

## YANGEDI SWAMP, KEYSBROOK

**Boundary Definition:** management/bushland (part to cadastre)/conservation wetland boundary (Areas of bushland within the boundaries of the Site are not accurately mapped. The boundary has been drawn to include any unmapped bushland.)

### SECTION 1: LOCATION INFORMATION

**Bush Forever Site no.** 77

**Area (ha):** bushland 364.954 (Site also includes open water.)

**Map no.** 81, 82

**Map sheet series ref. no.** 2033-II SW, 2033 II SE

**Other Names:** Submission Area 219

**Local Authorities (Suburb):** Shire of Serpentine-Jarrahdale (Keysbrook)

### SECTION 2: REGIONAL INFORMATION

#### LANDFORMS AND SOILS

##### Bassendean Dunes

Bassendean Sands (Qpb: S8)

##### Bassendean Dunes/Pinjarra Plain

Bassendean Sands over Guildford Formation (Qpb/Qpa: S10)

##### Wetlands (within the Bassendean Dunes/Pinjarra Plain)

Holocene Swamp Deposits (Qhw: Cps) (Qrw: Sp1, Sp2)

#### VEGETATION AND FLORA

##### Vegetation Complexes

###### Bassendean Dunes

Bassendean Complex — Central and South

###### Combinations of Bassendean Dunes/Pinjarra Plain

Southern River Complex

##### Floristic Community Types

###### Supergroup 2: Seasonal Wetlands

15 Forests and woodlands of deep seasonal wetlands

S1 *Astartea* aff. *fascicularis*/*Melaleuca* species dense shrublands

###### Supergroup 3: Uplands centred on Bassendean Dunes and Dandaragan Plateau

23a Central *Banksia attenuata* — *B. menziesii* woodlands

#### WETLANDS

**Wetland Types:** sumpland, dampland, palusplain, artificial channel

##### Natural Wetland Groups

###### Bassendean—Pinjarra transition OR Bassendean with fluvial features

Bennett Brook (B/P.4)

**Wetland Management Objectives:** Conservation (63.3ha), Resource Enhancement, Multiple Use

**Swan Coastal Plain Lakes EPP:** 5.7ha + 5.5ha = 11.2ha (total)

#### THREATENED ECOLOGICAL COMMUNITIES

Not assessed, Not determined, Vulnerable (floristic community type 15)

### SECTION 3: SPECIFIC SITE DETAIL

**Landscape Features:** open water, vegetated wetland, vegetated uplands

**Vegetation and Flora:** limited survey (DEP 1996 (Yang 01-03), part Site — Hart Simpson & Associates 1990, Masters and Associates 1992)

##### Structural Units

Uplands: *Banksia attenuata*, *B. menziesii* and *B. ilicifolia* Low Open Forest

Wetlands: *Melaleuca preissiana* Low Open Forest; *Melaleuca uncinata*, *M. viminea* and *M. lateritia* Tall Open

Scrub; *Melaleuca raphiophylla* Low Woodland to Tall Shrubland; *Regelia ciliata* Open Heath; mixed Herbland;

*Lepidosperma longitudinale* Sedgeland

**Scattered Native Plants:** within bushland mapped, <20% includes *Eucalyptus rudis* Woodland

**Vegetation Condition:** >50% Very Good to Excellent, <30% Good to Degraded, with areas of severe localised disturbance

**Total Flora:** 110 native taxa (plot-generated list only)

**Significant Flora:** *Stylidium longitubum* (3); *Myriocephalus helichrysoides*, *Stylidium utricularioides*, *Macarthuria apetala* (most southern location)

**Fauna:** not known

**Linkage:** no adjacent bushland; part of Greenway 129 (Tingay, Alan & Associates 1998a)

**Other Special Attributes:** contains plant communities representative of the eastern side of the Swan Coastal Plain

***SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE***

Not listed

***SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS***

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

**Recommendation:** Rural Complementary Mechanism (see Table 3, Volume 1).

## YANGEDI SWAMP, KEYSBROOK

**Boundary Definition:** management/bushland (part to cadastre)/conservation wetland boundary (Areas of bushland within the boundaries of the Bushplan Site are not accurately mapped. The boundary has been drawn to include any unmapped bushland.)

### SECTION 1: CADASTRAL INFORMATION

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

**Bushplan Site no. 77**      **Map no. 100, 101, 104, 105**      **Map sheet series ref. no. 2033-II SE, 2033 II SW**

<b>Other Names</b> Submission Area 219	<b>Area (ha):</b> total 447.283 (includes open water); bushland 364.954
<b>Local Authorities (Suburb)</b> Shire of Serpentine-Jarrahdale (Keysbrook)	<b>Zoning</b> <b>MRS:</b> Rural <b>TPS:</b> Rural, Landscape
<b>Ownership Categories</b> Private (including commercial organisation)	<b>Lot/Location/Reserve numbers (Purpose), Street name</b> 1, 2 Elliott Rd; 2 Hopeland Rd; 77, 80 Yangedi Rd

### SECTION 2: REGIONAL INFORMATION

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#### WETLANDS

**Wetland Types:** sumpland, dampland, palusplain, artificial channel

##### Natural Wetland Groups

**Bassendean—Pinjarra transition OR Bassendean with fluvial features**

Bennett Brook (B/P.4)

**Wetland Management Objectives:** Conservation (51ha), Resource Enhancement, Multiple Use

**Swan Coastal Plain Lakes EPP:** 5.7ha + 5.5ha = 11.2ha (total)

#### THREATENED ECOLOGICAL COMMUNITIES

Not assessed, Not determined, Vulnerable (floristic community type 15)

### SECTION 3: SPECIFIC SITE DETAIL

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**Significant Flora:** *Stylidium longitubum* (3); *Myriocephalus helichrysoides*, *Stylidium utricularioides*, *Macarthuria apetala* (most southern location)

**Fauna:** no known information

**Linkage:** no adjacent bushland

**Other Special Attributes:** contains plant communities representative of the eastern side of the Swan Coastal Plain

**SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE**

Not listed

**SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS**

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

**Opportunities and/or Constraints**

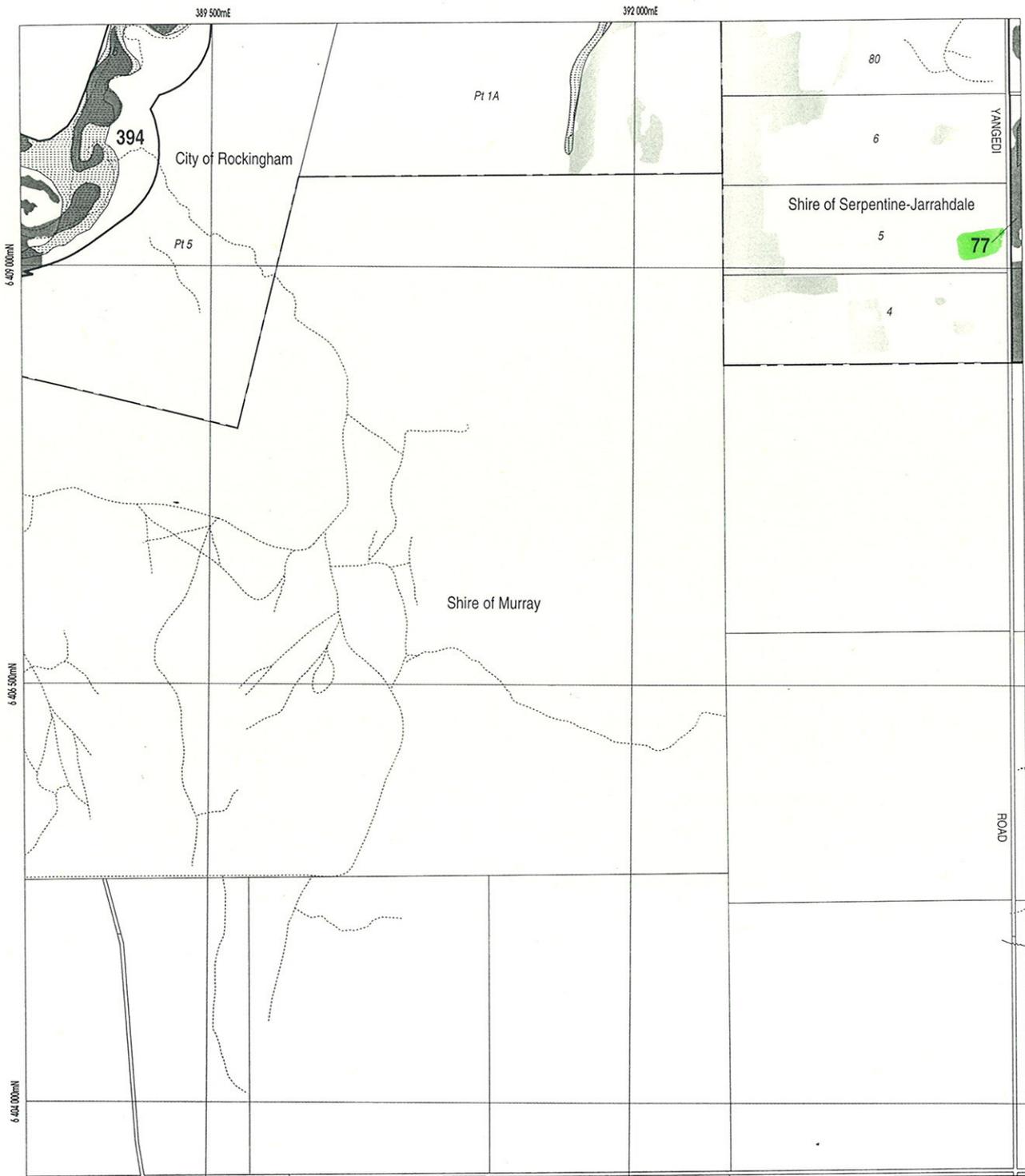
Opportunities: Bushplan Site/part Bushplan Site subject to Swan Coastal Plain Lakes EPP, Peel-Harvey Estuary EPP/SPP; location of conservation category wetlands; under TPS Landscape Zoning

Constraints: private land

**Recommendation:** The most appropriate mechanism for the protection of this Bushplan Site be considered through the public comment period in consultation with the land owner(s).

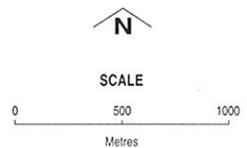
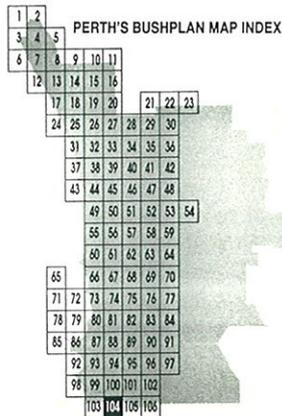
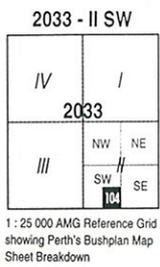




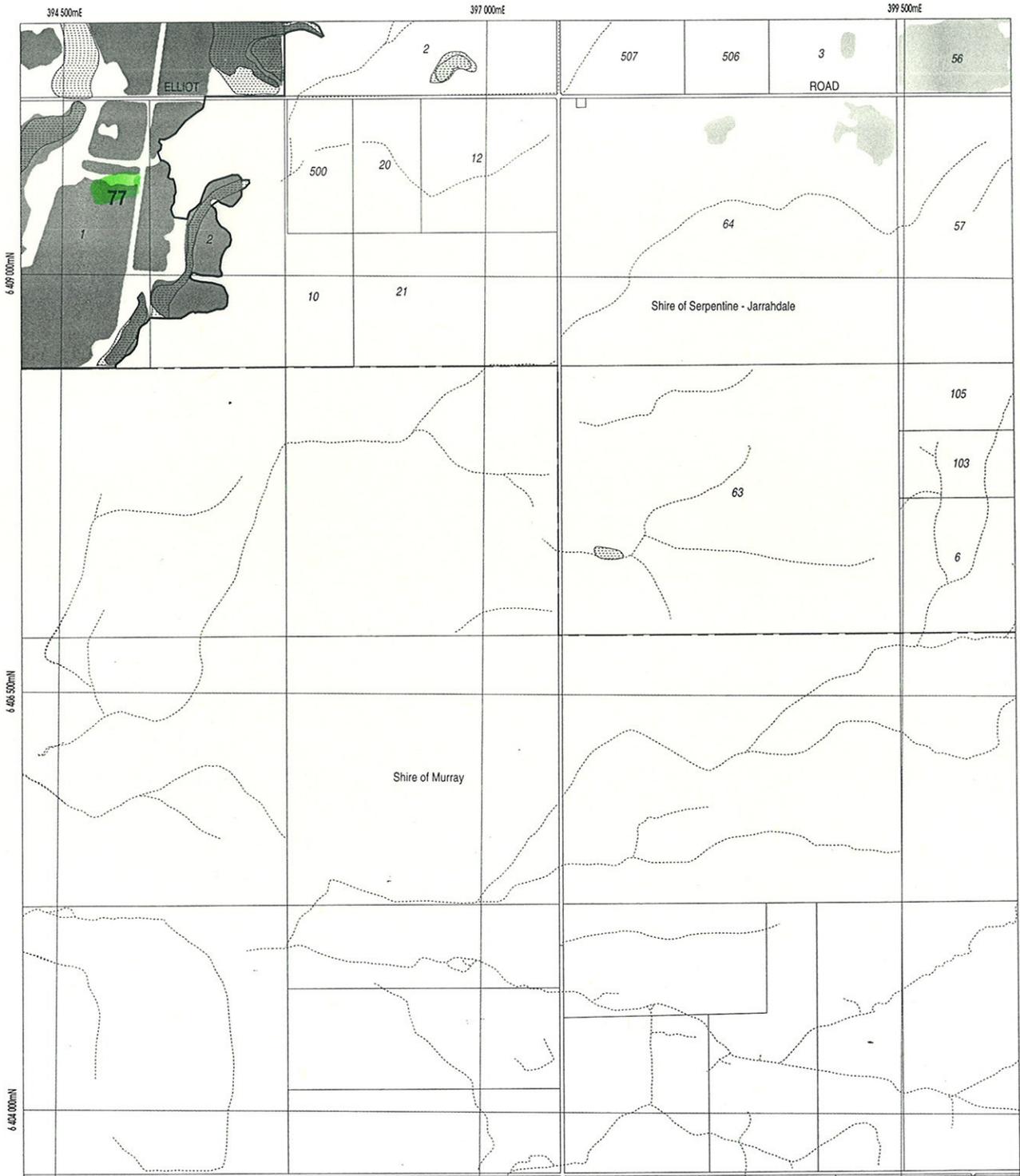


**LEGEND**

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

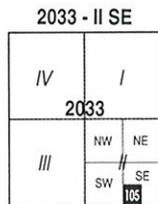


Produced by Project Mapping Section  
Land Information Branch, Ministry for  
Planning, Perth W.A. November 1998  
ntw-map177/envirom/bushplan/bushv2\_104.dgn  
Cadastral Data supplied by Department  
of Land Administration, W.A.  
Wetlands Data supplied by  
Water and Rivers Commission  
Native Vegetation Extent for Study Area  
supplied by Agriculture Western Australia

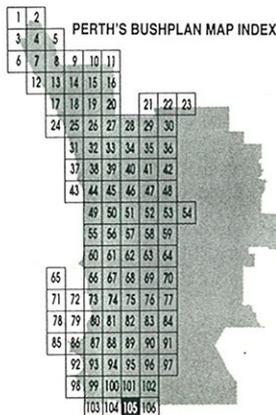


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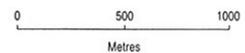
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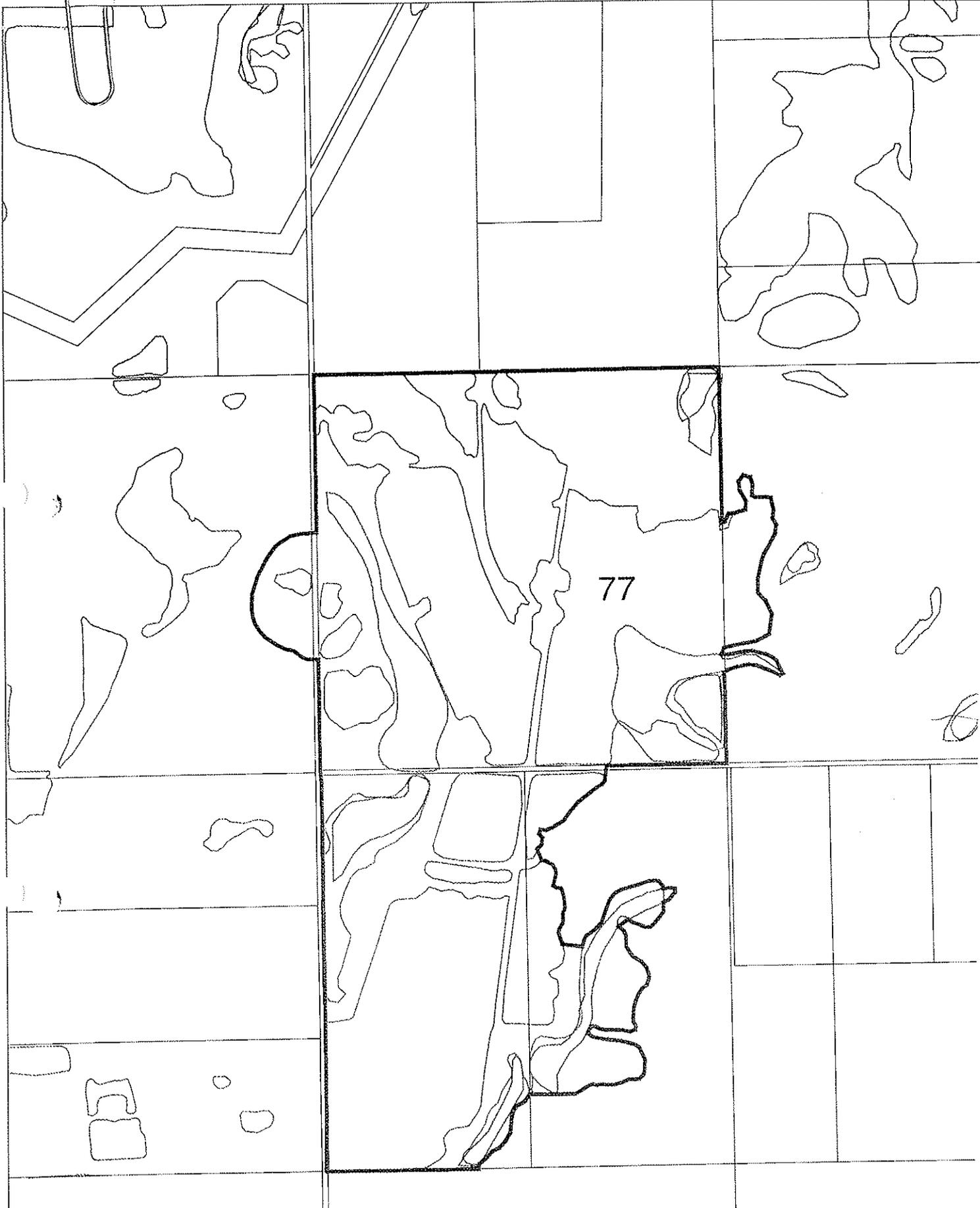
1 : 25 000 AMG Reference Grid showing Perth's Bushplan Map Sheet Breakdown



**SCALE**



Produced by Project Mapping Section  
Land Information Branch, Ministry for  
Planning, Perth W.A. November 1998  
ntw\_map17//environ/bushplan/bushv2\_105.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 SITES CORRECTED**

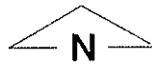


WESTERN  
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PLANNING  
COMMISSION



CUSTOMER  
FOCUS  
WESTERN AUSTRALIA

*P, 30/17, 22/10/98*



SCALE 1:2500



Metres

BJK. 2/7

BS 77

LEAVE AS IS WITH FOLLOWING NOTE

This is complicated BS, it has some threatened Community areas and the extent of this community needs more survey. In addition there has been clearing since 1992 in the top NE corner which was regrowing when we visited in 1995 but looks from 1997 photos as if it has been cleared again BUT the SE block looks more vegetated. - would leave as is



BUSHPLAN SITES CORRECTED



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COMMISSION



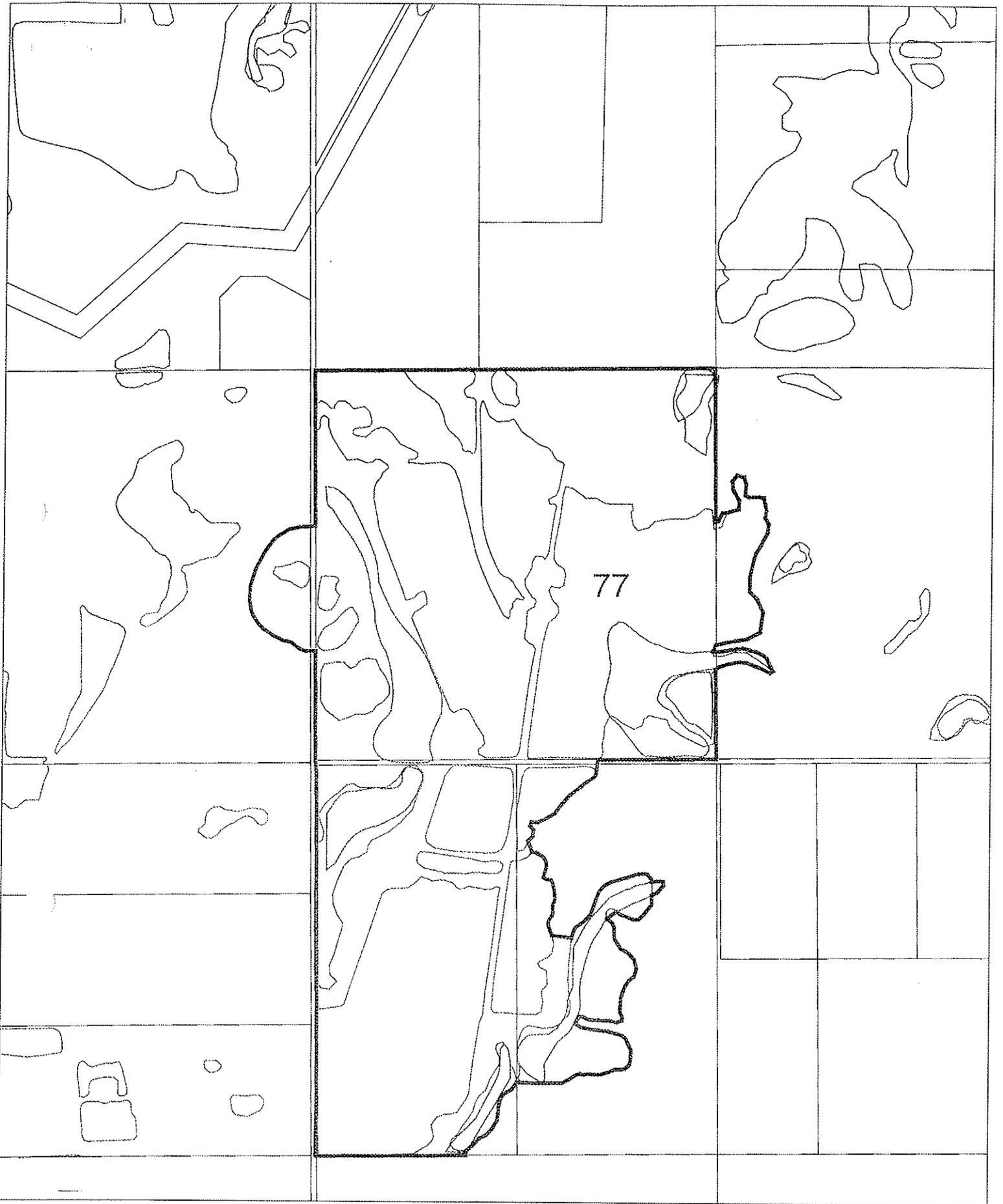
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FOCUS  
WESTERN AUSTRALIA



SCALE 1:2500



Metres



**BUSHPLAN SITES CORRECTED**



WESTERN  
AUSTRALIAN  
PLANNING  
COMMISSION



SCALE 1:2500



Metres



- to incorporating this area in the Shire's Conservation Zone Policy Area, through the Rural Strategy Review process. (Area 33.2 ha)
- xiii. Serpentine National Park & adjacent bushland Site [redacted] Vol 2 115-116 CALM managed land. Major need for weed control in National Park and adjacent state government lands.
- xiv. Kingsbury Drive Bushland Site [redacted] Vol 2 Pg 117 Council notes the importance of this vegetation and believes that protection and management of the site's vegetation is best achieved by working directly with the affected landowners. Consideration may be given to incorporating this area in the Shire's Conservation Zone Policy Area, through the Rural Strategy Review process. (Area 40.6 ha). One-to-one consultation with landowners is required.
- xv. Myara Brook Bushland Site [redacted] Vol 2 pg 118 -119, known locally as the Myara Brook Reserve; currently undergoing vesting change to be vested with Local Authority for the purposes of protection of Indigenous Flora and Fauna. Active management by local authority and community with support of federal and state government grants. Council supports retention of reserve, with assistance from State Government to fund management.
- xvi. Anketell Road Bushland Site [redacted] 247, Vol 2 Pg 213-214; Shire supports inclusion of land within Jandakot Botanical Park, except for cleared areas which should be assessed for alternative or complementary uses. Council proposes to site the Oakford voluntary Fire Brigade and a small meeting place on a 4000 m2 lot on the Pony Way frontage. This site is surrounded by a clearing of over 20 ha. Usage of this small portion of the clearing for community uses is complementary to the protection of the remaining 558.1 ha.
- xvii. Modong Nature Reserve and adjacent bushland Site [redacted] 248 Vol 2 pg 219 - Council notes the importance of this vegetation and the inclusion of private property.
- xviii. Duckpond Bushland Site [redacted] Vol 2 pg 222. Council notes the importance of this vegetation. Council believes that protection and management of the site's vegetation is best achieved by working directly with the affected landowners. Consideration may be given to incorporating this area in the Shire's Conservation Zone Policy Area, through the Rural Strategy Review process (area: 23.5 ha). One-to-one consultation with landowners is required.
- xix. Banksia Road Nature Reserve Site [redacted] Vol 2 pg 223-224. CALM estate.
- xx. Lowlands Bushland Site [redacted] 225 & [redacted] Vol 2 pg 224-227. Council notes the inclusion of this site in Perth's Bushplan. These sites are two of three properties currently before the Ministry for Planning for rezoning to Conservation. It is important that the rezonings be finalized as a matter of priority, so that an example is set for the Perth Metropolitan Area.
- xxi. Henderson Road Bushland Site [redacted] Vol 2 pg 229-230. Council notes the importance of this vegetation. Assistance needs to be given to landowners to fence off vegetation from stock. Council believes that protection and management of the site's vegetation is best achieved by working directly with the affected landowners. Consideration may be given to incorporating this area in the Shire's Conservation Zone Policy Area, through the Rural Strategy Review process. One-to-one consultation with landowners is required.
- xxii. Yangedi Swamp and adjacent Bushland, Site [redacted], pg 230-231, Council notes the importance of this vegetation. Assistance needs to be given to landowners to fence off vegetation from stock. Consideration will be given to incorporating this area in the Shire's Conservation Zone Policy Area, through the Rural Strategy Review process. One-to-one consultation with landowners is required. The site also includes one property currently before the Ministry for Planning for rezoning to Conservation. It is important that the rezoning be finalized as a matter of priority, so that an example is set for the Perth Metropolitan Area and other landowners. One-to-one consultation with landowners is required.
- xxiii. Wungong Brook Site [redacted] Vol 2 pg 402-403 Council notes the importance of this vegetation. Protection of the vegetation should be achieved through its inclusion in the proposed public reserve.

**SITE LOCATION**

Suggested name of area (1996)

sem veg = 307 ha (sl. less)

**Some Other Commonly used Names:**

Subm 219 Yangedi Swamp Bushland

**Area (ha):**

Total 257, bushland 70%(GIS) 90%  
MRA 12/92 run 11 5287 aerial photo)  
Zoning (MRS & town planning)

**Local Authorities (Suburb)**

Shire of Serpentine Jarrahdale

**Ownership categories:** Street name, Lot number

rural

**LANDFORM AND SOIL**

**Landscape features:** vegetated wetland

**Bassendean Dunes**

Bassendean sands (Qpb: S8)

sp1 sp2 S8 S10 Cps

**Bassendean Dunes/Pinjarra Plain**

Bassendean sands over Guildford Formation (Qpb/Qpa:S10)

**Wetlands (within the Quindalup Spearwood Bassendean Dunes Pinjarra Plain)**

Holocene swamp deposits (Qhw: Cps) (Qrw: Sp1, Sp2)

**REGIONAL VEGETATION AND FLORA**

**Vegetation Complex**

**Bassendean Dunes**

✓ Bassendean Complex - Central and South

**Combinations of Bassendean Dunes/Pinjarra Plain/Spearwood Dunes**

✓ Southern River Complex

**Floristic Community Types:**

**Supergroup 2: Seasonal Wetlands**

15 Forests and woodlands of deep seasonal wetlands

S1 *Astartea* aff. *fascicularis*/Melaleuca species dense shrublands

**Supergroup 3: Uplands, centred on Bassendean Dunes and the Dandaragan Plateau**

21a Central *Banksia attenuata* - *E. marginata* woodlands

**REGIONAL WETLAND**

✓ **Wetland Types:** sumpland, dampland, palusplain, artificial channel

✓ **Consanguineous suite** (undefined areas included in boundary)

**Bassendean - Pinjarra transition OR Bassendean with fluvial features**

Bennet Brook (B/P.4)

✓ **Wetland Management Objective:** Conservation, Resource Enhancement, Multiple Use

Lake EPP: 2.8ha

5.71 (1/2) = 2.85 16.75 (1/8) = 2.34 ~ 5.19 ha.

**THREATENED COMMUNITIES/SPECIES**

Not assessed, Presumed Totally Destroyed, Critically Endangered (floristic community type 3a, 3c, 10b, '19a', 20c, Perth to Gingin Ironstone Association, Communities of Tumulus Springs, Muehea Limestones, Stromatalite-like microbialite community of coastal freshwater lakes, Aquatic Mat Community of the Swan Coastal Plain, Stromatalite-like microbialite community dependant on fresh ground water of coastal brackish lakes), Endangered (floristic community type 2, 10a, 20a, 20b, '30a'), Vulnerable (floristic community type 15)

**AREA DESCRIPTION**

**Vegetation and Flora**

**Structural units:** not known, (limited survey), (detailed survey), (mapping)

Forest Woodland Shrubland Herbland Sedgeland Grassland

Eucalypts - *Eucalyptus calophylla*, *E. wandoo*, *E. marginata*, *E. todtiana*, *E. rudis*, *E. decipiens*, *E. lanepoolei*, *E. haemotoxylon* and *E. gomphocephala*

Sheoaks - *Allocasuarina fraseriana* and *Casuarina obesa*

Banksias - *Banksia attenuata*, *B. menziesii*, *B. prionotes*, *B. ilicifolia*, *B. grandis* and *B. littoralis*

Melaleucas - *Melaleuca preissiana*, *M. raphiophylla* and *M. lanceolata*

*Callitris preissii*.

*Jacksonia*, *Viminaria*, *Daviesia*, *Leucopogon*, *Regelia*, *Banksia*, *Dryandra*, *Grevillea*, *Hakea*, *Petrophile*, *Stirlingia*, *Gompholobium*, *Calytrix*, *Verticordia*, *Pericalymma*, *Melaleuca*, *Hibbertia*, *Halosarcia*, *Sarcocornia*, *Xanthorrhoea*, *Kingia* and *Acacia*

*Borya*, *Phlebocarya*, *Lomandra*, *Anigozanthos*, *Conostylis*, *Patersonia*, *Drosera* and *Stylidium*

*Baumea*, *Gahnia*, *Evandra*, *Schoenus*, *Mesomelaena*, *Alexgeorgia*, *Cyathochaeta*, *Loxocarya*,

*Leptocarpus*, *Restio* and *Juncus*

*Spinifex*, *Stipa*, *Danthonia* and *Poa*.

**Vegetation Condition:** >30% >50% >75% >90% Pristine, Excellent, Very Good, Good, Degraded, Completely Degraded with % Pristine, Excellent, Very Good, Good, Degraded, Completely Degraded with areas of severe localised disturbance

**Total Flora:** not known, (estimated), (site generated list only), (estimated >50% expected flora), (estimated >75% expected flora), (estimated >90% expected flora)

DRF/Priority - GIS: none recorded

DRF/Priority and significant flora - surveyed *Myriocephalus helichrysoides*, *Stylidium utricularioides*, *Stylidium longitubum* (3), *Macarthuria apetala* (2)

**Fauna**

Mammals: not surveyed

Linkage: bushland linkage to south, east and west

Special Attributes:

putted up

Avenda to the N  
(2km)

**INTERNATIONAL AND NATIONAL SIGNIFICANCE**

Not listed

**CONSERVATION RECOMMENDATIONS**

**Criteria met for inclusion:** eg XX, XY Y

**Constraints:** Private land, MRS Urban zoning, Mineral Resource Area, Mineral Lease,

**Recommendation:**

Draft Only

**Department of Environmental Protection System 6 Update: Site Based Flora List for Yangedi Swamp, Shire of Serpentine-Jarrahdale (Subm no. 219)**  
(123 taxa, Yang01-03, B.J. Keighery, 7/6/96)

110 ..... native to area  
Anthericaceae

Arnocrinum preissii  
Johnsonia pubescens  
Laxmannia squarrosa  
Thysanotus arbuscula  
Thysanotus multiflorus  
Thysanotus triandrus

Apiaceae

Homalosciadium homalocarpum  
Trachymene pilosa  
Xanthosia huegelii

Asteraceae

Cotula coronopifolia  
\* Hypochaeris glabra  
Myriocephalus helichrysoides  
Quinetia urvillei  
\* Ursinia anthemoides

Casuarinaceae

Allocasuarina humilis

Centrolepidaceae

Aphelia cyperoides  
Centrolepis drummondiana  
Centrolepis glabra  
Centrolepis mutica

Chenopodiaceae

Dysphania glomulifera  
Dysphania glomulifera subsp. glomulifera

Colchicaceae

Burchardia congesta

Crassulaceae

\* Crassula natans

Cyperaceae

Isolepis cernua

Isolepis marginata  
Isolepis oldfieldiana  
Lepidosperma angustatum  
Lepidosperma longitudinale  
Schoenus curvifolius  
Schoenus tenellus

Dasypogonaceae

Dasypogon bromeliifolius  
Lomandra hermaphrodita  
Lomandra sericea

Dilleniaceae

Hibbertia ferruginea  
Hibbertia hypericoides  
Hibbertia racemosa

Droseraceae

Drosera paleacea  
Drosera sp. scps

Epacridaceae

Conostephium pendulum  
Leucopogon conostephioides

Gentianaceae

\* Cicendia filiformis

Goodeniaceae

Dampiera linearis  
Goodenia pulchella

Haemodoraceae

Conostylis juncea  
Phlebocarya ciliata  
Phlebocarya filifolia

Haloragaceae

Myriophyllum drummondii

Iridaceae

Patersonia occidentalis

Juncaceae

\* *Juncus bufonius*

Lamiaceae

*Hemiandra pungens*

Lobeliaceae

*Lobelia tenuior*

\* *Monopsis debilis*

Loganiaceae

*Mitrasacme paradoxa*

Marsileaceae

*Pilularia novae-hollandiae*

Menyanthaceae

*Villarsia capitata*

Molluginaceae

*Macarthuria apetala*

Myrtaceae

*Astartea* aff. *fascicularis* s.thcst

*Calothamnus lateralis*

*Calytrix angulata*

*Calytrix fraseri*

*Eremaea pauciflora*

*Kunzea ericifolia*

*Melaleuca lateritia*

*Melaleuca preissiana*

*Melaleuca raphiophylla*

*Melaleuca teretifolia*

*Melaleuca thymoides*

*Melaleuca uncinata*

*Melaleuca viminea*

*Regelia ciliata*

*Scholtzia involucrata*

Orchidaceae

*Prasophyllum drummondii*

*Prasophyllum* sp. scps

*Pterostylis* sp. scps

*Pterostylis vittata*

Papilionaceae

Aotus gracillima  
Bossiaea eriocarpa  
Eutaxia virgata  
Gompholobium tomentosum  
Hovea trisperma var. trisperma  
\* Lotus angustissimus  
\* Trifolium dubium  
\* Trifolium repens

#### Poaceae

Agrostis avenacea  
Amphibromus neesii  
Amphipogon turbinatus  
\* Briza maxima  
\* Briza minor  
\* Lolium rigidum  
Stipa compressa  
\* Vulpia myuros

#### Proteaceae

Banksia attenuata  
Banksia ilicifolia  
Banksia menziesii  
Petrophile linearis  
Stirlingia latifolia

#### Restionaceae

Hypolaena exsulca  
Leptocarpus roycei MS  
Loxocarya flexuosa

#### Restionaceae

Lyginia barbata

#### Rutaceae

Eriostemon spicatus

#### Scrophulariaceae

Glossostigma drummondii  
Gratiola peruviana

#### Stylidiaceae

Stylidium brunonianum  
Stylidium divaricatum  
Stylidium longitubum  
Stylidium piliferum  
Stylidium repens

*Stylidium schoenoides*  
*Stylidium utricularioides*

**A VERTEBRATE FAUNA SURVEY  
OF  
WEST KINGIA, KEYSBROOK,  
WESTERN AUSTRALIA**

**Prepared for A & M Elliott**

**By Ninox Wildlife Consulting**

**August 2005**

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### List of Participants

#### **Ninox Wildlife Consulting**

Senior Zoologist	-	Jan Henry
Senior Ornithologist	-	Ken Youngson (1997-1998)
Assisting Ornithologist	-	Maureen Francesconi (2003-2004)

## 1 INTRODUCTION

The following report has been prepared by Ninnox Wildlife Consulting (Ninnox) for A. and M. Elliott and describes the results of a vertebrate fauna survey of West Kingia, Keysbrook in the Shire of Serpentine - Jarrahdale, Western Australia. Although the Southern Swan Coastal Plain (SSCP) is highly disturbed, there are two areas of particular conservation value in the Shire of Serpentine - Jarrahdale: Lowlands and West Kingia. However, very little information on the vertebrate fauna of SSCP is available although there are some data on the birds of the general area.

Initially, the survey within Kingia was conducted by Ninnox out of personal interest on a voluntary basis because of the lack of knowledge regarding the extant vertebrate fauna of the SSCP, particularly the ground-dwelling species. Two sampling periods were completed during November/December 1997 and July 1998 on a voluntary basis by Ninnox and members of the Serpentine – Jarrahdale Landcare District Committee (SJ-LCDC) and other members of the Keysbrook community. Following these surveys, an additional survey period was conducted in March 2003 (trapline sampling) and was supported financially by the National Heritage Trust and, once again, by voluntary assistance from the SJ-LCDC and Keysbrook community. Subsequently, additional bird sampling was conducted in various seasons through 2003 and 2004.

In addition, during the final trapping survey in March 2003, a University of Western Australia PhD student added traplines parallel to five of the existing six traplines to monitor the capture rates of reptile species by various trapping methods. These results have been added to the existing database held by Ninnox Wildlife Consulting. The PhD thesis is currently in preparation.

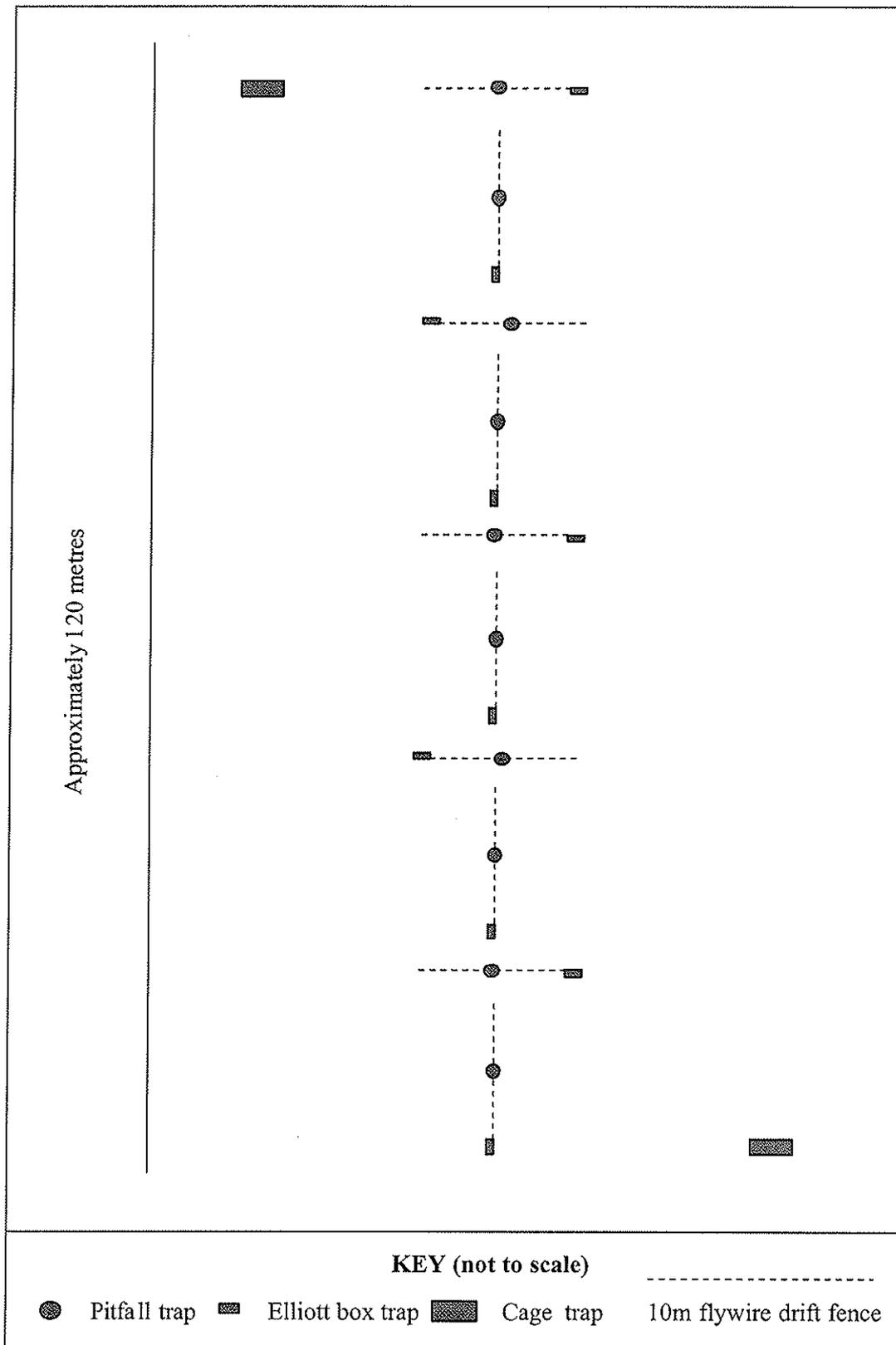
All of the data resulting from the various sampling periods have been presented in this report.

## 2 METHODS

### 2.1 Mammals, Amphibians and Reptiles

Five traplines were established in the major vegetation types within West Kingia during 1997. These vegetation types are described in full in a report by Trudgen and Archer (2001) which also gives an account of the history of not only West Kingia, but the SSCP. The vegetation description for each vertebrate sampling location is summarised in Table 1. An additional trapline was established in an adjacent property where a section of pasture with remnant Banksia trees had been fenced off from stock for four years. This latter site was established in order to ascertain the fauna recolonisation of highly disturbed areas once stock had been excluded.

Each trapping site comprised ten pitfall traps (20 litre plastic drums) bisected across the top by 10 metres of flywire drift fence 300mm high. Surface traps in each site consisted of medium 10 Elliott box traps and two wire cage traps which were placed in association with the pitfall traps. Figure 1 shows a diagrammatic layout of an individual trapline. Traps were monitored over a six-night period and all fauna information such as identification, breeding activity, age and sex was recorded on field data sheets. Traps were securely capped, covered with soil and left in position for future seasonal sampling or monitoring.



**Figure 1** *Diagrammatic layout of a vertebrate fauna trapline used in West Kingia during November/December 1997, July 1998 and March 2003.*

**Table 1** Summary description of each vertebrate fauna sampling site within Kingia (adapted from Trudgen and Archer (2001)).

Site Code	Summary Description
E1	Banksia low open forest consisting of <i>Banksia attenuata</i> , <i>Banksia menziesii</i> and <i>Banksia ilicifolia</i> over <i>Melaleuca thymoides</i> open heath over <i>Desmocladius flexuosus</i> closed sedgeland.
E2	Banksia low open forest consisting of <i>Banksia attenuata</i> , <i>Banksia menziesii</i> and <i>Banksia ilicifolia</i> over a tall open shrubland of <i>Adenanthos cygnorum</i> ssp. <i>cygnorum</i> and various other shrubs over <i>Desmocladius flexuosus</i> open sedgeland.
E3	Low woodland of <i>Allocasuarina fraseriana</i> over <i>Banksia attenuata</i> , <i>Banksia menziesii</i> , <i>Banksia ilicifolia</i> , <i>Xylomelum occidentale</i> over very open shrubland of <i>Hibbertia hypericoides</i> , <i>Allocasuarina humilis</i> , <i>Stirlingia latifolia</i>
E4	Open woodland of <i>Eucalyptus marginata</i> over woodland of <i>Allocasuarina fraseriana</i> over low open woodland of <i>Banksia attenuata</i> , <i>Banksia menziesii</i> , <i>Banksia ilicifolia</i> , <i>Xylomelum occidentale</i> over tall shrubland of <i>Kunzea glabrescens</i> over low shrubland of <i>Hibbertia hypericoides</i> , <i>Bossiaea eriocarpa</i> , <i>Conostephium pendulum</i> over and open sedgeland of <i>Desmocladius flexuosus</i>
E5	Highly degraded low, very open forest consisting of <i>Banksia attenuata</i> , <i>Banksia menziesii</i> and <i>Banksia ilicifolia</i> over <i>Desmocladius flexuosus</i> sedgeland and grasses.
E6	Low woodland of <i>Banksia attenuata</i> , <i>Banksia menziesii</i> , <i>Banksia ilicifolia</i> , <i>Xylomelum occidentale</i> over tall open shrubland of <i>Adenanthos cygnorum</i> ssp. <i>cygnorum</i> over a low shrubland of <i>Scholtzia involucrata</i> , <i>Calytrix flavescens</i> over mosaic of <i>Desmocladius flexuosus</i> open to closed sedgeland and low closed heath of <i>Actinostrobos acuminatus</i> .

## 2.2 Birds

Birds were sampled by the 'area search' method which consisted of the observer moving slowly through each habitat identifying and counting all bird species seen and heard. Recording took place during the peak bird activity period between 0700 hrs – 1100 hrs over five days in two of the three sampling periods. Sampling times in the various sites were rotated to minimise the effect of variations in weather and peak activity periods of birds. All information recorded for each sighting was logged on field data sheets.

Subsequent bird sampling has been conducted in three seasons, with an experienced ornithologist visiting West Kingia for one morning, visiting each site and staying within that site until all of the birds currently present had confidently been recorded.

## 3 RESULTS AND DISCUSSION

A total of three native mammal species, five frog, 25 reptile and 60 bird species have been recorded to date within West Kingia. Introduced or feral species included two birds and five mammal species. Tables 2 to 6 lists these species within the sampling sites as described in Table 1. All opportunistically recorded animals from the total West Kingia property are listed under a single heading (OP) in Tables 2 to 6.

### 3.1 Native Mammals

Only three native mammals were recorded in West Kingia during the three sampling periods to date (Table 2). The Honey Possum (*Tarsipes rostratus*) was recorded in five of the six sites including the highly degraded site E5. Southern Brown Bandicoots (*Isoodon obesulus*) was recorded in three sites but was particularly common in site E3. Predictably, the most commonly recorded native mammal was the Grey Kangaroo (*Macropus fuliginosus*) which was noted in all six sites.

**Table 2** List of native mammal species recorded during three sampling periods in the six locations within West Kingia.

		Sampling Site Code						
		E1	E2	E3	E4	E5	E6	
<b>NATIVE MAMMALS</b>								
<b>PERAMELIDAE</b>								
<i>Isoodon obesulus fusciventer</i>	Southern Brown Bandicoot	2		7			2	
<b>TARSIPEDIDAE</b>								
<i>Tarsipes rostratus</i>	Honey Possum	3	1		3	1	2	
<b>MACROPODIDAE</b>								
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	4	4	1	3	1	4	
		<b>No. of Species</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>

Further sampling could increase this number of species for the area although given the lack of connectivity to other intact areas of remnant vegetation and the lack of knowledge as to what remains of the original mammal fauna of the SSCP, the main group of native mammals that could be extant within West Kingia are the small, insectivorous bats. This group of mammals was not sampled during these three surveys.

### 3.2 Amphibians

Four species of amphibian (frog) species were identified to species level during the survey (Table 3). However, most commonly captured were individuals of the genus *Heleioporus* some of which were difficult to identify without hearing the male breeding call.

**Table 3** List of frog species recorded during three sampling periods in the six locations within West Kingia.

		Sampling Site Code						
		E1	E2	E3	E4	E5	E6	
<b>FROGS</b>								
<b>MYOBATRACHIDAE</b>								
<i>Crinia georgiana</i>	Quacking Frog				1			
<i>Crinia insignifera</i>	Squelching Froglet	12	46	34	37	5	24	
<i>Heleioporus eyrei</i>	Moaning Frog		4	4		8	8	
<i>Heleioporus psammophilus</i>	Sand Frog	2	3	2				
<i>Heleioporus</i> sp.	Unidentified <i>Heleioporus</i>	2	4	2	2	1	6	
		<b>No. of Species</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>3</b>

Most common was the very small Squelching Frog (*Crinia insignifera*) which was recorded in every site, with up to 46 individuals being captured in any single location. The lowest number captured was in the highly degraded site E5 although site E1 also had a relatively low number of captures.

Further sampling could increase the list of frogs for the area as several species thought to still occur on the SSCP have not been recorded. These include *Crinia glauerti*, *Limnodynastes dorsalis*, *Myobatrachus gouldii*, and *Pseudophryne guentheri*.

### 3.3 Reptiles

Twenty-four species of reptile have been captured to date in West Kingia (Table 4). This list includes four species of Legless Lizards, 11 Skinks, two Dragon Lizards, one Monitor, one Blind Snake and five Venomous Snakes.

One additional reptile was recorded opportunistically: the Long-necked Turtle (*Chelodina oblonga*), which was observed in a small soak within degraded dampland vegetation near the northern boundary of the property.

**Table 4** List of reptile species recorded during three sampling periods in the six locations within West Kingia.

		Sampling Site Code					
		E1	E2	E3	E4	E5	E6
<b>REPTILES</b>							
<b>PYGOPODIDAE</b>		<b>Legless Lizards</b>					
<i>Aprasia repens</i>		1	3	2	2	1	
<i>Lialis burtonis</i>		2	2	2			1
<i>Pletholax gracilis</i>			1				
<i>Pygopus lepidopodus</i>		1	1				
<b>SCINCIDAE</b>		<b>Skinks</b>					
<i>Acritoscincus trilineatum</i>		4	3	1	1	1	4
<i>Cryptoblepharus plagioccephalus</i>		7	6	9	10	5	11
<i>Ctenotus fallens</i>		1			4		
<i>Ctenotus australis</i>		2	2	10	1	3	2
<i>Hemiergis quadrilineata</i>		9	4	6	5		2
<i>Lerista elegans</i>			4	6	1	2	4
<i>Menetia greyii</i>		3	2	4	3	1	1
<i>Morethia lineocellata</i>			1	2	1		3
<i>Morethia obscura</i>							1
<i>Tiliqua occipitalis</i>			1				
<i>Tiliqua r. rugosa</i>		16	19	3	4		10
<b>AGAMIDAE</b>		<b>Dragon Lizards</b>					
<i>Pogona m. minor</i>				3	3	1	6
<i>Rankinia a. adalaidensis</i>			1	1			
<b>VARANIDAE</b>		<b>Monitors</b>					
<i>Varanus gouldii</i>		3					
<b>TYPHLOPIDAE</b>		<b>Blind Snakes</b>					
<i>Ramphotyphlops australis</i>		1		2	1	1	

		Sampling Site Code					
		E1	E2	E3	E4	E5	E6
<b>ELAPIDAE</b>	<b>Venomous Snakes</b>						
<i>Drysdalia coronata</i>			2				
<i>Elapognathus coronata</i>					1		
<i>Notechis scutatus</i>		1		1			
<i>Pseudonaja a. affinis</i>		1					
<i>Parasuta gouldii</i>		1	3	1			
	<b>No. of Species</b>	<b>15</b>	<b>16</b>	<b>15</b>	<b>13</b>	<b>8</b>	<b>11</b>

Two species of Legless Lizard, one Monitor, at least four Skinks, one Python and possibly four Venomous Snakes could yet be recorded from West Kingia. Some of these reptiles, for example, the Carpet Python (*Morelia spilota imbricata*), are thought to have been greatly impacted by loss of habitat on the SSCP and, if present, their numbers are probably greatly reduced (Bush *et al.* 1995).

### 3.4 Birds

Table 5 shows that 50 species of bird have been recorded to date within the six sampling sites listed in Table 1. An additional 14 species, mainly waterbirds and birds of prey, have been observed elsewhere in West Kingia (Table 6).

**Table 5** List of bird species recorded during three sampling periods in the six locations within West Kingia.

		Sampling Site Code					
		E1	E2	E3	E4	E5	E6
<b>BIRDS</b>							
<b>TURNICIDAE</b>							
<i>Turnix varia</i>	Painted Button-quail	1	1		2	1	
<b>COLUMBIDAE</b>							
<i>Phaps chalcoptera</i>	Common Bronzewing	2		1		1	
<i>Ocyphaps lophotes</i>	Crested Pigeon	3		1			
<b>PSITTACIDAE</b>							
<i>Calyptorhynchus baudinii</i>	Baudin's Cockatoo		5		55	55	6
<i>Cacatua roseicapilla</i>	Galah	4					
<i>Polytelis anthopeplus</i>	Regent Parrot	7		5			13
<i>Platycercus zonarius</i>	Australian Ringneck	21	6	17	24	16	11
<i>Platycercus spurius</i>	Red-capped Parrot	9	3	2	3	2	2
<i>Neophema elegans</i>	Elegant Parrot	10			1		
<b>CUCULIDAE</b>							
<i>Cuculus pallidus</i>	Pallid Cuckoo		1	1			
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo			1			
<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo	2		1			
<i>Chrysococcyx lucidus</i>	Shining Bronze-Cuckoo	4		4	1		
<b>HALCYONIDAE</b>							
<i>Todiramphus sanctus</i>	Sacred Kingfisher			1	2	2	
<b>MEROPIIDAE</b>							
<i>Merops ornatus</i>	Rainbow Bee-eater	12	3	1	2	2	

		Sampling Site Code					
		E1	E2	E3	E4	E5	E6
<b>MALURIDAE</b>							
<i>Malurus splendens</i>	Splendid Fairy-wren	11	11	9			12
<b>PARDALOTIDAE</b>							
<i>Pardalotus striatus</i>	Striated Pardalote			1		3	
<b>ACANTHIZIDAE</b>							
<i>Sericornis frontalis</i>	White-browed Scrubwren			5			5
<i>Gerygone fusca</i>	Western Gerygone	2	2	13	17	17	9
<i>Acanthiza apicalis</i>	Broad-tailed Thornbill	1	1				6
<i>Acanthiza inornata</i>	Western Thornbill			2	14	4	6
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	7	2	1	5	4	10
<b>MELIPHAGIDAE</b>							
<i>Lichmera indistincta</i>	Brown Honeyeater	76	133	125	83	82	60
<i>Lichenostomus virescens</i>	Singing Honeyeater		2				
<i>Meliphaga chloropsis</i>	White-naped Honeyeater	2	1		2		
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	6	2	13			
<i>Phylidonyris nigra</i>	White-cheeked Honeyeater	34	8	5	17	18	17
<i>Acanthorhynchus superciliosus</i>	Western Spinebill	15	13	24	20	23	33
<i>Manorina flavigula</i>	Yellow-throated Miner						2
<i>Anthochaera lunulata</i>	Little Wattlebird	50	14	18	17	9	15
<i>Anthochaera carunculata</i>	Red Wattlebird	15	5	7	8	7	9
<b>PETROICIDAE</b>							
<i>Petroica multicolor</i>	Scarlet Robin	1	5	7	4	8	1
<i>Petroica goodenovii</i>	Red-capped Robin				1		
<i>Petroica cucullata</i>	Hooded Robin	2					
<b>NEOSITTIDAE</b>							
<i>Daphoenositta chrysoptera</i>	Varied Sittella	2					
<b>PACHYCEPHALIDAE</b>							
<i>Pachycephala pectoralis</i>	Golden Whistler			1	1		
<i>Pachycephala rufiventris</i>	Rufous Whistler	10	7	13	19	18	10
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	4	3	4	5	4	
<b>DICRURIDAE</b>							
<i>Rhipidura fuliginosa</i>	Grey Fantail	4	3	6	12	8	10
<i>Rhipidura leucophrys</i>	Willie Wagtail	2	1				2
<i>Grallina cyanoleuca</i>	Magpie-lark					1	1
<b>CAMPEPHAGIDAE</b>							
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	2	6	4	7	6	2
<b>ARTAMIDAE</b>							
<i>Artamus cyanopterus</i>	Dusky Woodswallow	4			3		
<b>CRACTICIDAE</b>							
<i>Cracticus torquatus</i>	Grey Butcherbird	7	1	4		1	
<i>Cracticus tibicen</i>	Australian Magpie	21	6	6	5	3	4
<i>Strepera versicolor</i>	Grey Currawong	9	2		2	2	4
<b>CORVIDAE</b>							
<i>Corvus coronoides</i>	Australian Raven	2	5	21	15	3	4
<b>HIRUNDINIDAE</b>							
<i>Hirundo neoxena</i>	Welcome Swallow	2	2			5	3
<i>Hirundo nigricans</i>	Tree Martin	1	4	4	6	2	4
<b>ZOSTEROPIDAE</b>							
<i>Zosterops lateralis</i>	Grey-breasted White-eye	5	5	4	2	3	5
	<b>No. of Species</b>	<b>38</b>	<b>31</b>	<b>34</b>	<b>30</b>	<b>29</b>	<b>28</b>

The richest site for birds was site E1 with 38 species and the lowest was site E6 with 28 species. All other sites were similar with between 29 and 34 species.

**Table 6** List of birds recorded opportunistically in West Kingia.

BIRDS	
<b>PHALACROCORACIDAE</b>	
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant
<b>THRESKIORNITHIDAE</b>	
<i>Threskiornis molucca</i>	Australian White Ibis
<i>Threskiornis spinicollis</i>	Straw-necked Ibis
<b>ARDEIDAE</b>	
<i>Ardea novaehollandiae</i>	White-faced Heron
<i>Ardea pacifica</i>	White-necked Heron
<b>ANATIDAE</b>	
<i>Chenonetta jubata</i>	Australian Wood Duck
<i>Anas gracilis</i>	Grey Teal
<b>ACCIPITRIDAE</b>	
<i>Ephthianura albifrons</i>	Brown Goshawk
<i>Haliastur sphenurus</i>	Whistling Kite
<i>Ephthianura albifrons</i>	Wedgetail Eagle
<b>FALCONIDAE</b>	
<i>Falco peregrinus</i>	Peregrine Falcon
<i>Falco cenchroides</i>	Australian Kestrel
<b>PSITTACIDAE</b>	
<i>Calyptorhynchus latirostris</i>	Carnaby's Cockatoo
<b>HIRUNDINIDAE</b>	
<i>Hirundo nigricans</i>	Tree Martin

Two species recorded in West Kingia are considered Vulnerable under both Commonwealth and State legislation (*Environment Protection and Biodiversity Conservation Act 1999* and *Wildlife Conservation [Specially Protected Fauna] Notice 2000*): Baudin's Cockatoo (*Calyptorhynchus baudinii*) and Carnaby's Cockatoo (*Calyptorhynchus latirostris*). The Peregrine Falcon observed flying over site E1 is listed as 'Other Specially Protected Fauna' in the *Western Australian Wildlife Conservation [Specially Protected Fauna] Notice 2000*. The Rainbow Bee-eater (*Merops ornatus*) which was observed flying over five of the six sites is protected under the Japan/Australia Migratory Bird Agreement (JAMBA).

### 3.5 Introduced Species

Two introduced bird species and two introduced mammal species have been recorded during the sampling at West Kingia to date (Table 7). Only the House Mouse (*Mus musculus*) was common but even this ubiquitous animal was not recorded in every site. However, populations of this species fluctuate dramatically over the four seasons and also over the years as conditions vary.

Table 7 List of introduced species recorded within West Kingia.

		Sampling Location Codes						
		E1	E2	E3	E4	E5	E6	OP
<b>BIRDS</b>								
<b>HALCYONIDAE</b>								
<i>Dacelo novaeguineae</i>	Laughing Kookaburra		1	1	1	2		
<b>COLUMBIDAE</b>								
<i>Streptopelia senegalensis</i>	Laughing Turtle Dove	1						
<b>MAMMALS</b>								
<b>CANIDAE</b>								
<i>Vulpes vulpes</i>	Red Fox	S	S		S	S		
<b>FELIDAE</b>								
<i>Felis catus</i>	Feral Cat				S	S		
<b>LEPORIDAE</b>								
<i>Oryctolagus cuniculus</i>	Rabbit		S				S	
<b>MURIDAE</b>								
<i>Rattus rattus</i>	Black Rat						1	
<i>Mus musculus</i>	House Mouse	2	7	11			2	

S = Signs = scats, tracks diggings.

#### 4 CONCLUSIONS

This brief report concludes the work funded by the National Heritage Trust. However, while the list of species now known to occur within West Kingia is extensive, it is likely that additional species will be discovered should further sampling be undertaken. Birds are highly mobile and many species are considered nomadic and will move relatively large distances depending on flowering plants and/or the associated invertebrates that occur on a seasonal basis. There are a range of reptile and frog species that could occur in West Kingia that are uncommon and may take extensive sampling to locate. The possibility of additional small mammal species being found is low when the fragmentation of habitat on the SSCP is considered.



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**HOPELANDS  
 MINERAL SANDS PROJECT.  
 WETLAND VEGETATION.**

Prepared by  
 Hart, Simpson and Associates Pty Ltd  
 for  
 Pittston Mineral Sands Joint Venture

December 1991

See File →  
 177

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**BS 77**  
**YANGEDI**  
**BASS S**

**BS 378**  
**HENDERSON**  
**BASS S**

**DELL John**

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**From:** Alan and Marrion Elliott [kingia@inet.net.au]

**Sent:** Tuesday, 28 February 2006 5:54 AM

**To:** DELL John

**Subject:** Species list from Elliott Rd

Good morning John

Attached is the interim report from Jan with her permission. She is going to do a full report when time permits. I have seen also Tawny frog mouth, a Ninox that I thought was a rufa but Jan says that will be southern boobook, I took a photo of it and when I find it I will check. Red tail cockatoo, square tailed kite and emu. We are starting to get sea birds overfling due to the marron farm next door. Pellican, Shag, spoon bill. I am still trying to get hold of Greg Woodman to check on the fauna survey.  
Regards Alan

these 3 spp are  
BF declining species

4400 Henderson Rd

Delux holding Pylon

RMB 400 Henderson Sempy

Kolins consolidated

399 Henderson Rd

~~Kolins~~ Consolidation

RMB 294A

~~Drainage~~ Rd Baldwin  
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Steve Bolton

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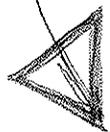
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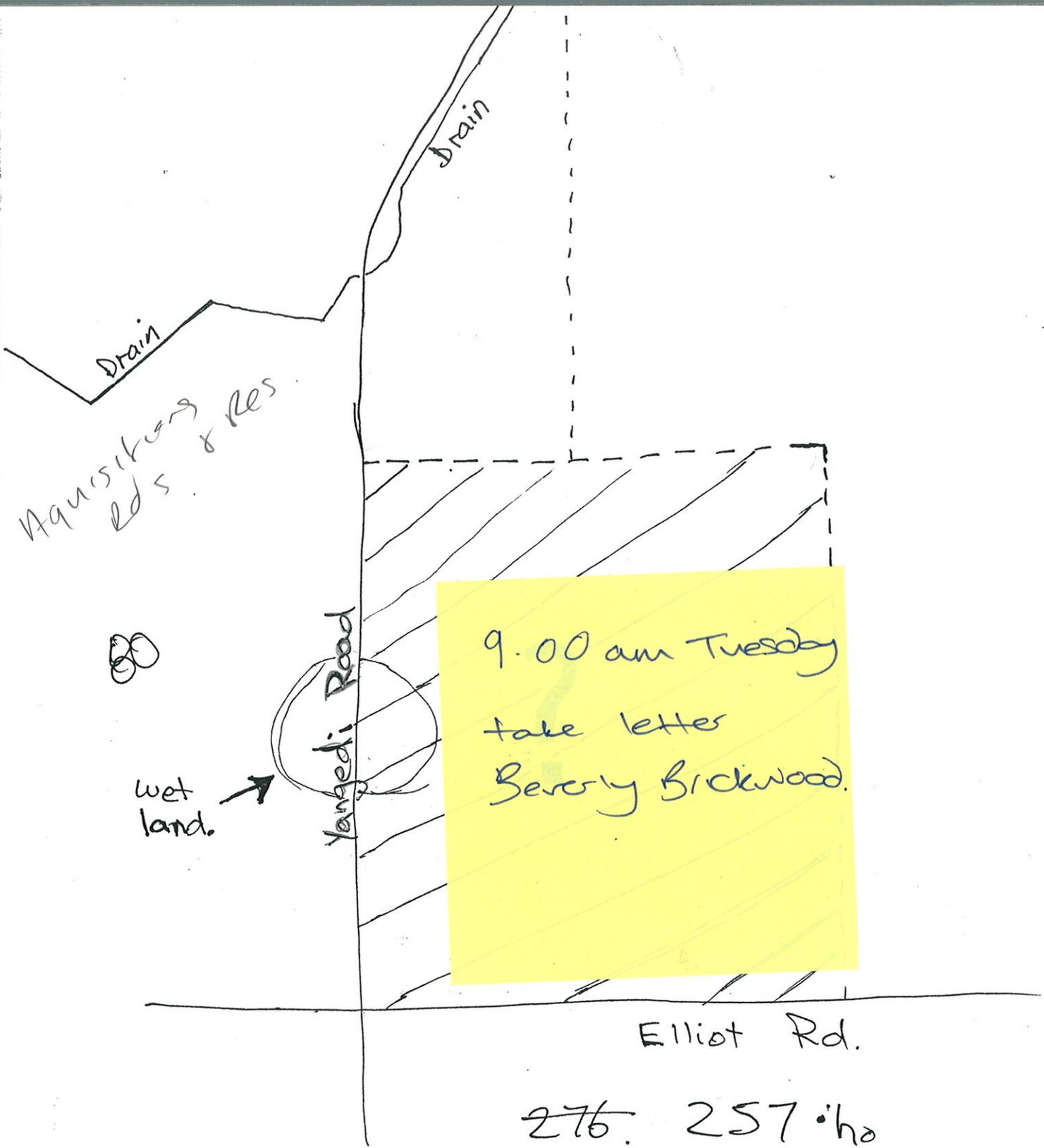
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nr Serpentine





9.00 am Tuesday  
 take letter  
 Beverly Brickwood.

276. 257 ha

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Yangi Bell  
 Graeme Brickwood  
 525 2330.

G. Brickwood

~~Morston road Armadale~~ ↑  
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Masters Rd  
 Armadale  
 399 3274

# SYSTEM 6 BUSHLAND SUBMISSION FORM FOR CONSIDERATION IN THE UPDATE PROGRAMME

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

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

**LOCATION, OWNERSHIP AND ZONING OF THE AREA**

### 1. Location

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

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

a) Bordering Roads: WEST RD, GALE BRIDGE RD, ELHART RD AND YANGGEDI RD

b) Nearest Corner: AREA KNOWN AS YANGGEDI SWAMP

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

d) Town/Suburb/Location: 4 KM WEST OF KEYS BROOK

e) Local Council: SERPENTINE JARRAHDALE

f) Site Name (if any): YANGGEDI SWAMP

g) Approximate size of the area (ha): 2 KM x 2 KM

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

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

j) Map no.: .....

k) Grid Ref: .....

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

m) Are you aware of any development proposals that are likely to affect the area?  
No

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

Please fill out those questions that you can answer

2. Who owns the area? (If owned by the person/s making the nomination please indicate) ..... Mit Brown .....

3. If you own the area, and may be interested in participating in conservation on private land initiatives please indicate (and leave your name and address at the end of this submission form) .....

4. What is the area zoned? (please indicate whether zoning is Town Planning Scheme or Metropolitan Region Scheme) ..... RUPAC .....

CAN YOU TELL US A LITTLE ABOUT THE PHYSICAL CHARACTERISTICS OF THE AREA

5. Why do you consider this area important? (Refer to Guiding Issues paper)  
..... contains high medium dense forest, wetland and swamp .....

6. What is/are the soil type/s and colours ? .....

Type: Sand/Clay/Gravel/Loam/Silt

Colour: White/Grey/Brown/Orange/Yellow/Red/Black

7. Does the area have any special features such as unusual landforms / landscapes that still retain their natural vegetation? Yes/No

If yes, what are they? .....

8. Is the area a wetland or does it include a wetland? ..... Both .....

If yes, what kind of a wetlands is it?

a) lake ✓

b) river

c) stream

d) swamp ✓

e) estuary

f) seasonally wet

g) other

9. What percentage of the wetland is open water in summer? ..... 30% - 50% ?

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

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

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

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

If yes, please give details of the work ..... some work has been done by shine in the 1950's

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

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

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

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

- m) Grazing: stock, overgrazing by feral or native mammals
- n) Proliferation of tracks, fire breaks and walk trails
- o) Off-road vehicle use
- p) Use as service corridors by the SEC, Main Roads, Water Authority.

(Source: B Keighery. Bushland Plant Survey, September 1994)

15. Does the area contain any plant species of special interest that you know of? (eg. declared rare flora, priority taxa, outlier populations) wild ... wattle

Do you know what they are? .....

16. Do you know of any native animals that use the area? small mammals

Can you list those you know of? (birds, mammals, reptiles, amphibians etc)  
many .....

17. Is the area used by any native animals of special interest? (eg. endangered species, large/important populations).....

If yes, please name them and indicate source of information  
 .....

**CAN YOU TELL US A LITTLE ABOUT THE SURROUNDING AREA**

18. Are there any bushland areas (including wetlands) near to this area?  
Yes .....

If yes, how close are they? 1 KM .....

Are they already conservation reserves? No .....

What is their approximate size? similar to this .....

19. Does the submitted area link other bushland areas? Yes .....

Please attach any additional information about the area which may be of use when assessing it.

35 [REDACTED] 6 16 [REDACTED]  
PITTSTON BLACK SANDS WA OF WA PTY LTD

HOPELANDS MINERAL SAND PROJECT

WETLAND SURVEY FOR WATERBIRD CONSERVATION VALUES

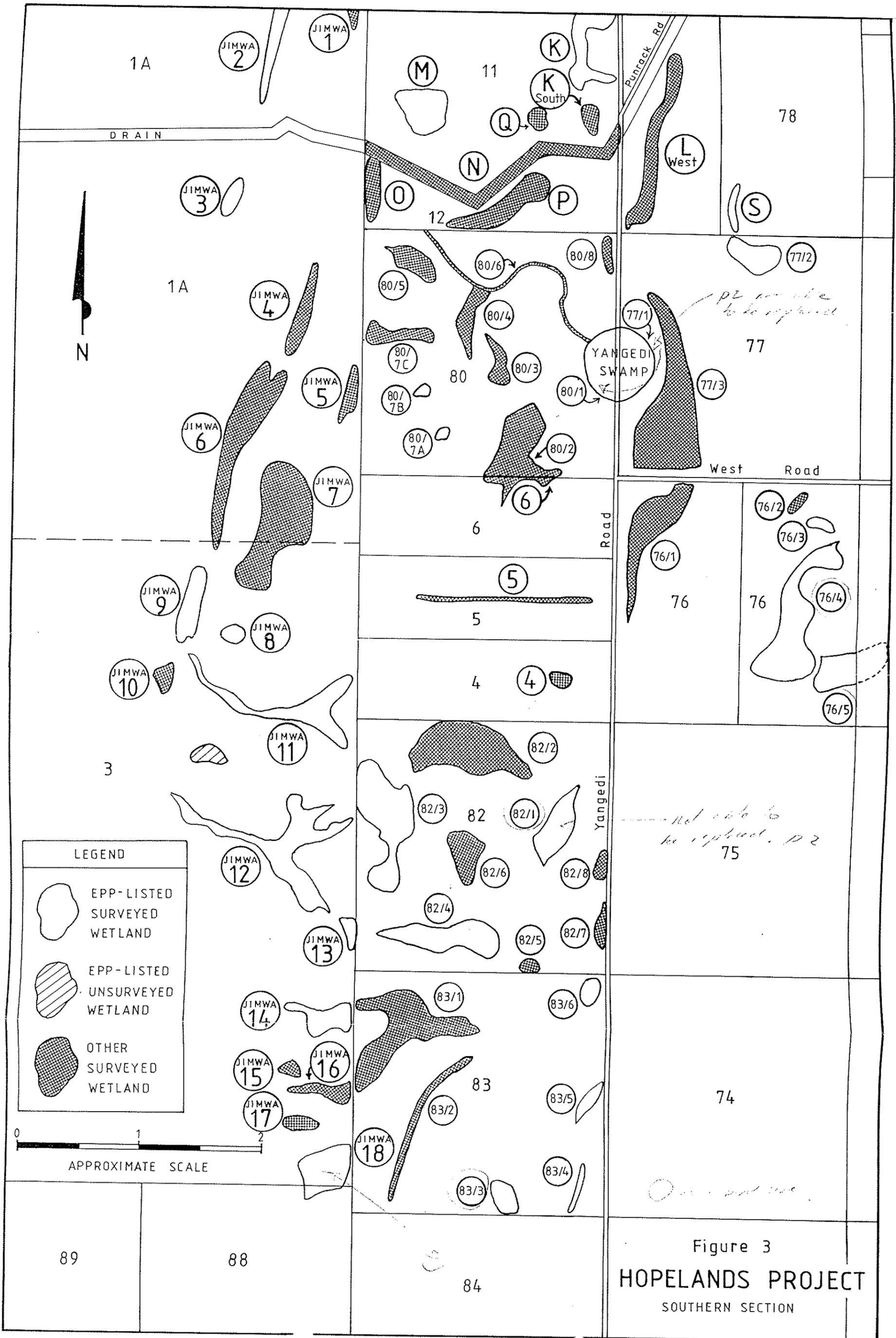
B K MASTERS AND ASSOCIATES  
ENVIRONMENTAL AND EARTH SCIENCE CONSULTANTS  
P O BOX 313  
CAPEL  
WA 6271

JANUARY 13, 1992

**BS 77**  
**BS 378**

**BASS S**

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DRAIN



APPROXIMATE SCALE

LEGEND

- EPP-LISTED SURVEYED WETLAND
- EPP-LISTED UNSURVEYED WETLAND
- OTHER SURVEYED WETLAND

Figure 3  
HOPELANDS PROJECT  
SOUTHERN SECTION

*pt. on site to be replaced*

*not able to be replaced. p 2*

*Over and out*

WETLAND E, Location 165

Wetland type: Lake

Water: winter - more than 2.0 metres, summer - between 0.2 and 1.0 metres

Vegetation: none - wetland is a constructed water supply dam

Waterbirds: Black-fronted Plover 1 (on adjoining land)

Grey Teal 2

White-faced Heron ? (tracks in mud)

Other observations: manager reports 100's of Maned Duck use (and pollute) this dam for 2 to 3 weeks each summer.

EPA EPP Wetland: YES

Importance for waterbirds: LOW

Management category: M

WETLAND E-south, Location 399

Wetland type: Dampland

Water: dry (watertable a few centimetres beneath ground surface)

Vegetation: dense heath, with a few vehicle tracks but otherwise lacking physical disturbance

Waterbirds: None

EPA EPP Wetland: NO

Importance for Waterbirds: LOW (MODERATE if Maned Duck usage is considered)

Management category: R

WETLAND F, Reserve 25911

Wetland type: Dampland

Water: mostly 0.1 metres or less, with a central area of 0.3 metres

Vegetation: low heath/sedges, moderately affected by past clearing, and low forest/thickets, with only minor physical damage (except for dam)

Waterbirds: White-faced Heron 1

Other observations: healthy frog population

Fox observed walking through 0.2 metre deep water along kangaroo track

Much evidence of rabbits throughout drier land

EPA EPP Wetland: YES

Importance for waterbirds: LOW

Management category: R

WETLAND G, Location 400

Wetland type: access denied and wetland not surveyed

EPA EPP Wetland: YES

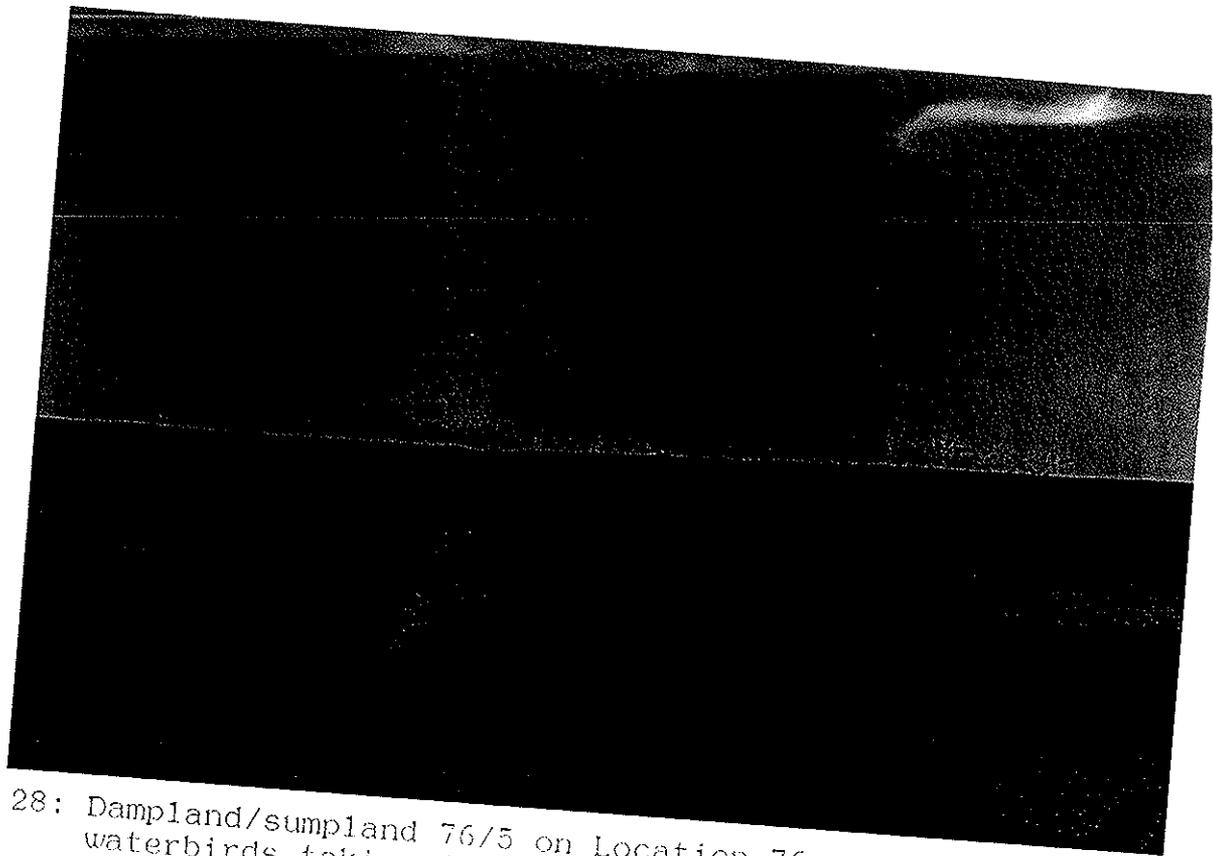


Photo 28: Dampland/sumpland 76/5 on Location 76, with 300+ waterbirds taking flight from roosting sites in flooded paddock.

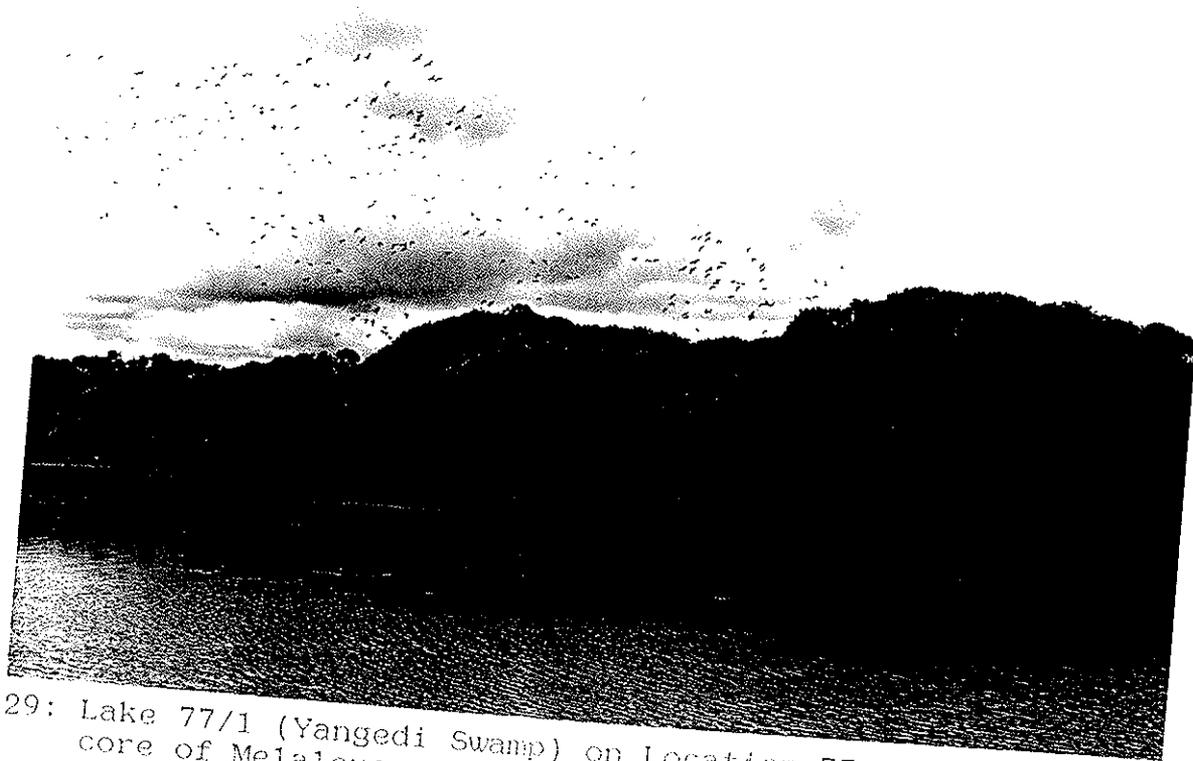


Photo 29: Lake 77/1 (Yangedi Swamp) on Location 77 showing dense core of Melaleuca woodland.

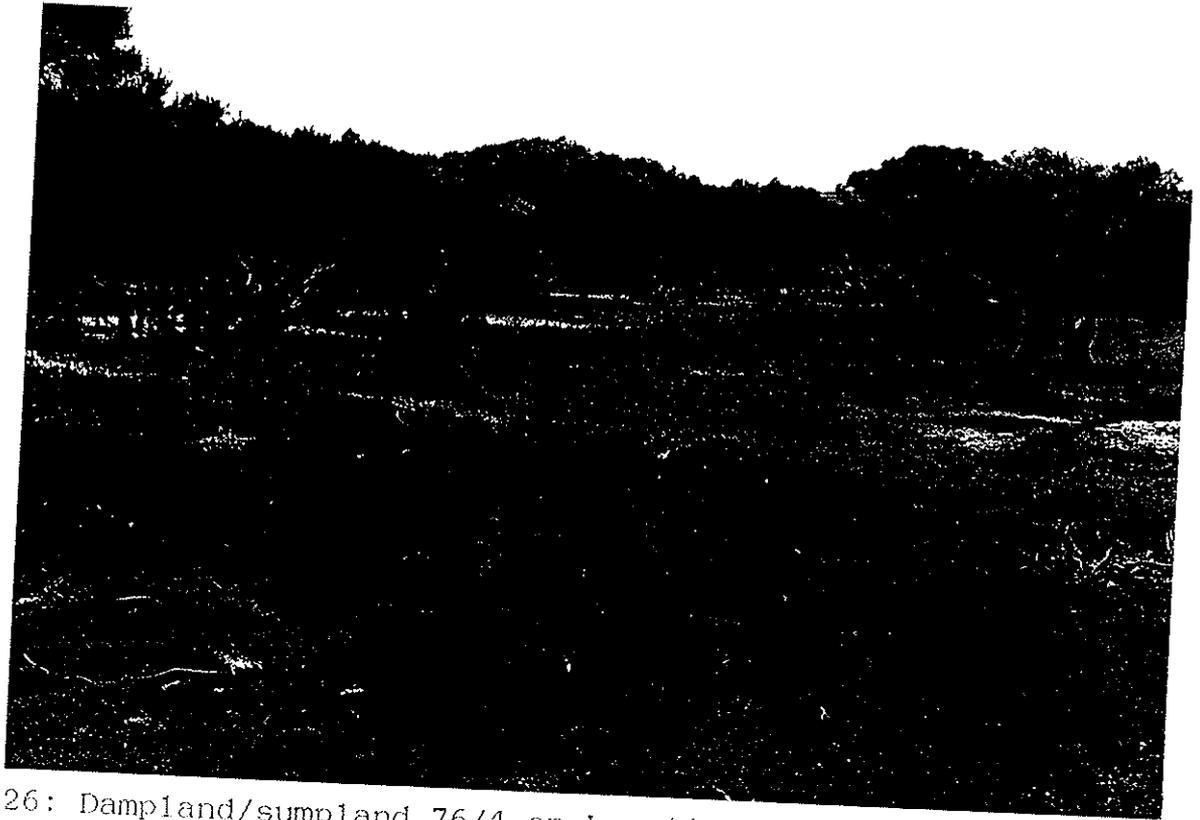


Photo 26: Damp/sumpland 76/4 on Location 76, showing open scrub with pasture understorey. Salt build-up is evident by the presence of Soldier's Button plants (yellow flowering) and bare mud patches.

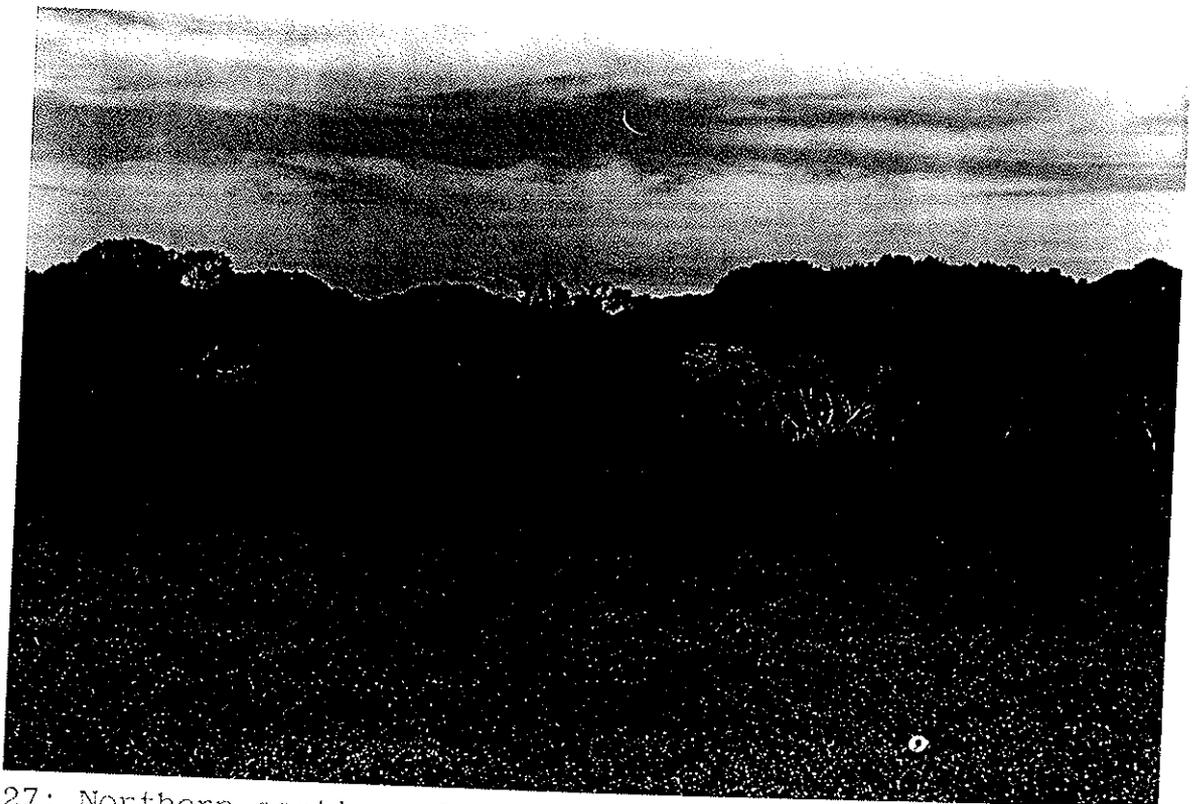


Photo 27: Northern section of damp/sumpland 76/4 on Location 76, showing open to dense scrub, drains and Soldier's Button pasture.

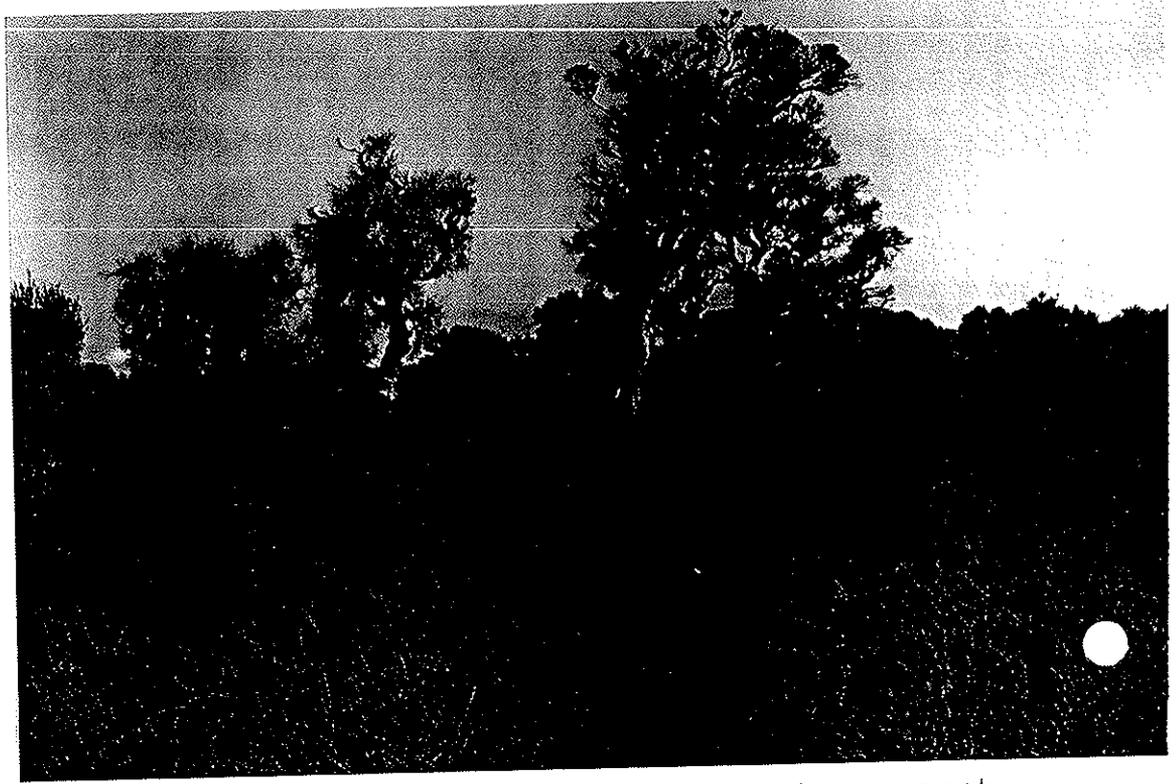


Photo 8: Low dense heath covered in Dodder with emergent *Melaleuca raphiophylla* within dampland F on reserve 25911.



Photo 9: Regrowth vegetation within sumpland H on Location 11, with grazing pressure preventing regrowth close to pasture.

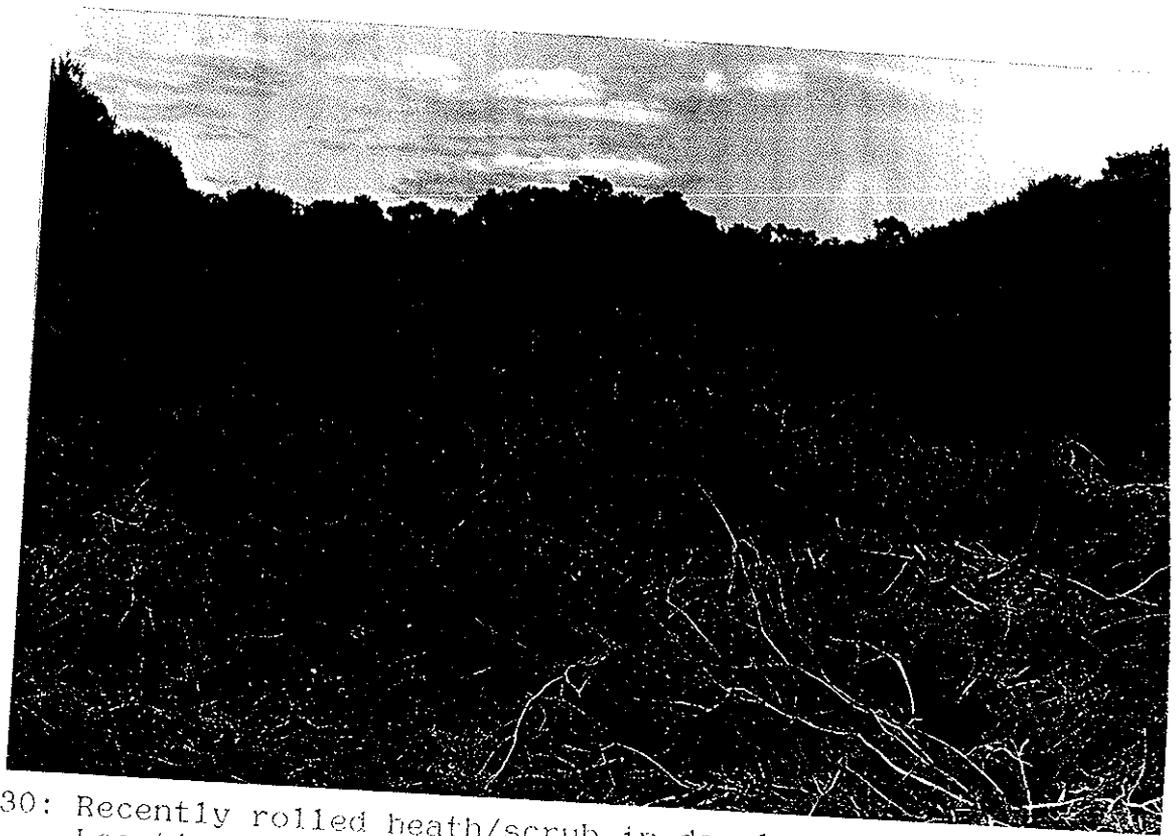
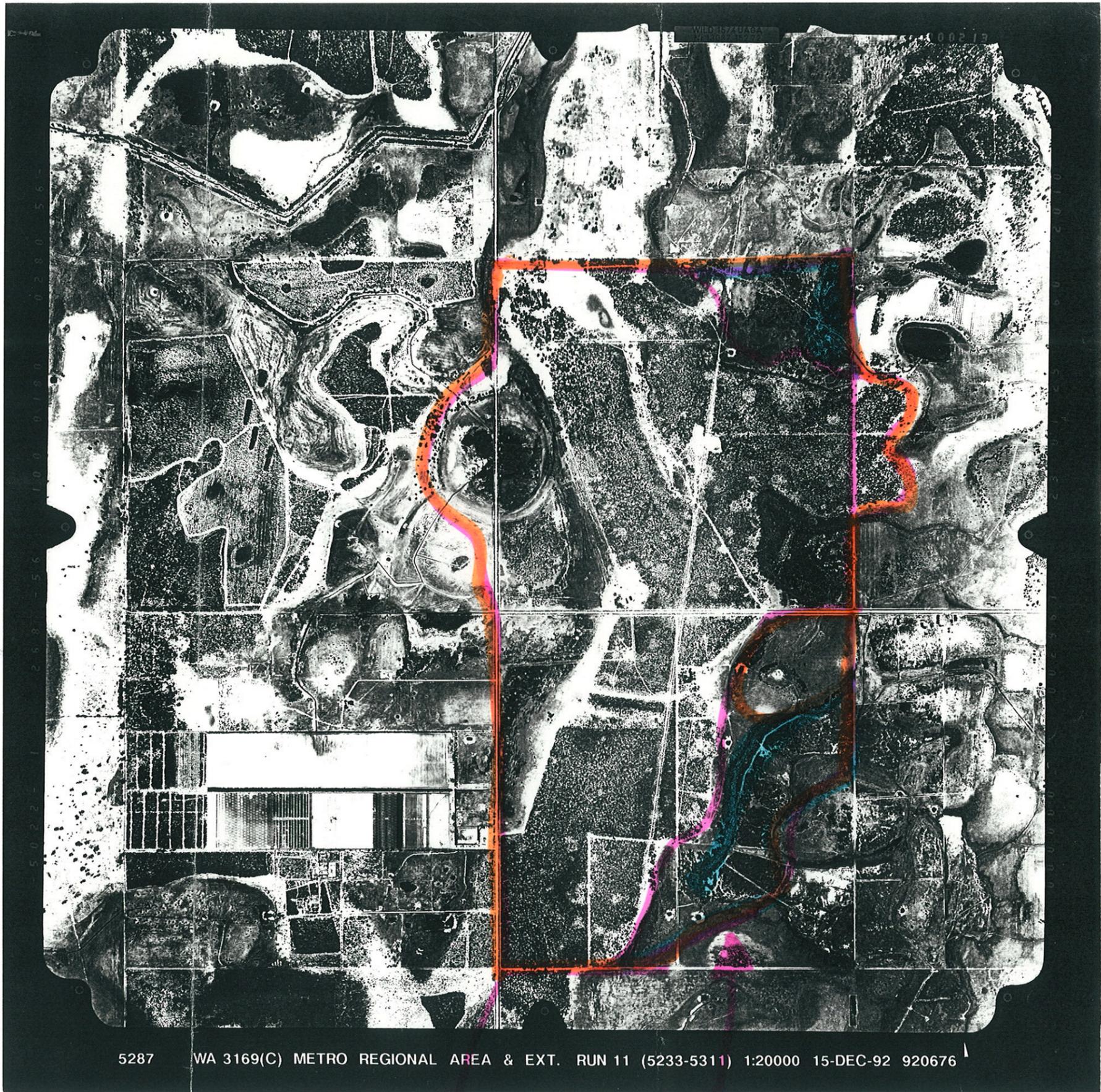


Photo 30: Recently rolled heath/scrub in dampland 77/2 on Location 77, with pasture species invasion throughout.



Photo 31: Dampland 77/3 on Location 77, showing healthy dense heath and Melaleuca scrub in background.

BJK 5/3/97.

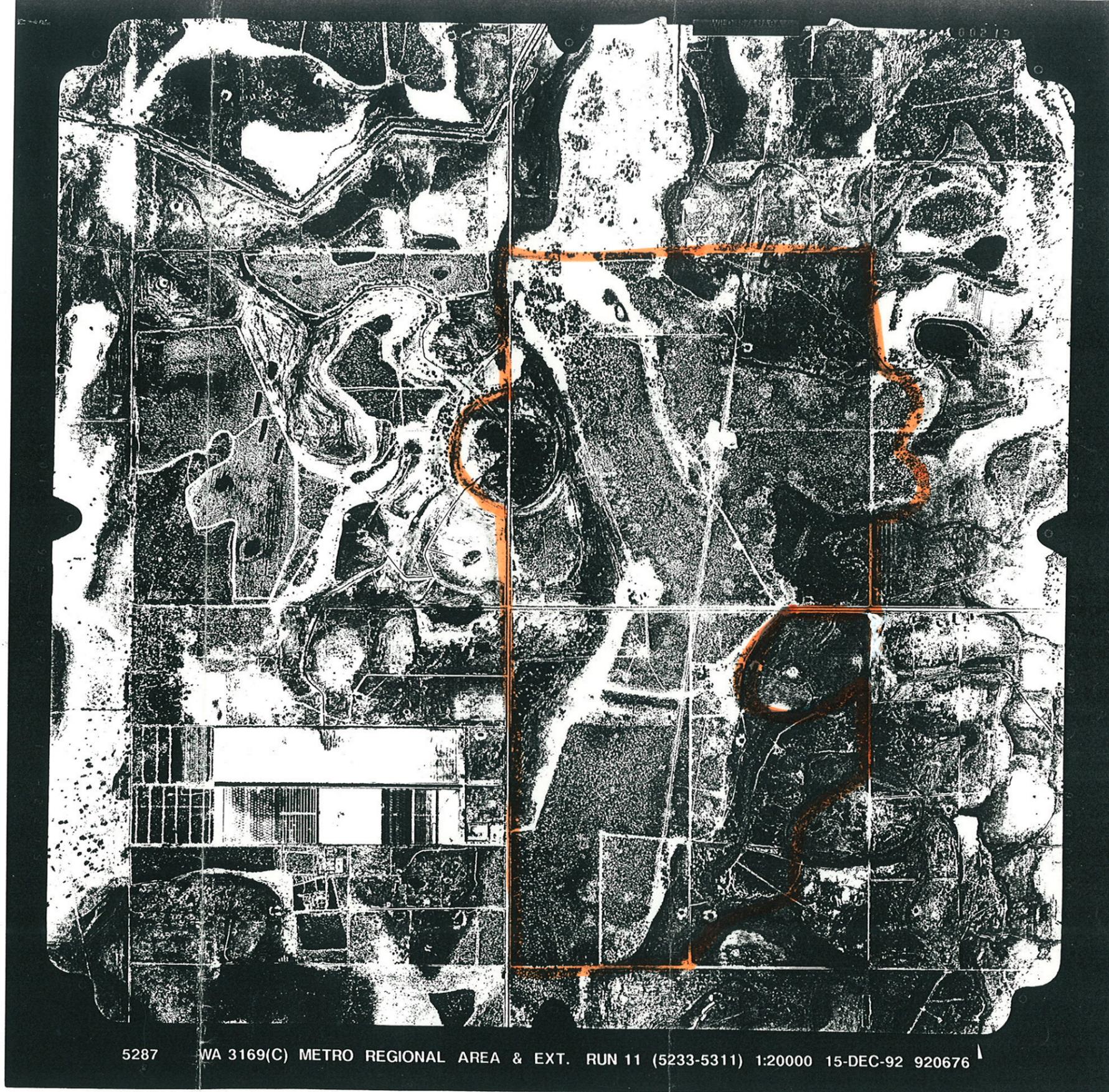


Modify

To include  
conservation  
category Wetlands  
(WAC) and SE cover  
waterbird habitat  
(Masters & ASSOC'S)

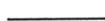
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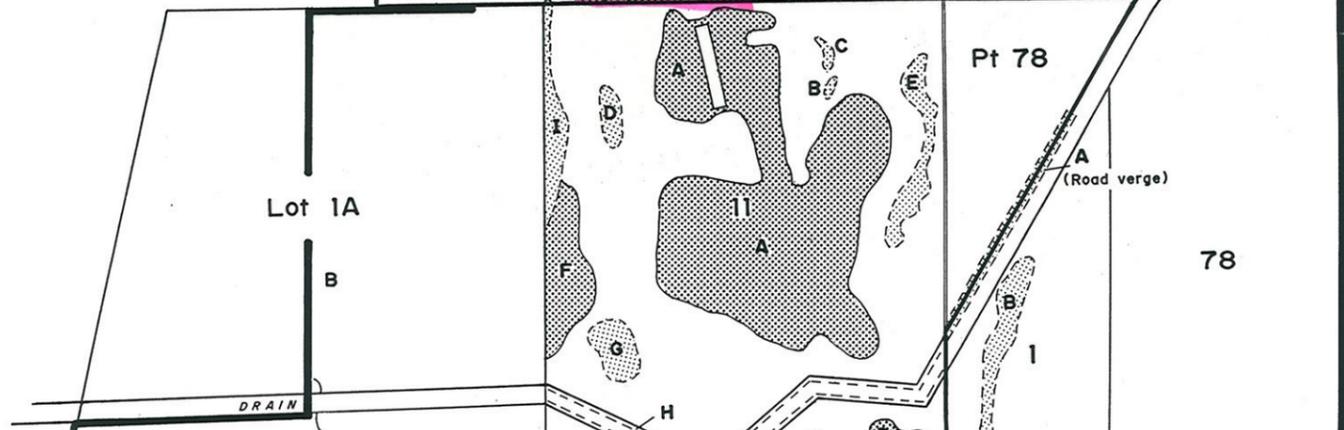
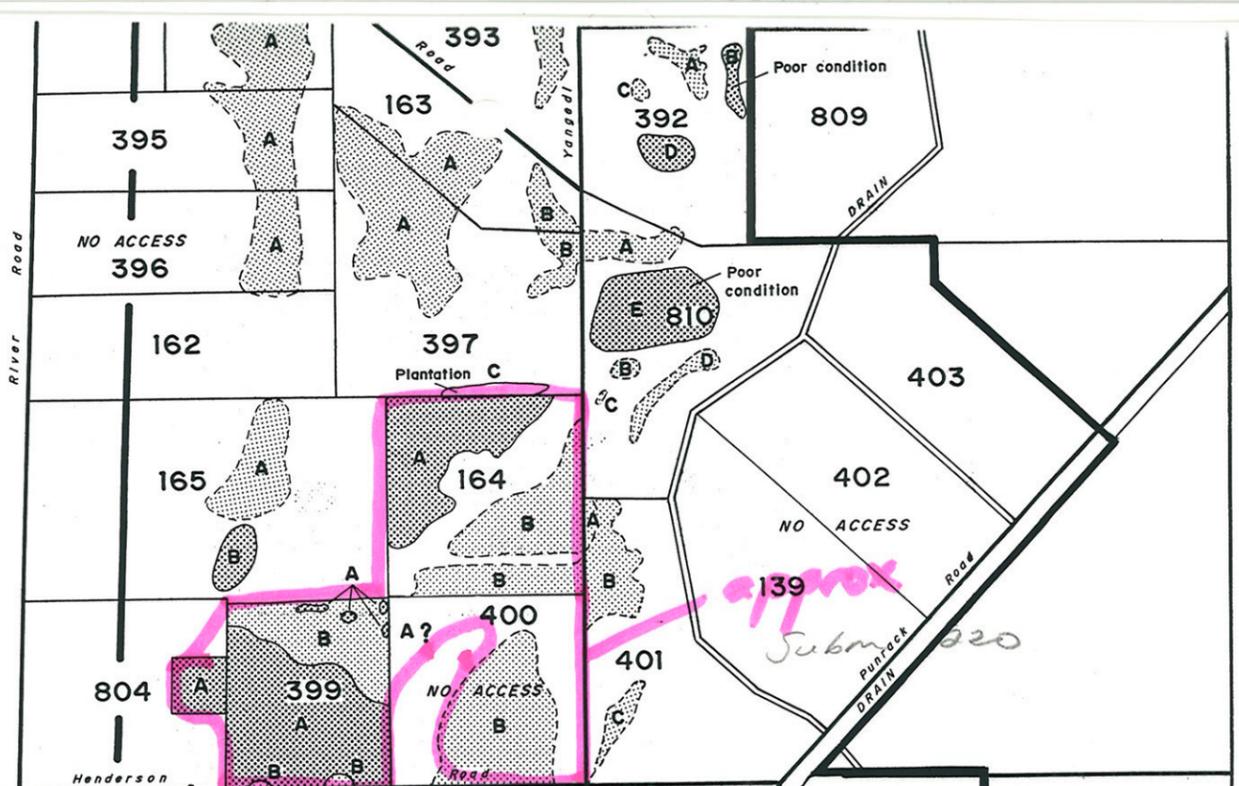
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5287 WA 3169(C) METRO REGIONAL AREA & EXT. RUN 11 (5233-5311) 1:20000 15-DEC-92 920676

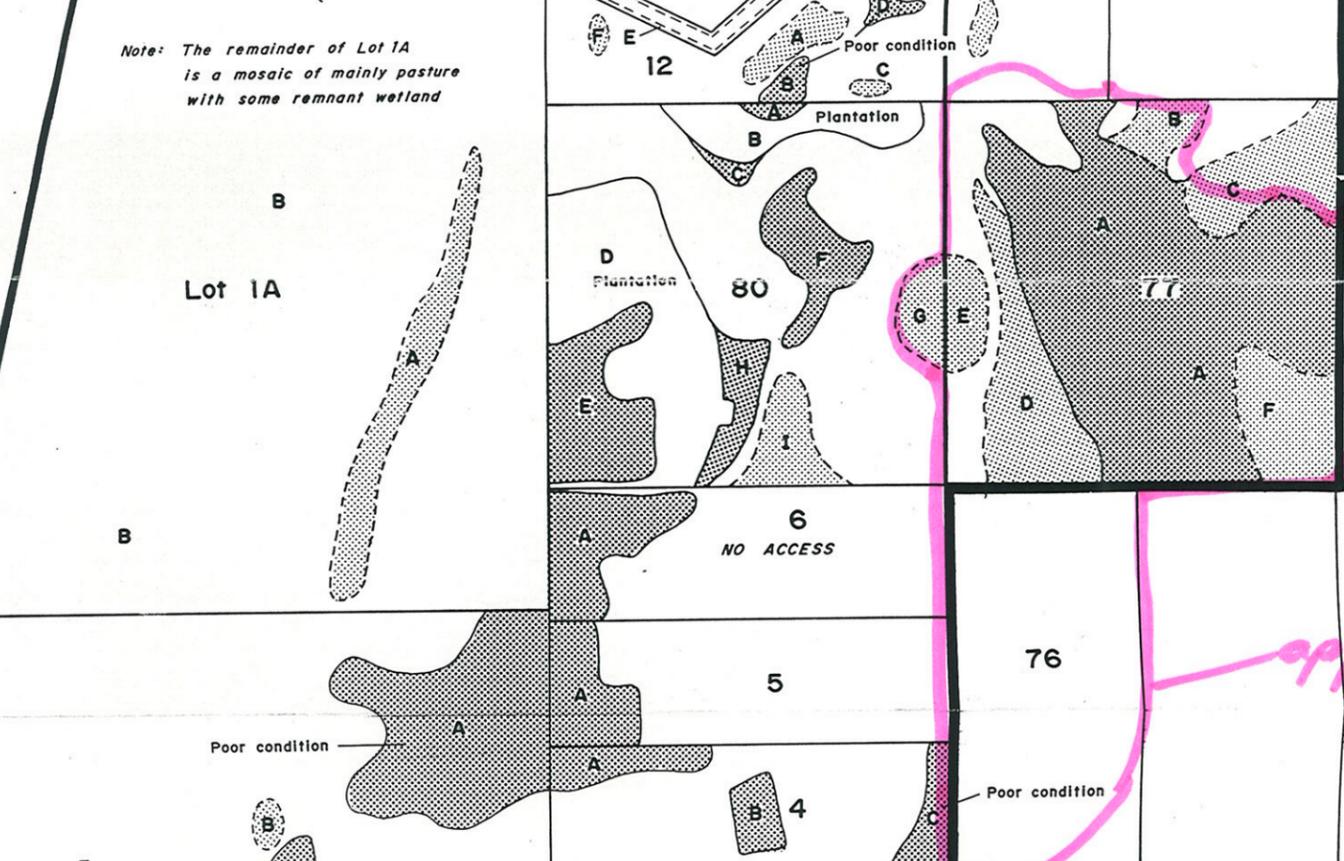
To include  
Cassette  
colony wetland  
and SE corner  
waterbird habitat

-  Study Area
-  Lot numbers
-  Blocks
-  Wetland boundary
-  Woodland boundary
-  Roads



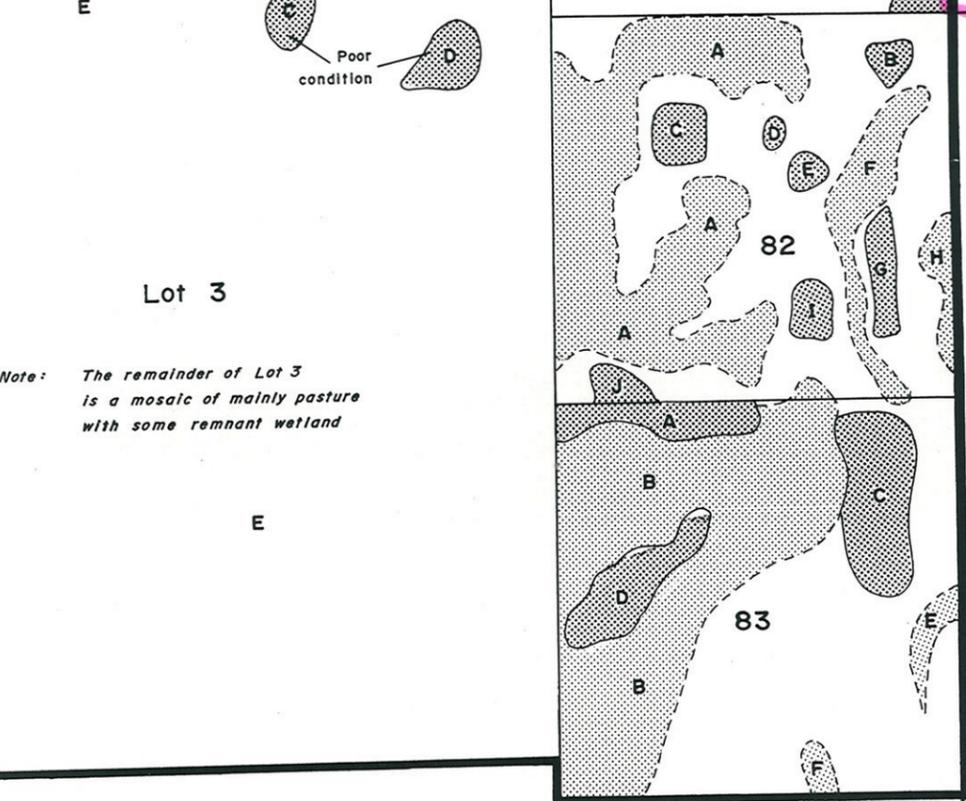
Note: The remainder of Lot 1A is a mosaic of mainly pasture with some remnant wetland

Subm 219

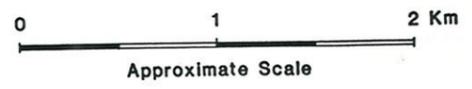


approx

Limit of aerial photos



Note: The remainder of Lot 3 is a mosaic of mainly pasture with some remnant wetland



Map 1  
HOPELANDS MINERAL SANDS PROJECT  
VEGETATION



(219) YANGØ1 Yangedi Road , Shire of Serpentine Jarrahdale  
28-11-95



(219) YANGØ1 Yangedi Road , Shire of Serpentine Jarrahdale  
28-11-95



(219) YANG02 Yangedi Road, Shire of Serpentine Jarrahdale  
28-11-95



(219) YANG03 Yangedi Road, Shire of Serpentine Jarrahdale  
28-11-95



**HART, SIMPSON and ASSOCIATES PTY LTD**  
ENVIRONMENTAL CONSULTANTS  
*Consultants to Industry and Government*

GEN

**HOPELANDS  
MINERAL SANDS PROJECT.  
WETLAND VEGETATION.**

Prepared by  
Hart, Simpson and Associates Pty Ltd  
for  
Pittston Mineral Sands Joint Venture

December 1991

**BS 77  
YANGEDI  
BASS S**

**BS 378  
HENDERON  
BASS S**

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Another Gazetted Rare Flora species, Diuris sp. (Kwinana) A. P. Brown 10.9.84 (an undescribed small donkey orchid), has been recorded as occurring amongst thick native sedges in a winter wet swamp near Medina. Although small (30 cm) this species would most likely have been observed if it was flowering. This species could occur in the area.

The following Priority species were recorded in the CALM database as occurring in the general area:

Acacia horridula  
 Anthotium junciforme  
 Eryngium sp. (Serpentine) G. Keighery 8757  
 Jacksonia sericea  
 Lasiopetalum glabratum  
 Lysinema elegans  
 Tetraria australiensis  
 Thysanotus glaucus  
 Verticordia lindleyi ssp. lindleyi  
 Verticordia plumosa var. ananeotes  
 Verticordia plumosa var. pleiobotrya  
 Villarsia submersa.

No Gazetted Rare Flora species were found during the field work. It is not possible to be completely confident that either Diuris purdiei or Diuris sp. (Kwinana) is not present, although they are unlikely to be present given the condition of the remnant vegetation.

Two Priority species were recorded for the study area. These were Cartonema philydroides and Jacksonia sericea which are both Priority Three species. Priority Three species are defined by CALM as "species which are known from several populations, at least some of which are not believed to be under threat (ie. not currently endangered)." These species have no specific legal protection.

Cartonema philydroides was observed in pasture on Lot 401 between wetlands B and C. This species has a wide distribution ranging from Kalbarri in the north through Midland, Bullsbrook and Harvey to Busselton in the south. This species appears to prefer disturbed areas.

Jacksonia sericea was observed on Lots 1A and 3 along the farm access tracks and occasionally through the pasture area, and on Lot 83 in the woodland C. The distribution of this species is far more restricted with a range from Wanneroo in the north to Mandurah-Pinjarra in the south. Marchant et al. (1987) considered this species to be endemic to the Perth region occurring on calcareous and sandy soils of the coastal plain.

Neither of these species can be regarded as primarily a wetland species.

These wetlands will require clearance from the EPA before disturbance can occur.

An alternative method of assessing the condition of the wetlands is the number of native plant species growing there. This measure is the diversity of plants in the site, with a high diversity indicating good condition and low diversity a poor condition. Similarly the degree of weed and pasture encroachment into the wetland is a measure of condition.

Four of the wetlands (Lot 11 E, Lot 11 G, Lot 164 B (part)/Lot 401 A, and Lot 395 A) exhibited a moderate native plant diversity. The factor common to Lot 11 E, Lot 11 G and Lot 164 B/Lot 401 A was that all had a section of dense thicket. Grazing pressure on the sedge and heath associations were not as apparent as on the taller species. Wetland Lot 395 A produced a high diversity by encompassing a long narrow strip of several different associations, each of which was individually degraded.

All other wetlands were degraded by weed and pasture encroachment and grazing, and showed low species diversity.

The least degraded accessible wetlands were:

Lot 164 B (part)/401 A and

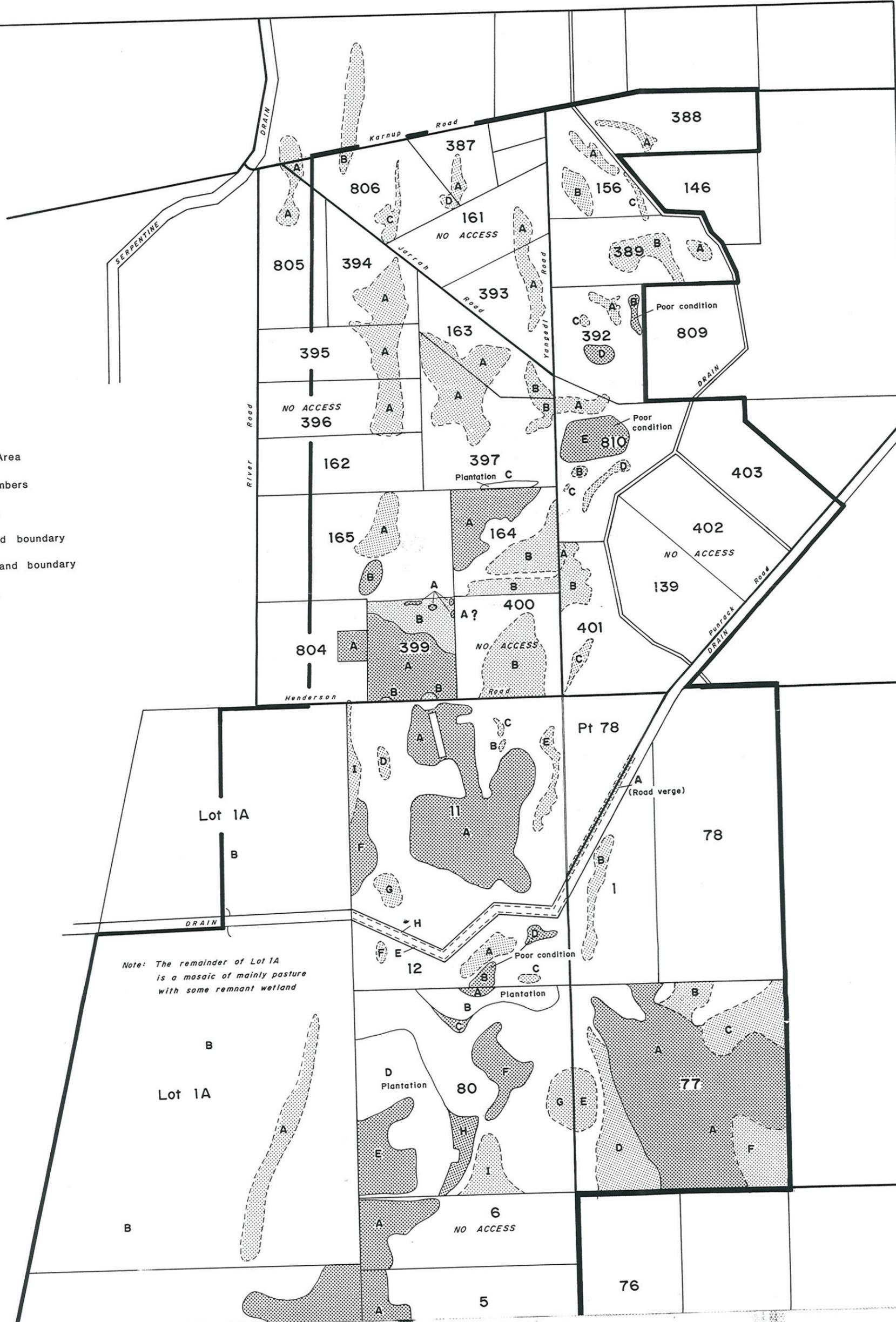
Lot 77 E (Yangedi Swamp, east).

Both these had minimal intrusion by weeds and had the greatest degree of "naturalness".

The apparent lack of any species of conservation interest is also an indication of the degraded state of the wetland vegetation. The total species list (Appendix 2) has only 108 species, of which only 86 are native. The species observed are all common and widespread. This total of 86 native species is much lower than would be expected from a survey of intact wetlands.



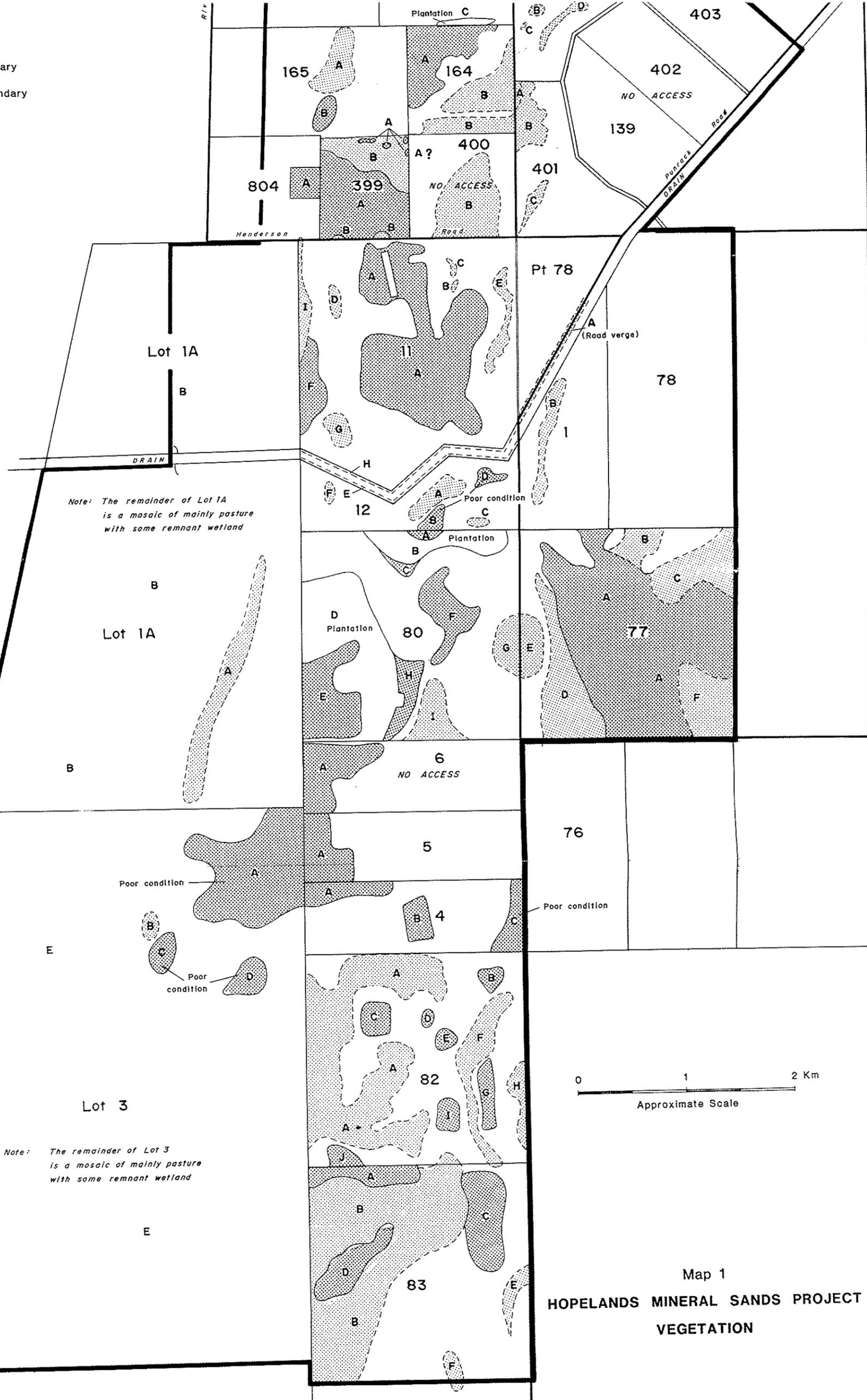
-  Study Area
-  Lot numbers
-  Blocks
-  Wetland boundary
-  Woodland boundary
-  Roads



Note: The remainder of Lot 1A is a mosaic of mainly pasture with some remnant wetland

Join with next page

-  Blocks
-  Wetland boundary
-  Woodland boundary
-  Roads



Map 1  
HOPELANDS MINERAL SANDS PROJECT  
VEGETATION

WETLAND: Lot 164 B and Lot 401 A.

Location: South and east of Lot 164 (Reserve 25911, Serpentine Airstrip), extending across the road to the north west corner of Lot 401.

Classification by Murray (1989) of part: Dampland, Microscale and Irregular (5.109).

Vegetation Description:

This wetland had two distinct vegetation types, but without distinct boundaries. The saturated and wet areas had low heath and sedges, and the drier areas were dominated by low forest and thicket. The low heath and sedges were dominated by Juncus pallidus and Lepidosperma longitudinale to 0.5m tall with 30-70% canopy cover. Below this was mixed open herbs to 0.2m tall, with 10-30% canopy cover, with no dominant species. The transition zone was dominated by Astartea fascicularis to 1m tall with 10-30% canopy cover.

The low forest and thicket was dominated by Melaleuca preissiana to 6m tall with 30-70% canopy cover, with occasional emergents to 12m tall. Below this was a thicket to 3m with a 30-70% canopy cover, dominated by Kunzea ericifolia. Below this was mixed dwarf scrub and open herbs to 0.5m tall, with a canopy cover of 10-30%, with no species dominating.

Condition:

This wetland is in fair condition with only a moderate amount of weed invasion around the edges and fire breaks. However it is bisected by Yangedi Road which has alienated a small section to the east of the main wetland. A small soak approximately 15m square has been dug in the wetland to provide a water source, and this detracts from the naturalness of the wetland.

WETLAND: 396 A. See 394 A and 395 A above, but access has not been agreed to this property.

WETLAND: Lot 399 B.

Location: Northern part of Lot 399, and small areas on the south..

Description by Murray (1989): Not classified.

Vegetation Description:

This wetland comprised emergent Open Low Woodland with a canopy cover of 2-10% to 3m tall. The dominant species was Melaleuca preissiana. Below this was a mosaic of two vegetation types, Low Heath C and D and Tall Sedges both with a canopy cover of 30-70% to 1m tall. The dominant species were Pericalymma ellipticum and Schoenus benthamii, respectively. Below both these strata there was Open Herbs with a canopy cover of 10-30% to 0.3m tall. No species dominated.

Condition:

The wetland in Lot 399 was in good condition, being fenced off from any grazing. Native species diversity was high with no alien species present.

WETLAND: Lot 400 B.

Location: Centre and south of Lot 400.

Classification by Murray 1989: Dampland, Mesoscale and Irregular (5.104).

Access to this property has not been gained from the land owner.

WETLAND: Lot 401 A. See Lot 164 B above.

WETLAND: Lot 401 B.

Location: North western part of Lot 401.

Description by Murray (1989): Sumpland/Dampland,  
Mesoscale, Irregular (5.105).

Vegetation Description:

The upper stratum was a mosaic of Low Forest A and Low Heath both with a canopy cover of 30-70% and heights of to 10m and to 1.5m respectively. Below the Low Forest, which was dominated by Eucalyptus rudis, was Scrub with a canopy cover of 10-30% to 3m tall. The dominant species was Kunzea ericifolia. Below this stratum was Dwarf Scrub with a canopy cover of 2-10% to 1m tall. The dominant species were Regelia ciliata and Astartea fascicularis. Below this was low grass to 0.5m tall, with 30-70% canopy cover. Pasture species dominated this stratum, including annual grasses and Paspalum.

The other component of the mosaic had a lower stratum of mixed Herbs with a canopy cover of 30-70% to 0.3m tall. No species dominated.

Condition:

The Low Forest part of this wetland was in a cleared paddock which had been heavily grazed. The vegetation of this wetland had also been disturbed by grazing, resulting in a low native plant species diversity. However, the Low Heath part was in good condition with minimum disturbance.

APPENDIX 2. ALPHABETICAL LIST OF THE PLANT  
SPECIES IDENTIFIED IN THE WETLANDS OF  
THE STUDY AREA.

Introduced species are marked with an asterisk.  
Nomenclature follows Green (1985 and supplements)  
and Marchant et al. (1987).

Acacia pulchella	Western Prickly Moses
Adenanthos meisneri	
Adenanthos obovatus	
Agonis linearifolia	
Alternanthera nodiflora	
Anigozanthos manglesii	Kangaroo Paw
Anigozanthos viridis	
*Arctotheca calendula	Cape Weed
Astartea fascicularis	
Banksia littoralis	Swamp Banksia
Boronia crenulata	
*Briza maxima	Blow-fly Grass
*Briza minor	
Burchardia umbellata	
Caladenia flava	Cowslip Orchid
Calothamnus hirsutus	
Calothamnus lateralis	
*Carpobrotus edulis	Pig-face
Chamaescilla corymbosa	
Conospermum ?capitatum	
Cotula coronopifolia	
Dampiera linearis	
Dasyogon bromeliifolius	
Dillwynia dillwynioides	
Drosera gigantea	
Drosera glanduligera	
Drosera menziesii	
Drosera stolonifera	
*Ehrharta sp.	Veldt Grass
Eriostemon spicatus	
Eryngium rostratum	
Eucalyptus calophylla	Marri
Eucalyptus marginata	Jarrah
Eucalyptus rudis	Flooded Gum
Euchilopsis linearis	
Evandra pauciflora	
Gompholobium tomentosum	
Goodenia filiformis	
Grevillea densifolia	
*Homeria miniata	Cape tulip
Hovea trisperma	
Hypocalymma angustifolium	
*Hypochoeris glabra	
Jacksonia furcellata	Stinkwood
Johnsonia pubescens	

Juncus pallidus	
*Juncus microcephalus	
Kennedia prostrata	
Kunzea ericifolia	
Kunzea recurva	
Lepidosperma longitudinale	Sword-grass
Leptocarpus sp. (un-named)	
Lobelia alata	
Lomandra maritima	
*Medicago sp.	Medics
Melaleuca incana	
Melaleuca lateriflora	
Melaleuca lateritia	
Melaleuca preissiana	Paperbark
Melaleuca raphiophylla	Paperbark
Melaleuca theretifolia	
Melaleuca thymoides	
Melaleuca viminea	
Melaleuca viminalis	Broom-bush
Microtis atrata	
Microtis unifolia	
*Monadenia bracteata	
*Monopsis simplex	
Nuytsia floribunda	Christmas Tree
Opercularia echinocephala	
*Ornithopus compressus	Yellow Serradella
*Paspalum sp.	Paspalum
Patersonia occidentalis	Purple Flag
*Pelargonium capitatum	
*Pennisetum clandestinum	
Pericalymma ellipticum	
Philydrella pygmaea	
Pimelea imbricata	
Podotheca gnaphalioides	
Pterostylis nana	Dwarf Greenhood
Pterostylis vittata	Banded Greenhood
Ranunculus muricatus	
Regelia ciliata	
*Romulea rosea	
*Rumex sp.	Guildford Grass
*Solanum nigrum	
Sowerbaea laxiflora	
Schoenus benthamii	
Stilingia latifolia	Blue-boy
Stylidium brunonianum	
Stylidium dichotomum	
Stylidium divaricatum	
Stylidium guttatum	
Stylidium junceum	

Thelymitra canaliculata	
Thelymitra flexuosa	
Tricoryne elatior	
*Trifolium sp.	Clover
Triglochin procera	
*Ursinia anthemoides	
Utricularia inaequalis	
Utricularia multifida	
Utricularia violacea	
Verticordia ?drummondii	
Villarsia ?albiflora	
*Watsonia sp.	Watsonia
Xanthorrhoea preissii	Blackboy
*Zantedeschia aethiopica	Arum Lilly

WETLANDS

SPECIES	LOT NUMBER																												
	156	156	156	163	163	164	165	387	388	389	389	392	392	393	394	395	397	397	399	401	401	401	806	806		806	810	810	810
WETLAND	A	B	C	A	B	B	A	A	A	A	B	A	C	A	A	A	A	B	B	A	B	C	B	C	D	A	B	C	D
<i>Acacia pulchella</i>							x																						17
<i>Adenanthos meisneri</i>																													1
<i>Adenanthos obovatus</i>																			x										1
<i>Agonis linearifolia</i>																													7
<i>Alternanthera nodiflora</i>																													4
<i>Anigozanthos manglesii</i>								x																					1
<i>Anigozanthos viridis</i>							x									x	x												4
* <i>Arctotheca calendula</i>	x	x	x	x	x				x					x	x	x	x	x								x			26
<i>Astartea fascicularis</i>	x	x	x	x	x	x					x	x	x			x	x	x	x		x	x	x	x			x	x	42
<i>Banksia littoralis</i>																													2
<i>Boronia crenulata</i>																													3
* <i>Briza maxima</i>	x	x	x	x			x	x	x	x					x	x	x	x			x	x	x		x	x	x		38
* <i>Briza minor</i>							x	x	x						x	x								x	x	x			23
<i>Burchardia umbellata</i>																													4
<i>Caladenia flava</i>																													2
<i>Calothamnus hirsutus</i>																													1
<i>Calothamnus lateralis</i>							x														x								7
* <i>Carpobrotus edulis</i>							x	x													x								4
<i>Chamaescilla corymbosa</i>																													3
<i>Conospermum ?capitatum</i>																													1
<i>Cotula coronopifolia</i>				x	x	x										x	x	x	x			x	x	x			x	x	34
<i>Dampiera linearis</i>							x	x																					7
<i>Dasypogon bromeliifolius</i>																x	x												7
<i>Dillwynia dillwynioides</i>								x																					3
<i>Drosera gigantea</i>							x									x	x												9
<i>Drosera glanduligera</i>				x																									9
<i>Drosera menziesii</i>																													1
<i>Drosera stolonifera</i>																x	x												8
* <i>Ehrharta</i> sp.	x	x	x				x	x	x					x									x	x	x	x	x		16
<i>Eriostemon spicatus</i>																													4
<i>Eryngium rostratum</i>																													3
<i>Eucalyptus calophylla</i>																x	x												6
<i>Eucalyptus marginata</i>																x	x												3
<i>Eucalyptus rudis</i>				x					x	x						x	x	x											22
<i>Euchilopsis linearis</i>																													4
<i>Evandra pauciflora</i>								x																					3
<i>Gompholobium tomentosum</i>																													1

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*Dill. dill*

WETLANDS

SPECIES	LOT NUMBER																												
	156	156	156	163	163	164	165	387	388	389	389	392	392	393	394	395	397	397	399	401	401	401	806	806		806	810	810	810
WETLAND	A	B	C	A	B	B	A	A	A	A	B	A	C	A	A	A	A	B	B	A	B	C	B	C	D	A	B	C	D
<i>Goodenia filiformis</i>							x															x	x						
<i>Grevillia densifolia</i>																											x	x	
* <i>Homeria miniata</i>																x	x												
<i>Hovea trisperma</i>																				x									
<i>Hypocalymma angustifolium</i>				x		x	x								x	x	x					x	x	x					
* <i>Hypochaeris glabra</i>	x	x	x			x	x		x	x	x	x		x								x	x	x	x				
<i>Jacksonia furcellata</i>							x													x									
<i>Jacksonia sericea</i>																				x									
<i>Johnsonia pubescens</i>																				x									
* <i>Juncus microcephalus</i>																													
<i>Juncus pallidus</i>	x	x	x	x	x	x	x			x		x		x	x	x	x	x				x	x	x	x				
<i>Kennedia prostrata</i>																										x	x		
<i>Kunzea ericifolia</i>					x	x	x	x								x	x												
<i>Kunzea recurva</i>											x		x									x	x	x		x	x	x	
<i>Lepidosperma longitudinale</i>						x																x							
<i>Leptocarpus sp. (un-named)</i>																x	x					x	x	x			x		
<i>Lobelia alata</i>					x						x																		
<i>Lomandra maritima</i>							x																					x	
* <i>Medicago sp.</i>								x	x						x										x	x			
<i>Melaleuca incana</i>																									x	x			
<i>Melaleuca lateriflora</i>																													
<i>Melaleuca lateritia</i>																													
<i>Melaleuca preissiana</i>	x	x	x		x	x			x	x	x				x	x	x							x	x	x	x		
<i>Melaleuca raphiophylla</i>																													
<i>Melaleuca teretifolia</i>																												x	x
<i>Melaleuca thymoides</i>																													
<i>Melaleuca viminea</i>																													
<i>Melaleuca uncinata</i>																													
<i>Microtis atrata</i>				x	x	x																							
<i>Microtis unifolia</i>																											x		
* <i>Monadenia bracteata</i>				x					x		x	x	x																
* <i>Monopsis simplex</i>																													
<i>Nuytsia floribunda</i>							x																						
<i>Opercularia echinocephala</i>																x	x												
* <i>Ornithopus compressus</i>				x	x	x			x	x	x	x	x	x	x	x	x	x	x										
* <i>Paspalum spp.</i>	x	x	x	x	x	x			x	x	x	x			x	x	x	x	x									x	
<i>Patersonia occidentalis</i>							x									x	x												

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WILD 1574 UAGA  
Nr 13037 152.72

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WILD 1574 UAGA  
Nr 13037 152.72

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WILD 1574 UA9A  
Nr 13037 152.72

0002 12

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