

SOUTH-WEST LINK FROM WILBINGA TO YANCHEP NATIONAL PARK

Boundary Definition: protected area boundary

SECTION 1: LOCATION INFORMATION

Bush Forever Site no. 284

Area (ha): bushland 550.6

Map no. 7

Map sheet series ref. no. 2034--IV NE, 2035--III SE, 2035--III SW

Other Names: not known

Local Authorities (Suburb): Shire of Wanneroo (Two Rocks)

System 6 (1983): Part M1 part System area bushland, only bushland described

SECTION 2: REGIONAL INFORMATION

LANDFORMS AND SOILS

Spearwood Dunes

Sands derived from Tamala Limestone (Qts: S7)

Tamala Limestone (Qtl: LS2)

Quindalup Dunes (Holocene Dunes)

Safety Bay Sands (Qhs: LS4)

VEGETATION AND FLORA

Vegetation Complexes

Spearwood Dunes

Cottesloe Complex — North

Quindalup Dunes

Quindalup Complex

Floristic Community Types

Supergroup 4: Uplands centred on Spearwood and Quindalup Dunes

26b Woodlands and mallees on limestone

28 Spearwood *Banksia attenuata* or *B. attenuata* — *Eucalyptus* woodlands

29b *Acacia* shrublands on taller dunes

WETLANDS

No wetlands mapped

THREATENED ECOLOGICAL COMMUNITIES

Not assessed

SECTION 3: SPECIFIC SITE DETAIL

Landscape Features: tall dunes, vegetated uplands

Vegetation and Flora: limited survey (DEP 1996 (Tokyu 02–04); Tingay, Alan & Associates 1991c)

Structural Units

Uplands — Sands derived from Tamala Limestone: *Banksia attenuata*, *B. menziesii* and *Eucalyptus todtiana*

Open Forest; *Eucalyptus gomphocephala* Woodland

Uplands — Tamala Limestone: *Melaleuca systema*, *Calothamnus quadrifidus* and *Gompholobium tomentosum*

Open Low Heath

Uplands — Safety Bay Sands (oldest dunes): Mixed Open Low Heath

Scattered Native Plants: *Eucalyptus gomphocephala* Woodland to Open Forest

Vegetation Condition: >75% Very Good to Excellent, <25% Good

Total Flora: not surveyed

Significant Flora: *Eucalyptus argutifolia* (R)

Fauna: structured survey of a larger area incorporating this site recorded birds (66 species), native mammals (6 species), reptiles (24 species) and amphibians (3 species) (Tingay, Alan & Associates 1991b). Significant bird species in the larger area: category 1 (1), category 3 (10) and category 4 (9). Significant mammal species in the larger area: Coastal Dunnart, Honey Possum and Western Brush Wallaby

Linkage: adjacent bushland to the north (Site 406), south, east and west (south and east through bushland to Sites 396 and 288); part of Greenways 2, 36 (Tingay, Alan & Associates 1998a); part of a regionally significant contiguous bushland/wetland linkage (Part A, Map 7)

Other Special Attributes: Recommended for protection in the study of City of Wanneroo bushland (Trudgen 1996)

SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE

Indicative place (AHC 2000 D); 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, Maintaining ecological processes or natural systems

Recommendation: Site with Some Existing Protection; the existing care, control and management of this Site is endorsed (proposed 'Gnangara Park' – Cabinet 1996; see Table 3, Volume 1).

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SECTION 1: CADASTRAL INFORMATION

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

Bushplan Site no. 284 **Map no.** 7, 8, 13 **Map sheet series ref. no.** 2034-IV NE, 2035-III, 2035-III SW

System 6 (1983): Part M1 part System area bushland, only bushland described

Other Names: not known

Area (ha): total 629.4; bushland 550.6

Local Authorities (Suburb)

Zoning

Shire of Wanneroo (Two Rocks)

MRS: Parks and Recreation

TPS: Landscape

Ownership Categories

State Government, Private (commercial organisation)

Lot/Location/Reserve numbers (Purpose), Street name

203, 401 Mitchell Pt; 201, 202 street not identified

SECTION 2: REGIONAL INFORMATION

LANDFORMS AND SOILS

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Tamala Limestone (Qtl: LS2)

Quindalup Dunes (Holocene Dunes)

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Linkage: adjacent bushland to the north (BS406), south, east and west (south and east through bushland to BS396 and BS288); part of proposed Greenways 37, 2 (Tingay, Alan & Associates 1997a); part of a regionally significant contiguous bushland/wetland linkage (Volume 2A, Map 8)

Other Special Attributes: Recommended for protection in the study of City of Wanneroo bushland (Trudgen 1996)



SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE

Not listed, Indicative Place of the Register of the National Estate

SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS

Criteria: Representation of ecological communities, Rarity, Maintaining ecological processes or natural systems

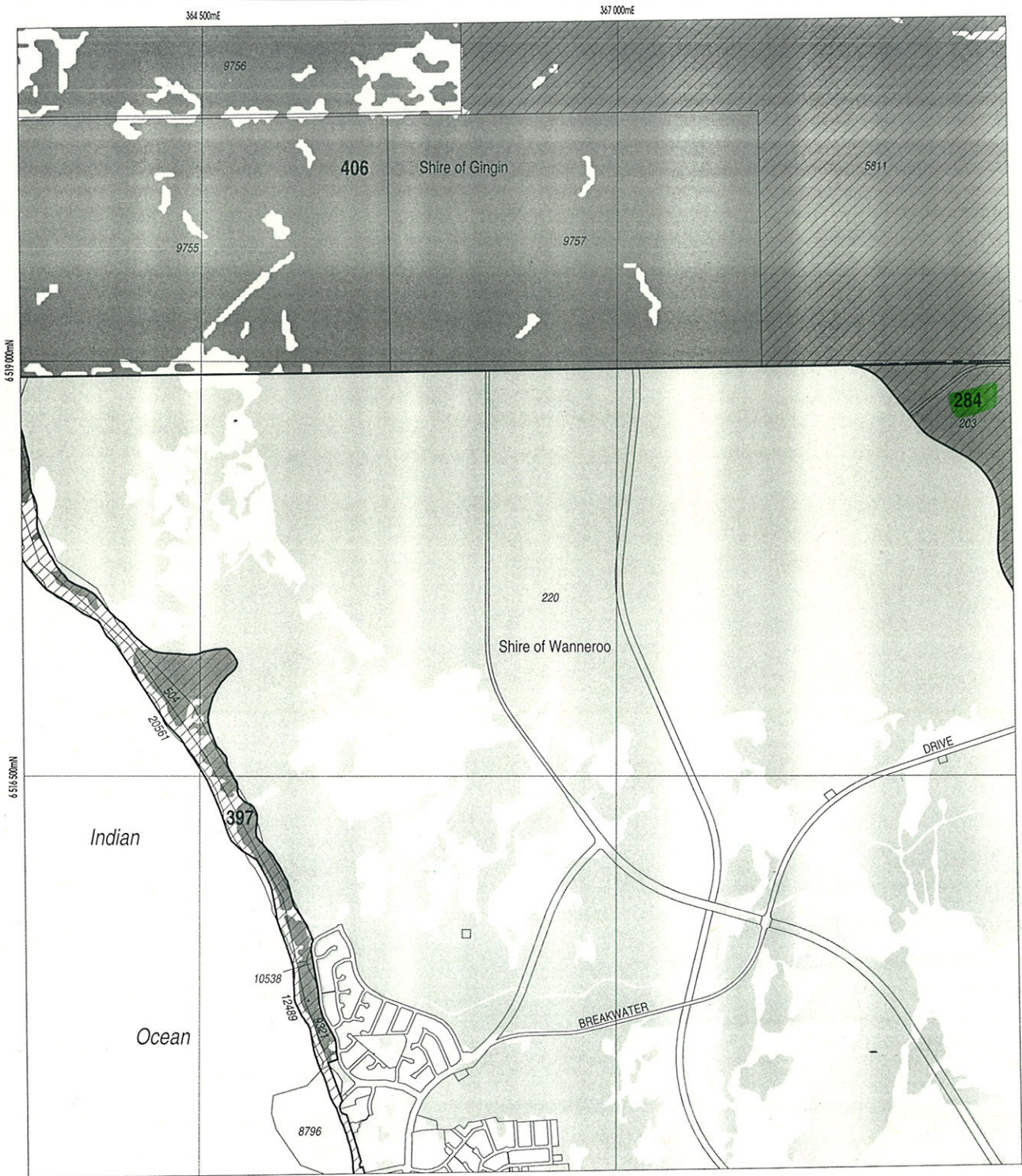
Opportunities and/or Constraints

Opportunities: Bushplan Site/part Bushplan Site location of Declared Rare Flora; under MRS Parks and Recreation Reservation and 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). This Bushplan Site is already reserved for Parks and Recreation in the Metropolitan Region Scheme — it should be made a reserve with a conservation purpose.





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

2035 - III SW

IV		I	
2035			
NW	NE		
SW	SE		
		II	

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

PERTH'S BUSHPLAN MAP INDEX

1	2										
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12	13	14	15	16							
17	18	19	20	21	22	23					
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98	99	100	101	102							
103	104	105	106								

SCALE

0 500 1000 Metres

Produced by Project Mapping Section
Land Information Branch, Ministry for Planning, Perth W.A. November 1998
ntw-map7/environ/bushplan/bushv2_7.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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2035 - III SE

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III		II	
SW	SE		

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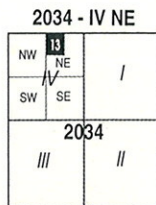
Metres

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Planning, Perth W.A. November 1998
ntw-map7/environ/bushplan/bushv2_8.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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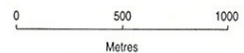
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SCALE



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 Land Information Branch, Ministry for
 Planning, Perth W.A. November 1998
 ntw-map7//environ/bushplan/bushv2_13.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

406

284

127

ODD IN THESE TWO SPOTS IN RELATION TO OUTCROPS BUT NOT A LOT WE CAN DO

APRIL PLOT

BUSHPLAN SITES CORRECTED

B BK/TG 22/10/98



WESTERN AUSTRALIAN PLANNING COMMISSION

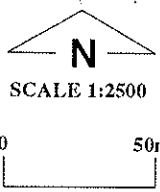


CUSTOMER FOCUS WESTERN AUSTRALIA

① BJK 20/7

Please print out orthophoto on A3 with boundaries veg + BS.

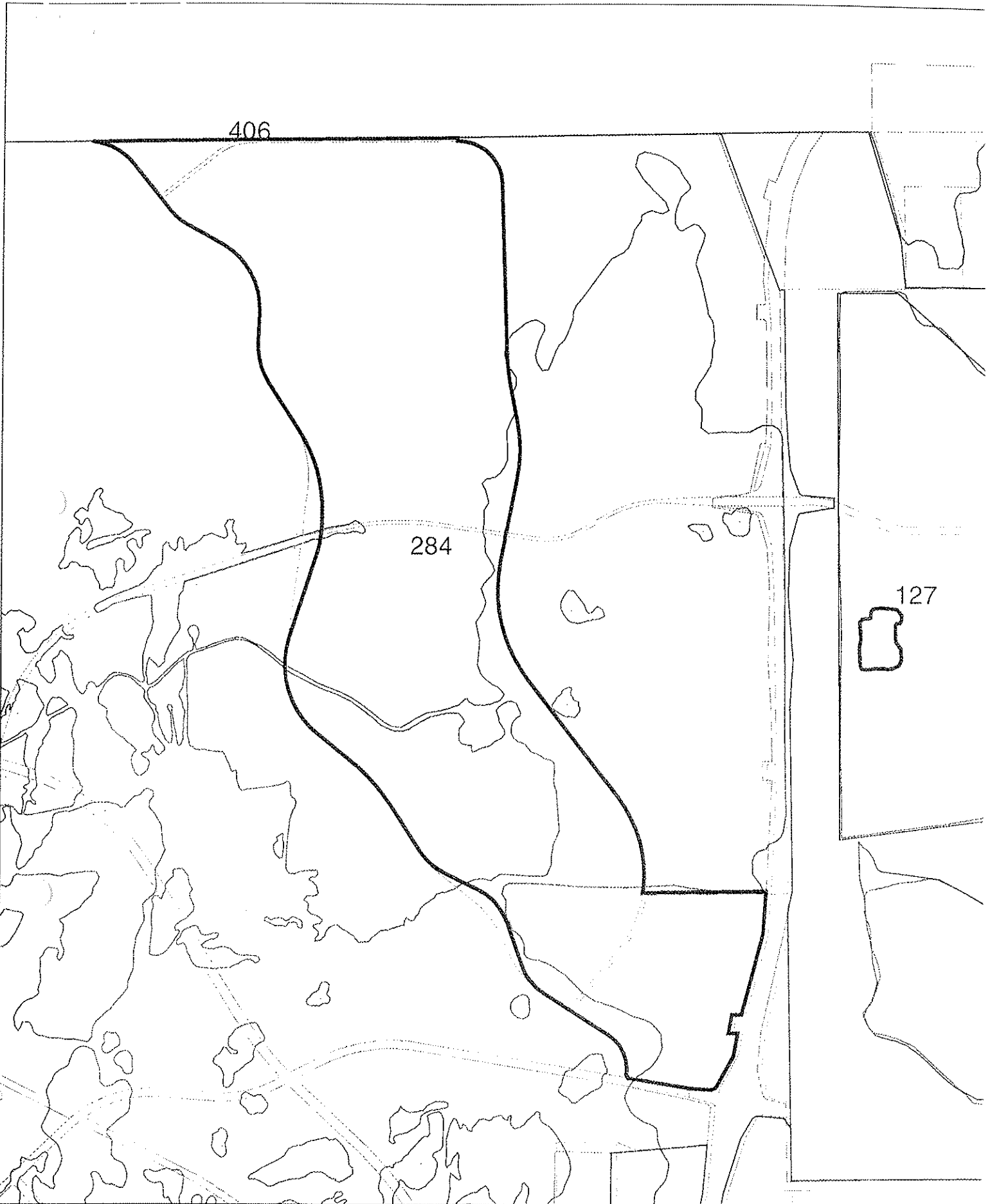
② THANKS CLIFF (P&K BANOMU) Metres



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0 50m

Metres



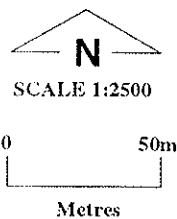
BUSHPLAN SITES CORRECTED



WESTERN
AUSTRALIAN
PLANNING
COMMISSION



BJR 20/7
Please print out
orthophoto on A3 with
boundaries V05 + BS.



NO AFFRAMES

cadastre

284

Follow
MRS PaR
Line

clip
cadastre

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cadastre

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cadastre

bp site 284



Cadastre



Bushplan sites refno 1-500 SCP BOUNDARY THEME



AG VEG 1998 BOUNDARY THEME

USE MRS PARKS AND RECREATION.

MFP INTERNAL USE ONLY

Prepared By: Andrea Zappacosta

Prepared For:

Map Ident: plot980707_1

Date: 07 Jul 98

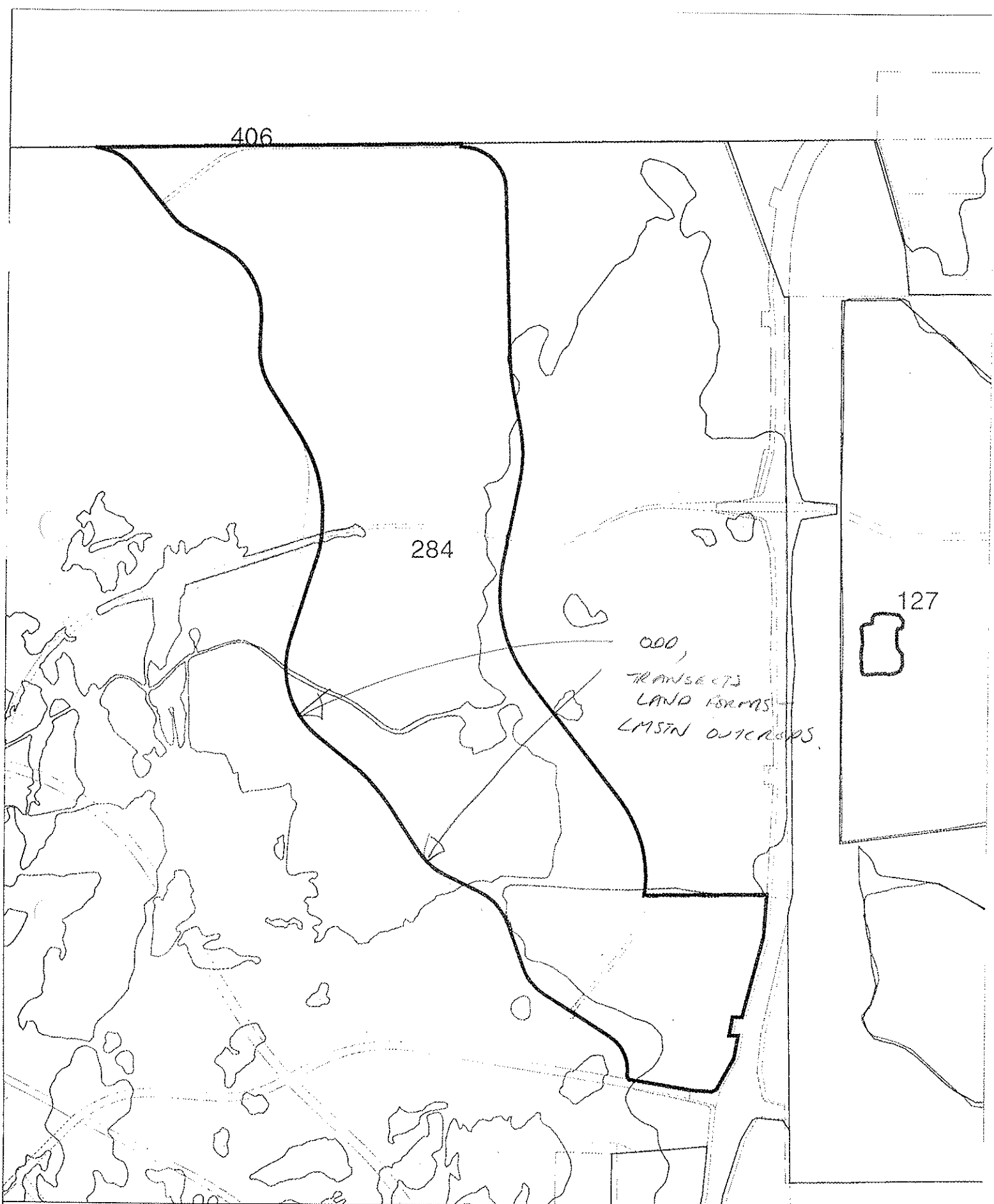
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MRS - PaR entire BP site

Subdivision - elapsed see over

Veg ex S1, ex55 - western
border of
BP site

(NOT TO SCALE 1:25941)



ARM PLT

BUSHPLAN SITES CORRECTED

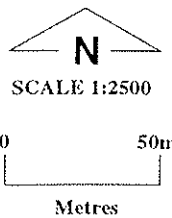


WESTERN
AUSTRALIAN
PLANNING
COMMISSION



CUSTOMER
FOCUS
WESTERN AUSTRALIA

WJA 20/7
Please print out
ortho photo on A3 with
boundaries V05 + BS.



NO AERIALS

cadastre

284

Follow
MRS PaR
Line

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cadastre

clif
cadastre

bp site 284



Cadastre



Bushplan sites refno 1-500 SCP BOUNDARY THEME



AG VEG 1998 BOUNDARY THEME

USE MRS PARKS AND RECREATION.

MFP INTERNAL USE ONLY

Prepared By: Andrea Zappacosta

Prepared For:

Map Ident: plot980707_1

Date: 07 Jul 98

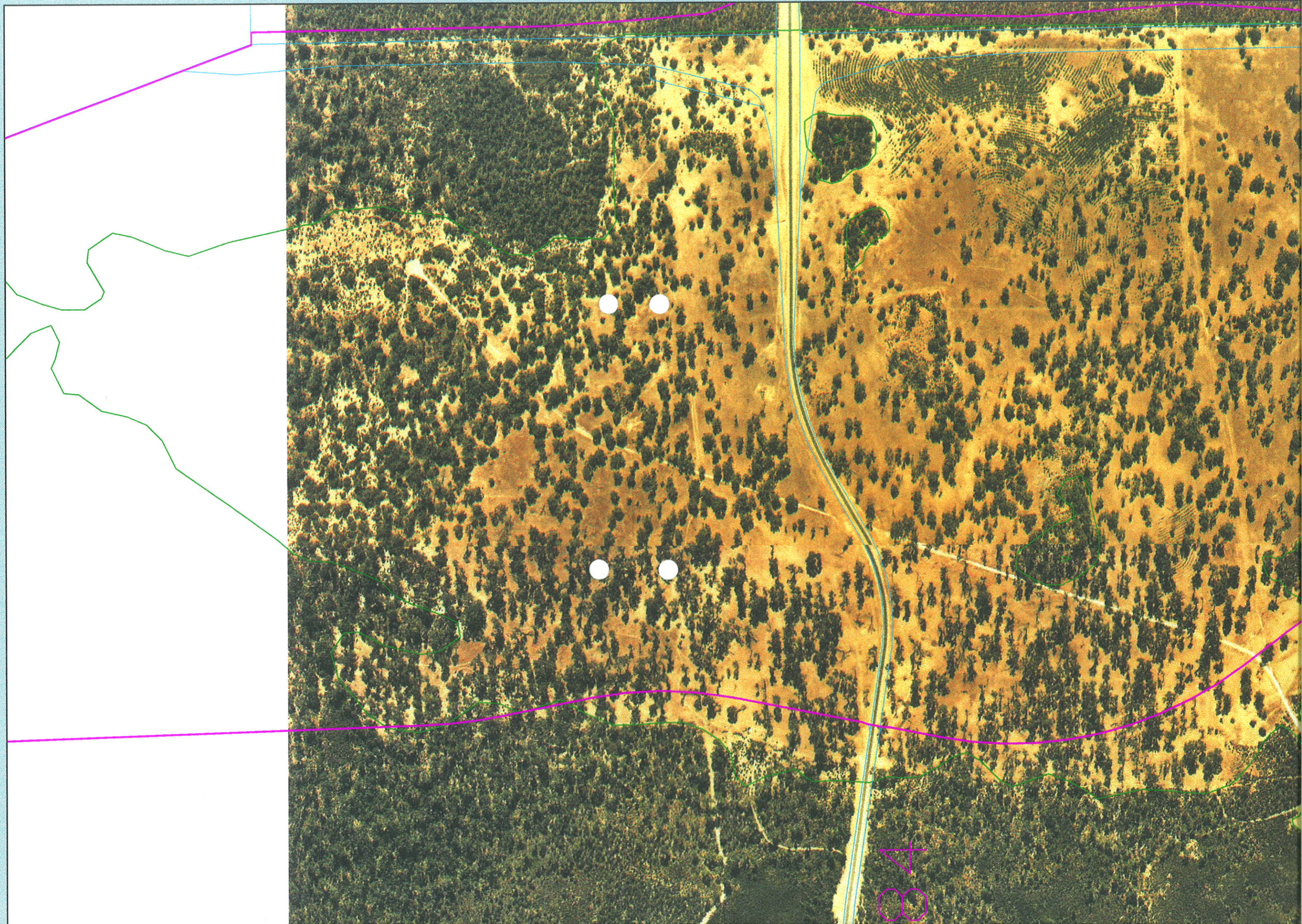
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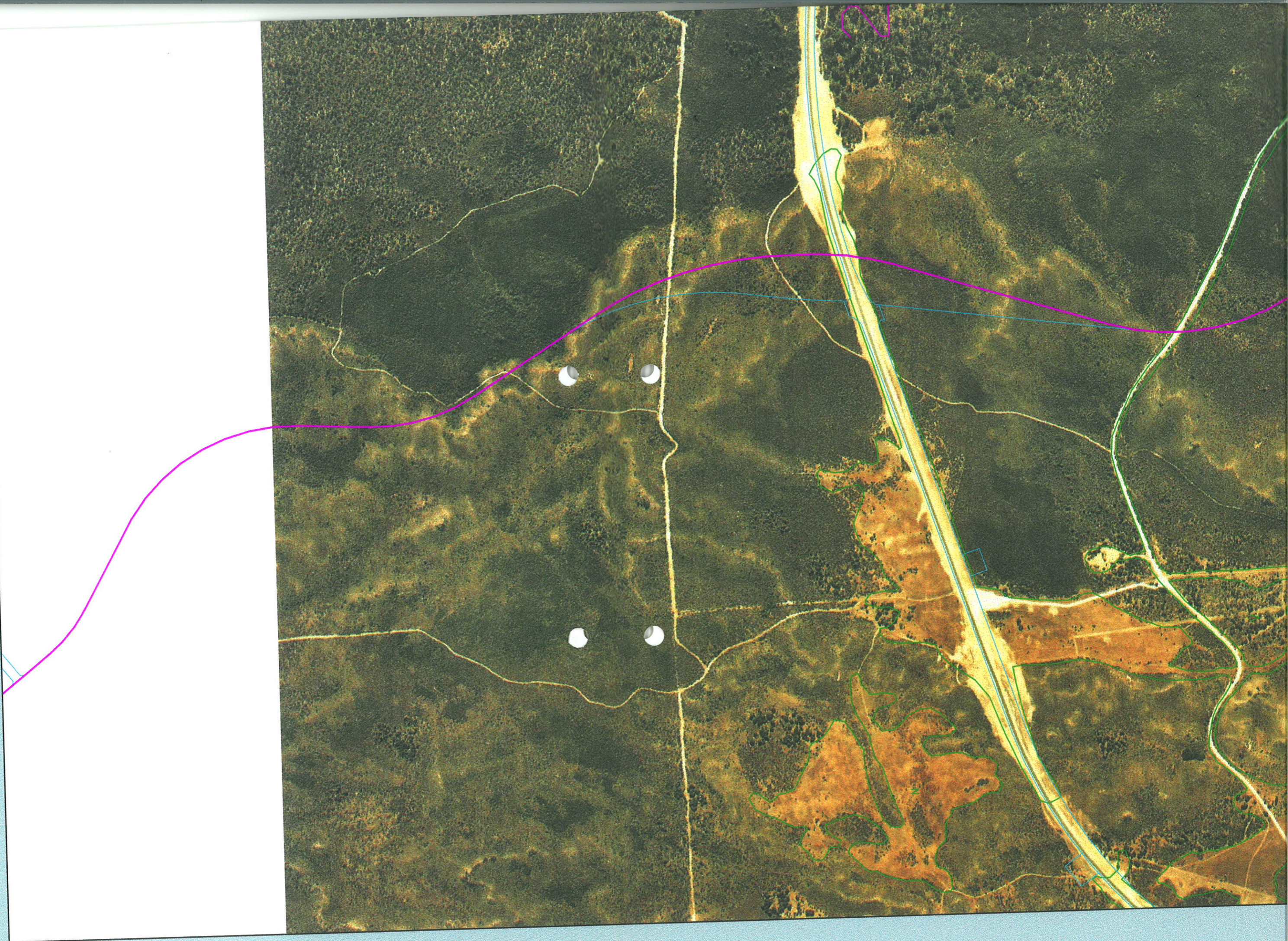
MRS - PaR entire BP site

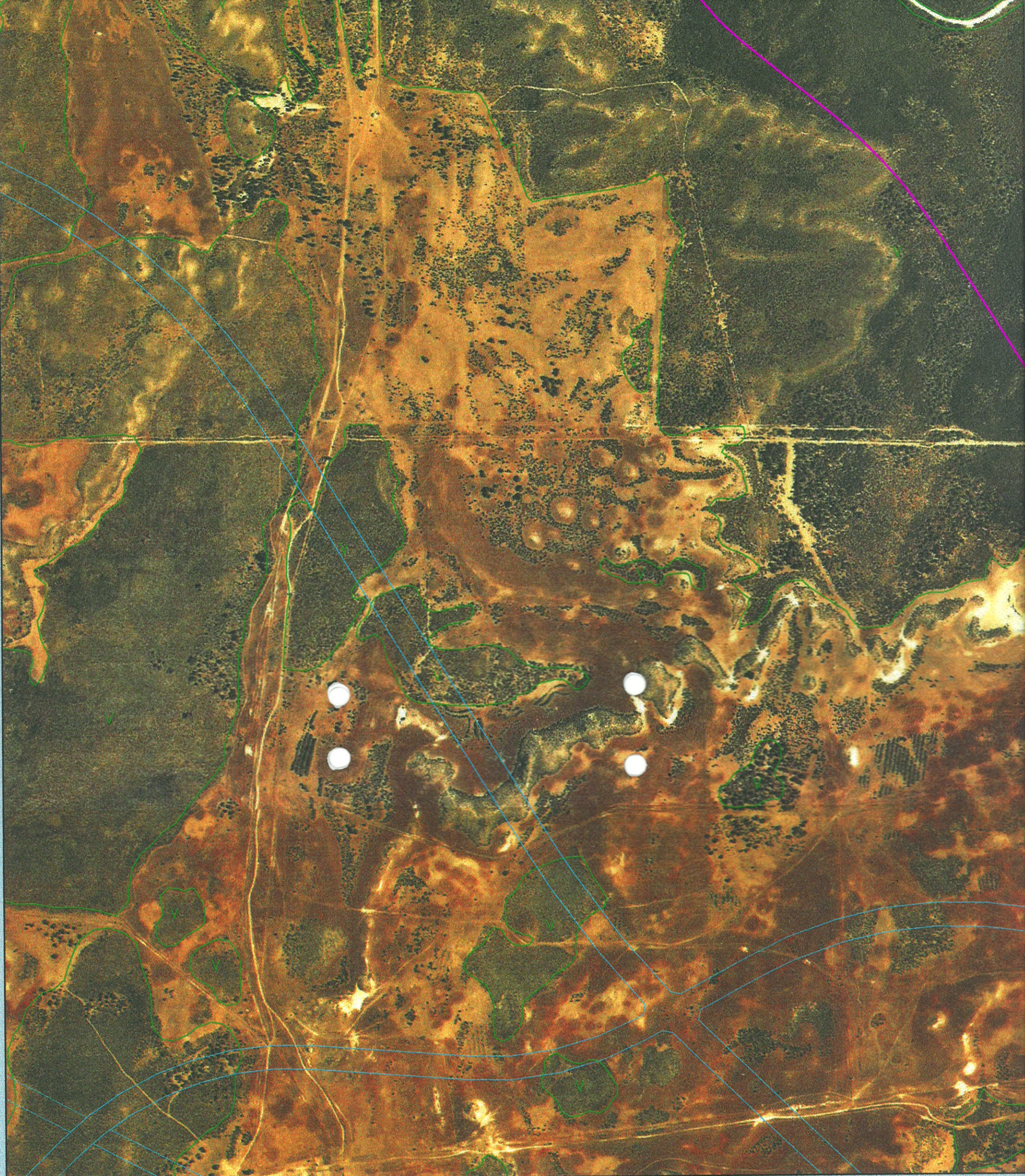
Subdivision - elapsed see over
approved

Veg ex SI, CXSS - western
border of
BP site

(NOT INCLUDED BTK 20/7)



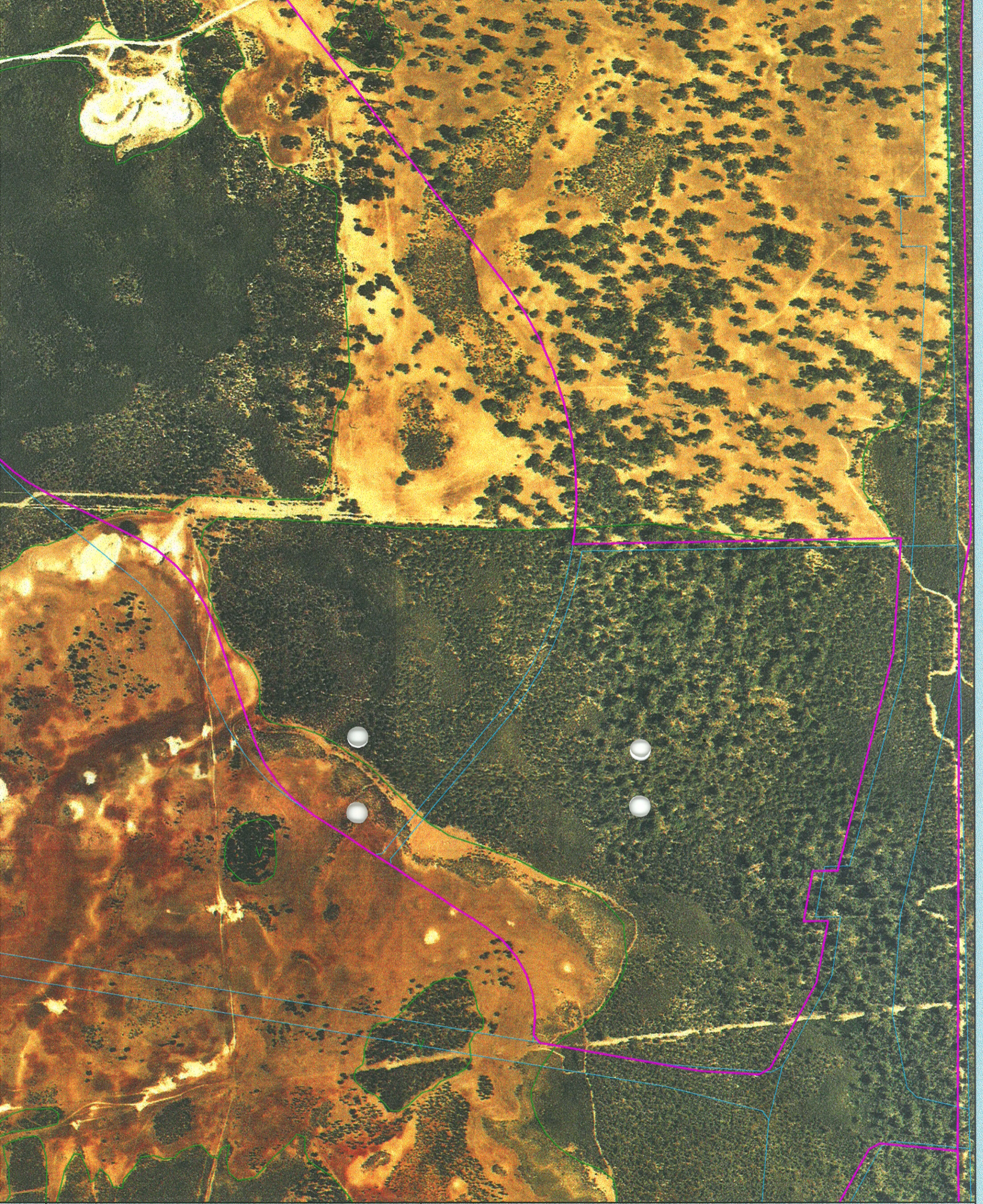




LEGEND



PRODUCED BY THE LAND INFORMATION BRANCH, STATUTORY MAPPING SECTION



SCALE 1:5000



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AERIAL PHOTOGRAPHY - ORTHO-RECTIFIED
ORIGINAL PHOTOGRAPHY - JANUARY 1998 SCALE 1:20000

POSITIONAL ACCURACY + OR - 10 METRES

88-084-SP001-2

TOKYU CORPORATION

RESPONSE TO
DRAFT NORTH-WEST CORRIDOR STRUCTURE PLAN
DEPARTMENT OF PLANNING & URBAN DEVELOPMENT
(February 1991)

YANCHEP STRUCTURE PLAN

VERTEBRATE FAUNA SURVEY

ALAN TINGAY & ASSOCIATES

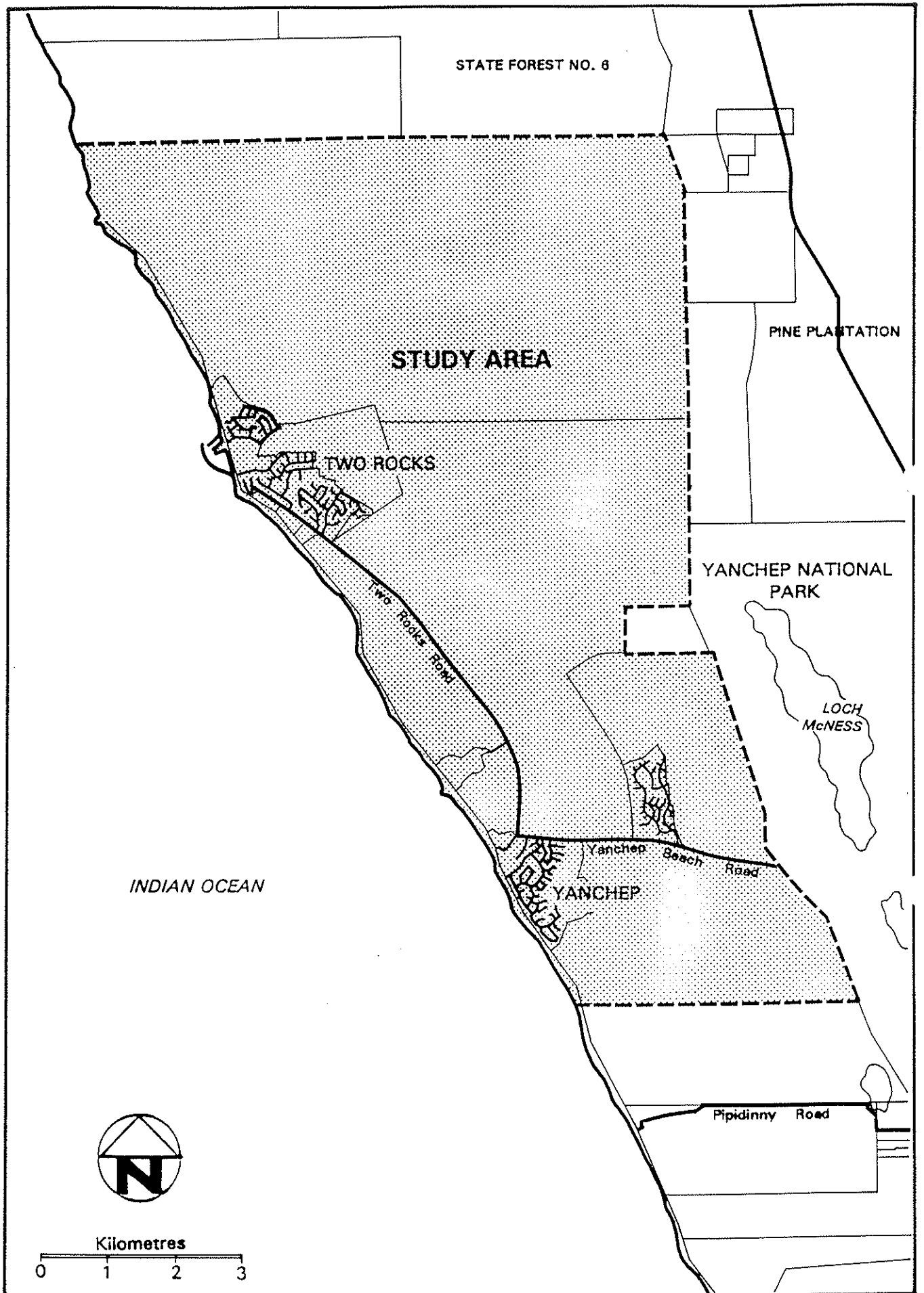
OCTOBER 1991

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ALAN TINGAY & ASSOCIATES

LOCATION OF STUDY AREA

FIGURE 1

APPENDIX 1

OBSERVED FAUNA ON YANCHEP PROPERTY

KEY:

A-HABITAT TYPE

1. Property as a whole
2. Coastal Heath (systematically surveyed)
3. Inland Heath (systematically surveyed)
4. *Banksia* Woodland (systematically surveyed)
5. Tuart *Eucalyptus gomphocephala* Woodland (systematically surveyed)
6. Other (opportunistic survey only includes pasture)

B. STATUS

- * Observed during survey
- # Rare or otherwise in need of special protection (Wildlife Conservation Act, 1990)
- (o) Introduced species

Numbers refer to maximum number of individuals seen during survey
(numbers not shown for opportunistic sightings)

Amphibian & Reptile Species						
Habitat Type	1	2	3	4	5	6
LEPTODACTYLIDAE/FROGS						
<i>Heleioporus eyrei</i>	*			2	3	
<i>Limnodynastes dorsalis</i>	*	1		1	1	
<i>Myobatrachus gouldii</i>	*			2	2	
Total Number of Species	3	1		3	3	
GEKKONIDAE/GECKOS						
<i>Crenadactylus o. ocellatus</i>	*				2	
<i>Diplodactylus spinigerus</i>	*	1				
<i>Phyllodactylus m. marmoratus</i>	*			3	2	
PYGOPOGIAE/LEGLESS LIZARDS						
<i>Apraisia repens</i>	*	1				
<i>Delma fraseri</i>	*		1	1		
<i>D. grayii</i>	*			1		
<i>Lialis burtonis</i>	*				1	
<i>Pletholax g. gracilis</i>	*	1				
AGAMIDAE/DRAGON LIZARDS						
<i>Pogona m. minor</i>	*	1		1		
<i>Tympanocryptis a. adelaidensis</i>	*			2		
SCINCIDAE/SKINKS						
<i>Cryptoblepharus plagiocephalus</i>	*			1	2	*
<i>Ctenotus fallens</i>	*	1		1		
<i>C. lesueurii</i>	*			1		
<i>Egernia kingii</i>	*	1				
<i>Hemiergis quadrilineata</i>	*	1	1	1	3	
<i>Lerista elegans</i>	*	2	2	1	2	
<i>L. praepedita</i>	*				1	
<i>Menetia greyii</i>	*		6	1	1	
<i>Morethia obscura</i>	*			1	1	
<i>M. lineocellata</i>	*		1		1	
<i>Tiliqua occipitalis</i>	*					*
<i>T. r. rugosa</i>	*	2	4	2	2	*
ELAPIDAE/ELAPID SNAKES						
<i>Pseudonaja a. affinis</i>	*	1	1			
<i>Vermicella bimaculata</i>	*			1		
Total Number of Species	24	10	7	12	11	3

Bird Species	1	2	3	4	5	6
DROMAIDAE						
<i>Dromaius novaehollandiae</i> /Emu	*		1	1	1	*
ANATIDAE						
<i>Tadorna tadornoides</i> /Australian Shelduck	*				5	
ACCIPITRIDAE						
<i>Elanus notatus</i> /Black-shouldered Kite	*		1			
<i>Lophoictinia isura</i> /Square-tailed Kite	*		1			
<i>Aquila audax</i> /Wedge-tailed Eagle	*		1	1		
<i>Hieraaetus morphnoides</i> /Little Eagle	*	1	1			
FALCONIDAE						
<i>Falco peregrinus</i> /Peregrine Falcon #	*		*			
<i>F. longipennis</i> /Australian Hobby	*			1	1	
<i>F. cenchroides</i> /Australian Kestrel	*	1	2			
OTIDIDAE						
<i>Ardeotis australis</i> /Australian Bustard	*		1			
LARIDAE						
<i>Larus novaehollandiae</i> /Silver Gull	*	1				
COLUMBIDAE						
<i>Colomba livia</i> /Feral Pigeon (o)	*	12	1			*
<i>Streptopelia chinensis</i> /Spotted Turtle-Dove (o)	*					
<i>Streptopelia senegalensis</i> /Laughing Turtle-Dove (o)	*	6		1		
<i>Phaps chalcoptera</i> /Common Bronzewing	*				1	
CACATUIDAE						
<i>Calyptorhynchus funereus latirostris</i> / Carnaby's Black Cockatoo #	*		1	10	4	
<i>Cacatua roseicapilla</i> /Galah	*	5		7	12	*
<i>C. sanguinea</i> /Little Corella	*					*
PLATYCERCIDAE						
<i>Barnardius zonarius</i> /Port Lincoln Ringneck	*			5	19	*
<i>Neophema elegans</i> /Elegant Parrot	*				*	
CUCULIDAE						
<i>Cuculus pallidus</i> /Pallid Cuckoo	*			1	2	
<i>C. pyrrhophanus</i> /Fan Tailed Cuckoo	*	1			3	
<i>Chrysococcyx basalis</i> /Horsfield's Bronze Cuckoo	*	1	1	1	2	
<i>C. lucidus</i> /Shining Bronze Cuckoo	*			1	2	
STRIGIDAE						
<i>Ninox novaeseelandiae</i> /Southern Boobook	*				2	
PODARGIDAE						
<i>Podargus strigoides</i> /Tawny Frogmouth	*			2		
ALCEDINIDAE						
<i>Dacelo novaeguineae</i> /Laughing Kookaburra (o)	*			1	1	
<i>Halcyon sancta</i> /Sacred Kingfisher	*		1			*
MEROPIIDAE						
<i>Merops ornatus</i> /Rainbow Bee-eater	*			2		
HIRUNDINIDAE						
<i>Cheramoeca leucosternum</i> /White-backed Swallow	*	1	1			
<i>Hirundo neoxena</i> /Welcome Swallow	*	4	1			
<i>Cecropis nigricans</i> /Tree Martin	*	18	1			
MOTACILLIDAE						
<i>Anthus novaeseelandiae</i> /Richard's Pipit	*	1				*

Bird Species						
Habitat Type	1	2	3	4	5	6
CAMPEPHAGIDAE						
<i>Coracina novaehollandiae</i> /Black-faced Cuckoo-shrike	*		2	3	3	
MUSCICAPIDAE						
<i>Petroica multicolor</i> /Scarlet Robin	*			3	6	
<i>Melanodryas cucullata</i> /Hooded Robin	*			1		
<i>Pachycephala rufiventris</i> /Rufous Whistler	*			3	3	
<i>Colluricincla harmonica</i> /Grey Shrike-thrush	*			1	5	
<i>Rhipidura fuliginosa</i> /Grey Fantail	*	3		2	5	
<i>R. leucophrys</i> /Willie Wagtail	*	1	1	1		
MALURIDAE						
<i>Malurus splendens</i> /Splendid Fairy-wren	*	1	8	5	18	
<i>M. leucopterus</i> /White-winged Fairy-wren	*	4				
ACANTHIZIDAE						
<i>Sericornis frontalis</i> /White-browed Scrubwren	*	22				
<i>Smicronis brevirostris</i> /Weebill	*				1	*
<i>Gerygone fusca</i> /Western Gerygone	*	2		4	12	*
<i>Acanthiza apicalis</i> /Inland Thornbill	*	1			1	
<i>A. inornata</i> /Western Thornbill	*			5	4	
<i>A. chrysorrhoa</i> /Yellow-rumped Thornbill	*				5	
MELIPHAGIDAE						
<i>Anthochaera carunculata</i> /Red Wattlebird	*	6	4	10	6	*
<i>A. chrysoptera</i> /Little Wattlebird	*	1	1	6	14	
<i>Lichenostomus virescens</i> /Singing Honeyeater	*	12	1	7	2	
<i>L. ornatus</i> /Yellow-plumed Honeyeater	*				*	
<i>Meliphreptus lunatus</i> /White-naped Honeyeater	*				*	
<i>Lichmera indistincta</i> /Brown Honeyeater	*	7	15	32	21	
<i>Phylidonyris novaehollandiae</i> /New Holland Honeyeater	*			2	3	
<i>P. nigra</i> /White-cheeked Honeyeater	*	3	5	11		
<i>P. melanops</i> /Tawny-crowned Honeyeater	*		12			
<i>Acanthorhynchus superciliosus</i> /Western Spinebill	*			1	4	
PARDALOTIDAE						
<i>Pardalotus punctatus</i> /Spotted Pardalote	*				4	
<i>P. striatus</i> /Striated Pardalote	*			1	8	
ZOSTEROPIDAE						
<i>Zosterops lateralis</i> /Silvereye	*	4	4	4		
GRALLINDAE						
<i>Grallina cyanoleuca</i> /Australian Magpie-lark	*			1	1	
ARTAMIDAE						
<i>Artamus cinereus</i> /Black-faced Woodswallow	*		7			*
CRACTICIDAE						
<i>Cracticus torquatus</i> /Grey Butcherbird	*	5	3	1	1	
<i>Gymnorhina tibicen</i> /Australian Magpie	*	3	2	5	7	*
CORVIDAE						
<i>Corvus coronoides</i> /Australian Raven	*	6	6	4	6	*
Total Number of Species	66	28	29	38	37	13
Total Number of Native Birds	63	26	28	37	37	12

Mammal Species						
Habitat Type	1	2	3	4	5	6
DASYURIDAE						
<i>Sminthopsis griseoventer</i> /Common Dunnart	*		1			
TARSIPEDIDAE						
<i>Tarsipes rostratus</i> /Honey Possum	*		1			
MACROPODIDAE						
<i>Macropus irma</i> /Western Brush Wallaby	*			*	*	
<i>M. fuliginosus</i> /Western Grey Kangaroo	*		11	16	8	*
VESPERTILIONIDAE						
<i>Eptesicus regulus</i> /King River Eptesicus	*				1	*
MURIDAE						
<i>Mus musculus</i> /House Mouse (o)	*	6		4	2	
<i>Rattus fuscipes</i> /Bush Rat	*	3				
<i>Rattus rattus</i> /Black Rat (o)	*	2				
LEPORIDAE						
<i>Oryctolagus cuniculus</i> /Rabbit (o)	*	1	*	*	*	*
CANIDAE						
<i>Vulpes vulpes</i> /Fox (o)	*	1	*	*		*
FELIDAE						
<i>Felis catus</i> /Feral Cat (o)	*	*		1		*
Total Number of Species	11	5	6	6	4	5
Total Native Mammals	6	1	3	2	3	2

TOKYU CORPORATION

RESPONSE TO
DRAFT NORTH-WEST CORRIDOR STRUCTURE PLAN
DEPARTMENT OF PLANNING & URBAN DEVELOPMENT
(February 1991)

YANCHEP STRUCTURE PLAN

FLORA AND VEGETATION REPORT

ALAN TINGAY & ASSOCIATES

FEBRUARY 1992

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2.3 Significant Flora

Several species recorded from the study area are of significance:

o *Eucalyptus argutifolia* (Myrtaceae) (Declared Rare Flora)

This newly described species is a Declared Rare Flora species and is therefore subject to conditions for rare flora as defined by the Wildlife Conservation Act, 1950-1979. It is a mallee eucalypt (1-4m tall) which is always associated with rugged limestone ridges. The few populations of this species that are known are usually in close proximity to limestone quarries and as such it is not only rare, but also endangered.

Two populations of *E. argutifolia* were found on the study site. The largest population (and possibly the second largest now known) is located west of the old limestone quarry in the north eastern sector of the property. This population consists of about 45 mallees up to 4m tall intermixed with other mallee eucalypt species. The second population of about 19 mallees to 1.5m tall is located about 1.4km north of White Road on the slope of a large limestone hill, again mixed with other mallee eucalypts.

Only 12 populations of *E. argutifolia* were previously known, with about 150 plants in total. The 64 plants and 2 new populations discovered in this survey significantly add to the knowledge of this rare and endangered species. (See Appendix 2 for survey results.)

o *Eucalyptus foecunda* (Myrtaceae) (Priority 3)

This species is a mallee eucalypt found on shallow sand over limestone soils, along the coast from south of Mandurah to north of Lancelin. It forms very dense patches of foliage from several metres diameter for one bush up to tens of metres in diameter for a clump of mallees. These clumps can easily be identified from colour aerial photography due to the density of foliage. Several large populations were found on the limestone ridge and at the base of the ridge which runs NNW/SSE in the north eastern part of the property. One population is located on the edge of the limestone area in the north western section. It is a Priority 3 species on the CALM Reserve Flora List (1991) which indicates it has several poorly known populations, with some on conservation land.

o *Stylidium* sp. '*maritima*' (Stylidiaceae)

Populations of this undescribed species are distributed between Yalgorup National Park and Breton Bay on older Quindalup Dunes and coastal limestone. While its range is reasonably large the populations are uncommon and its habitat is increasingly being cleared for development. In the study area it was recorded at one site on older Quindalup dunes, close to the coast just north of The Spot.

o *Allocasuarina lehmanniana* (Casuarinaceae)

This species occurs on old Quindalup Dunes and is uncommon on the Swan Coastal Plain, occurring in only one reserve (Trigg Bushland Reserve). It is abundant in a localised area south of the Yanchep townsite in an area destined for residential development. Only isolated plants occur outside this region in the study area.

o *Carpobrotus* sp.nov. *cg.modestus* (Aizoaceae)

This undescribed species of pigface has only recently been discovered in populations at Golden Bay, Padbury and Quinns Rock. This new finding is the northernmost locality for this species. It occurs on deep Spearwood sand, shallow sand over limestone and outcropping limestone. In the study area it was quite common in the northern section on limestone soils, and was recorded in four vegetation sampling sites. The conservation status of this species would be considered endangered and possibly rare, although it does not appear on any of these official lists at present.

o *Goodenia berardiana* (Goodeniaceae)

This species is not recorded in the Perth Flora or any other coastal area species lists. It is known to occur from Carnarvon to Southern Cross and on the south coast near Esperance. The closest known location to study site is Nambung National Park. In the study area it was found in *Melaleuca cardiophylla* Scrub.

o *Billardiera erubescens* (Pittosporaceae)

This species is not recorded in the Perth Flora or any other coastal area species lists. It is known from the south coast up to Wongan Hills, mainly on inland sites, it is a climber and was found at one location climbing among *Melaleuca cardiophylla* Scrub, near the start of White Road.

o *Thomasia triphylla* (Sterculiaceae)

Restricted to coastal limestone between Breton Bay and Augusta. It is at its northerly extent in the study area and was only found in association with *Melaleuca cardiophylla* on limestone.

o *Hydrocotyle diantha* (Apiaceae)

This species is at the northern end of its distribution, occurring on the sandy soils of the Swan Coastal Plain from Wilbinga to Esperance.

o *Westringia dampieri* (Lamiaceae)

Uncommon in the Perth Region and present at Rottnest, Garden Islands, Yanchep and Wilbinga. Observed only on coastal limestone at The Spot.

o *Mirbelia spinosa* (Papilionaceae)

Uncommon on coastal sites, usually found in the Darling Scarp in the Perth Region. Its range extends to the northern sandplains near Kalbarri. It is found in *Banksia* Woodland near the south eastern boundary of the property.

o *Stackhousia pubescens* (Stackhousiaceae)

Occurs in the Darling Scarp in the Perth Region and is also fairly common in the wheatbelt. Two collections from Rottne Island (1951, 1956) confirm that this species has been found previously in coastal locations. It is present on old Quindalup dunes in the northern part of the Yanchep property.

2.4 Planning Considerations Relating to Significant Flora

The Yanchep property has particular conservation value for those species which are in the following categories:

- 1) Rare or endangered,
- 2) Undescribed species needing further research,
- 3) Restricted distribution to the area or uncommon,
- 4) Outside or at the edge of their normal range, and
- 5) Not well represented in conservation reserves.

The conservation values of the species listed in Section 2.3 in terms of these categories is as follows:

<i>Eucalyptus</i> sp ' <i>argutifolia</i> '	1,5
<i>Eucalyptus foecunda</i>	1
<i>Stylidium</i> sp ' <i>maritima</i> '	2,5
<i>Allocasuarina lehmanniana</i>	5
<i>Carpobrotus</i> sp.nov.cg. <i>modestus</i>	2,4,5
<i>Goodenia berardiana</i>	4
<i>Billardiera erubescens</i>	4
<i>Thomasia triphylla</i>	4
<i>Hydrocotyle diantha</i>	4
<i>Westringia dampieri</i>	3
<i>Mirbelia spinosa</i>	4
<i>Stackhousia pubescens</i>	4

The two previously unknown populations of *Eucalyptus* sp '*argutifolia*' represent a significant addition to the known populations of this rare species. The larger population is possibly the second largest now known and its conservation should be considered a priority. The Wildlife Conservation Act, 1950-1979 requires the protection of rare flora such as *Eucalyptus argutifolia* unless specific exemption is granted. There are no statutory obligations relating to Priority 3 species such as *Eucalyptus foecunda* but all but one of the populations of *Eucalyptus foecunda* could be

4.1.3 Type A3 - *Acacia rostellifera*/*Spyridium globulosum* on Q3 Sand

In places inland from the youngest Q4 dunes fronting the coast are another set of dunes which would probably be classified as Q3 in age due to the development of an organic layer at the surface and weak cementation of the sand. The vegetation on the crests and slopes of these dunes contains a mixture of vegetation associations while the swale usually contains a *Lepidosperma gladiatum* Sedgeland. The most widespread example of this vegetation type is between The Spot and Yanchep where the vegetation is dominated by *Acacia rostellifera*.

ArSg *Acacia rostellifera*/*Spyridium globulosum* Closed Heath

The vegetation of this association is dense with up to 80% cover at the site studied and with a height averaging 1.5m tall. This association dominates the vegetation from The Spot to Yanchep between the young coastal Q4 dunes and the road. The two major species vary in their dominance with *Acacia rostellifera* frequently occurring in nearly pure stands (Ar) while in other areas *Spyridium globulosum* is more dominant (SgAr). The understorey is usually sparse due to the dense canopy cover and typically contains *Melaleuca acerosa*, *Parietaria debilis*, *Phyllanthus calycinus* and *Rhagodia baccata*.

Although this vegetation association may look like Q4 vegetation (particularly SgOa) because of their similarity in structure and presence of some common dominant species it is floristically more similar to the older Q2 dunes.

The two sites studies had 14 and 32 species in the quadrat.

Lg *Lepidosperma gladiatum* Sedgeland

Dense sedgelands of *Lepidosperma gladiatum* occur in some of the swales between Q3 and Q2 age dunes, mainly north of Two Rocks. The dense sedge cover precludes an abundance of other species with only limited presence of *Clematis microphylla*, *Acanthocarpus preissii*, *Rhagodia baccata* and *Melaleuca acerosa*. While the depth to groundwater is probably only 2m or so on average, the absence of any wetland indicator species suggests that the watertable never rises above the surface at these sites. No soaks or wetlands were observed in the entire study area.

Al & AlSg *Allocasuarina lehmanniana* Open Scrub and Scrub

Two associations occur on Q3 type dunes south of Yanchep which are dominated by *Allocasuarina lehmanniana*. This vegetation was burnt in January 1991 and was not sampled. The associations are:

- o A1 *Allocasuarina lehmanniana* Open Scrub to Scrub
- o AlSg *Allocasuarina lehmanniana*/*Spyridium globulosum* Scrub.

The species richness of the sites studies from this association averaged 16.7 species per 100m² (range 14-19).

OaSgMa *Olearia axillaris/Spyridium globulosum* Open Heath over
Melaleuca acerosa Heath

This association occurs just north of The Spot and appears to be a mixture between Q3 and Q2 type vegetation. The two dominant shrub species occur at a low density (40% at the site studied) with *Olearia* more typically being the most prominent species. Subshrubs typical of Q2 dunes occur such as *Conostylis candicans*, *Opercularia vaginata*, *Phyllanthus calycinus* and *Acacia lasiocarpa*.

The species richness of the site examined was 16.

4.2 Alliance B - Old Quindalup Dune Heath

4.2.1 Type B1 - *Melaleuca acerosa*/*Acacia lasiocarpa* on Q2 Dunes

The older Quindalup dunes (Q2) which occur close to the coast have a more developed soil profile than the Q3 and Q4 sites with an accumulation of organic matter in the topsoil and moderate cementation of the subsoil. The vegetation characteristic of this soil type occurs on rolling parabolic dunes generally with convex slopes. The dominant structural vegetation formation is a Heath usually dominated by *Melaleuca acerosa* with an abundance of *Lomandra maritima* in the understorey. Many variants of the basic vegetation type occur and are determined by a number of factors including exposure to salt spray, position on the dune, aspect, height of the dune, age of the dune and fire frequency.

MaAclLm *Melaleuca acerosa*/*Acacia lasiocarpa* Closed Heath over
Lomandra maritima Herbland

This vegetation association is the basic unit which occurs on the Q2 dunes. It occurs on all aspects of the dune slopes including the top. The height of the Heath is usually very low, less than 50cm, being affected by fire and exposure. Common associated species include *Hemiandra pungens*, *Loxocarya flexuosa*, *Opercularia vaginata*, *Conostylis candicans* and the native grasses *Poa drummondiana* and *stipa flavescens*. Other species may be locally abundant such as *Pimelea ferruginea* and *Leucopogon insularis* but are not common enough to warrant recognition as a distinct association. The most notable variant contains *Scaevola thesioides* which is common along the eastern part of Transect 5. This variant is described as MaAclSth Heath (*Melaleuca acerosa*/*Acacia lasiocarpa*/*Scaevola thesioides*).

Calothamnus quadrifidus also occurs as a co-dominant in certain areas north of Two Rocks and is described as MaCq Heath (*Melaleuca acerosa*/*Calothamnus quadrifidus*).

Some other areas with this vegetation association have taller shrub species. In particular the shrubs *Spyridium globulosum*, *Olearia axillaris* and *Myoporum insulare* occur frequently enough in some area to be called variants as follows:

A

APPENDIX 1

YANCHEP PLANT SPECIES LIST

YANCHEP SPECIES LIST

(* introduced species)

GYMNOPHYTA	CENTROLEPIDACEAE
ZAMIACEAE	Centrolepis drummondiana
Macrozamia riedlei	Centrolepis polygyna
ANGIOSPERMAE	DASYPOGONACEAE
MONOCOTYLEDONS	Acanthocarpus preissii
JUNCAGINACEAE	Calectasia cyanea
Triglochin sp A	Lomandra hermaphrodita
POACEAE	XANTHORRHOEACEAE
Aira caryphyllea*	Xanthorrhoea brunonsis
Ammophila arenaria*	Xanthorrhoea preissii
Avena fatua*	PHORMIACEAE
Briza maxima*	Dianella divaricata
Briza minor*	ANTHERICACEAE
Bromus diandrus*	Corynotheca micrantha
Ehrharta calycina *	Sowerbaea laxiflora
Ehrharta longiflora*	Thysanotus arenarius
Hordeum leporinum*	Thysanotus patersonii
Lagurus ovatus*	Thysanotus sparteus
Lolium perenne*	Thysanotus triandrus
Lolium ridigum*	Tricoryne elatior
Poa annua*	ASPHODELACEAE
Poa drummondiana	Asphodelus fistulosus*
Spinifex hirsutus	Trachyandra divaricata*
Spinifex longifolius	COLCHICACEAE
Stipa elegantissima	Burchardia umbellata
Stipa flavescens	Wurmbea monantha
Stipa semibarbata	HAEMODORACEAE
Vulpia bromoides*	Anigozanthos humilis
CYPERACEAE	Anigozanthos manglesii
Isolepis marginata	Conostylis aculeata
Isolepis nodosa	Conostylis candicans
Lepidosperma gladiatum	Conostylis setosa (teretifolia?)
Lepidosperma angustatum	Haemodorum spicatum
Mesomelaena pseudostygia	IRIDACEAE
Schoenus grandiflorus	Gladiolus caryophyllaceus*
Shoenus curvifolius	Homeria flaccida*
RESTIONACEAE	Orthrosanthos laxus
Ecdeiocolea monostactya	Patersonia occidentalis
Hypolaena exsulca	
Loxocarya fasciculata	
Loxocarya flexuosa	
Loxocarya pubescens	

ORCHIDACEAE	OLACACEAE
Caladenia 'arenicola'	Olax benthamiana
Caladenia flava	
Caladenia gemmata	LORANTHACEAE
Caladenia latifolia	Nuytsia floribunda
Caladenia longicauda	
Diuris longifolia	POLYGONACEAE
Elythranthera brunonis	Emex australis*
Lyperanthus nigricans	Rumex vesicarius*
Prasophyllum giganteum	
Pterostylis nana	CHENOPODIACEAE
Pterostylis vittata	Rhagodia baccata
	Threlkeldia diffusa
DICOTYLEDONS	
URTICACEAE	AMARANTHACEAE
Parietaria debilis	Ptilotus drummondii
	Ptilotus polystachyus
CASUARINACEAE	GYROSTEMONACEAE
Allocasuarina fraseriana	Tersonia cyathiflora
Allocasuarina humilis	
Allocasuarina lehmanniana	PHYTOLACCACEAE
	Phytolacca octandra*
PROTEACEAE	
Banksia attenuata	AIZOACEAE
Banksia grandis	Carpobrotus edulis*
Banksia menziesii	Carpobrotus virescens
Banksia prionotes	Carpobrotus sp. nov.
Conospermum stoechadis	Tetragonia decumbens*
Conospermum triplinervium	
Dryandra nivea	PORTULACAEAE
Dryandra sessilis	Calandrinia corrigioloides
Grevillea thelemanniana	Calandrinia liniflora
Grevillea vestita	
Hakea costata	CARYOPHYLLACEAE
Hakea lissocarpha	Cerastrium glomeratum*
Hakea prostrata	Petrorhagia velutina*
Hakea ruscifolia	Spergularia sp.A aff. diandra*
Hakea trifurcata	Stellaria media*
Petrophile linearis	
Petrophile media	RANUNCULACEAE
Petrophile macrostachya	Clematis microphylla
Petrophile serruriae	
Petrophile sp	LAURACEAE
Stirlingia latifolia	Cassytha flava
Synaphea spinulosa	Cassytha glabella
	Cassytha racemosa
SANTALACEAE	
Exocarpos sparteus	BRASSICACEAE
Leptomeria preissiana	Cakile maritima*
Leptomeria empetriformis	Heliophila pusilla*
Santalum acuminatum	Raphanus raphanistrum*
	Matthiola incana*
	Stenopetalum robustum

DROSERACEAE	Pelargonium australe
Drosera erythrorrhiza	Pelargonium capitatum*
Drosera macrantha	
Drosera menziesii	OXALIDACEAE
	Oxalis corniculata*
CRASSULACEAE	
Crassula colorata	RUTACEAE
Crassula glomerata*	Eriostemon spicatus
Crassula sp	
PITTOSPORACEAE	POLYGALACEAE
Billardiera erubescens	Comesperma confertum
MIMOSACEAE	EUPHORBIACEAE
Acacia alata	Euphorbia terracina*
Acacia cochlearis	Phyllanthus calycinus
Acacia cyclops	Poranthera microphylla
Acacia huegelii	
Acacia lasiocarpa	STACKHOUSIACEAE
Acacia pulchella var glaberrima	Stackhousia pubescens
Acacia rostellifera	Tripterooccus brunonsis
Acacia saligna	
Acacia truncata	SAPINDACEAE
Acacia xanthina	Dodonaea aptera
	Diplopeltis huegelii
PAPILIONACEAE	
Bossiaea eriocarpa	RHAMNACEAE
Daviesia divaricata	Cryptandra mutila
Daviesia decurrens	Cryptandra pungens
Gompholobium shuttleworthii	Spyridium globulosum
Gompholobium tomentosum	Spyridium tridentatum
Hardenbergia comptoniana	Trymalium ledifolium
Hovea pungens	
Hovea trisperma	STERCULIACEAE
Isotropis cuneifolius	Guichenotia ledifolia
Jacksonia furcellata	Thomasia cognata
Jacksonia stricta	Thomasia triphylla
Jacksonia sternbergiana	
Kennedia prostrata	DILLENACEAE
Lupinus sp.*	Hibbertia cuneiformis
Medicago arabica*	Hibbertia huegelii
Melilotus indica*	Hibbertia hypericoides
Mirbelia spinosa	Hibbertia racemosa
Nemcia capitata	Hibbertia spicata subsp leptotheca
Nemcia reticulata	
Sphaerolobium medium	VIOLACEAE
Templetonia retusa	Hybanthus calycinus
Trifolium campestre*	
Trifolium sp*	THYMELEACEAE
	Pimelea ferruginea
GERANIACEAE	Pimelea leucantha
Erodium botrys*	Pimelea rosea
	Pimelea sulphurea

<i>Erodium moschatum</i> *	
<i>Geranium solanderi</i> *	
MYRTACEAE	LAMIACEAE
<i>Angonis flexuosa</i> *	<i>Hemiandra pungens</i>
<i>Baeckea robusta</i>	<i>Westringia dampieri</i>
<i>Calothamnus quadrifidus</i>	SOLANACEAE
<i>Calothamnus sanguineus</i>	<i>Anthocercis ilicifolia</i>
<i>Calythrix leschenaultii</i>	<i>Anthocercis littorea</i>
<i>Eremaea pauciflora</i>	<i>Solanum sodomaeum</i> *
<i>Eremaea</i> sp A	SCROPHULARIACEAE
<i>Eucalyptus "argutifolia"</i> ms	<i>Parentucellia latifolia</i> *
<i>Eucalyptus "petrensis"</i> ms	
<i>Eucalyptus decipiens</i>	MYOPORACEAE
<i>Eucalyptus foecunda</i>	<i>Eremophila glabra</i>
<i>Eucalyptus gomphocephala</i>	<i>Myoporum insulare</i>
<i>Eucalyptus marginata</i>	
<i>Eucalyptus todtiana</i>	OROBANCHE
<i>Kunzea ericifolia</i>	<i>Orobanche minor</i> *
<i>Leptospermum laevigatum</i> *	
<i>Leptospermum spinescens</i>	RUBIACEAE
<i>Melaleuca acerosa</i>	<i>Opercularia vaginata</i>
<i>Melaleuca cardiophylla</i>	
<i>Melaleuca huegelii</i>	CAMPANULACEAE
<i>Melaleuca scabra</i>	<i>Wahlenbergia preissii</i>
<i>Verticordia nitens</i>	
APIACEAE	LOBELIACEAE
<i>Daucus glochidiatus</i>	<i>Isotoma hypocrateriformis</i>
<i>Eryngium rostratum</i>	<i>Lobelia tenuior</i>
<i>Foeniculum vulgare</i> *	
<i>Hydrocotyle diantha</i>	GOODENIACEAE
<i>Hydrocotyle tetragonocarpa</i>	<i>Dampiera linearis</i>
<i>Platysace juncea</i>	<i>Dampiera</i> sp
<i>Trachymene pilosa</i>	<i>Goodenia berardiana</i>
<i>Trachymene</i> sp	<i>Lechenaultia linarioides</i>
<i>Xanthosia huegelii</i>	<i>Scaevola canescens</i>
EPACRIDACEAE	<i>Scaevola crassifolia</i>
<i>Acrotriche cordata</i>	<i>Scaevola nitida</i>
<i>Astroloma microcalyx</i>	<i>Scaevola paludosa</i>
<i>Astroloma pallidum</i>	<i>Scaevola thesioides</i>
<i>Conostephium pendulum</i>	<i>Verrauxia reinwardtii</i>
<i>Conostephium preissii</i>	STYLIDIACEAE
<i>Leucopogon insularis</i>	<i>Stylidium "maritima"</i> ms
<i>Leucopogon lasiostachyus</i>	<i>Stylidium brunonianum</i>
<i>Leucopogon parviflorus</i>	<i>Stylidium bulbiferum</i>
<i>Leucopogon polymorphus</i>	<i>Stylidium calcaratum</i>
<i>Leucopogon propinquus</i>	<i>Stylidium junceum</i>
<i>Leucopogon sprengelioides</i>	

Lysinema ciliatum

ASTERACEAE

Arctotheca calendula*

PRIMULACEAE

Brachycome bellidioides

Anagallis arvensis*

Calocephalus brownii

Carduus pycnocephalus*

LOGANIACEAE

Craspedia sp

Logania vaginalis

Helichrysum ayersii

Helichrysum cordatum

Hypochaeris glabra*

Ixiolaena viscosa

Lagenifera huegii

Millotia myositidifolia

Olearia axillaris

Olearia rudis

Podolepis lessonii

Podotrochea angustifolia

Quinetia urvillei

Senecio lautus subsp. dissectifolius

Senecio lautus subsp. maritimus

Senecio quadridentatus

Sonchus oleraceus*

Ursinia anthemoides*

Waitzia citrina

Waitzia suaveolens

**METROPOLITAN REGION SCHEME
YANCHEP AREA AMENDMENT
ENVIRONMENTAL ASSESSMENT**

ALAN TINGAY & ASSOCIATES

OCTOBER 1993

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