NORTH LAKE AND BIBRA LAKE, NORTH LAKE/BIBRA LAKE

Boundary Definition: protected area/bushland boundary

SECTION 1: LOCATION INFORMATION

Bush Forever Site no. 244
Area (ha): bushland 128.2 (Site also includes open water.)
Map no. 52, 53, 58, 59
Map sheet series ref. no. 2033–I NW
Other Names: part of Beeliar Regional Park
Local Authorities (Suburb): City of Cockburn (North Lake, Bibra Lake)
System 6 (1983): Part M93 Part System area bushland, only bushland described

SECTION 2: REGIONAL INFORMATION

LANDFORMS AND SOILS
Bassendean Dunes
Bassendean Sands (Qpb: S8)
Spearwood Dunes
Sands derived from Tamala Limestone (Qts: S7)
Wetlands (within the Spearwood/Bassendean Dune interface)
Holocene Swamp Deposits (Qhw: Mps)

VEGETATION AND FLORA
Vegetation Complexes
Bassendean Dunes
Bassendean Complex — Central and South
Spearwood Dunes
Karrakatta Complex — Central and South
Wetlands
Herdsman Complex
Floristic Community Types: *not sampled, type inferred
Supergroup 2: Seasonal Wetlands
11 Wet forests and woodlands
*12 *Melaleuca teretifolia* and/or *Astartea* aff. *fascicularis* shrublands
Supergroup 3: Uplands centred on Bassendean Dunes and Dandaragan Plateau
23a Central *Banksia attenuata — B. menziesii* woodlands
Supergroup 4: Uplands centred on Spearwood and Quindalup Dunes
28 Spearwood *Banksia attenuata* or *B. attenuata — Eucalyptus* woodlands

WETLANDS
Wetland Types: lake, sumpland
Natural Wetland Groups
Spearwood—Bassendean interface
Bibra (S/B.1)
Wetland Management Objectives: Conservation (55.75ha), Resource Enhancement, Multiple Use
Swan Coastal Plain Lakes EPP: 3ha + 6.6ha + 31.4ha = 41ha (total)

THREATENED ECOLOGICAL COMMUNITIES
Not assessed

SECTION 3: SPECIFIC SITE DETAIL

North Lake
Landscape Features: open water, vegetated wetland, vegetated uplands
Vegetation and Flora: limited survey (part Site — DEP 1996 (Beel 01–03), EPA and WAWA 1990, Newman 1976, Weston 1993)
Structural Units: mapping (EPA and WAWA 1990, Cockburn Wetlands Committee 1976)
Uplands: *Eucalyptus marginata* Open Forest; *Banksia attenuata, B. menziesii* and *Allocasuarina fraseriana* Low Open Forest, with emergent *Eucalyptus marginata*
Wetlands: *Eucalyptus rudis, Melaleuca preissiana, M. rhaphiophylla* and *Banksia ilicifolia* Forest to Woodland, with *Kunzea glabrescens, Acacia saligna* and *Agonis linearifolia*; *Melaleuca teretifolia* Tall Shrubland; *Baumea articulata* and **Typha orientalis* Sedgelands
Vegetation Condition: >60% Very Good to Excellent, >30% Good to Degraded, with areas of severe localised disturbance (Weston 1993)
Total Flora: not known
Significant Flora: Weston 1993 — *Aotus cordifolia* (3); *Jacksonia gracilis, Villarsia violifolia*

Fauna: multiple surveys for birds (71 species) (RAOU 1996 D, 16 visits) (Newman 1976). Significant populations of Australasian Shoveler, Hardhead, Blue-billed, Musk, and Pink-eared Ducks. Significant bird species: category 1 (1), category 3 (9) and category 4 (4). Important summer refuge for migratory JAMBA/ CAMBA waders (AHC 2000 D). Significant mammal species: Quenda (Friend 1996 D). Only known urban wetland supporting freshwater sponges (AHC 2000 D)
Linkage: adjacent bushland to the north (across road); part of Greenways 82, 90 (Tingay, Alan & Associates 1998a); part of a regionally significant contiguous bushland/wetland linkage (Part A, Map 7)

Bibra Lake
Landscape Features: open water, permanent salt lake, vegetated wetland, vegetated uplands
Vegetation and Flora: limited survey (EPA and WAWA 1990, Keighery, BJ, 1996a, Newman 1976, Weston 1993)
Structural Units: mapping (EPA and WAWA 1990, Newman 1976)
Uplands: *Banksia attenuata, B. menziesii* and *Allocasuarina fraseriana* Low Open Forest, with *Eucalyptus marginata*
Wetlands: *Eucalyptus rudis, Melaleuca preissiana* and *M. rhaphiophylla* Open Forests; *Melaleuca teretifolia* Low Closed Forest or Closed Tall Scrub; Closed Sedgeland
Remnant Vegetation: not assessed
Vegetation Condition: >20% Good to Very Good, <80% Degraded, with areas of severe localised disturbance
Total Flora: not known
Significant Flora: *Dodonaea hackettiana* (4)
Fauna: multiple survey for birds (112 species) (RAOU 1996 D, 56 visits). Significant populations of Australasian Shoveler, Hardhead, Blue-billed, Musk, and Pink-eared ducks. Significant bird species: category 1 (1), category 2 (4), category 3 (14) and category 4 (8). Significant mammal species: Quenda (Friend 1996 D)
Linkage: bushland linkage to north (across road), south (Site 254, across road) and west (across road); part of Greenway 90 (Tingay, Alan & Associates 1998a)
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; subject to protection under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS
Criteria: Representation of ecological communities, Rarity, Scientific or evolutionary importance, 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).

NORTH LAKE AND BIBRA LAKE, NORTH LAKE/BIBRA LAKE

Boundary Definition: protected area/bushland boundary

SECTION 1: CADASTRAL INFORMATION

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

Bushplan Site no. 244 **Map no.** 67 **Map sheet series ref. no.** 2033–I NW

System 6 (1983): Part M93 Part System area bushland, only bushland described

Other Names: not known

Area (ha): total 398.5 (includes open water); bushland 127.2

Local Authorities (Suburb)
City of Cockburn (North Lake, Bibra Lake)

Zoning
MRS: Parks and Recreation, Controlled Access Highways, Urban
TPS: Landscape, Residential

Ownership Categories
State Government, Local Government, Private (commercial organisation)

Lot/Location/Reserve numbers (Purpose), Street name
0, 54, 55, 56, 57, 58, 59, 552, 2121 Progress Dr; 37, 72, 2550 Farrington Rd; 552 Gwilliam Dr; 53, 2033 Bibra Rd; 0, 20, 35, 100 Bibra Dr; 38, 39 Dixon Rd; 0, 1, 2, 3, 39, 40, 65, 387, 485 Hope Rd; 50 Parkway Rd; 10, 100, 536, 2016 Forrest Rd; 1 North Lake Rd; Closed; 0, 59, 303, 304 street not identified
Crown Reserve

SECTION 2: REGIONAL INFORMATION

LANDFORMS AND SOILS

Bassendean Dunes
Bassendean Sands (Qpb: S8)

Spearwood Dunes
Sands derived from Tamala Limestone (Qts: S7)

Wetlands (within the Spearwood/Bassendean Dune interface)
Holocene Swamp Deposits (Qhw: Mps)

VEGETATION AND FLORA

Vegetation Complexes

Bassendean Dunes
Bassendean Complex — Central and South

Spearwood Dunes
Karrakatta Complex — Central and South

Wetlands
Herdsman Complex

Floristic Community Types: *not sampled, types inferred

Supergroup 2: Seasonal Wetlands
11 Wet forests and woodlands
*12 *Melaleuca teretifolia* and/or *Astartea* aff. *fascicularis* shrublands

Supergroup 3: Uplands centred on Bassendean Dunes and Dandaragan Plateau
23a Central *Banksia attenuata* — *B. menziesii* woodlands

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

WETLANDS

Wetland Types: lake, sumpland

Natural Wetland Groups

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

Wetland Management Objectives: Conservation (235ha)

Swan Coastal Plain Lakes EPP: 3ha, 6.6ha and 31.4ha (41ha total)

THREATENED ECOLOGICAL COMMUNITIES
Not assessed

SECTION 3: SPECIFIC SITE DETAIL

<u>North Lake</u>

Landscape Features: open water, vegetated wetland, vegetated uplands

Vegetation and Flora: limited survey (part Bushplan Site - DEP 1996 (Beel 01-03), EPA and WAWA 1990, Newman 1976, Weston 1993)

Structural Units: mapping (EPA and WAWA 1990, Cockburn Wetlands Committee 1976)
Uplands: *Eucalyptus marginata* Open Forest; *Banksia attenuata, B. menziesii* and *Allocasuarina fraseriana* Low Open Forest, with emergent *Eucalyptus marginata*
Wetlands: *Eucalyptus rudis, Melaleuca preissiana, M. rhaphiophylla* and *Banksia ilicifolia* Forest to Woodland, with *Kunzea ericifolia, Acacia saligna* and *Agonis linearifolia*; *Melaleuca teretifolia* Tall Shrubland; *Baumea articulata* and **Typha orientalis* Sedgelands
Vegetation Condition: >60% Very Good to Excellent, >30% Good to Degraded, with areas of severe localised disturbance (Weston 1993)
Total Flora: not known
Significant Flora: limited survey (Weston 1993), *Aotus cordifolia* (3); *Jacksonia gracilis, Villarsia violifolia*

Fauna: surveyed by RAOU (1996 D), 16 visits, for birds (71). Significant populations of Australasian Shoveler, Hardhead and Blue-billed, Musk, and Pink-eared Ducks. Significant bird species: category 1 (1), category 3 (9) and category 4 (4). Significant mammal species: Quenda (Friend 1996 D)
Linkage: adjacent bushland to the north, south (BS254) and west; part of proposed Greenway 89 (Tingay, Alan & Associates 1997a); part of a regionally significant contiguous bushland/wetland linkage (Volume 2A, Map 8)

<u>Bibra Lake</u>
Landscape Features: open water, permanent salt lake, vegetated wetland, vegetated uplands
Vegetation and Flora: limited survey (EPA and WAWA 1990, Keighery, BJ, 1996a, Newman 1976, Weston 1993)
Structural Units: mapping (EPA and WAWA 1990, Newman 1976)
Uplands: *Banksia attenuata, B. menziesii* and *Allocasuarina fraseriana* Low Open Forest, with *Eucalyptus marginata*
Wetlands: *Eucalyptus rudis, Melaleuca preissiana* and *M. rhaphiophylla* Open Forests; *Melaleuca teretifolia* Low Closed Forest or Closed Tall Scrub; Closed Sedgeland
Remnant Vegetation: not assessed
Vegetation Condition: >20% Good to Very Good, <80% Degraded, with areas of severe localised disturbance
Total Flora: not known
Significant Flora: *Dodonaea hackettiana* (4)

Fauna: surveyed by RAOU (1996 D), 56 visits, for birds (112). Significant populations of Australasian Shoveler, Hardhead and Blue-billed, Musk, and Pink-eared Ducks. Significant bird species: category 1 (1), category 2 (4), category 3 (14) and category 4 (8). Significant mammal species: Quenda (Friend 1996 D)
Linkage: bushland linkage to north (across road); part of proposed Greenway 103 (Tingay, Alan & Associates 1997a)
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

SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS

Criteria: Representation of ecological communities, Rarity, Scientific or evolutionary importance, 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

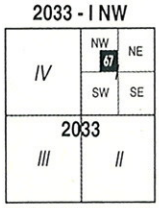
Opportunities and/or Constraints
Opportunities: Bushplan Site/part Bushplan Site subject to Swan Coastal Plain Lakes EPP; location of Scheduled Fauna, conservation category wetlands; under MRS Parks and Recreation Reservation and TPS Landscape Zoning, Crown Reserve
Constraints: private land; under MRS Urban Zoning, MRD regional road requirements

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

LEGEND

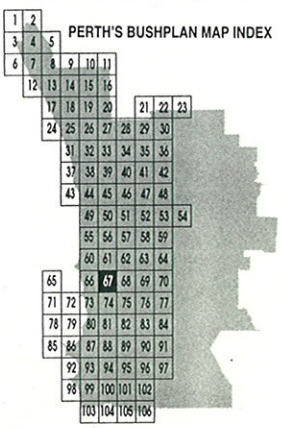
- 472 — Bushplan Sites With Regionally Significant Bushland
- Other Native Vegetation
- Conservation Category Wetlands
- Bushplan Sites With Some Existing Protection
- 696 — Lot Number, Location Number
- Channel Wetlands
- Local Government Boundary

2033 - I NW



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

PERTH'S BUSHPLAN MAP INDEX



N

SCALE

0 500 1000

Metres

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

ntw-map18//environ/bushplan//bushv2_67.dgn

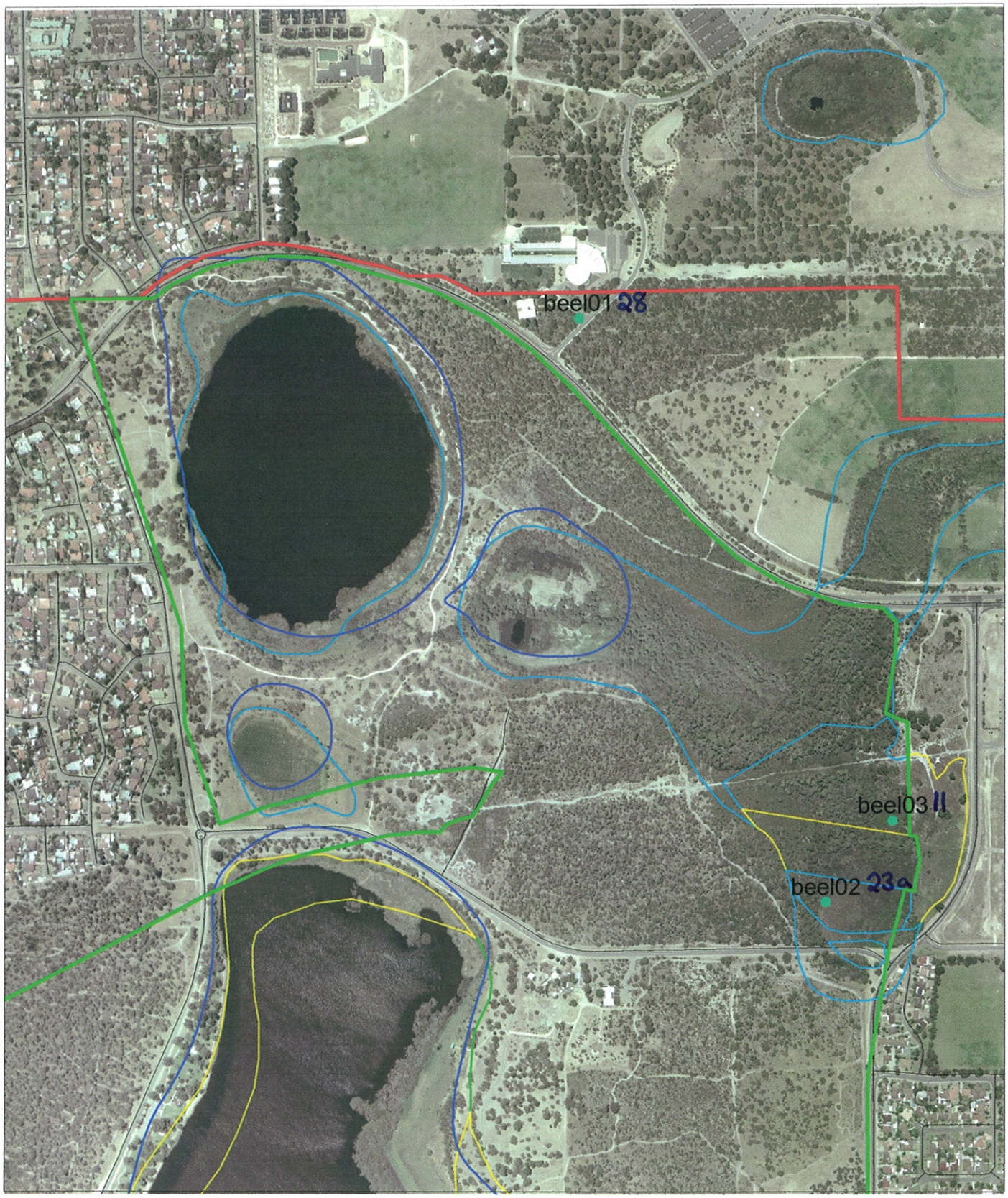
Cadastral Data supplied by Department of Land Administration, W.A.

Wetlands Data supplied by Water and Rivers Commission

Native Vegetation Extent for Study Area supplied by Agriculture Western Australia

Bushplan Site Map

Map 67



Bush Forever Sites
Local Government Authority Boundaries
Lakes EPP
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

Bush Forever Site 244: North Lake and Bibra Lake, North Lake/Bibra Lake

N

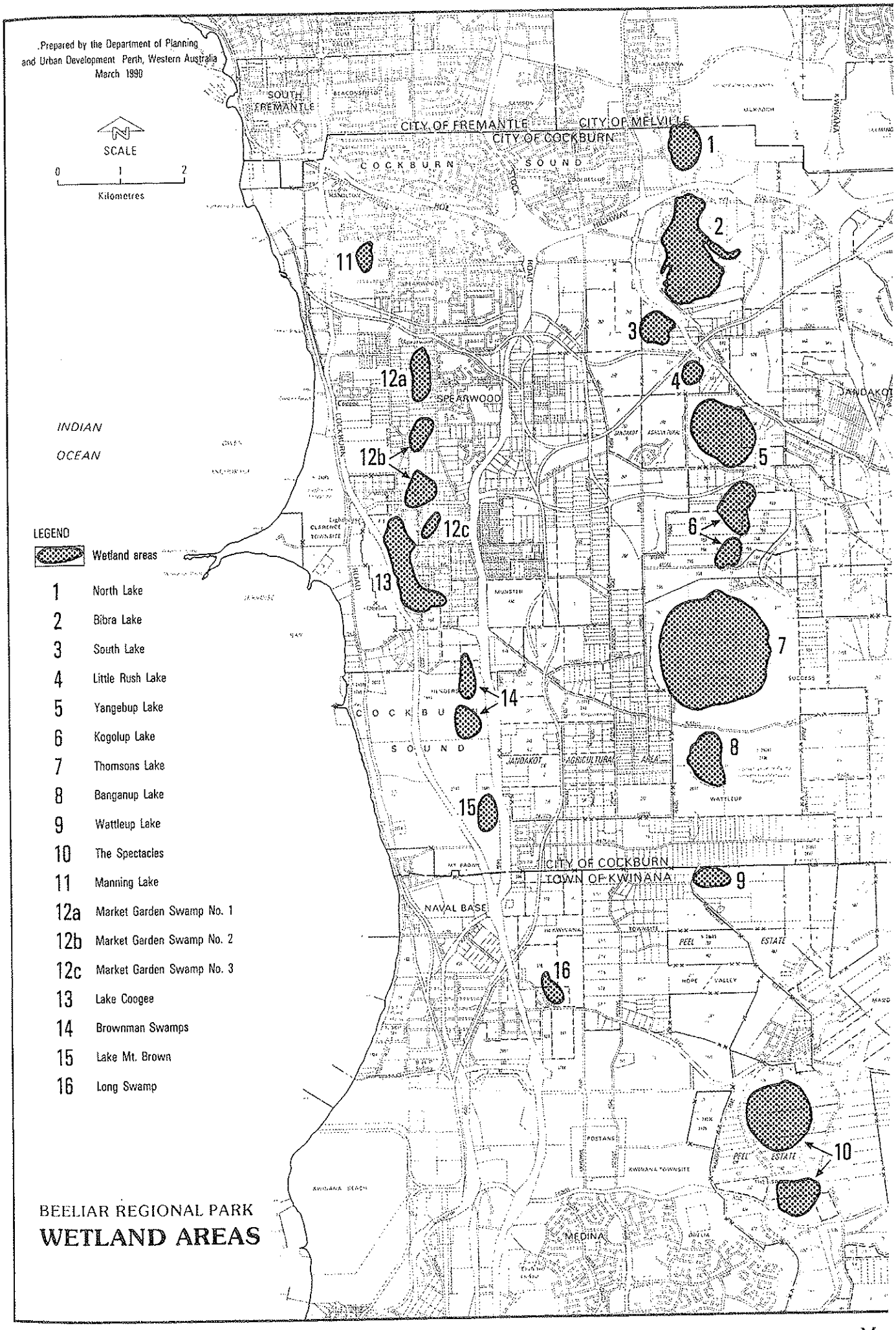
0 200 400 600 800 Meters

1:10000

Datum: GDA - Projection: MGA Zone 50

Department of Environment

Data Sources:
Cadastre DLI
Aerial Phototography : Skyview DLI


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
WATTLEUP
CITY OF COCKBURN
TOWN OF KWINANA
NAVAL BASE
PEEL ESTATE
POSTANS
KWINANA TOWNSITE
KWINANA BEACH
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

Ma

15/6/00.

Ken Richardson rang seeking listing of Bushplan Sites covering North Lake/Bibra Lake area. He is opposing extension of Roe Hwy through Bushplan Sites.

John Dell.

BJK 6/7/98

DS 244/240

Highway Res vegetation should be shown as orange to be consistent with other boundaries, eg in DS 244

Addition

Additional in response CL notes

- amalgamate 244/48

27/7/98.

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 388
BASS. S.
JANDAKOT

BS 389
BASS. STH
EAST of JAND

BS 390
BASS S
FORREST

BS 39
BASS. S.
THOMPSON

BS 392
SPEAR. S
HARRY WAF

BS 435
BS 429
SPEAR S
MARKE

Proposals for the

Jandakot Botanic Park

Final

Prepared for the Western Australian Planning Commission
by the Ministry for Planning
Albert Facey House
469 Wellington Street
Perth 6000 Western Australia

Ministry for Planning

March 1995

BS 244

R. A. O. U. T R A C K I N G D A T A B A S E

23/06/96 PARK SIGHTINGS REPORT Page No. 1

North Lake (M93)

ORDER:	REF:	BIRD NAME	NO. SIGHTINGS
0018	0216	Blue-billed Duck 3	15
0019	0217	Musk Duck 3	12
0022	0203	Black Swan	13
0025	0207	Australian Shelduck	7
0028	0202	Australian Wood Duck	2
0031	0948	Mallard	9
0032	0208	Pacific Black Duck	16
0033	0212	Australasian Shoveler 3	5
0035	0211	Grey Teal	14
0039	0213	Pink-eared Duck 3	1
0040	0215	Hardhead 3	12
0041	0061	Australasian Grebe	15
0042	0062	Hoary-headed Grebe	8
0043	0060	Great Crested Grebe	1
0128	0101	Darter	4
0129	0100	Little Pied Cormorant	12
0131	0099	Pied Cormorant	1
0132	0097	Little Black Cormorant	10
0133	0096	Great Cormorant	2
0135	0106	Australian Pelican	7
0139	0188	White-faced Heron	13
0145	0187	Great Egret	9
0150	0192	Nankeen Night Heron	1
0157	0179	Australian White Ibis	12
0158	0180	Straw-necked Ibis	1
0160	0182	Yellow-billed Spoonbill	5
0170	0228	Whistling Kite 4	2
0174	0219	Swamp Harrier	1
0177	0222	Collared Sparrowhawk 4	1
0181	0225	Little Eagle 4	2
0187	0240	Nankeen Kestrel	1
0204	0058	Purple Swamphen	13
0205	0056	Dusky Moorhen 3	15
0208	0059	Eurasian Coot	15
0267	0146	Black-winged Stilt	7
0282	0144	Black-fronted Dotterel	3
0297	0125	Silver Gull	14
0324	0957	Rock Dove	2
0326	0988	Laughing Turtle-Dove	6
0327	0989	Spotted Turtle-Dove	9
0356A	1266	White-tailed Black-Cockatoo /	3
0359	0273	Galah	2
0366	0254	Rainbow Lorikeet	1

0386	0294	Australian Ringneck		11
0387	0290	Red-capped Parrot		6
0446	0322	Laughing Kookaburra		7
0451	0326	Sacred Kingfisher		5
0453	0329	Rainbow Bee-eater		4
0471	0532	Splendid Fairy-wren	3	15
0492	0976	Striated Pardalote		7
0517	0463	Western Gerygone		12
0524	0476	Inland Thornbill	3	3
0528	0472	Western Thornbill	3	4
0531	0486	Yellow-rumped Thornbill		15
0537	0638	Red Wattlebird		15
0561	0608	Singing Honeyeater		12
0583	0597	Brown Honeyeater		12
0587	0631	New Holland Honeyeater	4	5
0597	0592	Western Spinebill		3
0653	0401	Rufous Whistler		8
0671	0415	Magpie-Lark		15
0673	0361	Grey Fantail		14
0676	0364	Willie Wagtail		15
0678	0424	Black-faced Cuckoo-shrike		7
0695	0702	Grey Butcherbird		12
0698	0705	Australian Magpie		15
0706	0930	Australian Raven		16
0763	0357	Welcome Swallow		10
0765	0359	Tree Martin		12
0768	0524	Clamorous Reed-Warbler		10
0781	0574	Silvereye		15

*** END OF REPORT ***

(1) 1

(2)

(3) 9

(4) 4

SUMMARY REPORT

TOTAL BIRDS SIGHTED	:	71
TOTAL NUMBER OF CARDS	:	16

*** END OF SUMMARY ***

Sobm 225 BS 244 PB076

9k

That section together with a type of Greenways link through to the existing reserve would have merit bearing in mind that there is only a small ratio of bush reserves in the western portion of Cockburn. The area is also becoming heavily industrialised (general and light industry) and this section of bushland would create a type of breathing space for the long term future.

Vicinity of Site 244 - Map 67:

You will note several shaded areas abutting the Kwinana freeway along its western edge between South Street and the Roe Freeway/Kwinana Freeway interchange. Map 67 indicates that some of this bushland could have potential for being saved despite of the interchange connections. The bush in this area has a particularly good diversity of flora and Banksia Woodland. It provides a good background for commuters beyond the Freeway and enhances such areas as Leeming and Bibra Lake. ***I suggest you make some small Bushplan sites out of those remnant areas.***

Map 67 - Bushplan Site [redacted]:

I recommend that this be extended where practical to include any remnant bushland between the northern boundary of Jandakot Airport and the Roe Freeway reserve. Bush in this area is of a relatively good condition and mainly Banksia Woodlands.

Map 74 - Bushplan Site 391:

The above site contains Thomson's and Kogolup Lakes. It has omitted to include good quality diverse Banksia/Tuart Woodland in Section IV south-west of the new subdivisions in Beeliar (just north west of Thomson's Lake). Part of this land is held by Water Corporation for a reservoir and the balance is owned by Homeswest.

I recommend the site include the Water Corporation land and bushland mentioned.

Map 74 - North East - Jandakot Caravan Park Site & Hird Road Swamp:

Site [redacted] extends towards Hird Road Swamp but does not cross Hammond Road to the actual Swamp. Although Hird Road Swamp is now used partly for storm water treatment, the swamp and adjoining bush is worthy of preservation. The bushland varies from Banksia Woodland through to Malaleuca and rushes. The associated bushland encircles the Jandakot Caravan Park and fronts Hammond Road directly north of the Caravan Park. Approximately 15 hectares of bush in that northern position has particularly diverse flora including many species becoming very rare in the region e.g. pink trigger plants; white triggers; spider orchids; donkey orchids, cats paws and numerous other plants.

BF # 244 (076)

Flora and Fauna Survey - Bushland Reserve No 39402 Bibra Lake for City of Cockburn

10/11/95

Prepared by :

Georgina Reiss

Regeneration Technology Pty Ltd

Suite 11 1 Sarich Way,

Technology Park,

Bentley WA 6102

SUMMARY

• Bibra Lake reserve (39402) represents a floristic composition and vegetation structure typical of open Banksia *attenuata-Banksia menziesii* woodland on Bassendean sands in the Perth Coastal Plain. Species richness is high with 83 native species represented at the site.

• No rare or priority flora were recorded in the reserve this includes the absence of *Caladenia huegelii* and *Anigozanthos humilis chryanthus*.

• Vegetation condition is average with a mean score of 3 for the seven plots assessed

• The number of weed species at the reserve and weed frequency in surveyed plots was average for Banksia woodlands but low in terms of overall cover and competitive threat.

• Although there is evidence of bandicoots on Bibra Lake reserve 39402, it is unlikely this reserve has a permanent population of Southern Brown Bandicoots. This reserve may be used as a corridor for the more transient male bandicoots during the mating season.

• This reserve supports a variety of reptiles and a few resident bird species however the main value of this reserve is in providing bush corridor for transient birds and mammals.

1.0 METHODS

1.1 Location and Size of Reserve

Bibra Lake Reserve 39402 is located in the City of Cockburn and is bounded by Parkview Way, Annois Rd and a Western Power boundary fence on the eastern side. It is approximately 6 ha and incorporates an upper dune crest on porous Bassendean sands.

1.2 Survey

The site was visited three times to assess the vegetation; 1) an initial site assessment in late September 1995, 2) a general collection and survey of plant species in mid October 1995, six east - west transects and three north - south transect were used for this purpose and 3) species frequency was assessed in early November 1995 using seven $20m^2$ plots, four at 50 m intervals along an east - west transect line and three at 50 m intervals along a north - south transect line.

Vegetation structure as recorded using Muir's classification (Muir 1977). Vegetation condition was scored using the five point scale developed by Trudgen (1991) and used by Gibson et al (1994) for a floristic survey of the Swan Coastal Plain. This system accords a score of one for least disturbed sites and five indicating highly disturbed sites with significant weed invasion. Species frequency and weed frequency were also recorded. Vegetation type is used to refer to structural vegetation units and community types classified according to Gibson et al (1994).

Fauna was assessed on a single occasion in early November. The report is attached.

2.0 RESULTS AND DISCUSSION

2.1 Vegetation Structure

Structurally, the vegetation type at Bibra Lake Reserve 39402 is open low wood land dominated by *Banksia attenuata* and *Banksia menziesii* with scattered *Eucalyptus marginata*, *Banksia ilicifolia* and *Nuytsia floribunda*.

The high frequency of *Acacia pulchella* and *Stirlingia latifolia* (Table 1) in the test plots is indicative that this area has been burnt within the last two to three years. Only one of the frequently recorded species is a weed (*Briza maxima*) and as a general indication shows that the weeds although present throughout the reserve do not represent the dominant species throughout the reserve.

Table 1 Frequent species based on presence in 6 or more plots.

Shrubs	Herbs
Acacia pulchella	*Briza maxima*
Allocasuarina humilis	*Burchardia umbellata*
Banksia menziesii	*Laxmannia squarrosa*
Bossiaea eriocarpa	*Patersonia occidentalis*
Gompholobium tomentosum	
Hibbertia hypericoides	
Stirlingia latifolia	

2.2 Floristics

The floristic composition of Bibra Lake Reserve 39402 belongs to the 'Group 3' classification of Gibson *et al* (1994), ie. typical of Bassendean Dunes. This vegetation group has the highest species richness (mean 60.4 native species per site) and lowest weed frequency (mean 3.4 species per site) of major vegetation types on the Swan Coastal Plain and this broad floristic 'supergroup' has high conservation value. Within this vegetation class are four distinct community types, with Bibra Lake Reserve 39402 most typical of Community Type 20 (Table 2).

Bibra lake Reserve 39402 has a high species richness with 83 native species recorded. This compares favourably with Group 3 Banksia woodlands indicating it is typical of this floristic group. It is of high species richness compared to Banksia woodland communities in general on the Swan Coastal Plain, which average a species richness of 7 to 86 per $100m^2$ (Gibson *et al*).

Table 2. Parameters used to assess vegetation of Bibra Lake Reserve 39402.

PARAMETER	VALUE	STATUS
Species richness (no. at site)	83	high
Weed frequency (mean species no./plot)	3	low
% Weed cover	15	low
Vegetation condition	3	average

2.3 Conservation Status

The reserve is typical of Banksia woodland Community type 20 (Gibson *et al*). This community type typically comprises *Banksia attenuata* woodlands, *Eucalyptus marginata-Banksia attenuata* woodlands or shrub lands, and extends from Koondoola in the northern coastal plain to Yarloop in the south. This community type is characterised by high species richness and is considered poorly reserved on the Swan Coastal Plain and of vulnerable conservation status.

The destruction of the understorey flora of the surrounding areas, in particularly of bush adjacent to Bibra Lake means there few areas to collect local provenance seed for bushland rehabilitation. The high number of taxa and the general condition of the flora at Bibra Lake reserve suggests that this particular piece of banksia woodland may be able to act as a donor site for seed for rehabilitation of other areas within the immediate vicinity.

No rare or priority flora were recorded on the site.

RECOMMENDATIONS

1. Retain Bibra Lake Reserve 39402 as a wildlife corridor and exclude all activities not compatible with such a purpose .

2. Retain Bibra Lake Reserve 39402 as a seed source for other local rehabilitation projects.

3. Undertake weed and fire management program to protect and enhance the quality of the flora and fauna of the reserve.

REFERENCES

Gibson, N., Keighery, B., Keighery G., Burbidge, A. and Lyons, M. (1994). A floristic survey of the southern Swan Coastal Plain. Unpublished report for the Australian Heritage Commission prepared by Dept. of Conservation and Land Management and the Conservation Council of WA (Inc).

Muir, B. (1977). Biological survey of the Western Australian wheatbelt. Part II. *Records of the WA Museum, Supplement No. 3.*

Trudgen, M.E. (1991). Vegetation condition scale. *In* Urban Bushland Policy. National Trust of Australia (WA), Perth.

APPENDIX 1. SPECIES PRESENCE/ABSENCE DATA FOR 7 PLOTS AT BIBRA LAKE RESERVE 39402, COCKBURN.

SPECIES	Presence/absence data Plot Number							
	1	2	3	4	5	6	7	Frequency
AIZOACEAE								
**Carpobrotus edulis*								0
ANTHERICACEAE								
Laxmannia squarrosa	+	+	+	+		+	+	6
Sowerbaea laxiflora		+						1
Thysanotus dichotomus	+							1
Thysanotus triandrus					+			1
APIACEAE								
Trachymene pilosa			+	+		+		3
ASTERACEAE								
**Arctotheca calendula*								0
**Hypochaeris glabra*								0
Podolepis gracilis								0
CASUARINACEAE								
Allocasuarina humilis	+		+	+	+	+	+	6
Allocasuarina fraseriana	+							1
COLCHICACEAE								
Burchardia umbellata		+	+	+	+	+	+	6
CYPERACEAE								
Lepidosperma angustatum	+			+	+	+	+	5
Lepidosperma scabrum				+			+	2
Mesomelaena pseudostygia	+		+	+		+		4
Schoenus aff. *brevisetis*	+	+						2
Schoenus grandiflorus	+						+	2
Schoenus curvifolius	+		+	+	+		+	5
Schoenus subflavus			+	+			+	3
Tetraria octandra				+				1
DASYPOGONACEAE								
Calectasia cyanea				+			+	2

SPECIES	Presence/absence data Plot Number							
	1	2	3	4	5	6	7	Frequency
Dasypogon bromeliifolius		+		+	+	+	+	5
Lomandra hermaphrodita			+		+			2
Lomandra preissii			+	+	+	+		4
Lomandra sericea								0
DILLENIACEAE								
Hibbertia huegelii						+		1
Hibbertia hypericoides	+	+	+	+	+		+	6
Hibbertia racemosa			+					1
Hibbertia subvaginata	+	+	+		+			4
DROSERACEAE								
Drosera stolonifera				+				1
EPACRIDACEAE								
Conostephium pendulum	+	+		+	+	+		5
Leucopogon conostephioides		+		+				2
EUPHORBIACECEAE								
**Euphorbia peplus*								0
GERANIACAEAE								
**Pelargonium caipiatum*								0
GOODENIACEAE								
Dampiera linearis	+				+			2
Scaevola canescens	+			+				2
Lechenaultia floribunda								0
HAEMODORACEAE								
Anigozanthos manglesii	+		+		+			3
Anigozanthos humilis		+						1
Conostylis aculeata			+	+	+	+	+	5
Conostylis setigera			+					1
Haemodorum spicatum		+						1
Phlebocarya ciliata								0
IRIDACEAE								
**Freesia affin leichtlinii*								0

SPECIES	Presence/absence data Plot Number							
	1	2	3	4	5	6	7	Frequency
**Gladiolus caryophyllaceus*	+	+	+		+			4
Orthrosanthus laxus								0
Patersonia occidentalis	+	+	+	+		+	+	6
LAMIACEAE								
Hemiandra pungens	+			+		+		3
LORANTHACEAE								
Nuytsia floribunda	+	+						2
MIMOSACEAE								
Acacia pulchella	+	+	+	+	+	+	+	7
Acacia stenoptera	+	+		+	+			4
MYRTACEAE								
Calytrix flavescens				+			+	2
Eremaea beaufortiodies	+		+	+	+	+		5
Eucalyptus marginata						+	+	2
Hypocalymma robustum						+	+	2
Melaleuca acerosa	+				+			2
Melaleuca scabra		+	+	+				3
ONAGRACEAE								
**Oenothera stricta*								0
ORCHIDACEAE								
OXALIDACEAE								
** Oxlis pes-caprae*								0
PAPILIONACEAE								
Bossiaea eriocarpa	+	+	+	+	+	+	+	7
Daviesia divaricata				+				1
Daviesia nudiflora			+					1
Daviesia triflora							+	1
Gompholobium tomentosum		+	+	+	+	+	+	6

SPECIES	Presence/absence data Plot Number							
	1	2	3	4	5	6	7	Frequency
Hovea trisperma			+				+	2
Hardenbergia comptoniana								0
Jacksonia sternbergiana		+						1
Kennedia prostrata		+				+		2
POACEAE								
**Aira caryophyllea*		+						1
Amphipogon turbinatus			+	+		+	+	4
**Briza maxima*	+	+	+	+		+	+	6
**Ehrharta calycina*	+	+				+		3
**Lagurus ovatus*								0
Neurachne alopecuroidea				+				1
POLYGALACEAE								
Comesperma calymega				+				1
PROTEACEAE								
Adenanthos barigerus								0
Adenanthos cygnorum			+					1
Banksia attenuata		+				+	+	3
Banksia ilicifolia							+	1
Banksia menziesii	+	+	+	+	+	+	+	7
Petrophile linearis	+	+			+	+	+	5
Stirlingia latifolia	+	+	+	+	+	+	+	7
Synaphea spinulosa								0
Xylomelum occidentale				+				1
RESTIONACEAE								
'Desmocladus' flexuosus ined (ex *Loxocarya flexuosus*)		+		+	+	+	+	5
Hypolaena exsulca		+						1
Lyginia barbata	+	+	+		+		+	5
RUTACEAE								
Boronia ramosa		+						1
Scholtzia involucrata		+				+	+	3

SPECIES	Presence / absence data Plot Number							
	1	2	3	4	5	6	7	Frequency
THYMELAEACEAE								
Pimelea rosea		+	+	+			+	4
Pimelea sulphurea			+				+	2
STYLIDIACEAE								
Stylidium brunonianum	+			+				2
VIOLACEAE								
Hybanthus calycinus				+				1
XANTHORRHOEACEAE								
Xanthorrhoea preissii	+	+	+		+			4
ZAMIACEAE								
Macrozamia riedlei								0
								Mean
Total number of species	32	35	33	40	33	29	33	**34**
Number of weed species	3	4	2	1	3	2	1	**3**
Weed Cover (%)	10	15	30	20	10	15	5	**15**
Vegetation condition	2.5	4	3.5	3	2.5	3.5	2	**3**

ANNOIS ROAD BUSHLAND, BIBRA LAKE

Conservation Value for Fauna

Prepared for: Revegetation Technology.
11B/1 Sarich Way,
Technology Park,
Bentley, 6102.

Prepared by: M.J. & A.R. Bamford,
CONSULTING ECOLOGISTS.
23 Plover Way,
Kingsley, WA, 6026.

08/11/'95

BACKGROUND

We have been asked to provide some brief comments on the conservation value for fauna of a small (6 ha) bushland remnant in the suburb of Bibra Lake. This assessment is based on a site visit conducted on the morning of 6 November 1995, our previous experience in similar habitats within and outside the Perth metropolitan area, and published information on fauna of bushland remnants in Perth. Most observations and comments are on vertebrate fauna, as invertebrates of bushland remnants are poorly known and therefore difficult to assess during a brief inspection.

The Annois Road bushland lies to the east of Bibra Lake (which is within Beeliar Regional Park), from which it is separated by the Bibra Lake Primary School. Land to the north and south is urbanized or developed for light industry. To the east of the Annois Road bushland lies the Kwinana Freeway, with bushland around Jandakot Airport beyond this.

The vegetation of the site is described in detail elsewhere. It is essentially *Banksia* woodland with a few emergent eucalypts (Jarrah *Eucalyptus marginata*) and a shrubby understorey. The understorey is invaded by weeds, particularly around the margins of the site, and the vegetation appears to be regenerating after a fire that had occurred perhaps two years previously. The site is level and contains no wetlands or damplands.

OBSERVATIONS ON FAUNA

During the site inspection, definite records of two reptile species, 11 bird species (one introduced) and three mammal species (all introduced and two domestic) were made (Table 1). In addition, diggings were noted which were probably made by the goanna *Varanus gouldii* or possibly *Varanus rosenbergi*. Some old diggings, partly obliterated by recent rain, may have been made by the Quenda or Southern Brown Bandicoot *Isoodon obesulus*. These were not clear, however, and it was apparent that there had been no recent activity by this species on the site.

While detailed observations were not made on invertebrates, a diversity of invertebrate life was noted and this included species that would not be expected to occur in the nearby suburbs. This included a small brown butterfly of the Sub-family Satyrinae.

CONSERVATION VALUE OF THE SITE FOR FAUNA

The fauna observed on the site during the brief visit represents only a small proportion of the fauna that could be expected to use the site. Detailed surveys of small bushland remnants elsewhere in the Perth metropolitan area have identified some common patterns to the survival of fauna in such areas (for example, Turpin 1990, How and Dell 1990, How and Dell in prep., Wykes 1991).

Frog and reptile species display a remarkable ability to persist in bushland remnants in urban areas. Most of the species that were present at the Annois Road site before the surrounding area was developed are probably still present on the site. Of the three frog species most likely to be present, one breeds terrestrially and the remaining two probably breed around Bibra Lake but migrate into upland habitats outside the breeding season. Some 25 reptile species may be present and could include the Black-striped Snake *Simoselaps (Vermicella) calonotus*, classified as endangered by Cogger *et al.* (1993). The Striped Lerista *Lerista lineata* may also be present and has a very restricted range between the Swan River and Rockingham, including Garden and Rottnest Islands.

Birds are less able to persist in bushland remnants than frogs and reptiles. Small, resident species, such as fairy-wrens, thornbills and scrubwrens, are unable to recolonize such sites if they disappear, as surrounding suburbs will not usually support them. Their disappearance from remnants can result from small population size which makes the species vulnerable to factors such as increased predation pressure from domestic cats. Mobile and migratory species which can utilize bushland remnants on a "part-time" basis and for which suburbs are not a barrier, may still be present, however. The bird species recorded on the site were all wide-ranging or nomadic species and no small, resident species were present. One such species, however, the Splendid Fairy-wren *Malurus splendens*, was present nearby at Bibra Lake. If detailed observations were made, as many as 50-60 species of birds could probably be recorded at the site. Species which may use the site would include several of conservation significance, most notably the Short-billed (white-tailed) Black-Cockatoo *Calyptorhynchus latirostris*, listed as vulnerable by Garnett (1992) and classed under Schedule Four (other specially protected fauna) of the Wildlife Protection Act.

The mammal fauna of the site is likely to be very depauperate. The only native species which may be consistently present are several species of bats, such as the White-striped Bat *Tadarida australis* and the Lesser Long-eared Bat *Nyctophilus geoffroyi*. These would shelter under loose bark and in hollows of the bankias and

eucalypts. The Quenda, which is listed under Schedule One (rare and likely to become extinct) of the Wildlife Protection Act, could be expected to visit the site occasionally. This species occurs around nearby Bibra Lake and young males, for example, may be displaced by adult males and find their way to the site. They would be unlikely to survive there, however, as the vegetation is not as dense as that which they usually favour and they would be subject to predation by domestic cats. Despite this, the site could be of significance for Quendas because it may act as a corridor for movement between Bibra Lake and suitable sites around Jandakot Airport and further east. The juxtaposition of the railway line pasing beneath the Kwinana Freeway may be significant in this respect, as it could be used as a wildlife underpass.

LOCAL SIGNIFICANCE OF THE FAUNA OF THE SITE

The Annois Road bushland is a small area compared with bushland in Beeliar Regional Park and the large area of bushland around Jandakot Airport. It is therefore unlikely that any fauna is present which isn't better represented elsewhere. The site does have local significance for fauna, however, because of its location.

As mentioned above, the site may be part of a corridor facilitating the movement of Quendas and other terrrestrial fauna between Beeliar Regional Park and other areas of native vegetation to the east. As development in the region continues, the preservation and enhancement of such wildlife corridors will become increasingly important if some components of the original fauna are to be retained within the urban area. The relationship between the site and the railway underpass beneath the Kwinana Freeway is particularly significant in this respect.

The site is also significant because it has community support, including from the adjacent primary school. Bushland remnants in urban areas inevitably become degraded and their value for fauna declines if active management is not undertaken. Such active management may be possible at the Annois road site because of the community interest and this enhances the long-term value of the site for fauna.

TABLE 1. Vertebrate fauna observed at the Annois Road bushland on 6 September 1995.

REPTILES	
Agamidae (dragon lizards)	
Bearded Dragon	*Pogona minor*
Scincidae (skink lizards)	
Fence Skink	*Cryptoblepharus plagiocephalus*
BIRDS	
Columbidae (pigeons and doves)	
Laughing Turtle-Dove	*Streptopelia senegalensis*
Cacatuidae (cockatoos)	
Galah	*Cacatua roseicapilla*
Psittacidae (parrots)	
Australian Ringneck (28)	*Barnardius zonarius*
Red-capped Parrot	*Purpureicephalus spurius*
Meliphagidae (honeyeaters)	
Red Wattlebird	*Anthochaera carunculata*
Little Wattlebird	*Anthochaera chrysoptera*
Brown Honeyeater	*Lichmera indistincta*
White-cheeked Honeyeater	*Phylidonyris nigra*
Artamidae (woodswallows and butcherbirds)	
Grey Butcherbird	*Cracticus torquatus*
Australian Magpie	*Gymnorhina tibicen*
Corvidae (ravens and crows)	
Australian Raven	*Corvus coronoides*
MAMMALS	
Leporidae (rabbits and hares)	
Rabbit	*Oryctolagus cuniculus*
Canidae (foxes and dogs)	
Domestic Dog	*Canis familiaris*
Felidae (cats)	
Domestic Cat	*Felis catus*

City of Cockburn

P.O. BOX 1215, BIBRA LAKE, WESTERN AUSTRALIA 6163
9 COLEVILLE CRESCENT, SPEARWOOD 6163
ALL WRITTEN COMMUNICATIONS TO BE ADDRESSED TO CITY MANAGER

ENQUIRIES *D Walsh*
OUR REF. *1114666; 6119*
YOUR REF.

OFFICE HOURS: 8.30 a.m.-4.30 p.m. MONDAY TO FRIDAY
TELEPHONE: ADMINISTRATION CENTRE (09) 411 3444
WORKS DEPOT 411 3490
FAX 411 3416

ENVIRONMENTAL PROTECTION
20 NOV 1995
File No: S/67/2/2 KMA 9
CHY

17 November 1995

Department of Environmental Protection
Westralia Square
141 Mounts Bay Road
PERTH WA 6000

ATTENTION KEVIN McALPINE

Dear Sir

NOMINATION OF BUSHLAND RESERVE NO 39402 CORNER OF ANNOIS AND PARKWAY ROADS, BIBRA LAKE IN SYSTEM 6 REVIEW

Further to previous correspondence in relation to nomination of the above reserve for inclusion in the System 6 Review, please find attached a copy of a report on a recently concluded Flora and Fauna Survey of the bushland carried out for the City.

As can be seen from the report whilst no rare flora or fauna were observed on the site, the reserve provides a valuable corridor linkage for the movement of transient mammal and bird species between Beeliar Regional Park to the west and bushland to the east of the site. Further to this the reserve contains vegetation with a high species richness and has low weed frequency and cover.

I trust that this information is useful in the consideration of the inclusion of the reserve in the System 6 Review. Please do not hesitate to contact Council's Manager - Environmental Services, Darren Walsh on 411 3444 should you require any further information in relation to the matter.

Yours faithfully

R W BROWN
CITY MANAGER/TOWN CLERK

DW:NW

Enc

001555

PROVISIONAL LIST OF NATIVE SPECIES
BIBRA LAKE RESERVE
11 October 1997

Compiled by Diana Corbyn, Denise Crosbie and Mike Hislop

Trees	
Common Sheoak	*Allocasuarina fraseriana*
Candle Banksia	*Banksia attenuata*
Holly-leaf Banksia	*Banksia ilicifolia*
Firewood Banksia	*Banksia menziesii*
Marri	*Eucalyptus calophylla*
Jarrah	*Eucalyptus marginata*
Christmas Tree	*Nuytsia floribunda*
Shrubs	
Prickly Moses	*Acacia pulchella var glaberrima*
Orange Wattle	*Acacia saligna*
Narrow-winged Wattle	*Acacia stenoptera*
Grass Wattle	*Acacia willdenowiana*
Dwarf Sheoak	*Allocasuarina humilis*
Kick Bush	*Astroloma pallidum*
Globe Heath	*Brachyloma preissii*
Pearl-flower	*Conostephium pendulum*
Marno	*Daviesia divaricata*
Daviesia	*Daviesia nudiflora*
Daviesia	*Daviesia physodes*
Daviesia	*Daviesia triflora*
Orange Eremaea	*Eremaea pauciflora*
Hairy Yellow Pea	*Gompholobium tomentosum*
	Hibbertia huegelii
Common Buttercups	*Hibbertia hypericoides*
Stalked Guinea-Flower	*Hibbertia racemosa*
Common Hovea	*Hovea trisperma*
Swan River Myrtle	*Hypocalymma robustum*
Granny's Bonnets	*Isotropis cuneifolia*
Grey Stinkwood	*Jacksonia furcellata*
Spearwood	*Kunzea ericifolia*
Beard-heath	*Leucopogon propinquus*
Zamia	*Macrozamia riedlei*
	Melaleuca seriata
Dog Weed	*Opercularia vaginata*
Pixie-mops	*Petrophile linearis*
Rose Banjine	*Pimelea rosea*
Berry Saltbush	*Rhagodia baccata ssp baccata*
Grey Fanflower	*Scaevola canescens*
Blueboy	*Stirlingia latifolia*
Slender Balga	*Xanthorrhoea brunonis*
Balga	*Xanthorrhoea preissii*
Climbing Plants	
Dodder-laurel	*Cassytha sp.*
Pale Sundew	*Drosera pallida*
Hardenbergia	*Hardenbergia comptoniana*
Climbing Lignum	*Muehlenbeckia adpressa*

Herbs

Catspaw	*Anigozanthos humilis*
Milkmaids	*Burchardia congesta*
Cowslip Orchid	*Caladenia flava*
Pink Fairy Orchid	*Caladenia latifolia*
Calandrinia	*Calandrinia corrigioloides*
Sand Lily or Zigzag Lily	*Corynotheca micrantha var micrantha*
Dense Stonecrop	*Crassula colorata var colorata*
Rufous Stonecrop	*Crassula decumbens*
Spiny Cottonheads	*Conostylis aculeata*
	Conostylis juncea
Bristly Cottonheads	*Conostylis setigera*
Flax-lily	*Dianella revoluta*
Common Donkey Orchid	*Diuris corymbosa*
Red-ink Sundew	*Drosera erythrorhiza ssp erythrorhiza*
Leafy Sundew	*Drosera stolonifera ssp stolonifera*
Blood Root	*Haemodorum laxum*
Running Postman	*Kennedia prostrata*
Stilt Lily	*Laxmannia squarrosa*
Hare Orchid	*Leporella fimbriata*
Tufted Mat-Rush	*Lomandra caespitosa*
	Lomandra suaveolens
Purple Flag	*Patersonia occidentalis*
Golden Podotheca	*Podotheca gnaphalioides*
Small Poranthera	*Poranthera microphylla*
Dark Banded Greenhood	*Pterostylis ?sanguinea*
Banded Greenhood	*Pterostylis ?vittata*
Prince of Wales Feather	*Ptilotus polystachyus*
Elephant Ears	*Pyrorchis nigricans*
Quinetia Daisy	*Quinetia urvillei*
Pink Fountain Triggerplant	*Stylidium brunonianum*
Twining Fringe Lily	Thysanothus manglesianus
	Thysanothus sparteus

Sedges and Jointed Sedges

Desmocladus	*Desmocladus flexuosus*
	Hypolaena exsulca
Giant Rush or Pale Rush	*Juncus pallidus*
	Lepidosperma pubisquamium
	Lepidosperma squamatum
	Lyginia barbata
Semaphore Sedge	*Mesomelaena pseudostygia*
Schoenus	*Schoenus curvifolius*
Schoenus	*Schoenus latitans*
	Tetraria octandra

Grass

	Amphipogon turbinatus
Speargrass	*Austrostipa compressa*
Weeping Grass or Rice Grass	*Microlaena stipoides*

PROVISIONAL LIST OF WEED SPECIES
BIBRA LAKE RESERVE
11 October 1997

Compiled by Diana Corbyn and Mike Hislop

Ferns		
DENNSTAEDTIACEAE	Bracken	**Pteridium esculentum*
Dicotyledons		
AIZOACEAE	Pigface	**Carpobrotus edulis*
ASTERACEAE	Capeweed	**Arctotheca calendula*
	Flaxleaf Fleabane	**Conyza bonariensis*
	Flat Weed	*Hypochaeris glabra
	Prickly Sowthistle	**Sonchus asper*
	Common Sowthistle	**Sonchus oleraceus*
	Ursinia	**Ursinia anthemoides*
BRASSICACEAE	Wild Turnip	**Brassica tournefortii*
CAMPANULACEAE	Cape Bluebell	*Wahlenbergia capensis
CARYOPHYLLACEAE	Velvet Pinks	**Petrorhagia velutina*
	French Catchfly	**Silene gallica*
	Mediterranium Catchfly	**?Silene nocturna*
	Corn Spurry	**Spergula arvensis*
CRASSULACEAE	Weedy Crassula	**Crassula thunbergiana*
EUPHORBIACEAE	Petty Spurge	**Euphorbia peplus*
	Geraldton Carnation Weed	**Euphorbia terracina*
FABACEAE	Sandplain Lupin	**Lupinus consentinii*
	Burr Medic	**Medicago polymorpha*
	Yellow Serradella	**Ornithopus compressus*
	Hare's Foot Clover	**Trifolium arvense*
	Hop Clover	**Trifolium campestre*
	Suckling Clover	**Trifolium dubium*
	Rough Clover	**Trifolium scabrum*
FUMARIACEAE	Whiteflower Fumitory	**Fumaria capreolata*
	Wall Fumitory	**Fumaria muralis*
GERANIACEAE	Long Storksbill or Geranium Weed	**Erodium botrys*
	Rose Pelargonium	**Pelargonium capitatum*
	Peppermint Pelargonium	**Pelargonium sp.*

LAMIACEAE	Dischisma	**Dischisma capitata*
	Zedweed	**Zaluzianskya divaricata*
MIMOSACEAE	Flinders Range Wattle	**Acacia iteaphylla*
MYRTACEAE	Victorian Teatree	**Leptospermum laevigatum*
OLEACEAE	Olive	**Olea europaea*
OROBANCHACEAE	Broomrape	**Orobanche minor*
OXALIDACEAE	Pink Oxalis	**Oxalis glabra*
	Soursob	**Oxalis pes-caprae*
	Purple Wood Sorrel	**Oxalis purpurea*
PHYTOLACCACEAE	Inkweed	**Phytolacca octandra*
POLYGONACEAE	Sorrel	**Rumex acetosella*
	?Clustered Dock	**Rumex ?conglomeratus*
SOLONACEAE	Black Nightshade	**Solanum nigrum*

Monocotyledons

ARACEAE	Arum Lily	**Zantedeschia aethiopica*
ASPARAGACEAE	Bridal Creeper	**Asparagus asparagoides*
HYACINTHACEAE	Yellow Lachenalia	**Lachenalia reflexa*
IRIDACEAE	Freesia	**Freesia X hybrida*
	Wild Gladiolus	**Gladiolus caryophyllaceus*
	One Leaf Cape Tulip	**Homeria flaccida*
	Yellow Guildford Grass	**Romulea flava*
	Guildford Grass	**Romulea rosea var australis*
POACEAE	Bearded Oat	**Avena barbata*
	Blowfly Grass	**Briza maxima*
	Shivery Grass	**Briza minor*
	Great Brome Grass	**Bromus diandrus*
	Couch	**Cynodon doctylon*
	Perennial Veldgrass	**Ehrharta calycina*
	Annual Veldgrass	**Ehrharta longifolia*
	Hare's Tail Grass	**Lagurus ovatus*
	Annual Ryegrass	**Lolium rigidum*
	False Hairgrass	**Pentaschistis airoides*
	Squirrel Tail Fescue	**Vulpia bromoides*
	Rat's Tail Fescue	**Vulpia myuros*

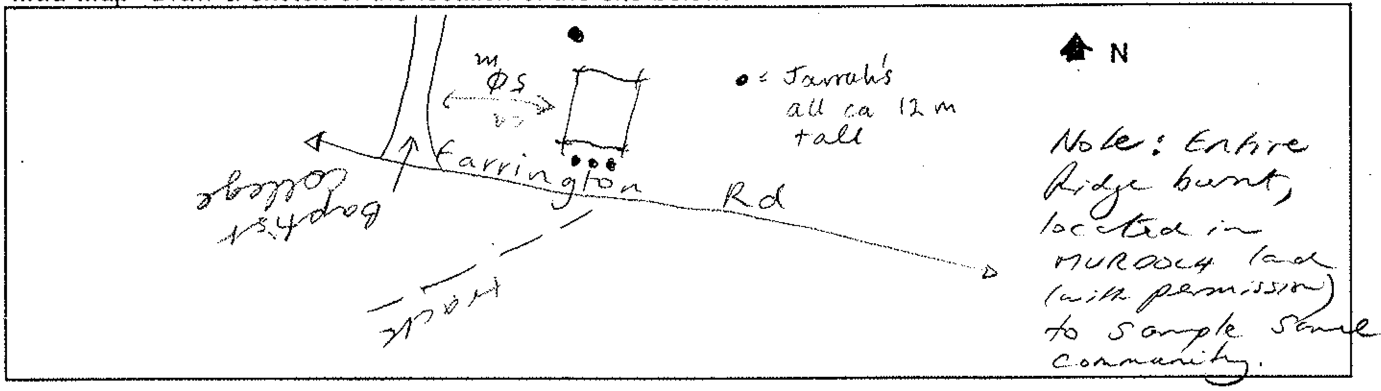
BUSHLAND PLANT SURVEY RECORDING SHEET 1- use pencil only

BUSHLAND AREA BEELIAR WETLANDS SITE NUMBER BEEL 1
DATE TRIP 25·10·94 RECORDERS BJK, NCT, JJA
DATE TRIP 30·11·94 RECORDERS BJK
DATE TRIP ______ RECORDERS ______
BOTANIST BJK

From '*Bushland Plant Survey*' written by B. Keighery (1994) and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

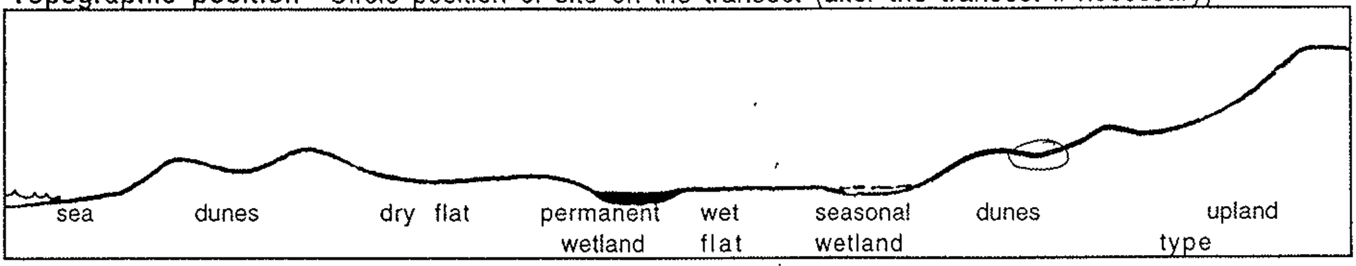
1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below.



Road Location	Farrington Rd. – above road on Nth
Geographic Location Latitude 32° 04.57' S Longitude 115° 49.85' E Altitude ? – 76m ~~≈ 20m Env geol.~~	
Reference Map	GPS out of battery! ± 39m ≈ 25M Env. geo.
Photograph Photographer's Name NCT	Photo No 3

Topographic position Circle position of site on the transect (alter the transect if necessary)



2. SITE DATA Circle the correct response.

Slope (flat) gentle steep	*Aspect* N NE E SE S SW W NW
Surface Soil Moist grey + brown sand (lots of organic matter)	*Colour*
Exposed rock type —	% surface —
Sub-surface Soil ? yellow sand	*Colour*
Rock — type —	depth to rock
Drainage (well) mod poor depth water cm	*Wet* all year winter/spring
Litter 30 – 70 % cover, Depth 2–3 cm	*Bare Ground* — %cover

upland
S/B.1

Env. geol : S8

BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Muir)- use pencil only

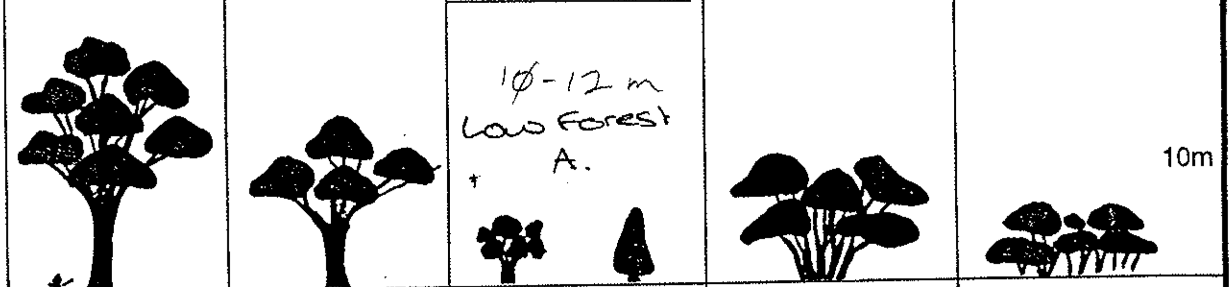
From '*Bushland Plant Survey*' written by B. Keighery (1994) and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

3. VEGETATION STRUCTURE AND COVER

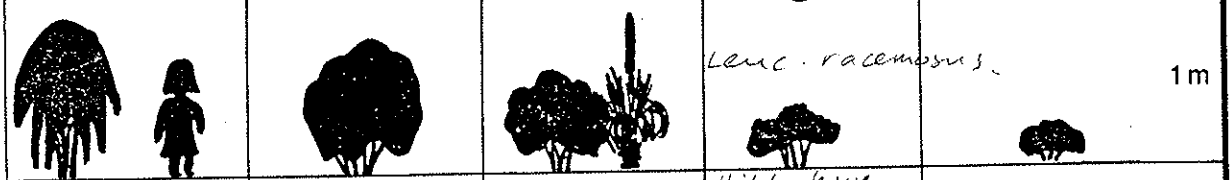
For each layer **record** - appropriate **life form**, **cover class** (see below).and **dominant species** in each layer.

Cover Class	2-10%	10-30%	30 - 70%	over 70%

	TREES			MALLEES	
	over 30m	15 - 30m	(5 - 15m) under 5m	over 8m	under 8m 30m 10m
LIFE FORM			10-12 m Low Forest A.		
COVER CLASS (%)			30 – 70		
DOMINANT SPECIES			B. menziesii B. attenuata E. marginata Allocas. fras		



	SHRUBS				SHRUBS
	over 2m	2m - 1.5m	1.5 - 1m	1 -0.5m	under 0.5m 2m 1m
LIFE FORM				Low Heath C. Leuc. racemosus.	
COVER CLASS (%)			<< 2%	Hibb. hyp. 30 - 70	
DOMINANT SPECIES			Mel. ?acerosa	Brachy. preiss. Stirl. latif. Macroz. / Xanth. pre	



	GRASSES	HERBS	SEDGES over 0.5m	under 0.5m 1m
LIFE FORM	Dense Low Grass	(Very open Herbs)	(Open Tall Sedges)	Low Sedges
COVER CLASS (%)	over 70%	Drosera stolon. 2 - 10	10 - 30	30 - 70
DOMINANT SPECIES	Briza max ''y (Aira cary)? Ehrharta caly Stipa compressa	Conostylis sp. Anigozan. hum. Ursinia anth Burchardia umb Patersonia occid	Mesom. pseudost Lyginea barbata Tetraria oct	Loxocarya flex

4. VEGETATION CONDITION

1 'PRISTINE'		COMMENTS Heavily infested with Briza some Ehrharta, Vulpia, Ursinia, Gladiolus (only herbs (annual) affected) Lots lots of seedling trees.
2 EXCELLENT		
3 VERY GOOD	towards	
4 (GOOD)		
5 DEGRADED		

BUSHLAND PLANT SURVEY RECORDING SHEET 1- use pencil only

BUSHLAND AREA Beeliar Wetlands SITE NUMBER Beel 2

DATE TRIP 25.10.94 RECORDERS BJK, JJA, NCT

DATE TRIP 30.11.94 RECORDERS BJK

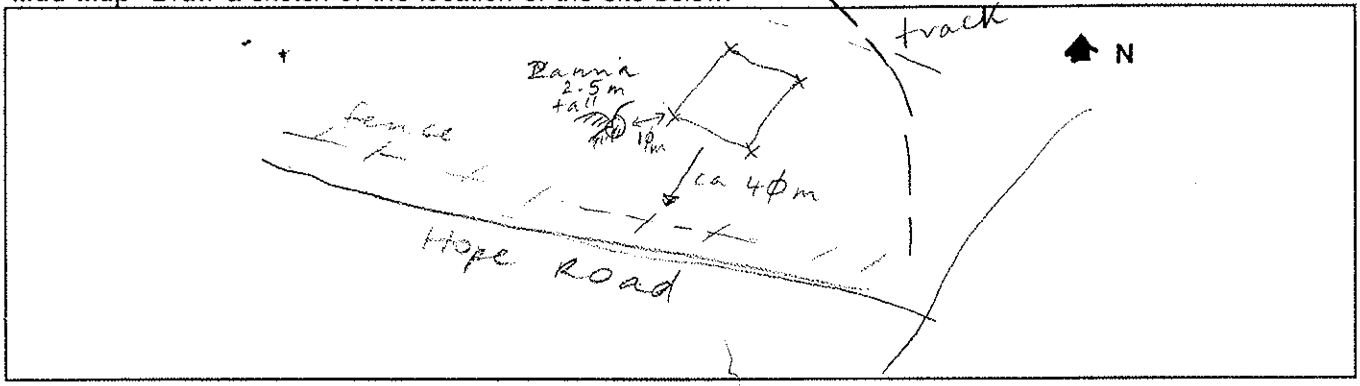
DATE TRIP ______ RECORDERS ______

BOTANIST BJK

From '*Bushland Plant Survey*' written by B. Keighery (1994) and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

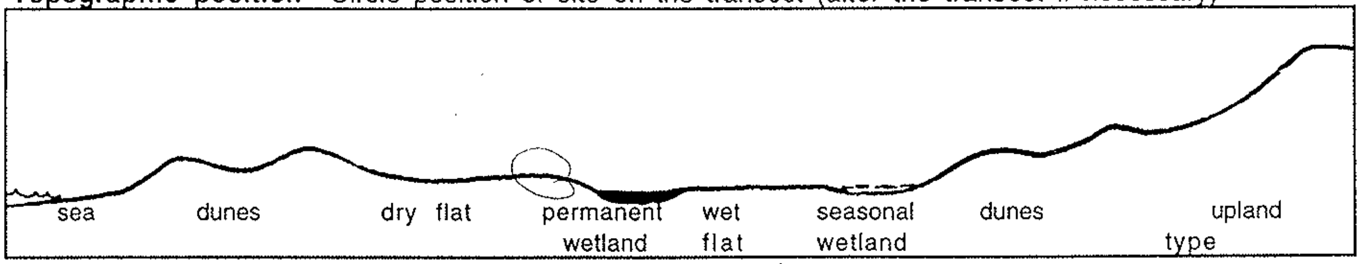
1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below.



Road Location	Hope Road Murdoch		
Geographic Location	Latitude 32° 05.11" S	Longitude 115° 50.02' E	Altitude ? 108m (≈20m Env geol.)
Reference Map			± 102m/43m
Photograph	Photographer's Name NCT		Photo No 84

Topographic position Circle position of site on the transect (alter the transect if necessary)



2. SITE DATA Circle the correct response.

Slope	(flat) gentle steep	*Aspect*	N NE E SE S SW W NW
Surface Soil	grey + brown sand (lots of organic matter)	*Colour*	
Exposed rock	*type*	% surface	
Sub-surface Soil	? sand	*Colour*	
Rock	*type*	depth to rock	
Drainage	(well) mod poor	depth water cm	*Wet* all year winter/spring
Litter	70+ % cover; Depth 4-5 cm	*Bare Ground*	— %cover

Env. geol : S8

upland zone of C 1

S/B.1

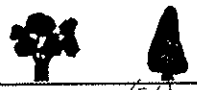
BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Muir)- use pencil only

From '*Bushland Plant Survey*' written by B. Keighery (1994) and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

3. VEGETATION STRUCTURE AND COVER

For each layer **record** - appropriate **life form, cover class** (see below).and **dominant species** in each layer.

Cover Class	2-10%	10-30%	30 - 70%	over 70%

	TREES			MALLEES	
	over 30m	15 - 30m	5 - 15m under 5m Low Forest A	over 8m	under 8m
LIFE FORM					30m 10m 
COVER CLASS (%)			3ϕ - 7ϕ (5ϕ)		
DOMINANT SPECIES			Alloc. fraseri B. menziesii B. ilicifolia		

	SHRUBS			SHRUBS	
	over 2m	2m - 1.5m	1.5 - 1m	1 -0.5m	under 0.5m
LIFE FORM	Open Scrub 			Hibb. hypp-bossiaea eriocBaeckea Petrop. lin. Jacksonia. 	Low Heath C. 2m 1m 
COVER CLASS (%)	2 + 1ϕ			3ϕ - 7ϕ	
DOMINANT SPECIES	Mel. ?scabra			Leuc. conos. Brachy preis Xanth. preis	

	GRASSES	HERBS	SEDGES over 0.5m	under 0.5m
LIFE FORM	Very open Low Grass 	Herbs 		Very open Low Sedges 1m 
COVER CLASS (%)	2 - 1ϕ	3ϕ → 7ϕ	-	2 - 1ϕ %
DOMINANT SPECIES	Briza maj Stipa.	Phleboc. cil Conosty. juncea Dasyp. brom		Loxocarya flex Hypolaena exsulca

4. VEGETATION CONDITION

1 'PRISTINE'	
2 EXCELLENT	
3 VERY GOOD	
4 GOOD	
5 DEGRADED	

COMMENTS Phlebocarya + Dasypogon.
Pretty good piece of bush!
Bron = Hazy Waring
Prob. not burnt for ages

BUSHLAND PLANT SURVEY RECORDING SHEET 1- use pencil only

BUSHLAND AREA BEELIAR WETLANDS SITE NUMBER BEEL 3

DATE TRIP 25.10.94 RECORDERS BJK, NCT, JJA

DATE TRIP 30.11.94 RECORDERS BJK

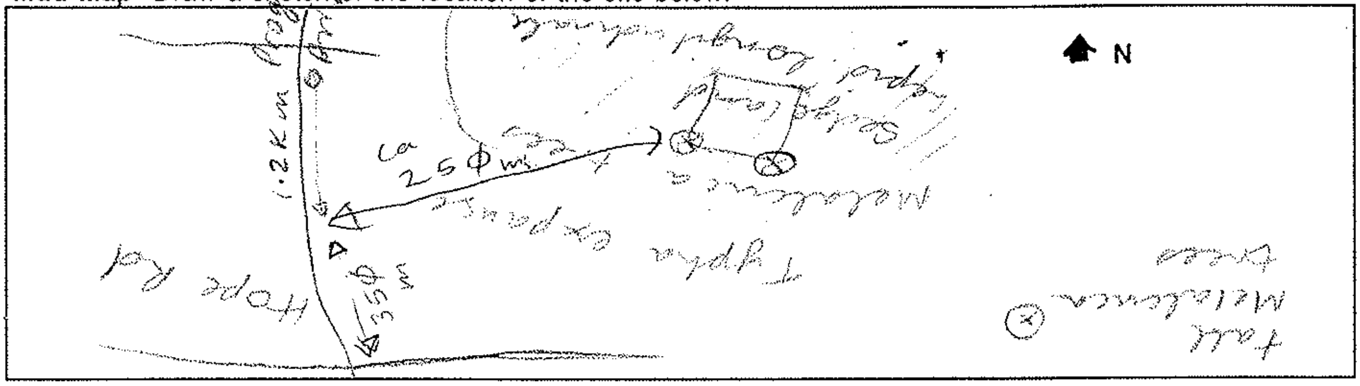
DATE TRIP ______ RECORDERS ______

BOTANIST BJK

From '*Bushland Plant Survey*' written by B. Keighery (1994) and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

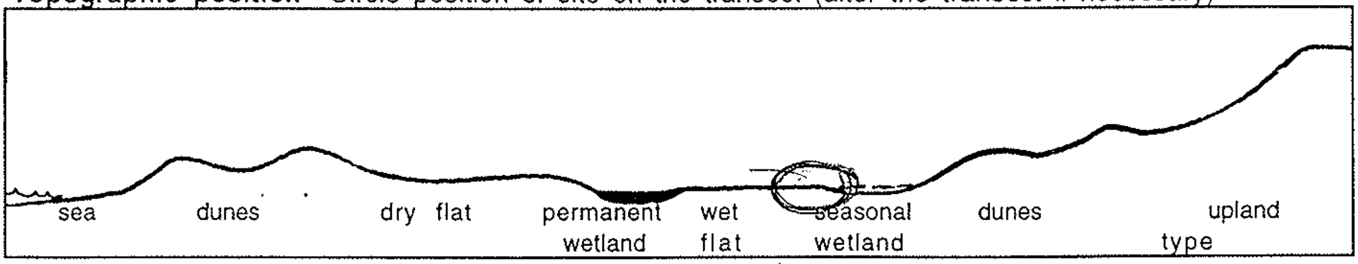
1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below.



Road Location	Hope Road (on Nth side of)
Geographic Location Latitude 32 05' 08" S Longitude 115 50' 09" E Altitude ± 7m	±20m Env. geol
Reference Map	± 43 m
Photograph Photographer's Name NCT	Photo No 45

Topographic position Circle position of site on the transect (alter the transect if necessary)



2. SITE DATA Circle the correct response.

Slope flat (very gentle) steep	*Aspect* N NE (E) SE S SW W NW
Surface Soil sandy + loam	*Colour* brown + grey
Exposed rock type —	% surface —
Sub-surface Soil clay	*Colour* —
Rock type	depth to rock
Drainage well mod (poor) depth water cm	*Wet* all year (winter/spring)
Litter 2-10 burnt % cover; Depth << 1 cm	*Bare Ground* 2-10 %cover

one leaf

sumpland S/B 1

Env. geol: Mps

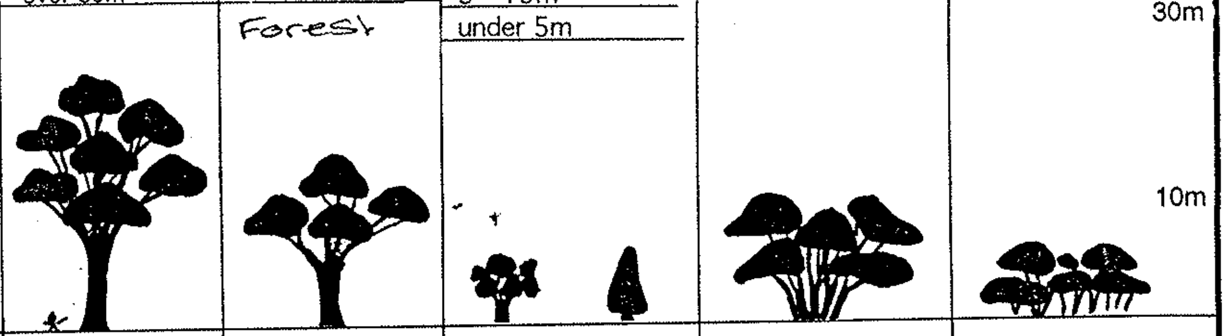
BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Muir)- use pencil only

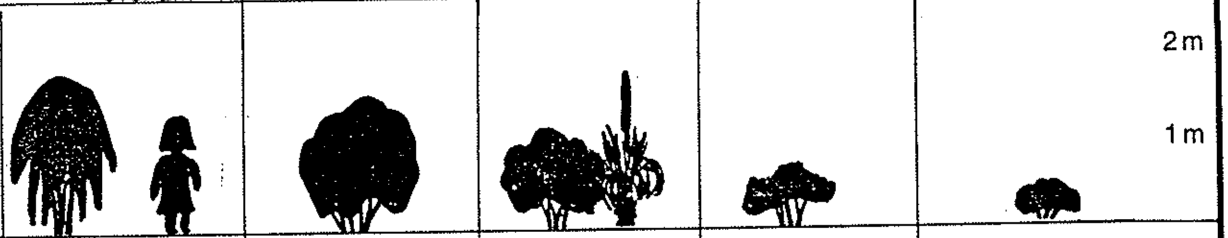
From '*Bushland Plant Survey*' written by B. Keighery (1994) and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

3. VEGETATION STRUCTURE AND COVER

For each layer **record** - appropriate **life form, cover class** (see below).and **dominant species** in each layer.

Cover Class	**2-10%**	**10-30%**	**30 - 70%**	**over 70%**

	TREES			MALLEES	
	over 30m	15 - 30m	5 - 15m / under 5m	over 8m	under 8m
LIFE FORM		Forest			30m / 10m
COVER CLASS (%)		30-70			
DOMINANT SPECIES		Mel. pre.			
		Euc. calop.			

	SHRUBS				
	over 2m	2m - 1.5m	1.5 - 1m	1 -0.5m	under 0.5m
LIFE FORM					2m / 1m
COVER CLASS (%)					
DOMINANT SPECIES					

	GRASSES	HERBS	SEDGES over 0.5m	under 0.5m
LIFE FORM		open Herbs	Tall sedges	1m
COVER CLASS (%)		10-30	30-70%	
DOMINANT SPECIES		Opercul. hisp.	Lepido. long	
		Anagallis arvensis		
		+ Other		

4. VEGETATION CONDITION

weeds: Arum lily 2 and. oath

		COMMENTS
1 'PRISTINE'		see spp list for weeds
2 EXCELLENT		fire last year.
3 VERY GOOD (circled)		
4 GOOD (circled)		
5 DEGRADED		

23/1/95 — 6/2/95.

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESCENCE

SITE No BEEL Ø2

Date 25/10/94

Label each plant with plants number, site code, date and plant's name or working name if required

Record on Sheet
- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

From '*Bushland Plant Survey*' written by B. Keighery (19940 and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

	TREES	No	Fl	ID
0	Bank. illic.			
0	Bank menz			0
	~~Bank illic~~ duplicate			
0	Allocas fras			

	MALLEES	No	Fl	ID

	SHRUBS	No	Fl	ID
0	Jacksonia ? stern (prostrate)	VSP		✓
0	Xanth. priessii			0
0	Leucop. conosteph.			0
0	Petrophile linearis			0
0	Brachyloma priessii			
0	Scholtzia involucrata			
0	Hibbertia racemosa			
0	Cassytha ? flava			
0	Gomph. tomentosum			
0	Melaleuca thymoides			
0	Bossiaea eriocarpa			
0	Callytrix ? flav. (low)		✓	
0	Leucopogon gracillimus			✓
0	Conostephium ? pend (slender)			
0	Hibbert. hyp.			

SHRUBS (cont.)	No	Fl	ID
30/11/94			0
Lobelia tenuior			0

GRASSES	No	Fl	ID
0 * Briza maxima			
0 Stipa compressa			
0 * Aira cary			
✓0 * Briza minor			
0 Danthonia occidentalis			✗
0 ? Stipa = Danthonia			
0 * Ehrharta longiflora			

HERBS	No	Fl	ID
0 Thysanotus (climb seeds)			
0 Dasy. brom.			
0 Caladenia (lf) ? flava			
0 Stylidium brunonianum			
0 Lechenaultia ~~[illegible]~~ floribunda			✗
✓0 Philotheca ciliata			
0 Stylidium repens			
0 Homa. homo			
0 * Sonchus olearaceus			
0 * Hypochaeris glabra			
0 Tricoryne pilosa			
0 Patersonia occidentalis			

	HERBS (cont.)	No	Fl	ID
0	Drosera palacea			
0	Microtis media	c		
0	Poranthera microphylla			
0	Thysanotus ? sparteus			
0	Quinetia urvillei			
0	Thysanotus ? thyr (fruit)	c		
0	Prickly Lettuce = Lactuca serriola			✗
0	Lomandra ? nig = Ø1			
0	Conostylis juncea			
0	Platysace compressa	c		✗
0	Xanth. hueg			

	SEDGES	No	Fl	ID
0	Loxo. flex			
0	Schoenus curvifolius			
0	Lyginia barb			
0	Centrolepis drumm.			
0	Carex priessi	c		
0	Hypolaena exsulca			
	ADJ			
0	Kunzea ericif.			
0	Hovea pungens			

23/1/95

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESCENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No BEEL Ø1
Date 25/10/94

Record on Sheet
- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

From 'Bushland Plant Survey' written by B. Keighery (19940 and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

TREES	No	Fl	ID
0 Bank att			
0 Bank menz			
0 Allocas fras.			
0 Euc. marg			
MALLEES			
30/11/94 no extras			
~~Isotropis cuneiformis~~			
~~[illegible]~~			
SHRUBS			
0 Brachyloma priessii			
0 Leucopogon racemulosus	C	30/11/94	
0 Hibb. hyp			
0 Stirlingia lat			
0 Macrozamia riedlii			
0 Gomph. tomentosum			✓
0 Hovea trisperma			
0 Melaleuca ?acerosa	C		✓
0 Conostephium pend			
0 Xanth. priessii			
0 Hibbertia racemosa			
0 Petrophile linearis			
~~Jacksonia sternbergiana~~			
0 Nemcia capitata			
0 Pimelea rosea	C		✓
0 Hibbertia hueg.			
0 Leucopogon parviflorus			
0 Pimelea sulphurea (sterile)			✓
0 Acacia pulchella			
0 Bossiaea erio			

0 Daviesia divar.

SHRUBS (cont.)	No	Fl	ID
HERBS			
0 Isotropis cunei.			
0 Lomandra suaveolens (blue)			
0 Stylid. schoenoides			
0 Xanthosia hueg			
0 Diuris ?long (~~sterile~~/seed)			
0 Podolepis gracilis			
GRASSES			
0 * Briza major maxima			
0 * Ehrharta long			
0 Stipa compressa			
0 * Vulpia myuros			
0 ? Stipa = Dichelachne crinita	C		✓
HERBS			
0 Kennedia prostrata			
0 Eryngium pinnat ssp pin			
0 * Glad. cary			
0 Conostylis aculeata			
0 Caladenia flava			
0 * Ursinia anthem.			
0 Burchardia umbellata			
✓ *0 Monadenia bracteata			
0 Poranthera microphylla			
0 Trachymene pilosa			
✓ *0 Hypochaeris glabra			
0 Thelymitra benthamiana			
0 Patersonia occidentalis			

HERBS (cont.)	No	Fl	ID
0 Anigozanthos humilis			
0 Drosera stolonifera			
0 Lomandra caespitosa			✓
0 Chamaescilla corymb			
0 Hardenbergia comp.			
0 Lomandra ?nigricans (sterile)			✓
0 Sowerbaea laxiflora			
0 Lagenifera hueg			
0 Thelymitra sp (seed)			
0 Tricoryne tenella			
0 Thysanotus (climbing seed)			
0 Lomandra priessii			
SEDGES			
0 Mesomelaena pseudostyg			
0 Lyginia barbata			
0 Tetraria octandra			
0 Loxocarya flex			
0 Lepidosperma squamatum			✓
0 Lepidosperma (angust)			
ADJ			
0 Bank ilic			

23/1/95 – 6/4/95

Not in Perth Flora

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESCENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No BFEL Ø3
Date 25/10/94

Record on Sheet
- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

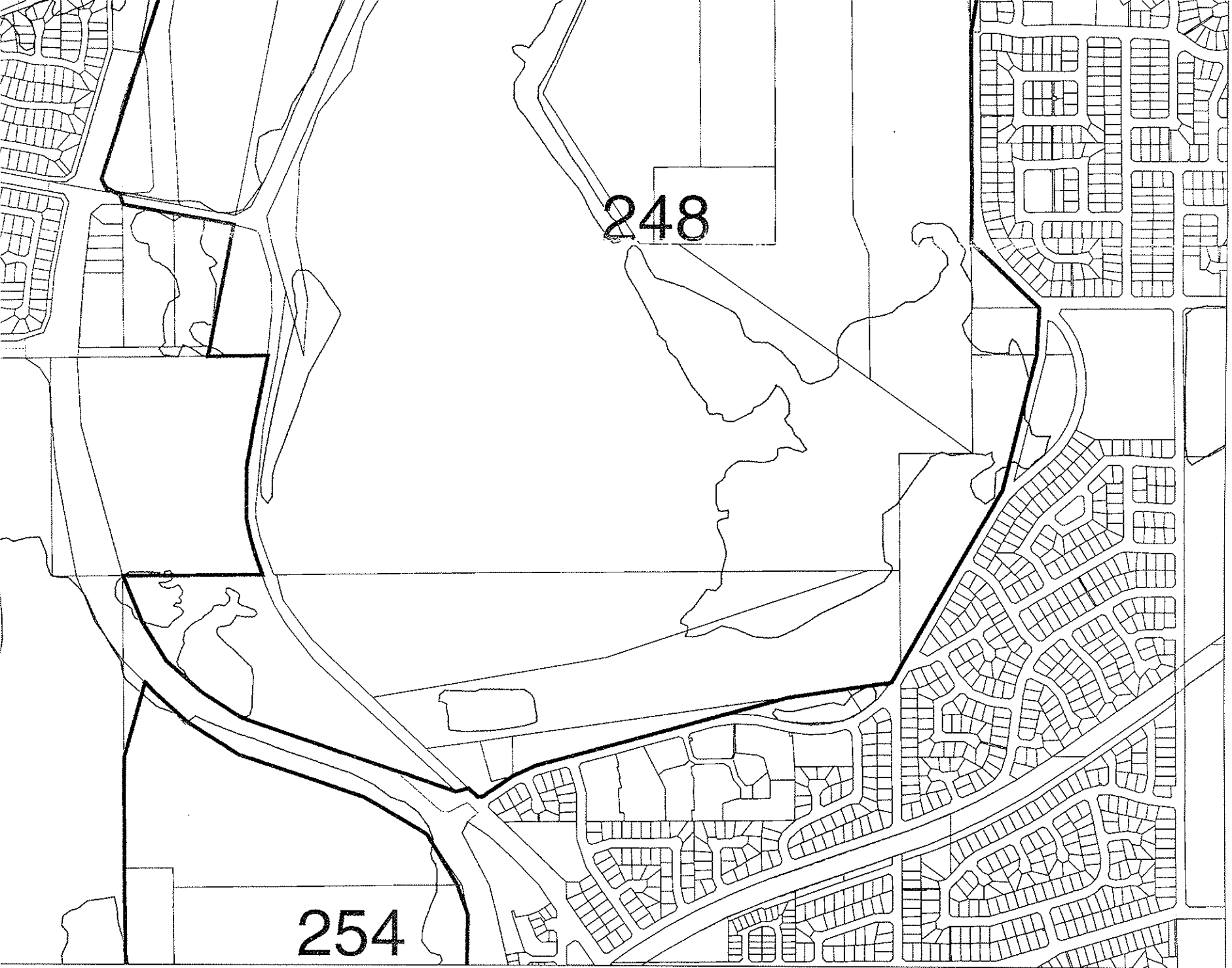
From '*Bushland Plant Survey*' written by B. Keighery (19940 and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

	TREES	No	Fl	ID
0	Mel. priessi.			
0	Euc. calophylla			
0	Euc. marginata			
	MALLEES			
	SHRUBS			
0	Macrozamia riedlii			
0	Astartea ^(aff.) fascic			
0	Acacia pulchella (seedling)			
0	Kunzea ericifolia (seedling)			
0	Xanth. priessii			
0	Phyllanthus calycinus			

SHRUBS (cont.)	No	Fl	ID
30/11/94			
0 Lobelia alata			
GRASSES			
0 Stipa compressa (fire)			
0 * Briza maxima			
0 * Briza minor			
0 ~~Dichelachne~~ = *Holcus set	C		X
0 * Aira cary			
HERBS			
0 * Conyza (seedling) sp.			✓
0 Opercularia hispidula			
0 Patersonia acid (swamp)			
0 Ixiolaena viscosa	C		X — VSP 30/11/94
0 * Hypochaeris glabra			
0 Homa. homa.			
0 * Sonchus oleraceus			
0 Anagalis arvensis			
0 * Vicia (small) sativa	C		X
0 * Solanum nigricans			
0 * Arum Lily * Zand aeth.			
0 * Aster subulata			

HERBS (cont.)	No	Fl	ID
0 Hydrocotyle scutell. VSP	C		✓
0 Epilobium ? hirtig (seed)	C		✓
0 Microtis media			
0 Trachymene pilosa			
0 *Trifolium cernua			
20/11/94 Lobelia alata dupl.		✓	
SEDGES			
0 Lepid. long			
0 Isolepis marginata			
ADJ			
0 Euc. rudis			
ADJ			
0 Fig = Ficus carica			
= BEELIAR Ø4			
ADJ Lake ~~[illegible]~~			
0 Epilob. ? bill. 0 Trig (prob)			
0 Mel. lateritia			
0 Bdum artic			
Myr (?? 6/2/95 do not know this)			

ADJ Haloragis brownii sedges
Boronia crenulata



BUSHPLAN SITES CORRECTED

WESTERN AUSTRALIAN PLANNING COMMISSION

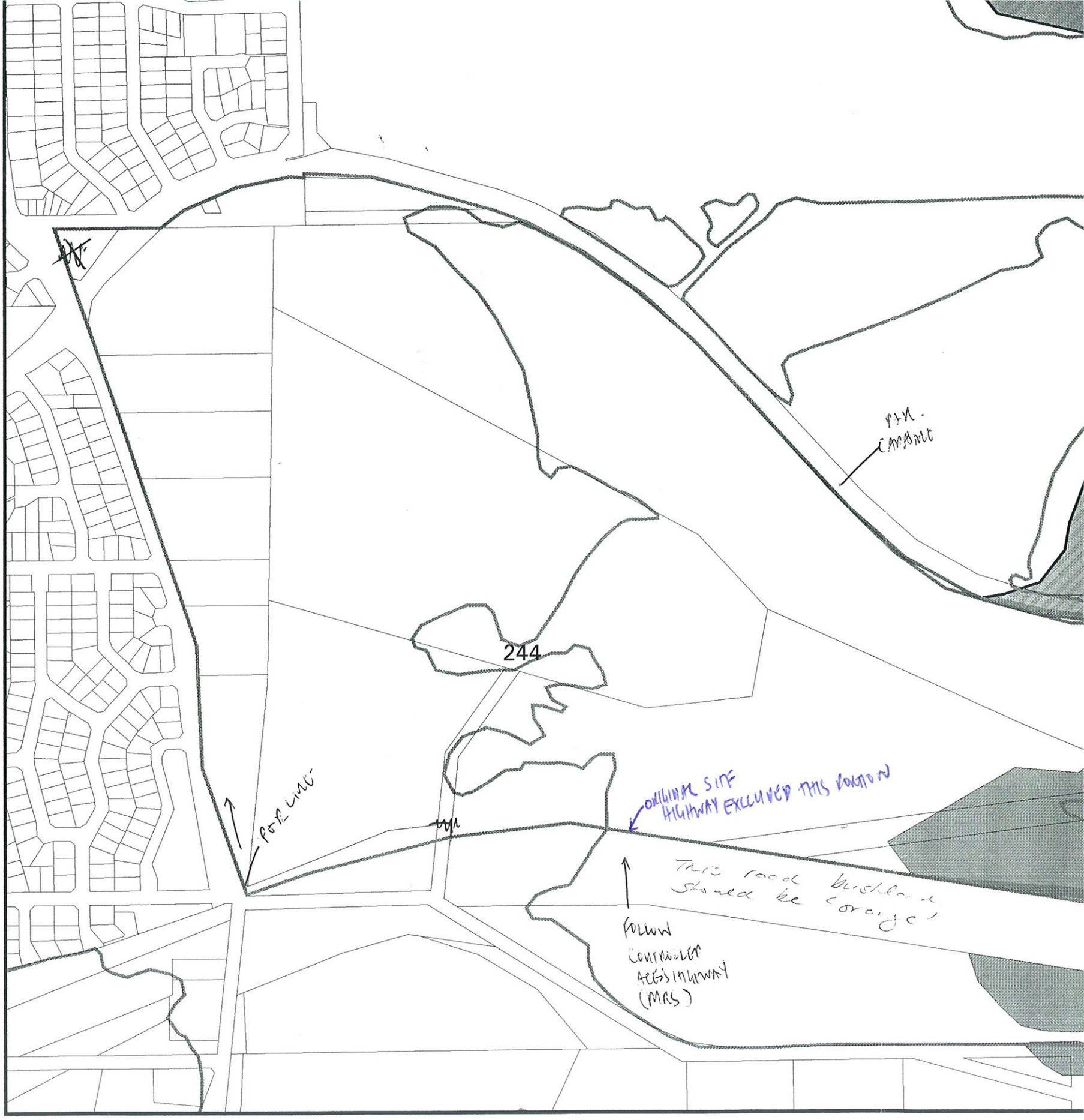
CUSTOMER FOCUS WESTERN AUSTRALIA

N

SCALE 1:2500

0 50m

Metres


244
ORIGINAL SITE
HIGHWAY EXCLUDED THIS PORTION
FOLLOW
CONTROLLED
ACCESS HIGHWAY
(MRS)

FILE BS 244 M93

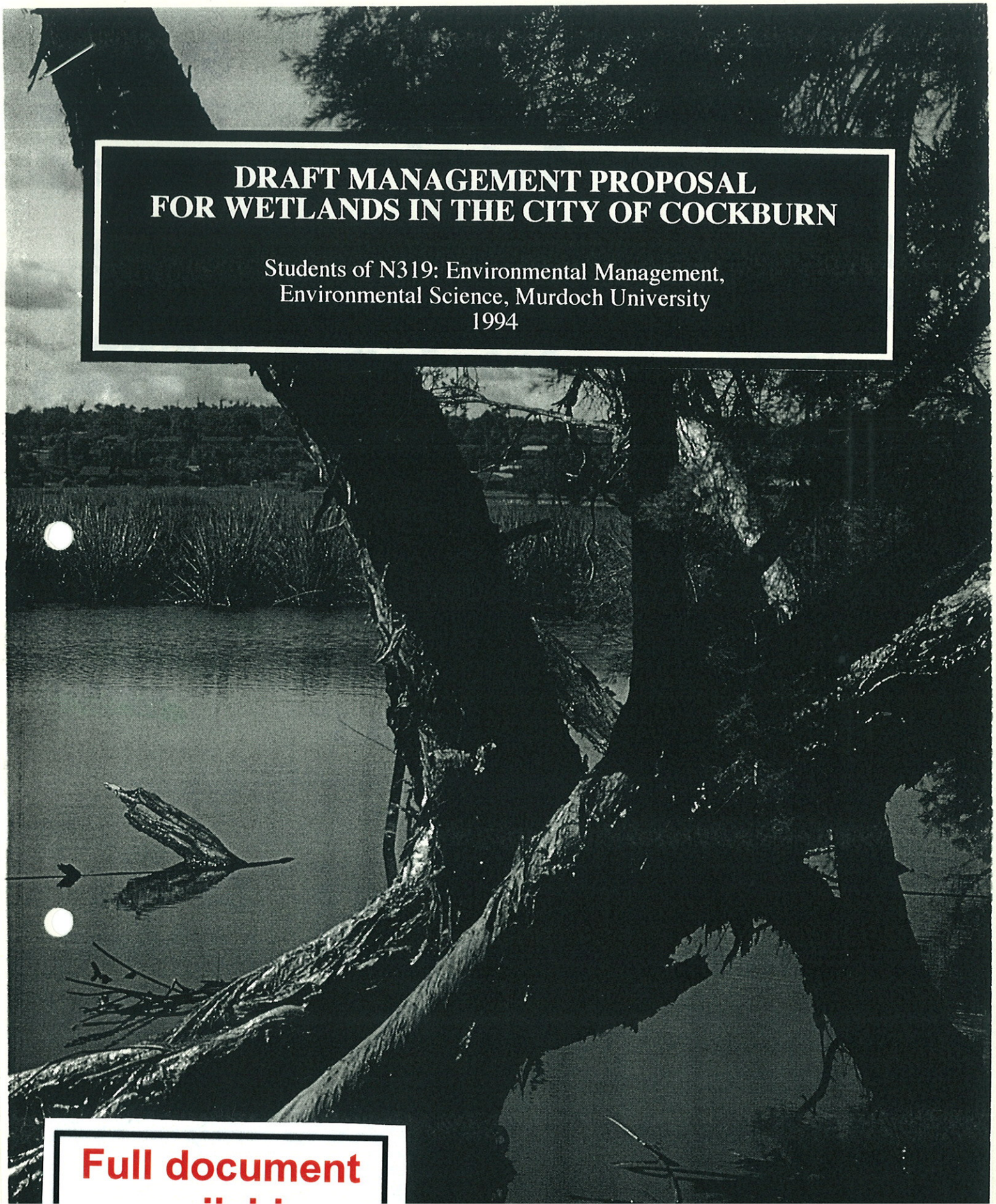
Proposed Farrington Road duplication Murdoch Drive to west of Bibra Drive

City of Cockburn

Report and recommendations of the Environmental Protection Authority

checked for Bushfire proformal 3/1/97 Nat

Full document available on request



DRAFT MANAGEMENT PROPOSAL FOR WETLANDS IN THE CITY OF COCKBURN

Students of N319: Environmental Management,
Environmental Science, Murdoch University
1994

Full document

Murray, F (editor) (1986), North Lake draft management plan. Environmental Science, Murdoch University, Western Australia.

Newman, P (editor) (1976), The Cockburn wetland study. Prepared by students of Murdoch University for the Town of Cockburn.

Newman, P and Hart, L (1984), Deepening urban wetlands: an assessment of water quality in four wetlands on the Swan Coastal Plain, Western Australia. Water, 11 (2) June, 1984.

9.6 BIBRA LAKE

55248

Full document available on request

9.6.1 GENERAL INFORMATION

LOCAL AUTHORITY: Cockburn City Council
MRS ZONE: Parks and Recreation
RESERVE NUMBERS: A6208
MANAGEMENT: Cockburn City Council
SYSTEM 6 RECOMMENDATION: M93
WAC CLASSIFICATION: LE.f.l.p.o.
WATER RESERVE: West of Jandakot Public Water Supply Area
ROADWORKS: Future Roe Freeway - northern end

9.6.2 PHYSIOGRAPHY AND GEOLOGICAL SETTING

Bibra Lake is a marsh in the high level interbarrier depression between the Bassendean and Spearwood Dunes (Gozzard, 1983). Megirian (1982) described the lake deposits and provided insights into the processes which have shaped the wetlands of the region. Megirian showed that Bibra lake deposits have been formed during at least three cycles of sedimentation to form three shallow infilled depressions. The lake deposits show evidence of three phases of rejuvenation and Megirian suggested possible explanations for these cycles, including climatic change, tectonism or eustatic changes and changes in the position of the Swan River channel with consequent alterations of the configurations of the water table.

The geology and hydrology have been described by Megirian and Davidson (1984). Deep grey sands occur on the eastern side of the lake while limestone pinnacles exposed in a sandpit on the west of the lake have now been incorporated into the landscape of the amusement park 'Adventure World'. The lake is separated by a low barrier from North Lake and related wetlands to the north. The margins of the lake have been substantially modified by landfill on the western and southern margins. Rubbish dumping also occurred on the north-eastern side of the lake prior to World War Two. (K Cole, pers comm.)

9.6.3 AREAS

Area defined by Progress Dr, Hope Road, and Bibra Drive	approx 237	ha
Water surface defined by water boundary 13.11.74 (15.03 m AHD)	135	ha
Water surface free from emergent vegetation	100	ha
.....	30	ha

J Arnold Wetlands

9.4.6 LAND USE

Until recently Piney Lake has been surrounded by pine plantations. Rezoning of Piney Lake and surrounding land from "urban" to "parks and recreation" reflects strong recognition of the natural features of Piney Lake.

9.4.7 VEGETATION (Figure 9.4)

Rodda (1986) made a detailed study of the vegetation of Piney Lake reserve and published a list of over 100 plant species.

The area is a mosaic of wetland woodland, sedgeland, residual pines and small areas of open water. There is a high degree of interspersion of the plant communities, adding to the interest and diversity of the area. Careful management of access to the area, and good control of fire will be essential to protect this valuable relic of swampland vegetation.

9.4.8 FAUNA

Rodda (1986) investigated the fauna of the Piney Lake reserve. Her report includes lists of aquatic invertebrates, aquatic vertebrates and terrestrial vertebrates, including 17 species of waterbirds.

9.4.9 MANAGEMENT ISSUES

It is understood that efforts are being made to infiltrate drainage waters to the sand to achieve as natural a water regime as possible. This should assist in sustaining the diverse vegetation.

Any modification of the lake and development of the open space should be planned to minimise water demand so that the integrity of the natural vegetation is maintained.

9.4.10 REFERENCES

Megirian, D (1982), The hydrogeology of North and Bibra Lakes, Western Australia. Unpublished B Sc, Honours thesis, Department of Geology, University of Western Australia.

Rodda, J (1986), Piney Lake Reserve. Wetlands Conservation Society, Western Australia.

9.5 NORTH LAKE AND ROE SWAMP BS244

9.5.1 GENERAL INFORMATION

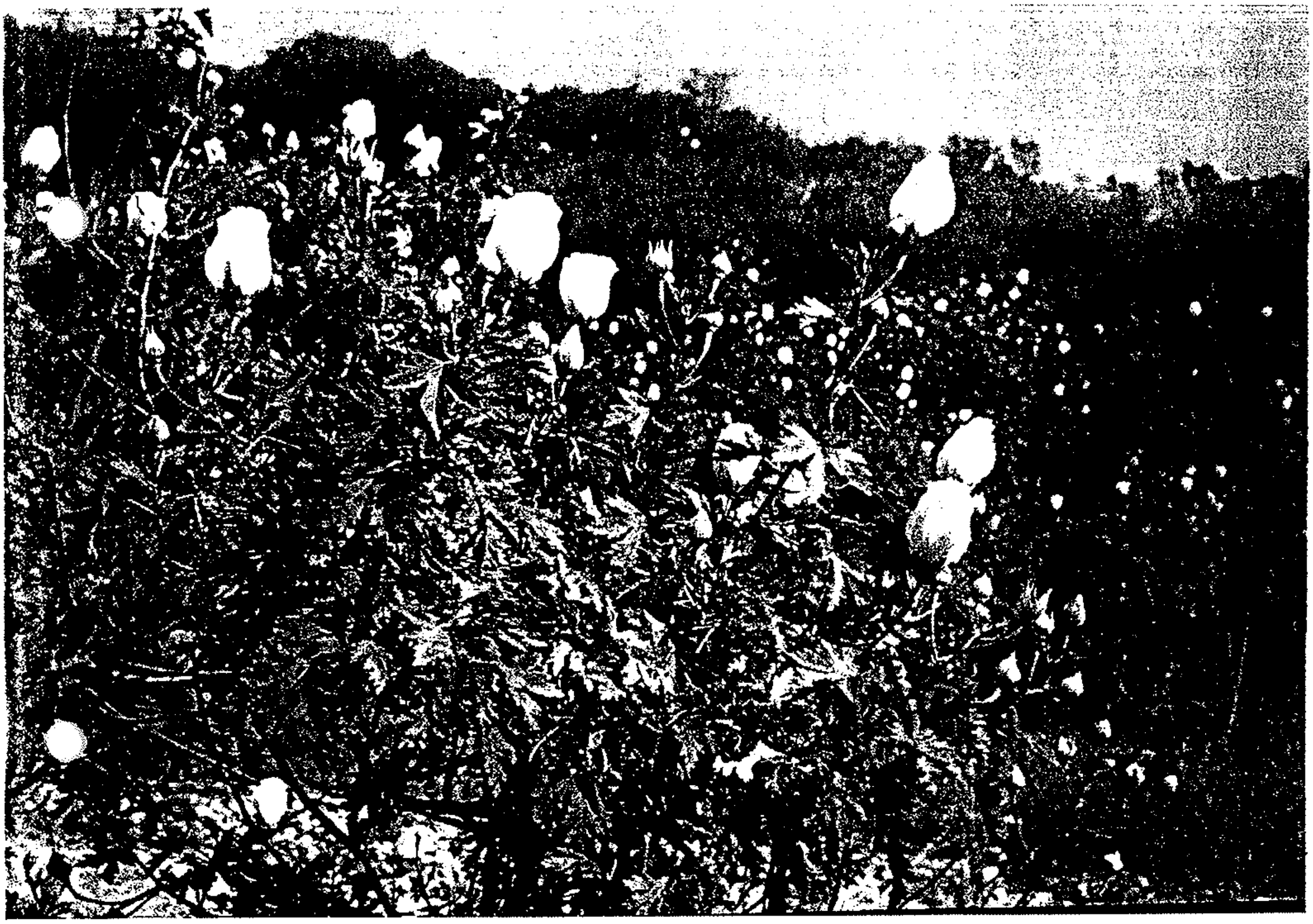
LOCAL AUTHORITY: Cockburn City Council
MRS ZONE: Parks and Recreation Reserve
RESERVE NUMBERS: N/A freehold land
MANAGEMENT: Not yet defined
SYSTEM 6 RECOMMENDATION: M93

Full document available on request

THE COCKBURN WETLANDS :
AN ENVIRONMENTAL STUDY

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, 91
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

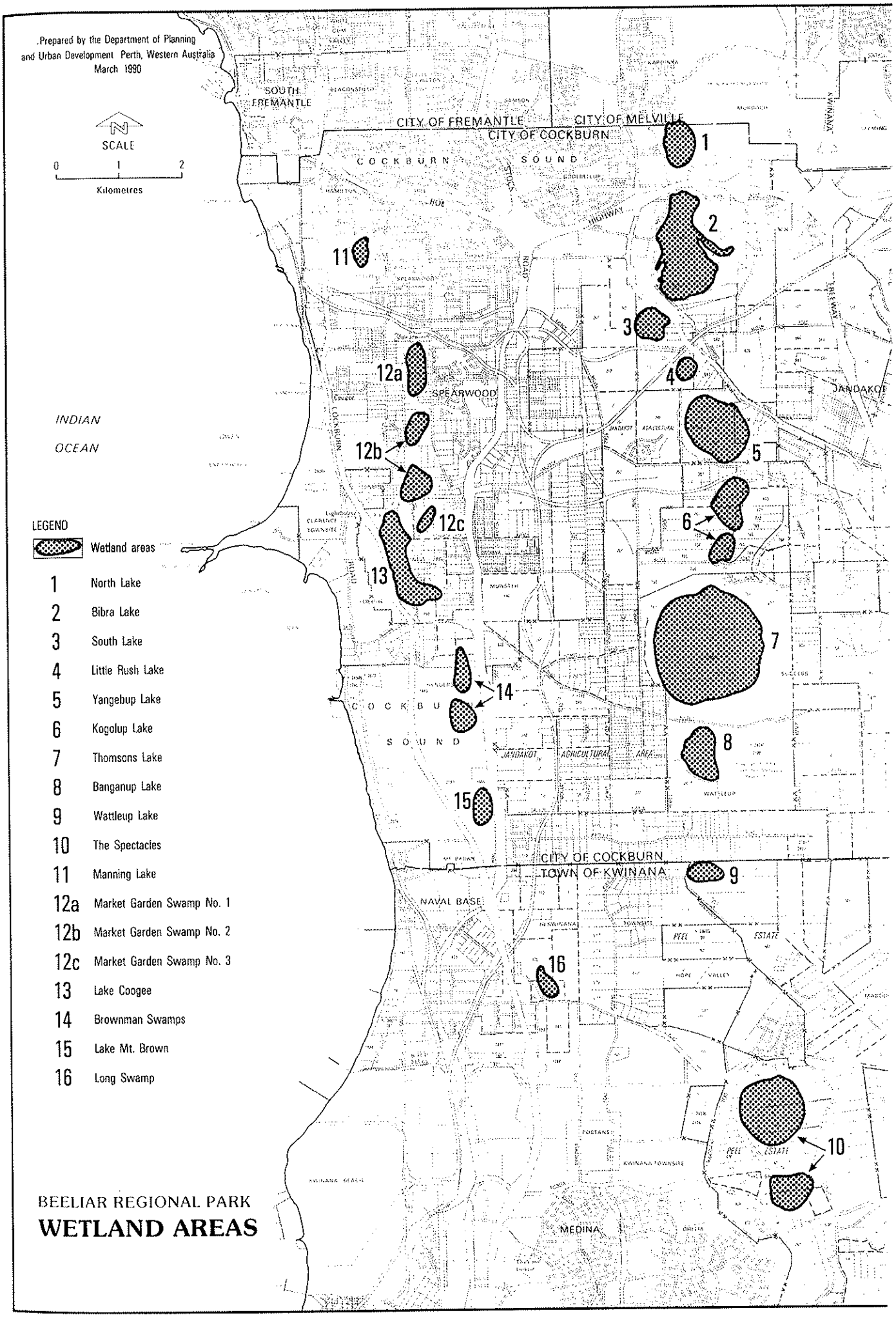
	Taxon	Prio Code	Geographic Range	Recorded Areas
	Danthonia occidentalis			Ba, T, F, 91
	Deyeuxia quadriseta			Ba, T, F
*	Diandrus gussonii			Ba, T
	Dichelachne crinita			F
*	Digitaria sanguinalis			Ba
*	Echinochloa crus-galli			MG
*	Ehrharta calycina			P, Ba, Bo, T, S, Y, MG, F, 91
*	Ehrharta longiflora			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

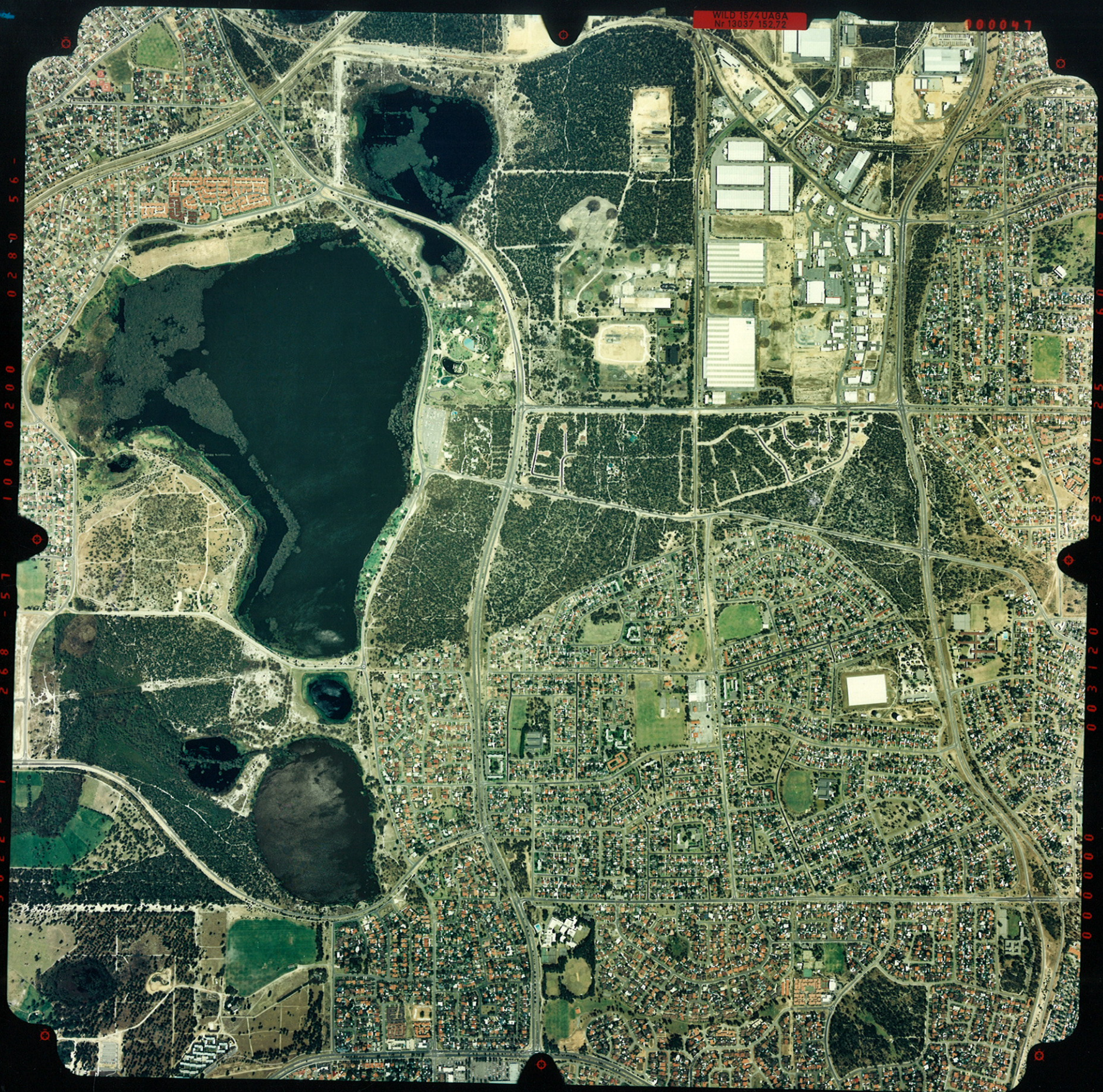
	Taxon	Prio Code	Geographic Range	Recorded Areas
	Petrophile linearis			P, Ba, M, T, S, Y, F
	Petrophile serruriae			F,91
	Stirlingia latifolia			P, Ba, M, T, S, Y, F
	Synaphea spinulosa			P, Ba, M, T, S, Y
	Xylomelum occidentale			Ba, M
Ranunculaceae				
	Clematis pubescens			Ba, M, T, Ma
*	Ranunculus 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
SPEARWOOD
JANDAKOT
INDIAN
OCEAN
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



5205 WA 3165 (C) METRO REGIONAL AREA & EXT. RUN 9 (5161-5244) 1:20000 11-DEC-92 920676