	Common in restricted locality
L. elegans	Common
Menetia greyii	Common
Morethia lineoocellata	Common
Bob-tail Lizard (Tiliqua rugosa)	Common
Swamp Skink Lizard (Leiolopisma trilineatus)	Common
Hemiergis peronii	Seen
-Elapidae (Snakes)	
Tiger Snake (Notechis scutatus)	Common around swamp.
Dugite (Demansia affinis)	Common in woodland
Little Whip Snake (Denisonia gouldii)	Seen
Varanidae (Race-horse Goanna)	Common. Young
Bungarra (Varanus gouldii)	animals found.

Table 9 Frogs in "G" area.

Species	Comment
Hylidae	
Slender Tree Frog (*Litoria adelaidensis*)	Common
Leptodactylidae	
Moaning Frog (*Heleioporus eyrei*)	Common
Western Banjo Frog (*Limmodynastes dorsalis*)	Common
Turtle Frog (*Myobatrachus gouldii*)	Fairly common
Ranidella glauerti	Common
R. insignifera	Common

Table 10 Other fauna in "G" area

Species	Comments
Fresh Water Crayfish	
Gilgie (*Cherax quinquecorinatus*)	Common. Food for wetland birds.
Aquatic Snails	
Physa sp.	Found attached to weed.
Fish	
Mosquito fish (*Gambusia affinis*)	Introduced. Common



WETLANDS CONSERVATION SOCIETY (INC)

(6) a to t

c/- 14 Stone Court, Kardinya, WA 6163

16 July 1995

The System Six Study Team
Department of Environmental Protection
141 St George's Terrace
Perth WA 6000

Dear Sir,

System Six Review

The Wetlands Conservation Society wishes to make a submission to the System Six Review. This submission is in two parts. Firstly some comments on the general principles and secondly some specific nominations.

(1) General Principles

The original System Six Red Book, published in 1983, included 19 general recommendations. Many of these are now irrelevant or outdated. Recommendations 1 - 6 relate to the management of State Forests. These have been overtaken by events. It is now clear that the only effective way to conserve State Forest is to place it in national parks or nature reserves. There is an urgent need to set aside a comprehensive and representative system of forest reserves and this should be part of a new general recommendation.

Recommendations 7 - 12 have also been overtaken by events. Many of the areas recommended for protection as reserves have been destroyed (eg. Casuarina M98, Buckland Hill M55, Port Kennedy M106, etc.) Many others have not been established because of CALM's reluctance to take on new reserves without additional funding. Perhaps these reserves should be vested in other authorities (eg. local government, community groups, LCDCs, etc.) if CALM are unwilling to accept them. The Port Kennedy LCDC has done an outstanding job of managing that reserve, for example, at little cost to the WA Government.

Recommendations 13 and 14 are still relevant and they should be supplemented by a recommendation about how this process will be funded. A regional improvement fund like the MRIF should be established to facilitate the acquisition of land for parks and recreation in regional areas.

Recommendations 15 - 17 need very careful attention. Although the Ministry for Planning has done quite a good job of identifying and resuming land for Regional

Parks, CALM has failed to co-operate and so far we still do not have any legally established Regional Parks. The WCS believes that the Regional Park Concept is extremely important in the System Six Area because of the multiple uses of reserves. The concept of a regional park as an area for conservation, recreation and landscape protection is now well established. We have least confidence in CALM's willingness to manage these Parks and we have proposed that MFP should continue to manage them until all of the policy and management issues have been resolved. We believe that funding should come from local authority rates, land tax and development tax. Ultimately a Regional Parks Authority may be the best body to manage them. Because they are so different to national parks and nature reserves the RPA should be quite different from the NPNCA and have its own budget. It should work closely with CALM, MFP and the local authorities.

Recommendations 18 and 19 are still relevant and have been partially implemented. However recommendation 18 does not specify which agency should fund and coordinate this task. This should be addressed in the update.

The General Recommendations should include an additional set which relate to the funding and implementation of the specific recommendations. We believe that there is a need for an implementation committee which will set priorities and review progress. A major review or progress report should be required every three years. A funding mechanism for implementation and management of the System Six conservation estate should be clearly identified in the general recommendations. The failure to do this was one of the main reasons why the original System Six exercise was so unsuccessful.

(2) Specific Recommendations

I am aware that the DEP has provided a detailed nomination form. However, we wish to nominate so many areas that it is quite impracticable for us to fill in such detailed forms. Most of the areas we wish to nominate are already documented in official Government reports, so the degree of detail requested is unnecessary. However, I would be happy to supply any additional information you require for any of the nominations we have made. Please call me on 337 7113 (h) or 360 2274 (w) or 310 1711 (fax) if you need further information.

Our specific recommendations for new areas to be included in the System Six Report are :

(a) The Spectacles Swamps near Kwinana. These are part of the Beeliar Regional Park and are fully described in the Planning Report for that Park. They are also zoned P & R in the MRS.

(b) Long Swamp on Hope Valley Road, Kwinana. This is also included in the Beeliar Regional Park. It is the last of the wetlands in the western chain of the Cockburn Wetlands. It is privately owned.

(c) Bollard Bulrush Swamp in Wellard. This is also part of the Beeliar Regional Park

(d) Tamworth Hill Swamp in Baldivis. This is part of the proposed Rockingham Lakes Regional park. It is fully documented in the ecological study of the Rockingham lakes carried out by V and C Semeniuk for the Australian Heritage Commission. It is zoned for Parks and Recreation in the MRS and it is affected by a mining claim.

(e) Anstey Swamp, Baldivis. This is also a part of the proposed Rockingham Lakes Regional Park. It is owned by the MFP and is zoned for Parks and Recreation. It is fully documented in the Semeniuk study and by the EPA in its original report on the Secret Harbour project.

(f) Paganoni Swamp, Baldivis. This wetland is an outstanding conservation area. It is owned by the MFP and is zoned for Parks and Recreation. it is fully documented in the Semeniuk study and in the Wildflower Society's nomination of this reserve to the Register of the National Estate.

(g) Lark Hill wetlands. This area lies adjacent to Port Kennedy M106 and contains some important wetlands and parallel dune formations. It is fully described by the Australian Heritage Commission in its listing of the area. The land is owned by the MFP and is zoned for Parks and Recreation. It is intended for inclusion in the Port Kennedy Scientific Park.

(h) Jandakot Botanical Park. This area is fully documented by the MFP in its Planning study for the Jandakot Botanical Park. It includes some areas such as M97, M98, M99 and M100 which are already in the System Six Red Book. However, there are several other important reserves in this area which should be included in the System Six Report. All of this land is reserved for Parks and Recreation and most of it is owned by the State.

(i) Piney Lake, Winthrop. This wetland was not included in System Six. However, it is part of the Beeliar Regional park and supports a diverse range of waterfowl and has some remnant vegetation. The City of Melville recently completed a management plan for this reserve.

(j) Blue Gum Swamp, Mt Pleasant. This wetland is an important wildlife refuge. It is well managed by the City of Melville and is being rehabilitated by a local group. It has a management plan, prepared by the City of Melville. It could be incorporated into M73 as it is very close to Booragoon Lake.

(k) Brixton Street Wetlands, Gosnells. These important wetlands should be added to M69. Their importance is well documented in the EPA assessment of the housing proposals for this area.

(l) Ken Hurst Park. Leeming. This is an important area of wetland and banksia woodland adjacent to M94. It contains declared rare flora as indicated in the Floristic Study of the Swan Coastal Plain. The Murdoch Branch of the Wildflower Society has done a detailed flora survey of the site. Contact Diana Corbyn for details.

(m) Twin Bartram Swamp, Hird Road Swamp, Solomon Road Swamp and Gibbs / Russell Swamp in Jandakot. These small wetlands are the best remaining examples of the Jandakot suite of wetlands. They are reserved in the local open space system and are well documented by V. Semeniuk in the report to Gold Estates on Wetlands East of Thomsons Lake.

(n) Creery Wetlands. These important samphire marshes should be added to C50 (Peel Inlet). Their values are fully documented in the Bamford Report which was attached to the proposal for the Harbour City Canal Estate.

(o) Vasse - Wonnerup Regional park. The whole area of the Broadwater, Deadwater and the Vasse Wonnerup estuaries should become a regional park. This concept should be proposed in the System Six update.

(p) Cockburn Wetlands - Eastern Chain M93. The boundaries of this area should be modified to coincide with the boundaries of the Beeliar Regional Park.

(q) Folly, Maramanup, Duck and Beenyup Pools, Baldivis. These small pools on the Folly Drain are important breeding and feeding areas for wildlife. The Folly Drain is an important wildlife corridor and its conservation value should be recognised in the System Six Report.

(r) West Corio Swamp, Karnup. This is an important breeding area for the straw-necked ibis. It should be protected. The EPA did an assessment of it several years ago when sand mining was proposed.

(s) Serpentine River Valley. The entire length of the Serpentine River and its flood plain should be listed in the System Six Report. It is a major wildlife corridor and a habitat for many species. It should be recommended as a regional park.

(t) Wilbinga and Guilderton. Two large blocks of coastal heathland south of the mouth of the Moore River. The Wilbinga block was proposed as a land swap for M1 which has been approved for subdivision. These blocks are adjacent to C12 and together provide an outstanding opportunity to conserve the best remaining transect of coastal vegetation in the northern part of System Six.

If you require further information about any aspect of this submission, please contact me. I would like some feedback on your decision about these areas.

Yours faithfully,

Philip Jennings
President

SYSTEM 6 BUSHLAND SUBMISSION FORM
FOR CONSIDERATION IN THE UPDATE PROGRAMME

If you wish to submit more than one area for consideration in the System 6 update, please use a separate form for each area.

Please fill in each section giving as much information as possible.

LOCATION, OWNERSHIP AND ZONING OF THE AREA

1. Location THE SPECTACLES

Please give as accurate and detailed a description as possible of the site location

Please include either a hand drawn or copied map showing the area of the area

a) Bordering Roads: HOPE VALLEY, McLAUGHLAN, [redacted] THOMAS, THE FREEWAY.

b) Nearest Corner: .....

c) Lot Number: ..... Street Number: .....

d) Town/Suburb/Location: .....

e) Local Council: TOWN OF KWINANA

f) Site Name (if any): .....

g) Approximate size of the area (ha): .....

h) Please locate the area on a map and give us map references if possible:

.....

i) Map: ..... Streetsmart /UBD/Other: .....

j) Map no.: .....

k) Grid Ref: .....

l) Please give any other information that may help us to find the location:

.....

m) Are you aware of any development proposals that are likely to affect the area?

.....

.....

NOTE: Areas that have already been given development APPROVAL should not be nominated

9. What percentage of the wetland is open water in summer? ..... 25% .....

CAN YOU TELL US A LITTLE ABOUT THE VEGETATION /FAUNA ON THE NOMINATED AREA.

10. What percentage of the area is indigenous vegetation? .....

11. If the area includes regions cleared of native bushland please indicate reasons for the inclusion. .....

.....

12. Has any previous flora or fauna survey work been done on the area? .....

If yes, please give details of the work .....

.....

.....

13. How would you rate the condition of the native bushland? (see attached table)

a) pristine
b) excellent
c) very good
d) good
e) degraded
f) completely degraded
g) don't know

14. Please indicate the disturbances affecting the area and where appropriate the percentage of the area disturbed.

a) Partial clearing
b) fragmentation
c) Selective removal of species: timber cutting, wildflower picking, mowing dieback and other plant diseases
d) Fire regime, including intensity, season and frequency
e) 'Enrichment plantings' that is plantings of species not found in that community
f) Weed invasion
g) Animal impact: horses, foxes, rabbits, cats, dogs, camels, goats etc
h) Soil movement, both removal and dumping
i) Changes in water regimes; flooding, drainage and watering
j) Salinity
k) Fertiliser drift and along waterways nutrient influx
l) Mining, including that for road works

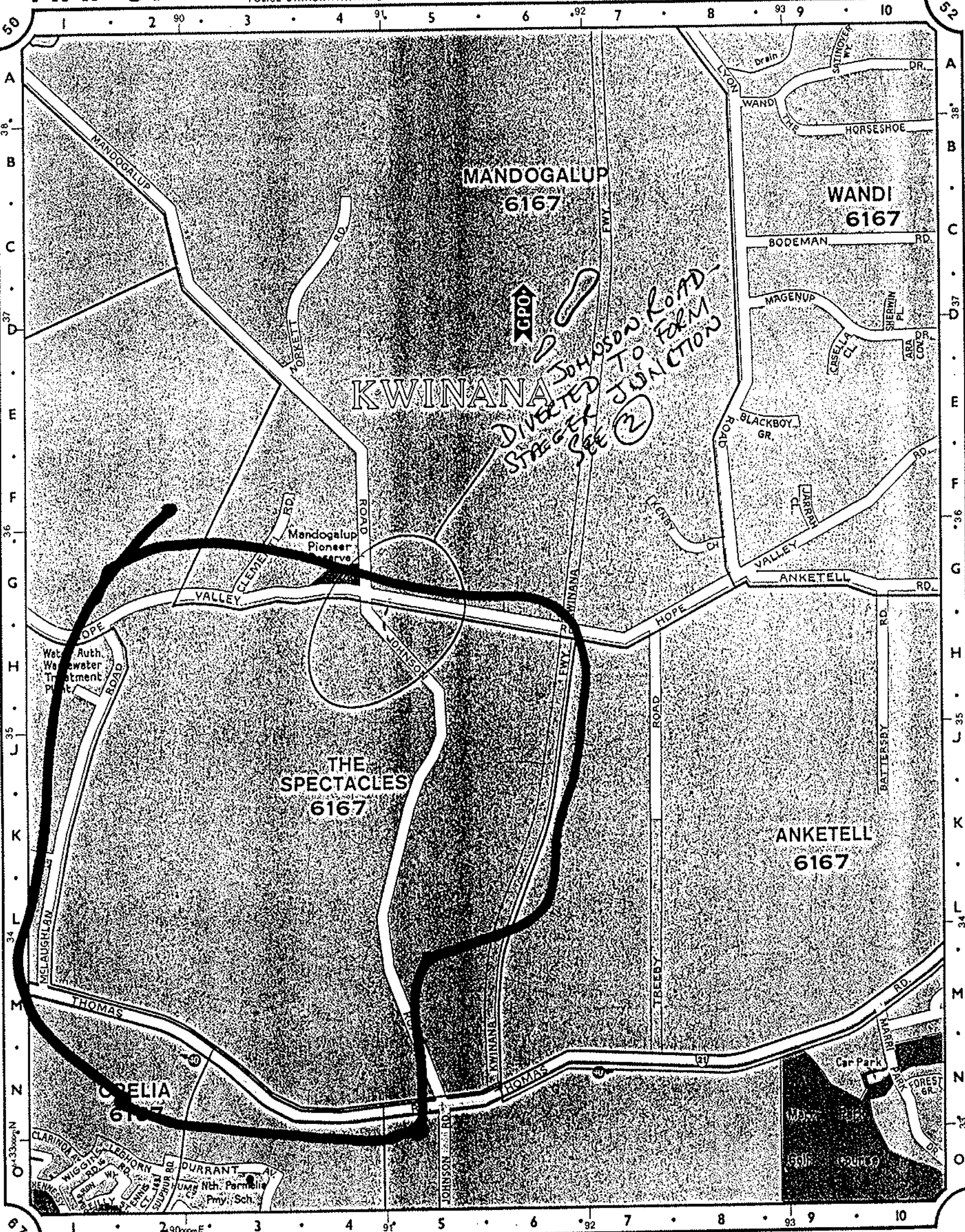
MAP 59

POST OFFICE .... ★
SCHOOL .... ●
POLICE STATION .... ▲

MAP 51 ADJOINS

PUBLIC TELEPHONE ....
HOSPITAL .... +
COUNCIL OFFICE .... ■

Kilometres 1km
Metres 500m 1000m



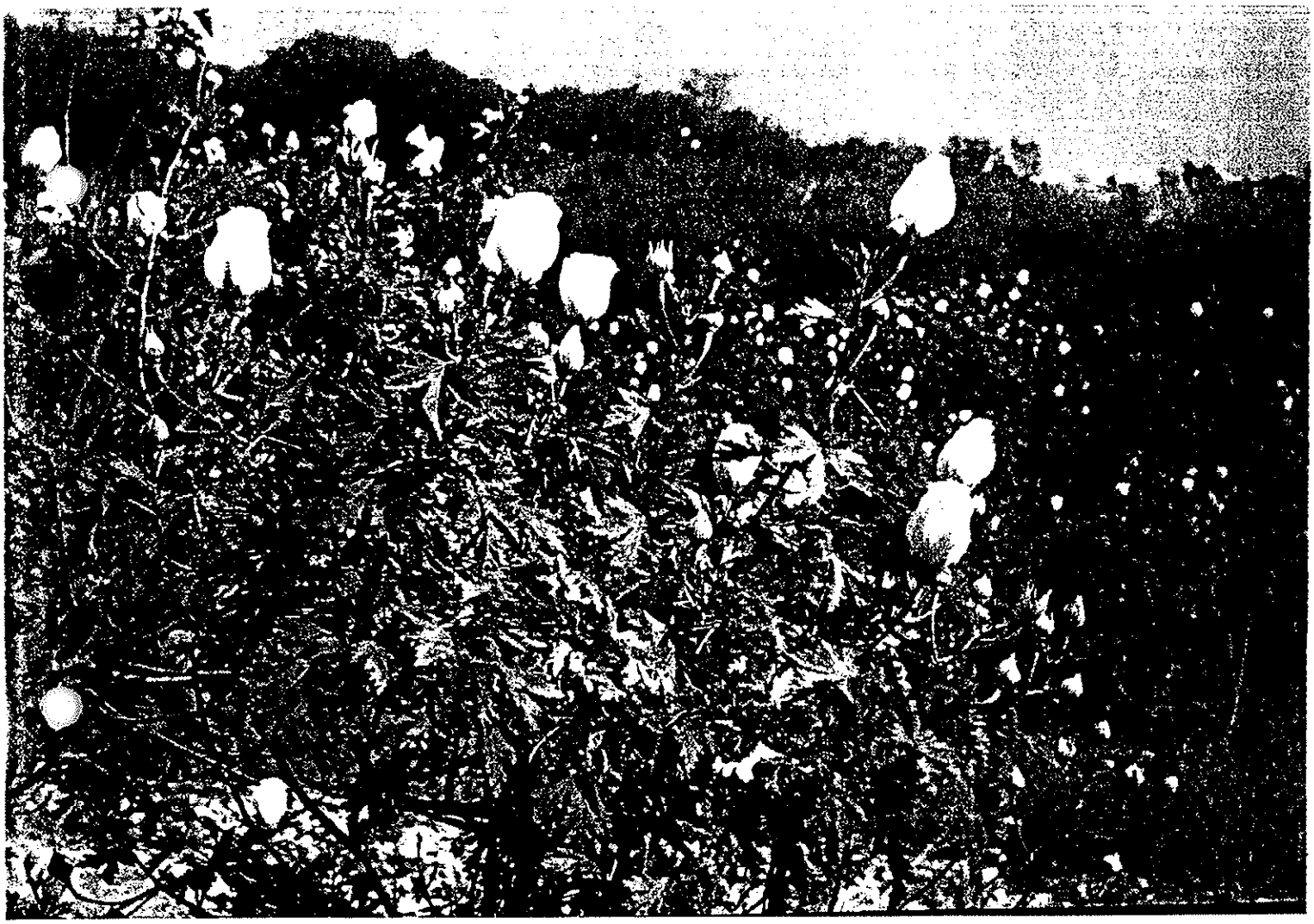
MANDOGALUP
6167
WANDI
6167
KWINANA
GPO
THE SPECTACLES
6167
ANKETELL
6167
CASUARINA
6167
MANDOGALUP
NORKETT RD
ROAD
JOHNSON
Mandogalup Pioneer Reserve
VALLEY
HOPE
ANKETELL RD
CLEMENT
Water Auth. Wastewater Treatment Plant
ROAD
MCLAUGHLAN
THOMAS
THOMAS
KWINANA FWY
TREEBY
ROAD
BATTERSBY RD
LYON ROAD
WANDI
THE HORSESHOE
SATINOVER WY
DR.
Drain
BODEMAN RD
MAGENUP
SHERWIN PL
CASELLA CL
ARA CON
BLACKBOY GR
JARRAH CL
VALLEY RD
MARRI PARK DR
FOREST GR
Car Park
Golf Course
CLARINDA PL
LESHORN
DURRANT AV
WIGGINS
JOHNSON RD
Nth. Parmelia Pmy. Sch.
MAP 58 ADJOINS
MAP 60 ADJOINS
JOHNSON ROAD - DIVERTED TO FORM STAGGER JUNCTION SEE ②

MAP 68 ADJOINS

1193

Part Report:
Value identification
not objection
assessment section
(contact Heritage
Commission, Melinda
Brown for complete
report) 13/5/96

Objection Assessment of the values of the vegetation and flora of the Beeliar Wetlands



Alogyne huegelii var. *glabrescens* to the west of Manning Lake

Prepared for the Australian Heritage Commission

by Bronwen Keighery, Consultant Botanist
November 1995 and February 1996

Table 2: Bushland Areas listed on the National Estate or being considered for listing.

Bushland Areas listed/interim listed on the National Estate

Bushland Area	Area (ha)	Native Flora	Flor. Com[10].	Veg. Assoc#.	Veg. Comp.[18]
Hepburn Heights/Pinnaroo	90	230*[1]	3*	19[11].	3
Trigg/Karrinyup Reserves	120	175[2]	4		2
Banksia Road Nature Reserve	33	150[3]	3		1
Marangaroo (Res 20091)	30*	130 *[4]	1		1
Neerabup National Park	1,111	242[5]	2		?2
Star Swamp	100	191[6]	3	13[11].	?2
Woodvale Nature Reserve	44	170[7]	1		1
Beeliar Wetlands	2700	406[22]	7	31[18]	4
Thompsons Lake NR	509	199[14]		15[14] 12[18]	3
Baganup Lake	254	279[15]	4	10[15]	3
Murdoch University	?	200[13]		5[13]	2
Yangebup Lake	103*	140[16]		5[16] 7[18]	2
Piney Lake	68	96[10]		6[10]	1
Booragoon Lake	13	34[12]		3[12]	1
Market Garden Lake	38	21[17]		7[17]	1

Unlisted areas subject to current nominations

Kings Park	400	290[20]	1	5[20]	1
Bold Park	221	221[21]	4		3
M91	56	86[23]	2		1

\# these are not directly compatible as they are based on variety of approaches to describing vegetation associations

* estimate of area, flora or floristic community types

1 estimate based on Keighery (1991), Tingay (1991), Foulds (1988) and AHC Listing Document

2+ G. Keighery pers. comm.

3+ G. Keighery pers. comm.

4 estimate from knowledge of the area

5+ G. Keighery pers. comm.

6 Bell *et al.* (1984)

7 Keighery and Langley (1994)

8 Gibson et al.(1994) and System 6 Update

9 Tingay (1991)

10 Rodda (1986)

11 Weston and Clay (1980)

12 Smith (1985)

13 Dell and Bennett (1986)

14 Crook and Evans (1981)

15 Clay (1986)

16 Ecoscape (1994)

17 Ecoscape (1995)

18 Newman *et al.* (1976)

19 Heddle *et al.* (1980)

20 Bennet in Kings Park Bushland Draft Management Plan (1993)

21 Keighery, Harvey and Keighery (1991)

22 Appendix Flora

23 Keighery and Keighery 1993

\+ Reserve flora lists for bushland areas on the Swan Coastal Plain are being compiled by G.J. Keighery with assistance from B.J. Keighery and N. Gibson to establish a better knowledge of the flora of these areas and to address species conservation status for the Swan Coastal Plain.

Table 3: Floristic Community Types found in the study area
Each site is located Map 1. Study site codes refer to the following areas:
Thom - Thomson Lake Nature Reserve (Gibson *et al.* 1994)
Harry - Banganup Lake and adjacent bushland, Harry Waring Marsupial Reserve or Jandakot Research Station (Gibson *et al.* 1994)
MTB - Lakes Mount Brown and Brownman Swamps and adjacent bushland (Gibson *et al.* 1994)
NAVB - M 91 (Gibson *et al.* 1994)
Beel - 1 & 2 North Lake and adjacent bushland (System 6 Update 1995)
- 3 Murdoch University

Floristic Community Type (site)	Generalised Description	Predominant Landform Type (after Churchward and McArthur 1980)
Wetland Super Group		
5 (Map 2a) Harry 3	Mixed shrub damplands Mean species richness per site: 38.4 Av.Cond: 2.1, Cons status: Low risk	Bassendean/Pinjarra
11 (Map 2a) Harry 6 Beel 3	Wet forests and woodlands Mean species richness per site: 27.2 Av.Cond: 2.7, Cons status: Low risk	Bassendean/Pinjarra
16 (Map 2a) *NAVB 1	Highly saline seasonal wetlands Mean species richness per site: 13.5 Av.Cond: 2.9, Cons status: Vulnerable	coastal and esturine
17 (Map 2a) MTB 05	*Melaleuca rhaphiophylla - Ghania trifida* seasonal wetlands Mean species richness per site: 13.6 Av.Cond: 2.3, Cons status: Low risk	Quindalup/ Spearwood
Bassendean Dune Super Group		
21a (Map 2b) Harry 05	Central *Banksia attenuata - E. marginata* woodlands Mean species richness per site: 54.6 Av.Cond: 2.5, Cons status: Low risk	Bassendean/ Spearwood
23a Map 2b) Harry 04 #Beel 02	Central *Banksia attenuata - B.menziesii* woodlands Mean species richness per site: 62.8 Av.Cond: 2, Cons status: Low risk	Bassendean
Spearwood/Quindalup Dune Super Group		
24 (Map 2b) Thom 02 MTB 1, 2, 3 & 4 *NAVB3 &4	Northern Spearwood shrublands and woodlands Mean species richness per site: 41.8 Av.Cond: 3, Cons status: Susceptible	Spearwood
28 (Map 2b) #Beel 1 Harry 1 & 2	Spearwood *Banksia attenuata* or *Banksia attenuata - Eucalyptus* woodlands Mean species richness per site: 55.2 Av.Cond: 2.5, Cons status: Low risk	Spearwood
29a (Map 2b) *NAVB 2	Coastal shrublands on shallow sands Mean species richness per site: 40.7 Av.Cond: 2.3, Cons status: Susceptible	Quindalup

Appendix 1

This list was compiled from a series of published and unpublished lists for the study area. The principle references are cited in the key to column 4. Records were also extracted from the text of Environmental Science Murdoch University (1986) and Newman et al (1980). As most of these lists date from the 1980's there was a need to update the nomenclature.

Some additions have also been made from field visits in October and November 1995 for this study.

Key

Column 1: Taxon
Taxa are listed alphabetically in family, genera and species. Nomenclature is after Gibson *et al.* (1994). A * preceding a the genus name indicate a non-native taxon, these may be naturalised taxa or planted taxa.

Column 2: Priority Code (Department of Conservation and Land Management 1995)

Column 3: Gegraphical Range/Significant Taxa
N = Populations at the northern limit of their known range
S = Populations at the southern limit of their known range
W = Populations at the western limit of their known range
Geographic Limit - Location of limits as defined above.
= Significant taxa (see Sections 3.3.1 and 3.4.1.2 for details of significance)

Column 4: Areas

P Piney Lake Reserve (Rodda 1986)
Ba Banganup Lake (Weston and Clay 1980)
Bo Booragoon (Lake Smith 1985)
M Murdoch University (Dell and Bennett 1986)
T Thompson's Lake Nature Reserve (Crook and Evans 1981)
S The Spectacles (Clay 1986)
Y Yangebup Lake (Ecoscape 1994)
Ma Manning Lake (this report)
MG Market Garden Swamps (Ecoscape 1995)
MB Floristic Database for Swan Coastal Plain (Gibson *et al.*1994) and System 6 Update
F Floristic Database for Swan Coastal Plain (Gibson *et al.*1994) and System 6 Update.
91 System 6 area M91 (Keighery and Keighery 1993)

Taxon	Prio Code	Geographic Range	Recorded Areas
Aizoaceae			
*Carpobrotus aquilaterale			P, Ba, T, S
*Carpobrotus edulis			Ba, Bo, M, T, Y, F, 91
Carpobrotus virescens			91
Carpobrotus virescens X edulis			91
*Tetragonia decumbens			F, 91
Amaranthaceae			
Ptilotus drummondii			Ba, T, Y, 91
Ptilotus ?manglesii			P
Ptilotus polystachyus			M, Y
Anredaceae			
*Anredera cordifolia			MG
Anthericaceae			
Arnocrinum preissii			Ba, T, Y
Caesia micrantha			Ba, M, T
Caesia occidentalis			F
Chamaescilla corymbosa			Ba, M, T, S, F
Corynotheca micrantha			Ba, M, T, S, Y
Dichopogon capillipes			Ba, T, Y, F
Laxmannia ramosa			Ba
Laxmannia squarrosa			P, Ba, T, M, F
Sowerbaea laxiflora			P, Ba, M, T, S, Y, F
Thysanotus arenarius			Y
Thysanotus asper			M
Thysanotus manglesianus/patersonii complex			P, Ba, T, Y,F, 91
Thysanotus multiflorus			M
Thysanotus sparteus			Ba, T, Y, F
Thysanotus thyrsoideus			F
Thysanotus triandrus			Ba, M, Y, F
Tricoryne elatior			Ba, Bo, M, T, S, Y
Tricoryne tenella			F
Amaryllidaceae			
*Narcissus tazetta			
Apiaceae			
Apium annuum			F, 91
Apium prostratum			F
Centella cordifolia			Ba, Bo, M, T, S, Y
Daucus glochidiatus			F, 91

Taxon	Prio Code	Geographic Range	Recorded Areas
Eryngium pinnatifidum subsp. pinnatifidum			Ba, M, T, Y, F
*Foeniculum vulgare			T, Y, Mg, Ma, 91
Homalosciadium homalocarpum			Ba, Y, F
Hydrocotyle diantha			F
Hydrocotyle scutellifera			F
Platysace compressa			Ba, M, T, F
Trachymene pilosa			M, Y, F
Xanthosia huegelii			Ba, M, , S, Y, F
Araceae			
*Zantedeschia aethiopica			S, Y, H, MG, F
Asclepidaceae			
*Gomphocarpus fruticosus			MG
Asparagaceae			
*Myrsiphyllum asparagoides			Ma
Asphodelaceae			
*Asphodelus fistulosus			Ba, M, T, 91
*Trachyandra divaricata			91
Asteraceae			
*Arctotheca calendula			Ba, T, S, Y, 91
*Aster subulatus			Ba, T, F
Asteridea pulverulenta			Ba, Y
Brachyscome iberidifolia			Ba, M
*Carduus pycnocephalus			Ba
*Centaurea melitensis			Ba, F, 91
*Cirsium vulgare			Ba, MG, 91
*Conyza albida			F, 91
*Conyza bonariensis			Bo, F, 91
Cotula coronopifolia			Ma
*Dittrichia graveolens			MG, 91
*Helianthus annua			MG
Helichrysum cordatum			M, 91
Hyalosperma cotula			Ba, T, F, 91
*Hypochaeris glabra			Ba, Bo, S, Y, MG, F, 9
Ixiolaena viscosa	N	North Lake	Bi, N, F
*Lactuca serriola			Y, F
Lagenifera huegelii			Ba, S, Y, F
Millotia myosotidifolia			Ba, M, t
Millotia tenuifolia			F

Taxon	Prio Code	Geographic Range	Recorded Areas
Olearia axillaris			Ba, M, T, F, 91
Olearia elaeophila			Y
Pithocarpa corymbulosa			Y
Podolepis canescens			Ba, T
Podolepis gracilis			Ba, M, T, Y, F
Podotheca angustifolia			Y, F
Podotheca chrysantha			Ba, M, T, F
Podotheca gnaphalioides			P
Pseudognaphalium luteoalbum			Ba, F
Quinetia urvillei			Y, F
Senecio hispidulus			Ba, T
Senecio lautus			Ba, M, T, Y, F, 91
Siloxerus humifusus			Ba, M, F
*Solidago canadensis			MG
*Sonchus asper			Ba, M, F, 91
Sonchus hydrophilus			F, 91
*Sonchus oleraceus			F, 91
*Taraxacum officinale			MG
*Urospermum picroides			F, 91
*Ursinia anthemoides			Ba, S, Y, F
*Vellereophyton dealbatum			Ba, T, F, 91
Waitzia citrina			T, F
Waitzia suaveolens			F
Azollaceae			
Azolla filiculoides			Y, H
Brassicaceae			
*Brassica oxyrrhina			Y
*Brassica tournefortii			Ba, MG, F, 91
*Heliophila pusilla			Ba, F, 91
*Lobularia maritima			MG
*Sisymbrium orientale			MG
*Raphanus raphanistrum			BO, MG
*Rorippa naturtium-aquaticm			Ba, T
Callitrichaceae			
*Callitriche stagnalis			Ba
Campanulaceae			
*Wahlenbergia capensis			Ba, Y
Wahlenbergia preissii			Ba, F

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Cannaceae			
	*Canna generalis			MG
	*Canna ochnoides			MG
	Caryophyllaceae			
	*Arenaria serpyllifolia			F
	*Cerastium glomeratum			Ba, F
	*Minuartia hybrida			F, 91
	*Petrorhagia velutina			Ba, T, Y, 91
	*Sagina apetala			Ba, F
	*Sagina maritima			F, 91
	*Silene gallica			Ba, T, Y, F, 91
	*Stellaria media			Ba, F, 91
	Casuarinaceae			
	Allocasuarina fraseriana			P, Ba, M,, T, S, Y, F
	Allocasuarina humilis			P, Ba, M,, T, S, F, 91
	Centrolepidaceae			
	Centrolepis aristata			Ba
	Centrolepis drummondiana			Ba, T, Y, F
	Chenopodiaceae			
	Atriplex cinerea			F, 91
	Atriplex hypoleuca			Ma
	*Atriplex prostrata			T
	*Chenopodium album			MG
	*Chenopodium ambrosioides			Ba, T
	*Chenopodium murale			91
	Chenopodium pumilio	N	Balangup L	Ba
	Rhagodia baccata			F
	Rhagodia baccata subsp. baccata			91
#	Rhagodia baccata subsp. dioica			91
	Sarcocornia quinqueflora			MG, Ma, F, 91
	Suaeda australis			MG, 91
	Threlkeldia diffusa			F, 91
	Colchicaceae			
	Burchardia congesta			P, Ba, Bo, M,, T, S, Y,F
	Commelinaceae			
	Cartonema philydroides			Ba, M, T
	*Tradescantia fluminense			Bo

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Convolvulaceae			
#	Wilsonia backhousei			91
#	Wilsonia humilis			91
	Crassulaceae			
	Crassula colorata			P, Ba, Y, F, 91
	Crassula exserta			F, 91
	*Crassula glomerata			Ma, F, 91
	Crassula pedicellosa			F
	Cucurbutaceae			
	*Citrullus lanatus			MG
	*Cucumus myriocarpus			S, MG
	Cuscutaceae			
	*Cuscuta epithymum			Ba
	Cyperaceae			
	Baumea arthrophylla			Ba, T
	Baumea articulata			P, Ba, M, T, S, F
	Baumea juncea			T, Y ,F
	Baumea preissi			Ba, T
	Baumea riparia			Ba, T
	Baumea rubigenosa			Ba, T
	Bolboschoenus caldwellii			Ba, T, MG
	Carex preissii			F
*	Cyperus congestus			Ba, T, S, Y, MG
*	Cyperus eragrostis			Y
	Cyperus polystachyos			Ba, T
	*Cyperus rotundus			Bo, MG
	*Cyperus tenellus			P
	*Cyperus tenuiflora			Bo, M
#	Eleocharis sphacelata			K
#	Fimbristylis vilata			M, S
	Gahnia trifida			Ma, MG, F, MB
	Isolepis cernua			F, 91
	Isolepis marginata			Ba, T, F
	Lepidosperma angustatum			M, S, Y, F, 91
	Lepidosperma costale			Ba, T
	Lepidosperma drummondii			M
#	Lepidosperma gracile			M
	Lepidosperma longitudinale			Ba, Bo, M, T, S, F

Taxon	Prio Code	Geographic Range	Recorded Areas
Lepidosperma scabrum			Ba, T, S
Lepidosperma sp. (Coastal terete BJK & NG 231)			F
Lepidosperma tenue			M, S
Lepidosperma squamatum			Y, F
Mesomelaena pseudostygia			P,Ba, M, T, S, Y, F
Mesomelaena tetragona			P
Schoenus aff. laevigatus			F
Schoenus brevisetis			F
Schoenus brevifolius			Ba, T
Schoenus clandestinus			Ba, Y, F
Schoenus curvifolius			Ba, M, T, S, Y, F
Schoenus grandiflorus			Ba, T, S, Y, 91
Schoenus rodwayanus			F
Schoenus subflavus			Ba, T
Tetraria octandra			P, M, Y, F
Dasypogonaceae			
Acanthocarpus preissii			F, 91
Calectasia cyanea			Ba, M, T, S
Dasypogon bromeliifolius			P, Ba, M, T, S, F
Lomandra caespitosa			F
Lomandra hermaphrodita			F
Lomandra integra			M
Lomandra maritima			Ma, F, 91
Lomandra micrantha			Ba
Lomandra nigricans			Ba, T, F
Lomandra preissii			F
Lomandra suaveolens			Ba, M, F
Dennstaedtiaceae			
Pteridium esculentum			Bo, T, S, P, H, N
Dilleniaceae			
Hibbertia acerosa			91
Hibbertia huegelii			Ba, M, T, Y, F
Hibbertia hypericoides			P, Ba, M, T, S, Y, Ma F, 91
Hibbertia racemosa			P, Ba, M, T, S, Y, F, 91
Hibbertia spicata subsp. leptotheca	3	S Yalgorup	F, 91
Hibbertia stellaris			P, M
Hibbertia subvaginata			M, T, F

Taxon	Prio Code	Geographic Range	Recorded Areas
Droseraceae			
Drosera erythrorhiza			Ba, M, T, S, Y, F
Drosera gigantea subsp. gigantea			P
Drosera glanduligera			Ba, M, T
Drosera macrantha			Ba, M, T, S, F
Drosera menziesii subsp. penicillaris			P, Ba, M, T, F
Drosera paleacea			Ba, M, Y, F
Drosera pallida			Ba, M, Y, F
Drosera stolonifera			M, Y, F
Epacridaceae			
Acrotriche cordata			91
Astroloma pallidum			Ba, M, T, S, Y, F
Brachyloma preissii			Ba, M, F
Conostephium pendulum			P, T, S, Y, F
Conostephium preissii			Ba, M, T, Y
Leucopogon australis			P, M, 91
Leucopogon conostephioides			Ba, M, T, Y
Leucopogon gracillimus			F
Leucopogon oxycedrus			Ba
Leucopogon parviflorus			M, Ma, F
Leucopogon propinquus			Ba, Bo, M, T, S, Y, F
Leucopogon racemulosus			M, F
Lysinema ciliatum			P, Ba, M, T, S
Euphorbiaceae			
* Euphorbia peplus			Ba, T, Y, Ma, MG, F, 91
* Euphorbia terracina			Y, Ma, 91
Monotaxis grandiflora			P, Ba, M
Monotaxis occidentalis			Ba, Y
Phyllanthus calycinus			Ba, M, T, S, Ma, F, 91
Poranthera microphylla			Ba, F
* Ricinus communis			Y, MG
Fagaceae			
* Quercus suberus			P
* Quercus sp.			S
Frankeniaceae			
Frankenia pauciflora			91
Fumariaceae			
* Fumaria capreolata			Ba, T

	Taxon	Prio Code	Geographic Range	Recorded Areas
*	Fumaria muralis			Ba, T
Gentianaceae				
*	Centaurium erythraea			F
*	Centaurium spicatum			Ba
Geraniaceae				
*	Erodium botrys			Ba, T
*	Erodium cicutarium			Ba, T, F, 91
*	Geranium molle			Ba, T, F, 91
*	Pelargonium capitatum			P, T, S, Ma, MG, F, 91
*	Pelargonium domesticum			Bo
	Pelargonium littorale			F
Goodeniaceae				
	Dampiera linearis			P, Ba, M, T, S, F
#	Dampiera triloba			M
	Goodenia ?pulchella			Ba, M, T
#	Lechenaultia biloba	W		M
	Lechenaultia expansa			Ba, T
	Lechenaultia floribunda			P, M, S, Y
	Lechenaultia linarioides	S	Spectacle	S
	Scaevola canescens			Ba, M, T, S, Y
	Scaevola crassifolia			91
	Scaevola globulifera			M
	Scaevola repens			M, Y
Haemodoraceae				
	Anigozanthos humilis			P, Ba, M, T, S, Y, F
	Anigozanthos manglesii			P, Ba, M, T, S, Y
	Anigozanthos viridis			T
	Conostylis aculeata			P, Ba, M, T, S, Y, F, 91
	Conostylis candicans			P, M, T, F
	Conostylis setigera			P, Ba, M, T, Y, F
	Haemodorum paniculatum			Ba, M, T, Y
	Haemodorum spicatum			Ba, Bo, T, Y
	Phlebocarya ciliata			P, Ba, M, T, S, F
	Tribonanthes ?uniflora			P
Gyrostemonaceae				
	Tersonia cyathiflora			MB
Haloragaceae				
	Glischrocaryon aureum			Ba

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Gonocarpus cordiger			Ba
	Gonocarpus pithyoides			F
	Myriophyllum crispatum			Ba
	Myriophyllum integrifolia			Ba
Iridaceae				
*	Chasmanthe floribunda			S
*	Gladiolus caryophyllaceus			P, Ba, M, T, S, Y, F, 91
*	Homeria flaccida			Ba, Y, F, 91
*	Ixia paniculata			Ba
	Patersonia occidentalis			P, Ba, M, T, S, Y, F
	Patersonia occidentalis (swamp form)			N
*	Romulea rosea			Ba, M, T, S, Y, F, 91
*	Tritonia sp.			B
Juncaceae				
*	Juncus acutus			MG, C
*	Juncus articulatus			Ba
*	Juncus bufonius			Ba
	Juncus caespiticius			Ba
	Juncus kraussii			MG, Ma
	Juncus pallidus			P, Bo, M, T, S,Y
	Luzula meridionalis			Ba, T
Juncaginaceae				
	Triglochin calcitrapum			91
	Triglochin procerum			Ba, M, T, F
Lamiaceae				
#	Hemigenia sericea			MB
	Hemiandra pungens			P, Ba, M, T
*	Stachys arvensis			Ba
Lauraceae				
	Cassytha flava			F, 91
	Cassytha glabella			M
	Cassytha pubescens			91
	Cassytha racemosa			Ba, M, T, F, 91
Lemnaceae				
	Lemna disperma			Ba
Lobeliaceae				
	Lobelia alata			F
	Lobelia tenuior			F

	Taxon	Prio Code	Geographic Range	Recorded Areas
Loganiaceae				
	Mitrasacme paradoxa			Ba
Loranthaceae				
	Nuytsia floribunda			P, Ba, Bo, M, T
Lythraceae				
*	Lythrum hyssopifolia			Ba
Malvaceae				
	Allogyne huegelii var. glabrescens	S	Manning L.	Ma
*	Lavatera plebeia			MG, 91
	Lawrencia spicata			91
*	Malva parviflora			MG
Menyanthaceae				
	Villarsia albiflora			Ba
	Villarsia ?capitata			Ba, T
Mimosaceae				
	Acacia cochlearis			Ba, T, Y, F
	Acacia cyclops			Ba, M, T, Y, MG, 91
	Acacia huegelii			Ba, M, T, Y, MG, 91
	Acacia lasiocarpa var. lasiocarpa			F, 91
*	Acacia longifolia			Y, Bl
	Acacia pulchella			P, Ba, Bo, M, T, Y, MG, F, 91
	Acacia rostellifera			T, Ma, F, 91
	Acacia saligna			P, Ba, Bo, M, T, Y, MG, Ma, F, 91
	Acacia stenoptera			Ba, M, T, S, Y, F
	Acacia truncata			Ma, 91
	Acacia willdenowiana			P, M, T, Y
Molluginaceae				
	Macarthuria australis			Ba, T
Moraceae				
*	Ficus carica			MG, H, Ma
*	Morus nigra			MG, Ma, S
Myoporaceae				
	Eremophila glabra			F, 91
	Myoporum insulare			91
Myrtaceae				
	Agonis linearifolia			M, N, H
	Astartea aff. fascicularis			Ba, Bo, M, T, S, Y, F
	Baeckea camphorosmae			Ba, T, S

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Beaufortia elegans			M
	Calothamnus lateralis			P
	Calothamnus quadrifidus			Ma, 91
	Calytrix angulata			Ba, T, S
	Calytrix flavescens			Ba, M, T, F
	Calytrix fraseri			Ba, M, T, F
*	Chamelaucium uncinatum	S	Bold Park	P, M, Ma, Y
	Eremaea ?asterocarpa			Ba, T
	Eremaea pauciflora			Ba, M, T
	Eucalyptus calophylla			P, Ba, M, S, Y, F
*	Eucalyptus citriodora			P
	Eucalyptus decipiens			Ma, MB, 91
	Eucalyptus gomphocephala			Ba, M, T, S, Y, Ma, MG, MB, Ma, F
	Eucalyptus marginata			P, Ba, M, T, S, Y, F
	Eucalyptus rudis			P, Ba, Bo, M, T, S, Y, F
	Eucalyptus todtiana			Ba, T, Y, F
	Hypocalymma angustifolium			P, Ba, M, T, F
	Hypocalymma robustum			P,Ba, M, T, S, Y, F
	Kunzea ericifolia			Ba, M, T, S, Y, F
*	Leptospermum laevigatum			P, M, S, Y, MG
	Melaleuca acerosa			Ma, F, 91
	Melaleuca cuticularis			Co, MG
	Melaleuca huegelii			Ma, MB, 91
	Melaleuca incana			S
*	Melaleuca lanceolata			Ma
	Melaleuca lateritia			P, M, Ro, S, F
	Melaueca preissiana			Ba,Bo, M, T, S, Y, F
	Melaleuca rhaphiophylla			P, Bo, M, S, Y, Ma, MG, Co, Ma, F
	Melaleuca seriata			Ba, M
	Melaleuca teretifolia			P,Ba, Bo, M, T, S,MG, F
	Melaleuca thymoides			P,Ba, M, T, F
	Melaleuca viminea			MG
	Pericalymma ellipticum			P, Ba, M, F
	Regelia inops			M
	Scholtzia involucrata			Ba, M, T,S, F
	Verticordia drummondii			Ba, T
Oleaceae				
*	Olea europea			MG

	Taxon	Prio Code	Geographic Range	Recorded Areas
Onagraceae				
	Epilobium billardierianum			Ba, F
	Epilobium hirtigerum			Ba, F
*	Oenothera stricta			MG
Orchidaceae				
	Caladenia deformis			Ba, T, S, Y
	Caladenia denticulata			Ba, T
	Caladenia discoidea			Ba, T
	Caladenia flava			P, Ba, T, S, Y, F
	Caladenia gemmata			Ba, T
	Caladenia latifolia			Ba, T, Y, F, 91
	Caladenia longicauda			Ba, M, T
	Caladenia ?paludosa			Ba, M, T
	Diuris emarginata			Ba, T
	Diuris longifolia			P, Ba,M, T, F
	Elythranthera brunonis			P, Ba, M, T, F
	Elythranthera emarginata			M
#	Epiblema grandiflorum			Ba
	Leporella fimbriata			M
	Lyperanthus nigricans			Ba, M, Y
	Microtis media			Ba, M, T, Y, F
*	Monadenia bracteata			F, 91
	Prasophyllum fimbria			Ba
	Prasophyllum ovale			Ba, T
	Prasophyllum parvifolium			Ba
	Pterostylis aff. nana			M, T
	Pterostylis recurva			Ba
	Pterostylis scabra var. robusta			M
	Pterostylis vittata			M, S, Y
	Thelymitra benthamiana			F
	Thelymitra campanulata			Ba, M, T
	Thelymitra crinita			M
Orobanchaceae				
*	Orobanche minor			Ba, M, Y
Oxalidaceae				
*	Oxalis pes-caprae			Ba, T
*	Oxalis purpurea			Ba, T

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Papilionaceae			
	Aotus cordifolia			P, Ba, M
	Aotus gracillima			P, Ba, M, T
	Aotus procumbens			M, Y
	Bossiaea eriocarpa			P, Ba, M, , S, YTF
	?Callistachys lanceolata			P
*	Cystus prolifera			M
	Daviesia decurrens			Ba, M, T, Y
	Daviesia divaricata			P, M, Y, F
	Daviesia nudiflora			Ba, M, T, Y
	Daviesia physodes			P, BL, Ba, M, T, S
	Daviesia triflora			P, Ba, M, T, S, Y, F
	Eutaxia virgata			E, Ba, M
	Gompholobium confertum			M
	Gompholobium tomentosum			P, Ba, M, T, S, Y, F
	Hardenbergia comptoniana			P, Ba, Bo, M, T, S, Y, MG, , 91F
	Hovea pungens			P, Ba, M, T, S, F
	Hovea trisperma			Ba, M, T, S, F
	Isotropis cuneifolia			Ba, M, T, S, Y, F
	Jacksonia aff. sericea (swamp form)	eP		N
	Jacksonia furcellata			P, Ba, Bo, M, T, S, Y, 91
	Jacksonia sternbergiana			P, Ba, Bo, M, T, S, Y, F
	Kennedia coccinea			91
	Kennedia prostrata			P, Ba, Bo, M, T, S, Y, F
	Latrobea tenella			Ba, M
*	Lupinus angustissimus			Y, MG
*	Lupinus cosentinii			Ba, T, S, Y, MG
*	Medicago polymorpha			Ba, T
*	Melilotus indicus			Ba, T, MG, F, 91
	Nemcia capitata			P, Ba, M, T, S, Y, F
	Nemcia reticulata			F, 91
*	Ornithopus sativus			Ba
	Oxylobium lineare			P, M
	Pultenaea ochreata			Ba, M, T, S
	Pultenaea reticulata			P, Ba, T, S, F
	Sphaerolobium vimineum			Ba, M, F
	Templetonia retusa			Ma, MG
*	Trifolium angustifolium			Ba

	Taxon	Prio Code	Geographic Range	Recorded Areas
*	Trifolium arvense			MG
*	Trifolium campestre			Ba, T, Y, F, 91
*	Trifolium cernuum			Ba, F, 91
*	Trifolium dubium			Ba, T
*	Trifolium glomeratum			Ba
*	Trifolium pratense			Ba, t
*	Vicia hirsuta			Ba, T
*	Vicia sativa			P, Ba, M, T, M, F
	Viminaria juncea			Ba, M, T, S
Phytolaccaceae				
*	Phytolacca octandra			91
Phormiaceae				
	Dianella revoluta			P, Ba,.Bo, M, T, S, Y, MG,
Pinaceae				
*	Pinus pinaster			P, Ma
Pittosporaceae				
	Pittosporum phylliraeoides			MG
	Pronaya fraseri			Ba, M
	Sollya heterophylla			MG
Plantaginaceae				
*	Plantago lanceolata			MG
Poaceae				
*	Aira caryophyllea			Ba, Y, F, 91
*	Aira cupaniana			Ba
*	Aira praecox			Ba
	Amphipogon laguroides			Ba, M, T, F
	Amphipogon turbinatus			Ba, M, T, F
*	Arundo donax			Y, MG
*	Avellinia michelii			F
*	Avena barbata			P, Ba, T, F, 91
*	Avena fatua			Y, MG, F
*	Briza maxima			P, Ba, T, S, Y, F, 91
*	Briza minor			P, Ba, T, S, Y, MG, F, 91
*	Bromus diandrus			F, 91
*	Bromus hordeaceus			F, 91
*	Catapodium rigidum			91
*	Cortaderia selloana			T
	Cynodon dactylon			Bo, T, S, Y, MG

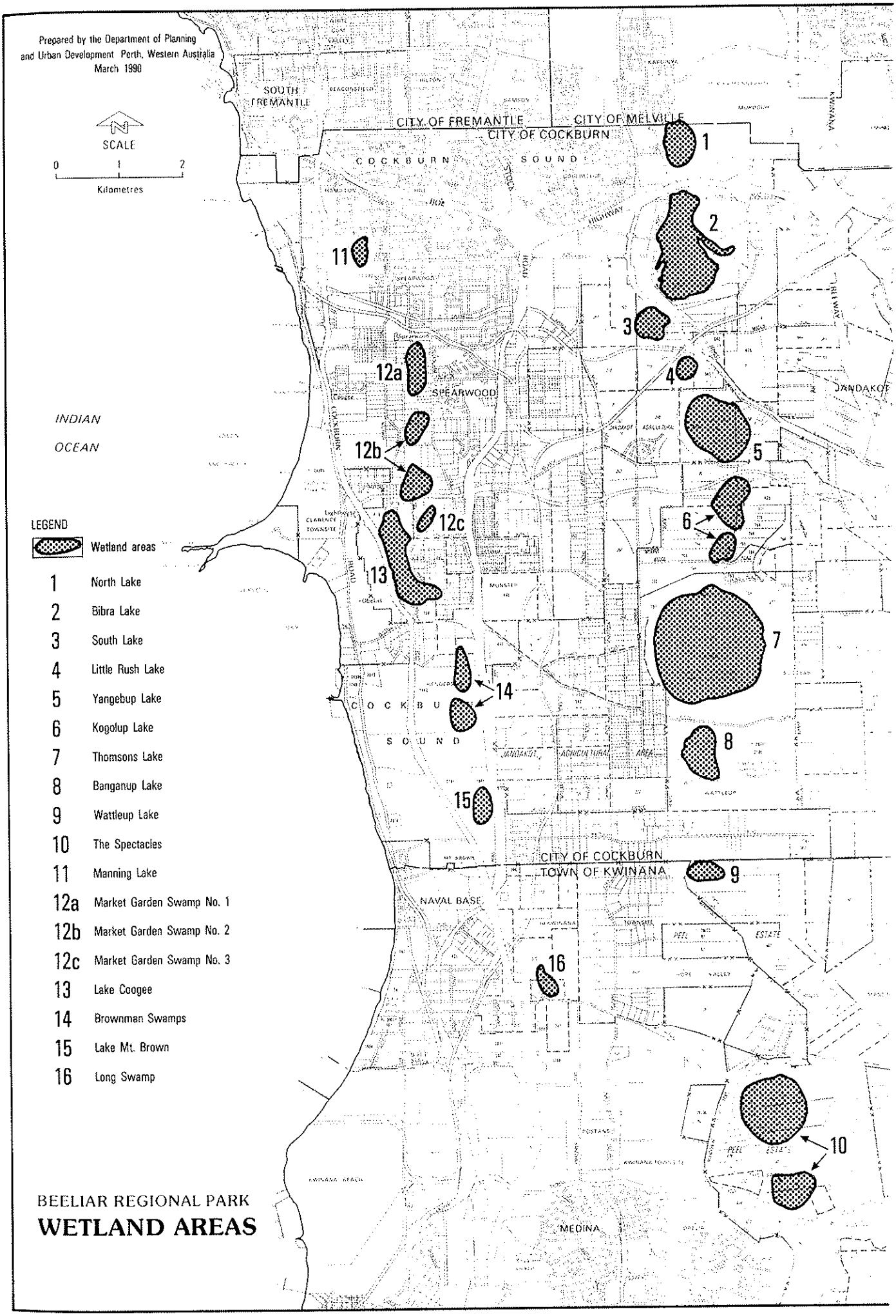
	Taxon	Prio Code	Geographic Range	Recorded Areas
	Danthonia occidentalis			Ba, T, F, 91
	Deyeuxia quadriseta			Ba, T, F
*	Diandrus gussonii			Ba, T
	Dichelachne crinita			F
*	Digitaria sanguinalis			Ba
*	Echinochloa crus-galli			MG
*	Ehrharta calycina			P, Ba, Bo, T, S, Y, MG, F, 91
*	Ehrharta longiflora			Ba, T, Y, F
	Hemarthria uncinata			Ba, T
*	Holcus setiger			F
*	Hordeum leporinum			Y
*	Lagurus ovatus			Ba, T, Y, MG, F, 91
*	Lolium multiflorum			91
*	Lolium perenne			Ba, T
*	Lolium rigidum			Y, F
	Microlaena stipoides			Ba, T, F
*	Paspalum dilatatum			MG
*	Paspalum distichum			Y, MG
*	Paspalum vaginatum			Ba, T, Y
*	Pennisetum clandestinum			Bo, S, Y, MG, Ma
*	Phalaris minor			91
*	Poa annua			F
	Poa drummondiana			Ba, T, 91
	Poa poiformis/porphyroclados			Ba, F, 91
*	Polypogon monspeliensis			Ba, T
*	Rhynchelytrum repens			Y
*	Secale cerale			MG
	Sporobolus virginicus			Y, F, 91
	Spinifex longifolius			91
*	Stenotaphrum secundatum			Ba, Bo, T, MG
	Stipa compressa			Ba, T, Y, F
	Stipa flavescens			Ba, T, Y, 91
	Stipa semibarbata			Ba, T
	Stipa variabilis			Ba, T
*	Vulpia bromoides			Ba, T, F
*	Vulpia myuros			Ba, F, 91
Polygalaceae				
	Comesperma calymega			Ba, M, T, F

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Comesperma confertum			F, 91
	Comesperma flavum			Ba
	Comesperma virgatum			Ba, M, T
Polygonaceae				
*	Emex austrlis			MG, Ma
	Muehlenbeckia polybotrya			Ba, T
*	Polygonum aviculare			MG, Ma
	Polygonum salicifolium			Bl, Bo, T
*	Rumex acetosella			Ba, T
*	Rumex crispus			Ba, T
Portulacaceae				
	Calandrinia calyptrata			F
	Calandrinia corrigioloides			Ba, T, F, 91
	Calandrinia granulifera			Ba
	Calandrinia liniflora			Y
	Portulaca oleracea			MG
Primulaceae				
*	Anagallis arvensis			P, Ba, M, T, S
	Samolus junceus			F, 91
	Samolus repens			F, 91
Proteaceae				
	Adenanthos cygnorum			P, Ba, M, T, S
	Adenanthos obovatus			S
	Banksia attenuata			P, Ba, Bo, M, T, S, Y, F, 91
	Banksia grandis			Ba, M, T, Y
	Banksia ilicifolia			P, Ba, Bo, M, T, Y, F
	Banksia littoralis			P, Ba, Bo, M, T, F
	Banksia menziesii			P, Ba, Bo, M, T, S, Y, F, 91
	Conospermum stoechadis			Ba
	Conospermum triplinervium			Ba, T
	Dryandra nivea			Ba, T, S, Y, Ma, F, 91
	Dryandra sessilis			M, T, Y, Ma, F, 91
	Grevillea preissii			Ma, F, 91
	Grevillea vestita			Ba, Y, 91
	Hakea lissocarpha			Ba, S, 91
	Hakea prostrata			Ba, M, T, Y, Ma, F, 91
	Persoonia saccata			P, Ba, T, S, Y
	Petrophile brevifolia			Y

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Petrophile linearis			P, Ba, M, T, S, Y, F
	Petrophile serruriae			F,91
	Stirlingia latifolia			P, Ba, M, T, S, Y, F
	Synaphea spinulosa			P, Ba, M, T, S, Y
	Xylomelum occidentale			Ba, M
Ranunculaceae				
	Clematis pubescens			Ba, M, T, Ma
*	Ranunculus muricatus			Ba, M, T
Restionaceae				
	Alexgeorgea nitens			Y
#	Empodisma gracillimum			M
	Hypolaena exsulca			Ba, M, T, F
	Leptocarpus aristatus			P, M, Y
	Leptocarpus coangustatus			F
	Leptocarpus scariosus			Ba
	Lepyrodia muirii			Ba, T
	Loxocarya flexuosa			M, S, Y F, 91
	Loxocarya pubescens			Ba, T, S
	Lyginia barbata			P, M, T, S, Y
	Restio stenostachyus			Ba, T
Rhamnaceae				
	Cryptandra mutila			F, 91
	Spyridium globulosum			Ma, 91
Rubiaceae				
*	Galium aparine			F, 91
*	Galium murale			F
	Opercularia hispidula			Ba, F
	Opercularia vaginata			Ba, M, S, Y, F, Ma
Rutaceae				
	Boronia crenulata			Ba, M, T, F
	Boronia ramosa			M
	Eriostemon spicatus			P, Ba, M, T, S, Y, F
Salicaceae				
*	Salix babylonica			Bl, Bo, MG
Santalaceae				
	Dodonaea aptera			Y
	Dodonaea hackettiana	4	eW	Ba, T, S
	Exocarpos sparteus			Ba, Bo, M, T, S

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Leptomeria cunninghamii			F
	Leptomeria empetriformis			Ba, T
	Leptomeria spinosa			Ba
	Santalum acuminatum			Ba, 91
Scrophulariaceae				
*	Bellardia trixago			Ba, F
*	Cymbalaria muralis			Ba
*	Dischisma arenarium			Ba, F
	Gratiola peruviana			Ba
*	Parentucellia latifolia			Ba
*	Parentucellia viscosa			Ba, M, F, 91
*	Verbascum virgatum			M, T, 91
*	Veronica arvensis			F
Solanaceae				
*	Nicotiana glauca			Y, MG, 91
*	Solanum nigrum			Ba, T, S, MG, 91
	Solanum symonii			Y, MG, 91
Stackhousiaceae				
	Stackhousia monogyna			P, Ba, MG
Sterculiaceae				
	Thomasia cognata			F, 91
Stylidiaceae				
	Levenhookia pusilla			F
	Levenhookia stipitata			Ba, M, F
	Stylidium brunonianum			P, Ba, M, T, Y
	Stylidium bulbiferum			F, 91
	Stylidium calcaratum			Ba, M
	Stylidium junceum			P, Ba, T
	Stylidium piliferum			Ba, M, T, S, F
	Stylidium repens			Ba, M, T, F
	Stylidium schoenoides			Ba, M, T, Y, F
Thymelaeaceae				
	Pimelea angustifolia			Ba, M , T
	Pimelea calcicola			Ma, F, 91
	Pimelea rosea			P, Bo, M, T, S, Y, F
	Pimelea sulphurea			M, Y, F
Tropaeolaceae				
*	Tropaeolum majus			Y

	Taxon	Prio Code	Geographic Range	Recorded Areas
	Tremandraceae			
	Platytheca galioides			Ba, M, T
	Typhaceae			
	Typha domingensis			Ba, T, S
*	Typha orientalis			Y, MG
	Urticaceae			
	Parietaria debilis			91
	Verbenaceae			
*	Lantana camera			Y
	Violaceae			
	Hybanthus calycinus			P, Ba, M, T, S, Y, F, 91
	Vitaceae			
*	Vitus vinifera			MG
	Xanthorrhoeaceae			
	Xanthorrhoea brunonis			S
	Xanthorrhoea preissii			P, Ba, Bo, M, T, S,Ma, MG, F
	Zamiaceae			
	Macrozamia riedlei			Ba, Bo, M, S, Y, F, 91
	Zygophyllaceae			
	Zygophyllum fruticulosum	S	Port Kennedy	91
*	Tribulus terrestis			MG


Prepared by the Department of Planning and Urban Development Perth, Western Australia March 1990
SCALE
0 1 2
Kilometres
SOUTH FREMANTLE
CITY OF FREMANTLE
CITY OF MELVILLE
CITY OF COCKBURN
COCKBURN SOUND
INDIAN OCEAN
SPEARWOOD
JANDAKOT
JANDAKOT AGRICULTURAL AREA
CITY OF COCKBURN
TOWN OF KWINANA
NAVAL BASE
MEDINA
LEGEND
Wetland areas
1 North Lake
2 Bibra Lake
3 South Lake
4 Little Rush Lake
5 Yangebup Lake
6 Kogolup Lake
7 Thomsons Lake
8 Banganup Lake
9 Wattleup Lake
10 The Spectacles
11 Manning Lake
12a Market Garden Swamp No. 1
12b Market Garden Swamp No. 2
12c Market Garden Swamp No. 3
13 Lake Coogee
14 Brownman Swamps
15 Lake Mt. Brown
16 Long Swamp
BEELIAR REGIONAL PARK
WETLAND AREAS

Map

MAIN ROADS
WESTERN AUSTRALIA

KWINANA FREEWAY

FORREST ROAD TO THOMAS ROAD

PUBLIC ENVIRONMENTAL REVIEW
IMPACT ON WETLANDS

AIREY RYAN & HILL
Consulting Engineers

In Association With

LE PROVOST ENVIRONMENTAL CONSULTANTS

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The Spectacles (looking west from Johnson Rd where Ridge proposed to cross)

The Spectacles (looking East from Johnson Rd where rail line is proposed to cross)

BP 269

bp site 269

Map Ident: plot980527_1	DATE: 27 May 98
Prepared By: Andrea Zappacosta	Prepared For:
Scale 1:AUTO	MFP INTERNAL USE ONLY

0 500 m

AG VEG 1998 BOUNDARY THEME

Cadastre

Bushplan sites refno 1-500 SCP BOUNDARY THEME

Existing P+R.

RAIL RESERVE
Road verge issue
BOK 24/8

ADD?

bp site 269

AG VEG 1998 BOUNDARY THEME

Cadastre

Bushplan sites refno 1-500 SCP BOUNDARY THEME

Road verge issue BJK 24/8

Existing P+R.

Map Ident: plot980527_1	DATE: 27 May 98
Prepared By: Andrea Zappacosta	Prepared For:
Scale 1:AUTO	MFP INTERNAL USE ONLY

0 500 m

Subm 6

9.12.6 LAND USE

The wetlands are adjacent to land used for market gardening.

The northern wetland has been affected by filling and clearing of wetland vegetation. Should an increase in water levels occur it would be expected that it would move from sedgeland to open water as in the southern wetland.

The southern wetland appears to be managed by the landowner as a landscape feature. The open water and paperbark woodland provide a range of waterfowl habitats.

9.12.7 VEGETATION (Figure 9.19)

These two areas provide some wildlife habitats

9.12.8 FAUNA - See above. (Section 9.12.7)

9.13 THE SPECTACLES BS269

9.13.1 GENERAL INFORMATION

LOCAL AUTHORITY: Town of Kwinana
MRS ZONE: Rural
RESERVE NUMBERS: n/a - owned by Alcoa, Industrial Lands Development Authority and private landowners
MANAGEMENT: Landowners
SYSTEM 6 RECOMMENDATION: n/a
WETLAND ADVISORY COMMITTEE CLASSIFICATION: LE.f.l.se.c
PURPOSE: n/a
DRAINAGE: Bisected north to south by the Peel Main Drain; subsidiary east west drains - two in Big Eye, one in Small Eye.
ROADWORKS: Kwinana Freeway extension will pass east of the Spectacles.

9.13.2 PHYSIOGRAPHY AND GEOLOGICAL SETTING

The Spectacles is situated at the interface of the Bassendean and Spearwood Dunes but differs from lakes to the north in that there is an outcrop of Spearwood Dunes on the eastern side (Gozzard, 1983).

9.13.3 AREAS

Large Eye Spectacle

Total wetland	113.1 ha
Paperbark	56.2 ha
Sedgeland	46.3 ha
Open water zone	3.7 ha
Modified wetland	6.9 ha

Small Eye Spectacle

Total wetland	28.4 ha
Paperbark	10.9 ha
Sedgeland	15.6 ha
Open water	1.9 ha

BS 244
BASS. STH
NTH LAKE

BS 247
SPEAR. S.
MANNING

BS 248
BASS. S.
BIBRA

BS 254
BASS. S.
STH. LK.

BS 256
BASS. S
YANGEB.

BS 261
SPEAR S
L. COOGEE

BS 262
BASS. S
PIARRA

BS 263
BASS. S.
W. GIBBS

BS 269
SPEAR. S.
SPECTACLE

BS 273
+ BS 404
SPEAR S.
CASUARINA

BS 342
BASSEND S.
ANST. KEAN

BS 344
BASS. S
DE YOUNG

BS 346
SPEAR. S
COOGEE

BS 347
BASS. S.
WANDI

BS 348
BASS. S.
MODONG

BS 353
BASS S
BANKSIA

BS 389
BASS. STH
EAST d JAND

BS 390
BASS S
FORREST R

BS 39
BASS. S.
THOMPSON

BS 392
SPEAR. S
HARRY WAL

BS 435
BS 429
SPEAR S
MARKE

BS
BASS. S.
JANDAKOT

Proposals for the

Jandakot Botanic Park

Final

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