

CAVERSHAM AIRBASE BUSHLAND, WEST SWAN/WHITEMAN

Boundary Definition: protected area boundary

SECTION 1: LOCATION INFORMATION

Bush Forever Site no. 200

Area (ha): bushland 97.0

Map no. 37

Map sheet series ref. no. 2034-II NE

Other Names: Submission Area 199

Local Authorities (Suburb): Shire of Swan (West Swan)

SECTION 2: REGIONAL INFORMATION

LANDFORMS AND SOILS

Pinjarra Plain

Guildford Formation (Qpa: Mgs1)

Bassendean Dunes

Bassendean Sands (Qpb: S8)

Bassendean Dunes/Pinjarra Plain

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

VEGETATION AND FLORA

Vegetation Complexes

Combinations of Bassendean Dunes/Pinjarra Plain

Southern River Complex

Floristic Community Types

Supergroup 2: Seasonal Wetlands

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

S2 Northern *Pericalymma ellipticum* dense low shrublands

S7 Northern woodlands to forests over tall sedgelands alongside permanent wetlands

Supergroup 3: Uplands centred on Bassendean Dunes and Dandaragan Plateau

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

REGIONAL WETLANDS

Wetland Types: palusplain, sumpland, artificial channel

Natural Wetland Groups

Bassendean—Pinjarra transition OR Bassendean with fluvial features

Bennett Brook (B/P.4)

Wetland Management Objectives: Resource Enhancement, Multiple Use

Swan Coastal Plain Lakes EPP: none identified

THREATENED ECOLOGICAL COMMUNITIES

Not assessed, Not determined

SECTION 3: SPECIFIC SITE DETAIL

Landscape Features: vegetated uplands, vegetated wetlands

Vegetation and Flora: limited survey (DEP 1996 (Cavs 02, 06–07, 09–11))

Structural Units

Uplands: *Eucalyptus marginata* Woodland to Open Woodland over *Banksia attenuata* and *B. menziesii* Low

Woodland; *Eucalyptus calophylla* Tall Woodland

Wetlands: *Melaleuca raphiophylla* and *Eucalyptus rudis* Closed Forest; *Melaleuca preissiana* Low Woodland;

Hypocalymma angustifolium and *Pericalymma ellipticum* Open Low Heath

Scattered Native Plants: not assessed

Vegetation Condition: >60% Very Good, <40% Good to Degraded, with areas of severe localised disturbance

Total Flora: 110 native taxa, 33 weed taxa (plot-generated list, DEP 1996)

Significant Flora: *Kunzea* aff. *recurva* (GJK 12828), *Burchardia bairdiae*

Fauna: not known

Linkage: adjacent native vegetation to the north and west; part of Greenway 39 (Tingay, Alan & Associates 1998a)

Other Special Attributes: contains area of significant undeveloped remnant vegetation and/or regional open space identified by Semeniuk, V&C Research Group (1992)

SECTION 4: INTERNATIONAL AND NATIONAL SIGNIFICANCE

Not listed

SECTION 5: SELECTION CRITERIA AND RECOMMENDATIONS

Criteria: Representation of ecological communities, Rarity, General criteria for the protection of wetland, streamline and estuarine fringing vegetation and coastal vegetation, Criteria not relevant to determination of regional significance, but which may be applied when evaluating areas having similar values

Recommendation: Site with Some Existing Protection; the existing care, control and management intent of reserve is endorsed (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. 200 **Map no.** 47 **Map sheet series ref. no.** 2034-II NE

Other Names

Area (ha): total 139.4; bushland 97.0

Submission Area 199

Local Authorities (Suburb)

Zoning

Shire of Swan (West Swan)

MRS: Parks and Recreation, Important Regional Roads

TPS: Rural

Ownership Categories

Lot/Location/Reserve numbers (Purpose),

Commonwealth Government

Street name

1 Harrow St

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LANDFORMS AND SOILS

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Fauna: no known information

Linkage: adjacent native vegetation to the north and west; part of proposed Greenway 40 (Tingay, Alan & Associates 1997a)

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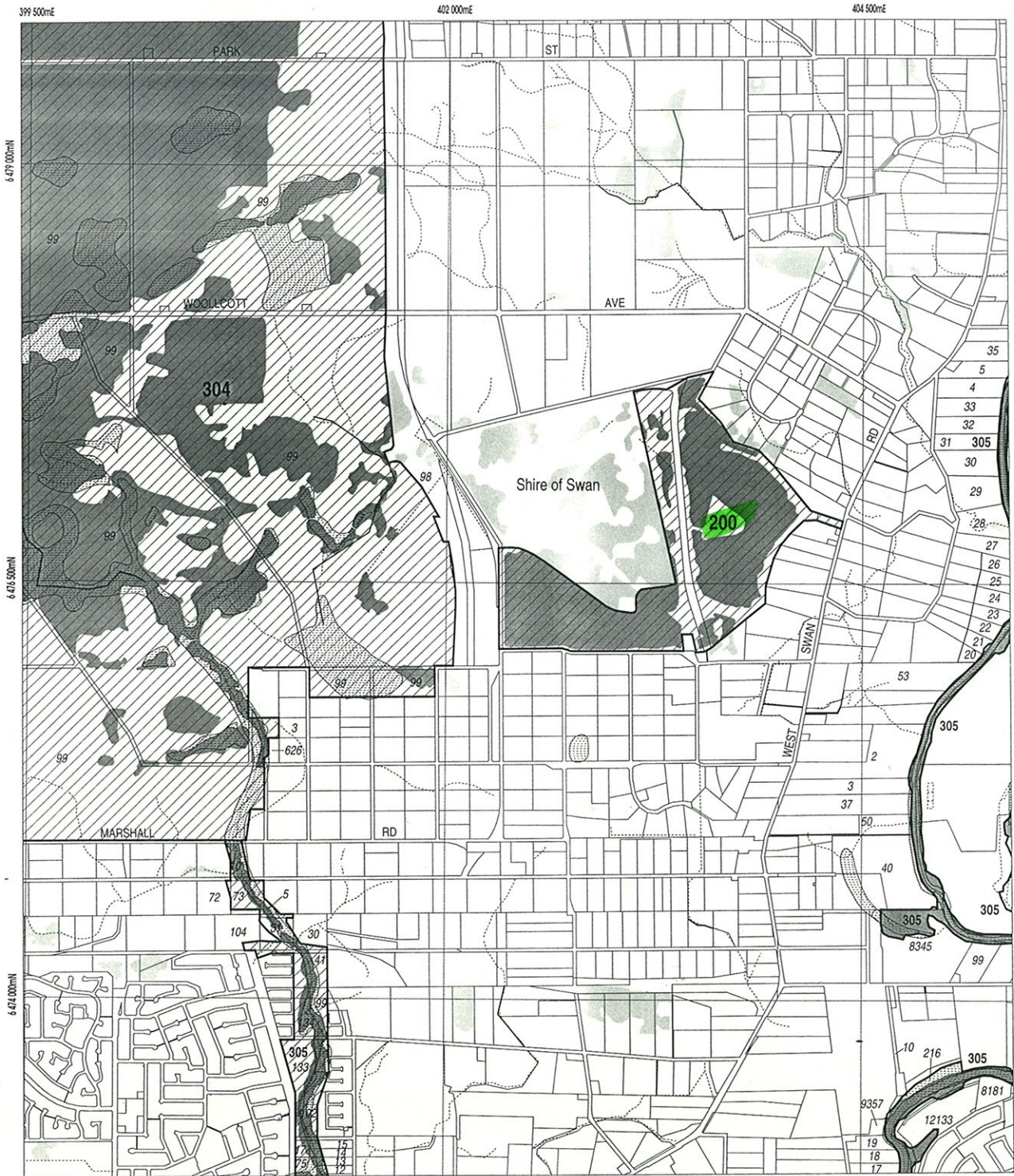
Opportunities and/or Constraints

Opportunities: Bushplan Site/part Bushplan Site subject to Swan and Canning Rivers EPP; under MRS Parks and Recreation Reservation

Constraints: under MRD regional road requirements, General Mineral Resource Area (clay)

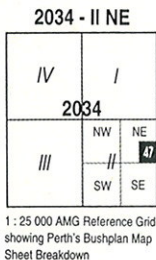
Recommendation: The most appropriate mechanism for the protection of this Bushplan Site be considered through the public comment period in consultation with the land owner(s). This may include parts for which — The existing care, control and management intent of the reserve is endorsed. Long-term security and support for conservation management of the Bushplan Site to be enhanced by: amending the purpose of the reserve to include conservation; and applying appropriate mechanisms in consultation with the reserve management body.





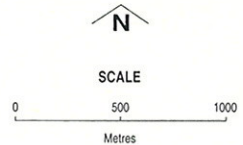
LEGEND

- 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

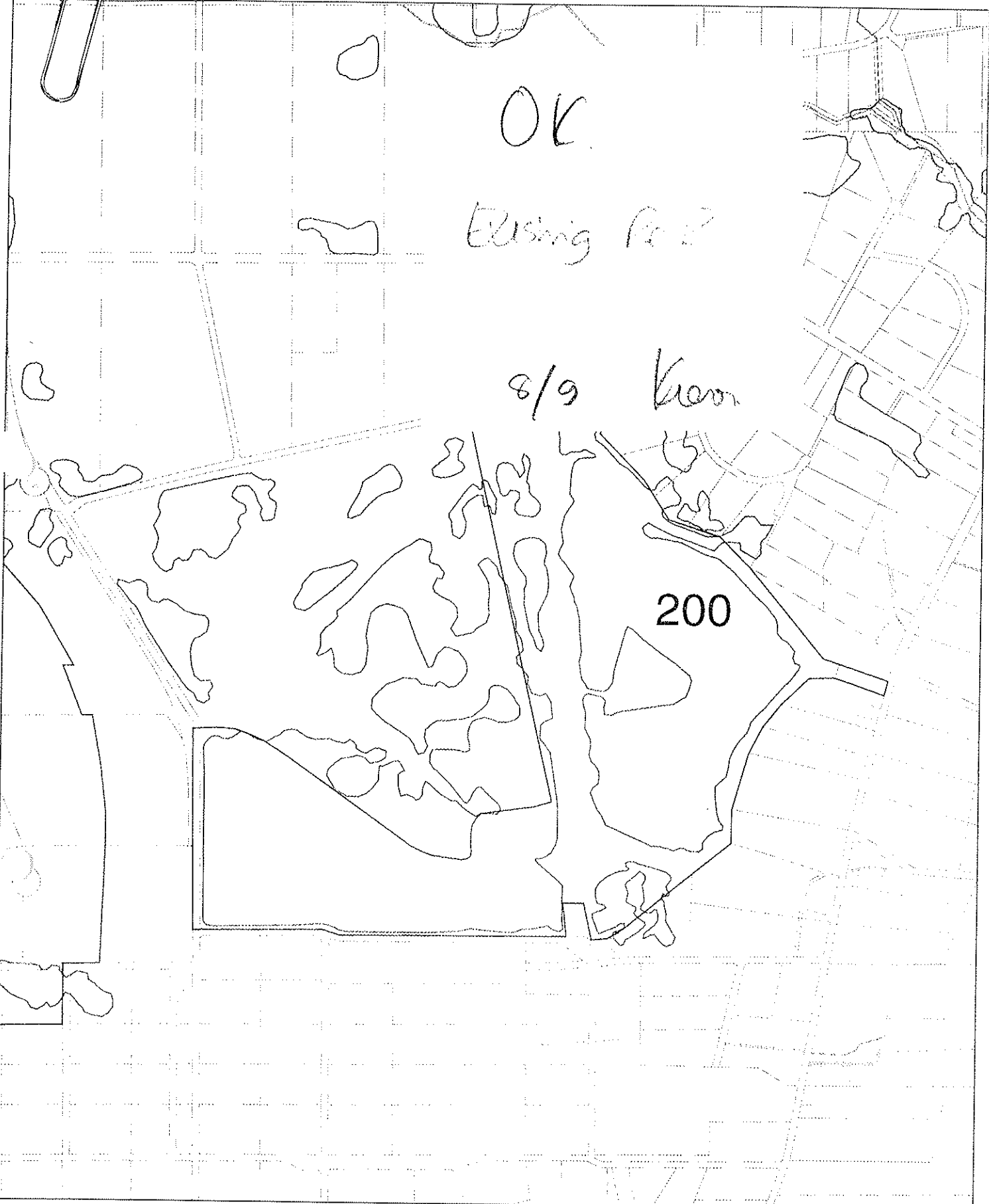


PERTH'S BUSHPLAN MAP INDEX

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Produced by Project Mapping Section
 Land Information Branch, Ministry for
 Planning, Perth W.A. November 1998
 ntw-map11/enviros/bushplan/bushv2_47.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

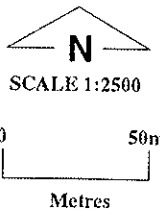


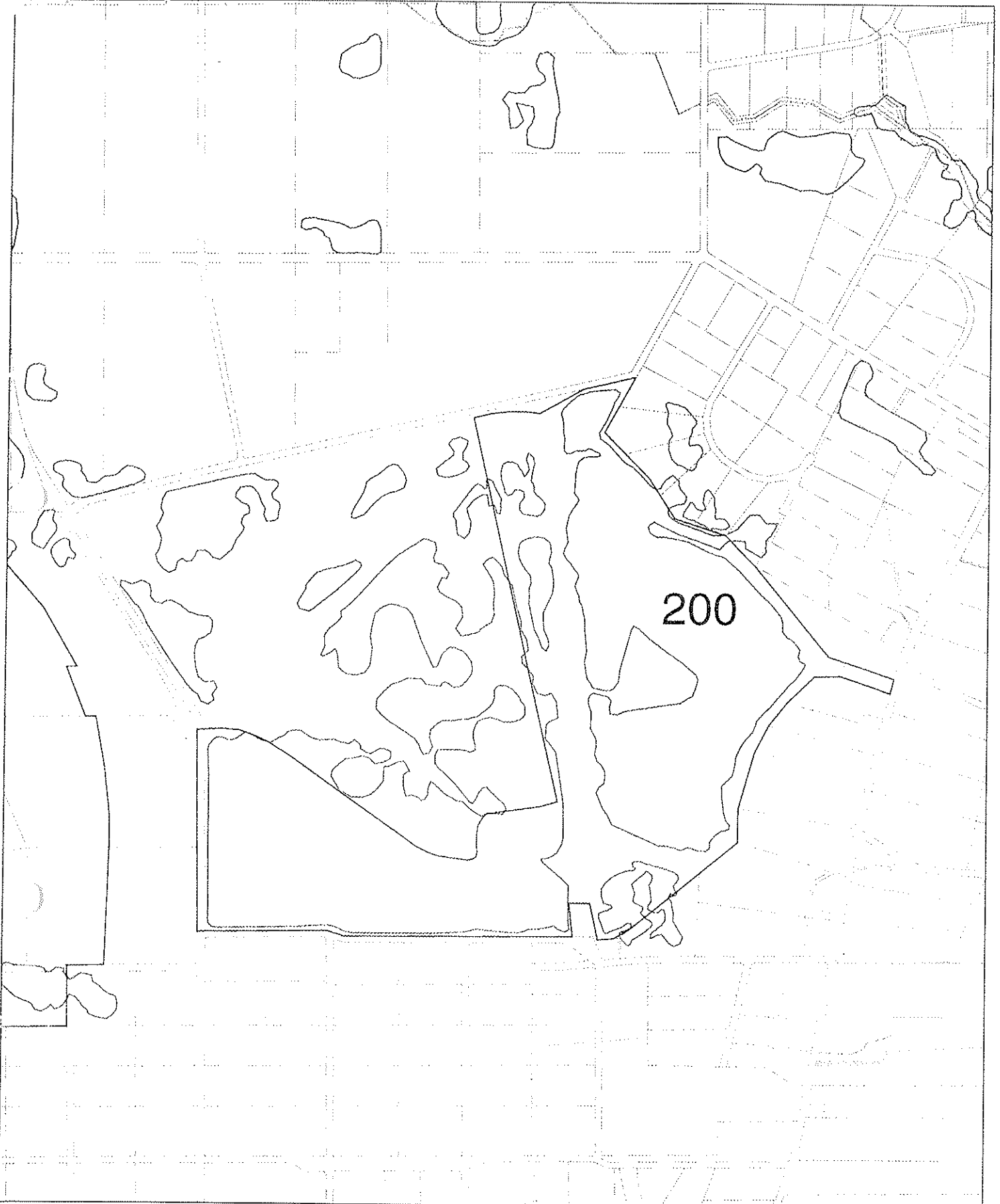
WESTERN
AUSTRALIAN
PLANNING
COMMISSION



CUSTOMER
FOCUS
WESTERN AUSTRALIA

Whiteman Park
This is the
proposed P&R
boundary BY WHO?
B Tc/BK 22/10/06





BUSHPLAN SITES CORRECTED

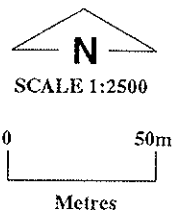


WESTERN
AUSTRALIAN
PLANNING
COMMISSION






CUSTOMER
FOCUS
WESTERN AUSTRALIA

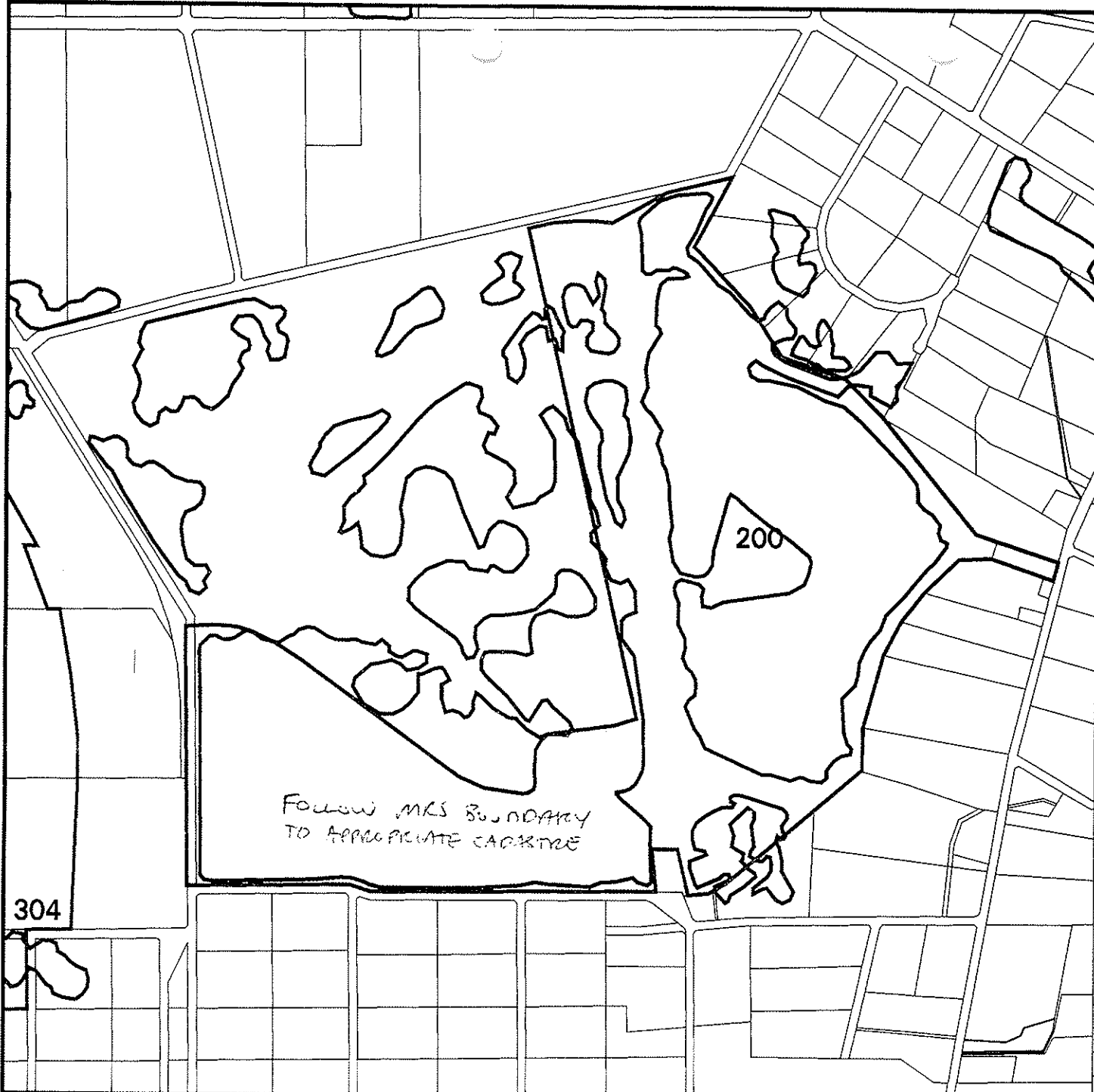
*This is the
proposed P&R
boundary*



bp site 200

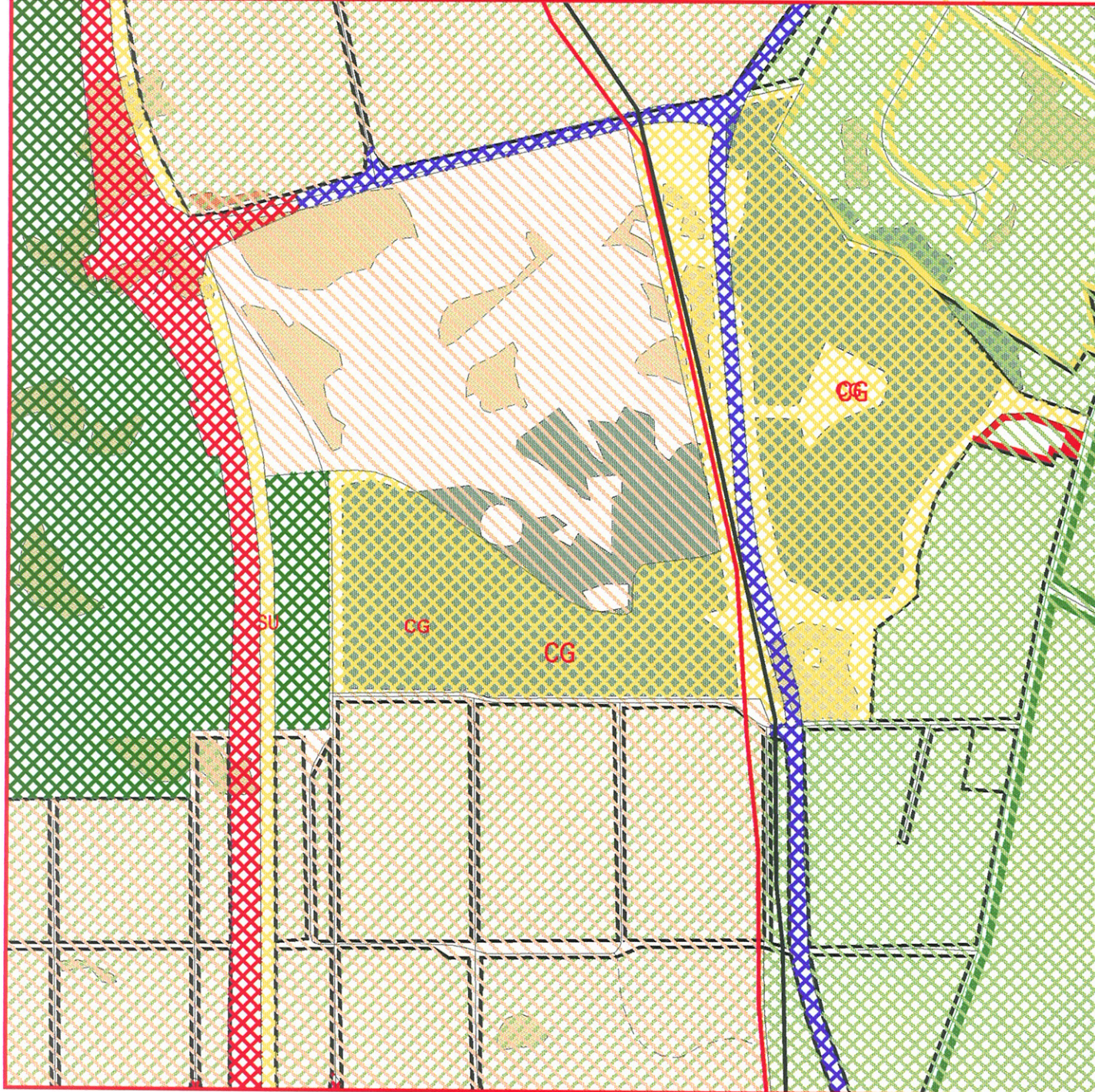
"SECURE" P&R

-  AG VEG 1998 BOUNDARY THEME
-  Cadastre
-  Bushplan sites refno 1-500 SCP BOUNDARY



MFP INTERNAL USE ONLY
Prepared By: Andrea Zappacosta
Prepared For:
Map Ident: plot980526_1
Date: 26 May 98
Scale 1: 13539

Caversham Town planning scheme



- VERY POOR CONDITION
- POOR CONDITION
- GOOD CONDITION
- Unclassified Road
- Private Road
- Urban Arterial
- WANG Pipeline
- Natural Gas Pipeline
- TPE
- TPE
- UPI
- RU
- PA
- CO
- IM
- PP

Swan Z 9

- SPECIAL RURAL
- GENERAL RURAL
- SWAN VALLEY RURAL
- CARAVAN PARK
- SPECIAL PURPOSE CONVENIENCE STORE
- PARKS & RECREATION
- CONTROLLED ACCESS HIGHWAYS
- IMPORTANT REGIONAL ROADS
- PP - COMMONWEALTH GOVERNMENT







MFP INTERNAL USE ONLY

Prepared By: barbara pedersen
 Prepared For: Kevin McAlpine
 Date: 11 Aug 95 Scale 1: 15816
 Map Ident: plot950811 2

Caversham

Remnant veg, cadastre and wetlands



-  VERY POOR CONDITION
-  POOR CONDITION
-  GOOD CONDITION
-  EPA System 6
-  Gngangara Mound EPP
-  Unclassified Road
-  Private Road
-  Urban Arterial
-  WANG Pipeline
-  Natural Gas Pipeline
-  BASIN WETLAND
Sumpland
Seasonally Inundated
-  CHANNEL WETLAND
River
Permanently Indundated
-  FLAT WETLAND
Palusplain
Seasonally Waterlogged Flat
-  HIGHLAND
-  ARTIFICIAL CHANNELS
-  CREEKS
-  Cadastre

MFP INTERNAL USE ONLY

Prepared By: barbara pedersen

Prepared For: Kevin McAlpine

Date: 11 Aug 95

Scale 1: 15816

Map Ident: plot950811 1

4. Bushplan site 385: Reid Hwy Bushland

Recently *Eleocharis sphacelata* was discovered at this site, the most southerly distribution of this species known, with the next population at Gin Gin. Vesting for this area needs to be established so that appropriate management for conservation can occur. The Bennett Brook Catchment group will be active in the eastern end of the reserve in the near future, as the RSPCA are establishing a centre there, and have requested the assistance of the catchment group in implementing a rehabilitation plan.

5. Bushplan site 201: Koondoola Open Space

The area needs to be zoned for conservation, and the local councils need to take an active management role in the reserve

6. Bushplan site 307: Lightning Swamp

A Management Plan was prepared for this area by Murdoch University in 1996, however it is difficult for management to occur until a local council accepts vesting. At present the boundaries of Swan and Bayswater Councils may change, and neither council will accept vesting until this is determined. This needs to be resolved immediately, as the eastern section is not fenced, and four wheel drive vehicles are rapidly degrading the perched wetland.

7. Bushplan site 400: Victoria Rd Bushland

The zoning of this site needs to urgently be changed to conservation, and a management body appointed.

8. Bushplan site 200: Caversham Airbase

A report on vegetation and fauna was published in 1998 Final Report: Henley Brook and West Swan Landcare Project, Bevan Carter. This area is under threat from housing from Homeswest, and requires immediate protection. It contains the priority 3 species *Restio stenostachyus*.

9. Bushplan site 302: Swan River Bassendean to Upper Swan

The catchment group have recently enlarged their boundaries to include this area, and are keen to work with landholders to extend the riparian vegetation buffer

10. Bushplan site 205: Bennett Brook

The catchment group has 3 restoration areas along the brook, which is an extremely important wildlife corridor between Whiteman Park and the Swan River. It is under threat from new subdivisions which are too close to the brook, allowing only a 30m buffer. Often these are opposed by the Shire and won on appeal to the Minister. It is vital that buffers on all wetland systems are increased to 100m. Other pressures include proposed developments at Whiteman Park on the edge of the brook, pumping from the Gngangara mound leading to decreased flow in the headwaters and increased polluted stormwater flow carrying sediment from council and Water Corporation drains into the Brook. Apart from the Quenda, Bennett Brook supports freshwater mussels as well as many species of native fish (Report from Murdoch University 1998)

Department of Environmental Protection System 6 Update: Site Based Flora List for Caversham Airbase (Subm no. 199)

(~~254~~ taxa, Cavs01, 02, 06, 07, 09-11, B.J. Keighery, 11/6/96)

149

Anthericaceae

- 1 Chamaescilla versicolor
- 2 Sowerbaea laxiflora
- 3 Thysanotus arbuscula
- 4 Thysanotus sp. manglesianus/patersonii scps
- 5 Thysanotus thyrsoides
- 6 Tricoryne elatior
- 7 Tricoryne tenella

*Some deducted as
only in excluded
area.*

Apiaceae

- 8 Homalosciadium homalocarpum
- 9 Trachymene pilosa

Asparagaceae

- * Myrsiphyllum asparagoides

Asteraceae

- * Arctotheca calendula
- * Conyza sp. scps
- 10 Gnaphalium sphaericum
- 11 Hyalosperma cotula
- 12 * Hypochaeris glabra 1
- 13 Lagenifera huegelii
- 14 Podolepis gracilis
- 15 Quinetia urvillei
- 16 Siloxerus humifusus
- * Sonchus oleraceus 2
- * Ursinia anthemoides 3
- * Vellereophyton dealbatum 4

Campanulaceae

- * Wahlenbergia capensis 5
- 6 Wahlenbergia preissii

Caryophyllaceae

- * Petrorhagia velutina 6

Casuarinaceae

- 7 Allocasuarina humilis

Colchicaceae

- 8 Burchardia bairdiae

- 7 Burchardia congesta
- 20 Burchardia multiflora

Cyperaceae

- 1 Baumea juncea
- 2 Cyathochaeta avenacea
- 3 Cyathochaeta clandestina
- 4 Isolepis marginata
- 5 Lepidosperma angustatum
- 6 Lepidosperma longitudinale

Dasypogonaceae

- 7 Dasypogon bromeliifolius
- 7 Lomandra caespitosa
- 7 Lomandra hermaphrodita
- 30 Lomandra suaveolens

Dilleniaceae

- 1 Hibbertia huegelii
- 2 Hibbertia hypericoides
- 3 Hibbertia racemosa

Droseraceae

- 4 Drosera erythrorhiza
- 5 Drosera gigantea
- 6 Drosera glanduligera
- 7 Drosera neesii
- 8 Drosera nitidula
- 9 Drosera pallida

Epacridaceae

- 40 Conostephium pendulum
- 1 Conostephium preissii

Euphorbiaceae

- 2 Poranthera microphylla

Goodeniaceae

- 3 Dampiera linearis
- 4 Goodenia pulchella
- 5 Lechenaultia expansa

Haemodoraceae

- 5 Anigozanthos humilis
- 7 Conostylis juncea
- 8 Haemodorum sp. scps

- ♀ Phlebocarya ciliata
- 50 Tribonanthes australis

Iridaceae

- * Gladiolus caryophyllaceus ?
- * Homeria flaccida ♂
- 1 Patersonia occidentalis
- 2 Patersonia occidentalis (swamp form) sthst
- * Romulea rosea ♀
- * Sparaxis bulbifera ♀

Juncaceae

- * Juncus bufonius "
- 3 Juncus pallidus

Lamiaceae

- 4 Hemiandra pungens

Mimosaceae

- 5 Acacia huegelii
- 6 Acacia incurva
- * Acacia longifolia scps 12
- 7 Acacia saligna
- 8 Acacia willdenowiana

Myrtaceae

- 9 Astartea aff. fascicularis sthst
- 60 Calytrix flavescens
- 1 Eremaea pauciflora
- 2 Eucalyptus calophylla
- 3 Eucalyptus marginata
- 4 Eucalyptus rudis
- 7 Hypocalymma angustifolium
- 6 Hypocalymma robustum
- 7 Kunzea littericola "white" scps
- 8 Melaleuca preissiana
- 9 Melaleuca raphiophylla
- 70 Melaleuca sp. B FPR (BJK&NG 054)
- 1 Melaleuca viminea
- 2 Pericalymma ellipticum
- 3 Scholtzia involucrata
- 4 Verticordia densiflora

Oleaceae

- * Olea europaea 13

Orchidaceae

- ✓ Caladenia flava
- ✓ Elythranthera brunonis
- ✓ Eriochilus dilatatus
- ✓ Leporella fimbriata
- * Monadenia bracteata 14
- Pterostylis vittata

Papilionaceae

- ✓ Bossiaea eriocarpa
- 30 Daviesia triflora
- 1 Gompholobium tomentosum
- 2 Hovea trisperma var. trisperma
- 3 Isotropis cuneifolia
- 4 Jacksonia furcellata
- ✓ Jacksonia sternbergiana
- * Lotus angustissimus 15
- * Lupinus sp scps 16
- * Medicago polymorpha 17
- ✓ Nemcia capitata
- 7 Sphaerolobium vimineum
- * Trifolium campestre 17
- * Trifolium repens 19
- * Trifolium sp. scps 20

Phormiaceae

- 8 Dianella revoluta

Poaceae

- * Aira caryophyllea 21
- * Anthoxanthum odoratum 22
- * Briza maxima 23
- * Briza minor 24
- * Bromus diandrus 25
- 7 Danthonia occidentalis
- * Ehrharta calycina 26
- * Ehrharta longiflora 27
- * Lolium rigidum 28
- 90 Microlaena stipoides
- * Pentaschistis airoides 29
- * Poa annua 30
- 1 Stipa compressa
- * Vulpia bromoides 31
- * Vulpia myuros 32

Primulaceae

- * Anagallis arvensis 33

Proteaceae

- ✓ Banksia attenuata

- 3 Banksia ilicifolia
- 4 Banksia menziesii
- 5 Dryandra nivea
- 6 Petrophile linearis
- 7 Stirlingia latifolia

Restionaceae

- 8 Alexgeorgea nitens
- 9 Hypolaena exsulca
- 10 Loxocarya fasciculata
- 1 Loxocarya flexuosa
- 2 Lyginia barbata
- 3 Restio stenostachyus

Rutaceae

- 4 Eriostemon spicatus

Scrophulariaceae

- 5 Gratiola peruviana

Stylidiaceae

- 6 Stylidium brunonianum
- 7 Stylidium calcaratum
- 8 Stylidium carnosum
- 9 Stylidium guttatum
- 10 Stylidium repens

Xanthorrhoeaceae

- 1 Xanthorrhoea brunonis
- 2 Xanthorrhoea preissii

Department of Environmental Protection System 6 Update in conjunction with
Bevan Carter and volunteers: Site Based Flora List Caversham Airbase
(Cavs01-02, 06-11, B.J. Keighery, 16/4/96) 149 taxa

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- Sphaerolobium vimineum
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- * Trifolium repens
- * Trifolium sp. scps

Phormiaceae

- Dianella divaricata

Poaceae

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- * Anthoxanthum odoratum
- * Briza maxima
- * Briza minor
- * Bromus diandrus
- Danthonia occidentalis
- * Ehrharta calycina
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- * Lolium rigidum
- Microlaena stipoides
- * Pentaschistis airoides
- * Poa annua
- Stipa compressa
- * Vulpia bromoides
- * Vulpia myuros

Primulaceae

- * Anagallis arvensis

Proteaceae

Banksia attenuata
Banksia ilicifolia
Banksia menziesii
Dryandra nivea
Petrophile linearis
Stirlingia latifolia

Restionaceae

Alexgeorgea nitens
Hypolaena exsulca
Loxocarya fasciculata
Loxocarya flexuosa
Lyginia barbata
Restio stenostachyus

Rutaceae

Eriostemon spicatus

Scrophulariaceae

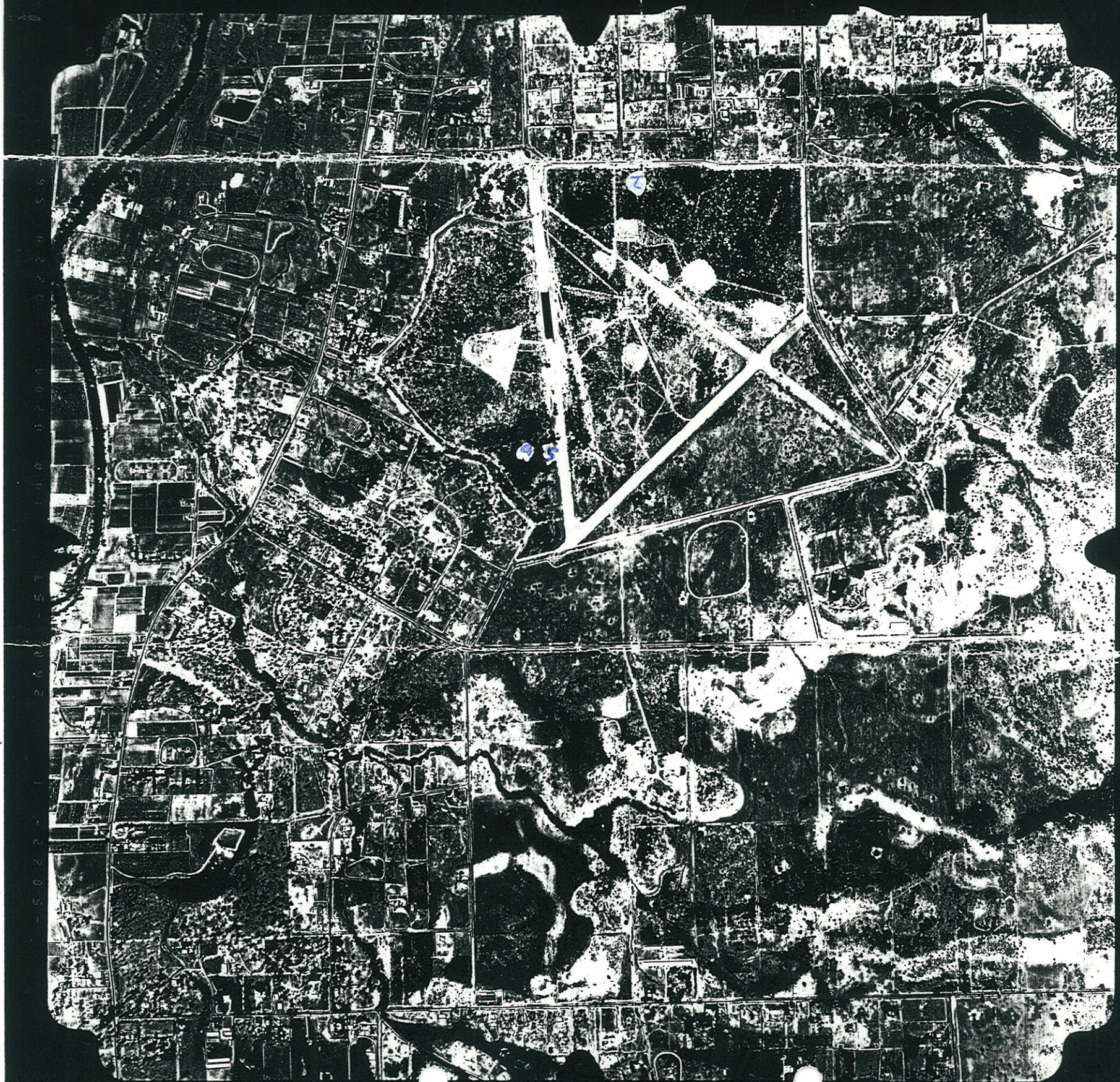
Gratiola peruviana

Stylidiaceae

Stylidium brunonianum
Stylidium calcaratum
Stylidium carnosum
Stylidium guttatum
Stylidium repens

Xanthorrhoeaceae

Xanthorrhoea brunonis
Xanthorrhoea preissii



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 Caversham Airbase

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: Yorrlledean, Lord St, HANROW ST

b) Nearest Corner: Those three corners

c) Lot Number: Street Number:

d) ~~Town/Suburb~~/Location: West Swan

e) Local Council: Swan

f) Site Name (if any): as above

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

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

.....

i) Map: Streetsmart /UBD/Other:

j) Map no.:

k) Grid Ref:

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

.....

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

MRS 950/33 only.

no development APPROVALS - Still under Commonwealth title.

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

changing over within years.

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)

Commonwealth - then into State Ownership soon.

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) MRS 950,133

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)

refer attachment.

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

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? Southern wood Vegetation Significant from Semenuks Environmental Report.
(refer to attachment)

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

If yes, what kind of a wetlands is it?

- a) lake
- b) river
- c) stream
- d) swamp
- e) estuary
- f) seasonally wet
- g) other

Huge Drainage System from properties north of yard area & going into Springs in Airbase into Whiteman Park - this is the feeder into 'Horse Swamp'!

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

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.

Area not habitated - Greenbelt for Kangaroos etc into Whitehouse Park.

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

ROIU - (Bird) (many surveys over area and w/Park) as part of an Australian Grant.

If yes, please give details of the work

Part of National Landcare Grant of Henbury Brook Locality Group.

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 None from this group.
- 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)

Do you know what they are?

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

Abundance of variety of animals! Trapping being done.
Can you list those you know of? (birds, mammals, reptiles, amphibians etc)

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? across the Road
into Whiteman Park.

Are they already conservation reserves? Not Reserved as yet.

What is their approximate size? ?

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.

Table 2: Vegetation Condition Scale

Modified from Trudgen 1991 by B. J. Keighery for the Swan Coastal Plain Survey 1993.

1 = 'Pristine'

Pristine or nearly so, no obvious signs disturbance.

2 = Excellent

Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species

For example damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.

3 = Very Good

Vegetation structure altered, obvious signs of disturbance.

For example disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.

4 = Good

Vegetation structure significantly altered by very obvious signs of multiple disturbance.

Retains basic vegetation structure or ability to regenerate to it.

For example disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.

5 = Degraded

Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management.

For example disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.

6 = Completely Degraded

The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.

These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.

Source: B Keighery. Bushland Plant Survey, September 1994

Caversham Airbase.

This Area is significant for a number of reasons.

Most importantly, not been habitated for 50 years, never used for the purpose.

Built for evacuation during war and for use as the Guildford Airfield, delivering stocks etc. It has a area of runways, that are used for training of Police and emergency services in pursuit training.

All the taxiways, have grown over.

Significant Vegetation

National Landscape Grant over 5 years, by the Henley Brook Locality Group via the Swan Valley Raters Association.

An integrated grant showing: plant identification, flora and fauna, hydrological lines with an educational basis, with environmental science 3rd-6th year students using the practical experience as part of their course. Remapping using GIS systems. This area is part of the study.

Plant identification is being conducted by regional botanist and catalogued with the WA Herbarium in Perth.

Quite significant plants have been identified

as the first part of the Grant.

This can also assist 'Whiteman Park' in their educational conservation study.

Saithenwood vegetation and Woodland.

Christine Semencuk's report of the NE Corridor stated that this vegetation if not pristine, was in extremely good condition. She did not study the Area, in her brief, but as passing unenclosed and bordering Areas.

Her view was that if the Jandakot Area was lost to this vegetation through urban development, this area was the only type left in the metropolitan Area.

The Benefit of this Area, is Whiteman Park to the West and rural living surrounding the Area.

Caversham Embase is also a greenbelt corridor for animals passing between the two Areas of the 'base and Park'!

Animal Identification

The Grant has not started as yet, for animal identification, however, there is a large breeding group of 'Black Gloved Wallabies', Bandicoots of all types, Migratory Kangaroos, crossing too and fro, and types of lizards, snakes and birds breeding in the Area.

Groundwater system

The Curbase is part of an integral network of natural drainage systems, springs and in part the northern section of the 'Base' has a underground spring, that is the feeder from properties across the road (Yuledeem) that is the main feeder into 'Horse Swamp' in Whiteman Park, that in turn feeds into Bennett Brook.

This system is important as the flusher, so to speak, making Horse Swamp one of the only 'wet lakes' in the metropolitan area, that is used by birds for breeding, feeding.

This is also used by fish spawning and into Bennett Brook and the Swan River.

Swan Valley Legislation

Communities in Henley Brook have been pushing, for this Area ('Base') to be included in the 'Case B' of the Swan Valley.

Making a Greenbelt from Whiteman Park into the Swan Valley

- having Conditions that are included in Case B!

Representation has been made to the Upper House Committee looking into the proposed legislation, by members of the Henley Brook Locality Group, and Ratepayers Association in the Swan Valley.

Their decision for the legislation was stood over for 3 months to look at this proposal and help protect the 'Base', and to be included into the Conservation Area of Whiteman Park.

The proposal Swan Valley legislation goes to the Spring sitting (around October 1995).

I feel because of the significance of
Whiteman Park, Bennett Brook, The Aubase,
all these areas are related and connected
together, through their water systems,
the EPA should do a very comprehensive
study to support this area which could
be quite unique.

Original Significance

The Aubase is used by The Independent all
aboriginal School in Harrow Road being
'Culunga School,' which has won awards for
the type of school it is.

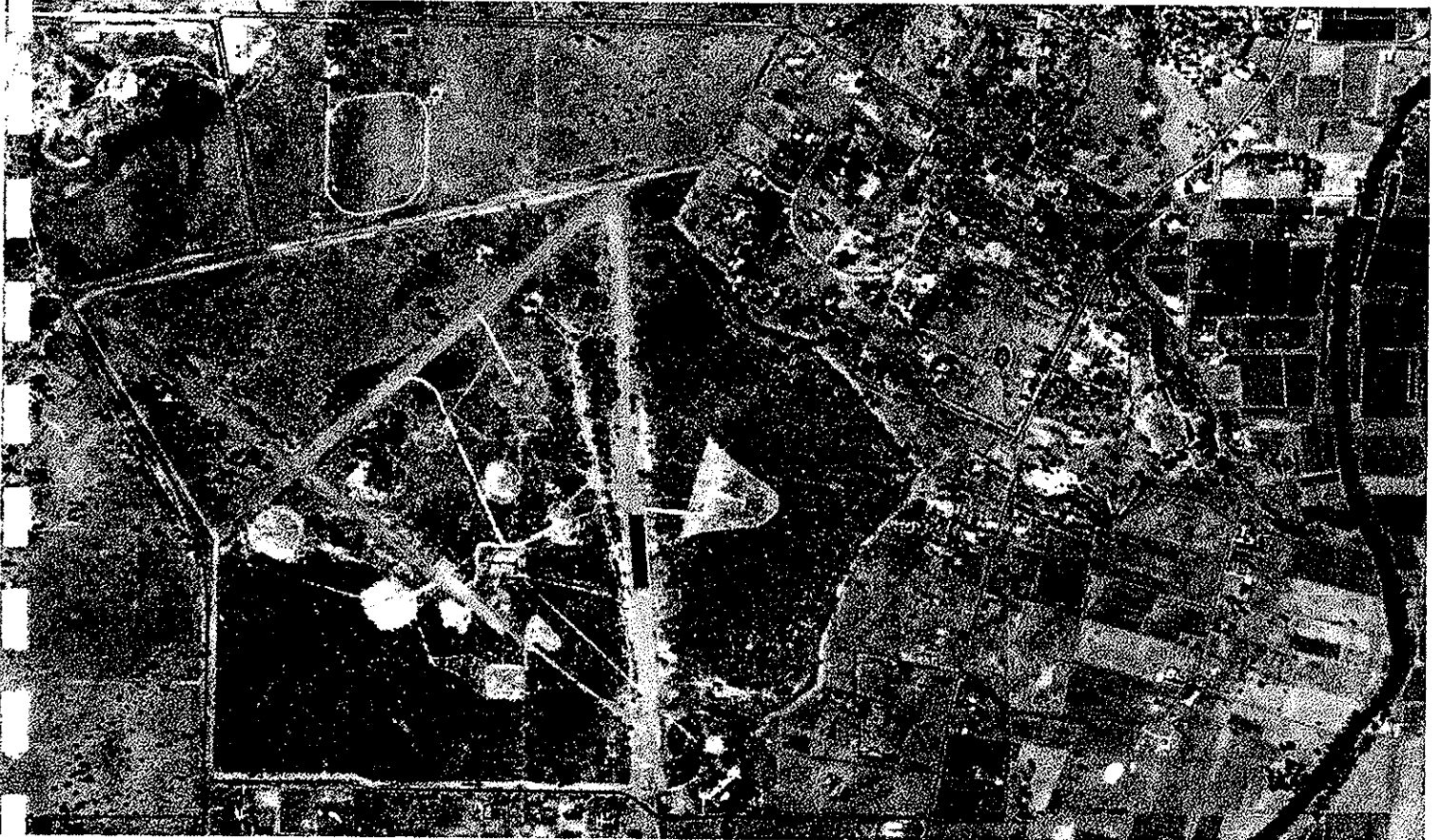
Part of their curriculum in all age groups,
is to use the vegetation, tracks, birds, animals,
and water, for aiding the children in their
heritage, found at the Caversham Aubase.

NB

The National Landcare Grant is from Gungahlin Road, in the North, Reid Highway in the South, Whiteman Park to the West and The Swan River to the East.

The Success Hill Action Group also a Landcare Grant, looking at Areas South of Reid Highway, specifically Bennett Brook region and including knowledge of plant and animal identity, cat hair, water remapping etc. This group is being helped by the Swan Valley Noongars in Caversham, and their knowledge of the Area.

Caversham Airfield Base Report



By Bevan Carter

For Henley Brook and West Swan Landcare Project

May 1996

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Bronwen Keighery for her skills and the technical knowledge she provided
Jan Gathe for assistance in identifying plants at the herbarium and on site
Mollie Dowdall for her dedication, talent and continued support
Ben de Haan for his enthusiasm and meticulous work in preparing and displaying our specimens.
Peter Melling for assistance with identifying birds.
Lyn Dunstan for assistance with identifying plants

The project owes much to these volunteers who donated their time throughout the year:

Eileen Bouwman
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Ken Lydon
Kevin Parker
Rick Wishart
Glenn Sander
Jennifer Catalano
Sue Hurt

Thanks also to eight young people, participants from the LEAP project, who spent one day mapping a quadrat.

I am grateful to the School Principal and Penny Voss of the Foothills School for providing a place for the group to work on our collection of specimens and for allowing us to store our growing herbarium at the school.

Bevan Carter

HENLEY BROOK AND WEST SWAN LANDCARE PROJECT

CAVERSHAM AIRFIELD BASE REPORT

1. HISTORY OF STUDY AREA 1829-1996

The present day Caversham airfield base is located on land first granted to Edward Barrett-Lennard in 1829, later acquired and farmed by Edward Barrett-Lennard in the early years of the Swan River Colony. Specifically, the study area cuts across the original location H and half of G.1 some 800 metres behind the site of Edward Barrett-Lennard's original barn and gardens and about 300 metres west of the main road. (See cover aerial photo)

Edward Pomeroy Barrett-Lennard travelled from England to the Swan River Colony on the *Marquis of Anglesea* arriving on 23 August 1829 accompanied by his six servants. On 15 October he was assigned lot G.2 comprising 200 acres in West Swan and appeared to have moved immediately to his allotment and began effecting improvements to his land such as fencing, clearing and erecting buildings.

Captain Charles Freemantle gave an interesting insight into Barrett-Lennard's life in a diary entry for September 5th 1832.

I went on to a Mr Lennard's estate. A young man of good family, son of the Member for Essex, Sir Thomas Barrett-Lennard,¹. He has done more than any of the settlers, having cleared a great deal; has a good stock of cattle and his land is well fenced in. His own house is a miserable place, but he is wise enough to live a little in the rough at first, and employs his means on the improvement of his land; he is a well educated gentlemanly young man. Most of his early life has been spent running about the Continent and the change now to that of a settler is as different as can well be imagined, but he is doing well, is hard working and industrious and I have no doubt of his ultimate success. He has some good crops of wheat coming on, which looks well."

¹ In actuality his brother, not father, was the Member for Essex

John Septimus Roe's eye sketch of Swan River landholdings made in 1829 shows the property to the south, location H as being assigned to the Colonial Surgeon, C.H. Simmonds, who did not perform the preliminary formalities. Barrett-Lennard requested this lot as part of his grant and, with the permission of Stirling, performed the location duties for this area as well as G.2². Lots G.2 and H totalling 4834 acres were officially amalgamated on 18 March 1836 as Swan Location H and the combined property became known as *St. Leonards*, the name Barrett-Lennard originally gave to location G.2. Late in 1836 Edward went back to England and married Elizabeth Graham in September 1837 returning to the colony on 2 May 1839 accompanied by his bride.

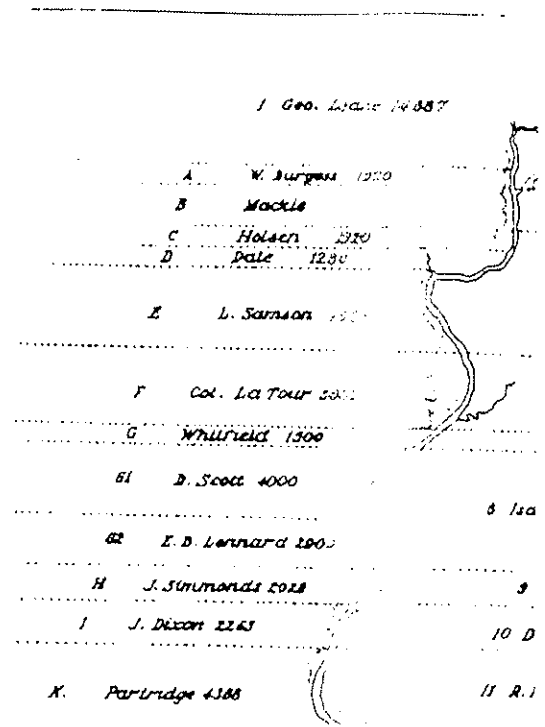


Figure 1 Sketch of landholdings at the West Swan

The lot on the northern boundary, G.1 (4000 acres), had initially been assigned to the assistant harbour master at Fremantle, Captain Daniel Scott. On May 8 1839 Scott surrendered the 3400 acres furthest from the river to the Crown and sold the 600 acres adjacent to the river to Barrett-Lennard. After performing the location duties Barrett-Lennard received full freehold title on 14 April 1840, and re named the property *Cossington Farm* after his wife's family home in Somerset.

The 1842 map of the proposed new road to Cruise's Mill drawn by Philip Chauncey, then colony surveyor, clearly shows Barrett-Lennard's barn, garden and paddock adjacent to the river between *St. Leonard's Creek* and *Wandoo Creek*. The house on the property had been destroyed by fire in 1841.

It is probable that none of the sandy soil away from the river flats was used for farming in the early days of the colony as it was too poor for growing produce. In addition, there were many poisonous plants in the vicinity and local

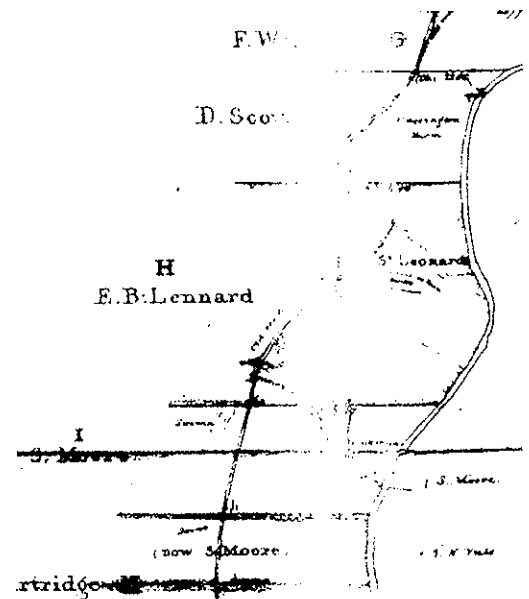


Figure 2 Sketch of property at 1842

² Location duties apparently involved carrying out capital improvements to the land to the equivalent of 1/6d for every acre assigned.

Aborigines intermittently speared unguarded stock.

The land on which the Airfield base is sited, being so close to the homestead must have been grazed by the owners' stock in later years, particularly in the wetter areas. This is evidenced by a notice which appeared in the 21 November 1866 issue of the *Inquirer* on the occasion of Barrett-Lennard's bankruptcy and subsequent forced sale of goods and stock:

F. Lochee and others v. E.P.B. Lennard.

The Sheriff will cause to be sold by public auction on Wednesday 28 Nov. instant at 11 in the forenoon on the premises of the defendant at St. Leonards, Middle Swan (unless this execution is previously satisfied): About 80-tons of hay, 12 horned cattle, 66 horses, 3 carts, harness and bridles, 2 plows, harrow and roller, 20 pigs, six working horses, carpenters' tools etc. Household furniture, tables, chairs, sofa, beds, and bedding, glass, china, clocks and books, etc.

*A. Hillman Sheriff - Perth 19 Nov. 1866.*³

It is unlikely that so many horses and other stock would have been sustained on the river flats as these were cropped for hay. Barrett-Lennard and later owners must have therefore kept their stock chiefly on the poorer soils away from the river in the latter half of the 19th century.

Edward's son, Edward Graham Barrett-Lennard continued to farm the property in a desultory manner as he was reputedly "...incapable of hard work; supervising and moving stock was all he could manage."⁴ Presumably much of that grazing took place on the poorer soils.

His grandson, George Hardey Barrett-Lennard on the other hand,

...brought imaginative and dynamic management to St. Leonards. He developed a large piggery there while still in his teens. It became highly profitable and enabled him to start bigger ventures. He grew extensive crops for chaff and baled(?sic) hay. In 1914 when there was a crippling drought in the inland areas he made a killing. He planted all the land he could and sold his hay for 10 pounds a ton - a huge price at the time. He developed an extensive vineyard on a belt of red loam between the river flats and the sand. It consisted mainly of table grape varieties for the Perth market, but he also made some wine."⁵

³ *Inquirer* 21/11/1866

⁴ Donald Barrett-Lennard

⁵ *Ibid.*

Stock would have continued to be grazed on the Caversham airfield land, especially the swampy areas, during this time of aggressive farming of the flats.

When George died in 1917 most of the river flat land was subdivided into smallholdings and rural blocks and sold chiefly to returned servicemen. The sandy area away from the river containing the present day Caversham airfield base and Mussell Pool, was bought by William Padbury who resold it ten years later during the depression to Albert Marshall.

During World War Two three runways were constructed on this land to form an airfield base. The land was resumed from the owner and records show it was officially acquired by the Commonwealth from Mr Marshall in 1950. Mr Marshall retained grazing rights of the land until the seventies. The property continued to be grazed into the eighties.

The eastern side of the airfield was used by sporting car clubs in the 1950s and 1960s. Remains of an old bitumen race track is still visible winding along the eastern boundary of the base and connecting with the North / South runway.

Grasses have been kept under control by the many kangaroos and rabbits which thrive in the base and consequently there is very little fuel for bushfires. There appears to be no sign of bush or scrub fires having occurred on the property over the last 20 years or so.

2. LOCATION AND CHARACTERISTICS.

Featured on the cover of this report is an aerial photograph of Locations G, H and I released by the Department of Land Administration (DOLA) in January 1995. The Caversham airfield base which is officially referred to by the Australian Air Force as the Caversham Transmitting Station, is on the left half of the photograph. The base comprises approximately 2500 hectares of land, currently owned by the Commonwealth Department of Defence, situated east of the southern end of Whiteman Park.

The airfield is clearly identified in any aerial photograph of the region by its three runways, each of which is constructed of introduced gravel. The eastern runway runs north-south and extends the whole length of the base. Part of it has been bitumenised and is used by the Police Department to train young recruits in driving skills. The runway to the north lies approximately east-west and intersects the western runway which runs diagonally across the base.

There are several bare circles scattered throughout the base which at ground level are cleared land with transmitters occupying the centres of each circle.

Only two buildings remain on the base; the caretakers house and the workshops both of which are visible just below the centre of the photo.

3. REMNANT VEGETATION PROJECT

Community groups sought National Landcare Funding in 1994 to complete a flora and fauna survey of Henley Brook and West Swan. Examination of aerial photographs indicated there were two significant tracts of remnant bush and one of these was on the Air Force Base at Caversham.

The remnant vegetation map shown below was produced by the Perth Environment Project (PEP)⁶ from the 1991 aerial photograph of the Perth region and the 1993 Landsat satellite image.

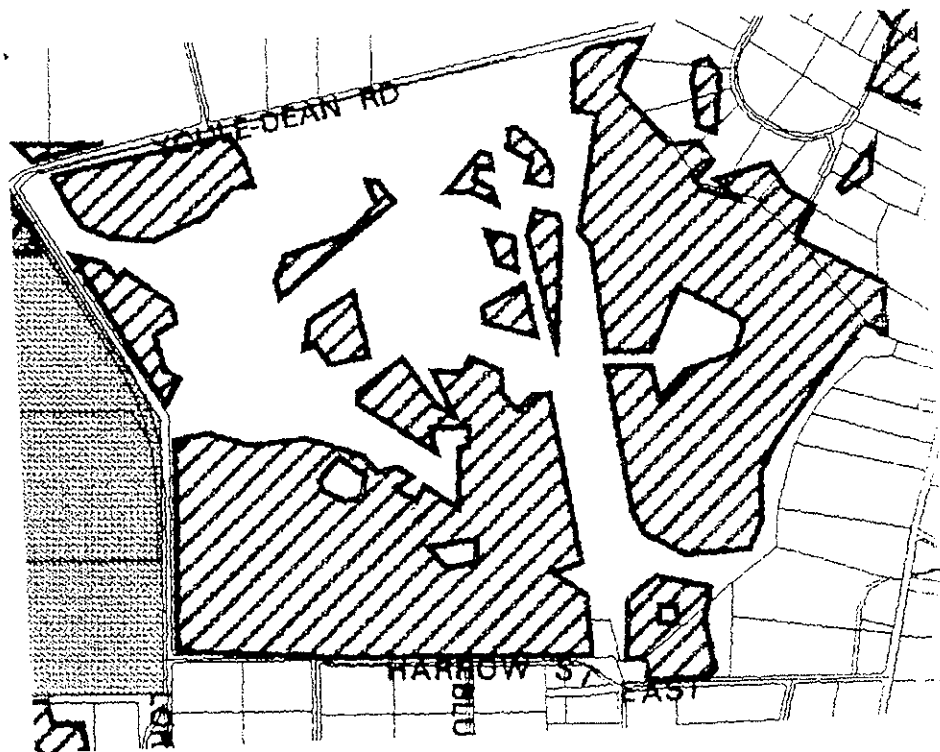


Figure 3 Vegetation map from the Perth Environmental Project (PEP) 1994.

The hatched areas indicate stands of remnant vegetation. The PEP, however, did not detail the type and/or quality of this vegetation. Part of the object of the Landcare project established in February 1995 with my appointment as

⁶ The PEP was an initiative of the former Department of Planning and Urban Development

Coordinator, was to carry out this task and to establish the accuracy of the vegetation area map.

A preliminary survey suggested the map was reasonably accurate but that much of the shrub and sedge included in the study area was not recognised as remnant bush. The line art scan of the 1995 aerial photograph from DOLA shown below gives a more accurate picture of the remnant vegetation.



Figure 4 Line Art scan of 1995 aerial photograph

The dark areas, except for the black rectangle on the eastern runway, represent vegetation. The above scan identifies virtually all of the shrub, sedge and Xanthorrhoea that was omitted from the PEP map. Generally the PEP map has identified remnant vegetation where there are stands of large trees but has missed the patches dominated by low level vegetation.

4. STUDY METHOD

My first task as Coordinator of the Henley Brook and West Swan Landcare Project (HBWSLCP) was to attract and select volunteers from amongst the community to assist in carrying out the ground work involved. Over the period 14 people volunteered their time and expertise to help the project. I had a regular session every Tuesday with the volunteers to collect specimens in the field and/or identify plants. Work on the project's field herbarium was carried

out at either the State Herbarium or at the Foothills School in Guildford whose Principal generously provided a room and space to store our plants and materials.

The ground work at the Caversham Base was carried out using the procedures outlined in Bronwen Keighery's *Bushland Plant Survey* (See appendix 2 for the work-sheets used in the survey). This involved:

1. selecting quadrats measuring ten square metres
2. giving sufficient information so that the site could be found again.
3. recording vegetation structure and cover at different heights
4. describing the soil and litter cover
5. assessing the quality of the remnant vegetation
6. collecting and labelling specimens
7. identifying and preserving a sample of every species found in that quadrat
8. developing a field herbarium

To date information is available from fifteen (15) sites. Ms Keighery assessed sites at sites 9 and 10 and checked the information gathered from seven other sites. The survey results were used by Ms Keighery in her site based flora list for the Caversham Airbase which was included in Submission 199 System 6 update to the Department of Environmental Protection

4.1 Selecting quadrats

The whole study area was preliminary surveyed on foot over several visits to get an impression of the soil types and plant communities. Aerial photographs were also used to help locate important vegetation patches.

We then selected sites that were

- typical of the plant community
- the least disturbed part of the community
- away from the boundaries of plant communities, and
- easily found again

Once sites were selected, steel pegs were placed at each corner of the quadrat square and thin nylon rope was stretched between them. After the specimens were collected and the data sheets completed, the rope was removed, but the pegs were left in place so that the quadrat could be revisited at a different season to collect other species and flowering specimens.

4.2 Locating the quadrat site

The quadrat site was recorded in sufficient details to enable its exact location to be revisited at a later date for further data and specimen collection. This is

important because different plants flower at different times of the year and it is vital, if possible to collect the flowers of specimen plants for accurate identification. In addition some plants, even though they are perennials can only be discovered at certain times of the year. An example would be orchids which sprout, flower and die within a short space of time, leaving little or no evidence on the ground of their existence.

The location of a quadrat site is recorded on its work sheets by measuring the distance from the nearest roads and listing significant, permanent landmarks, such as dominant trees which are also physically marked by tying strips of yellow tape to them. The 'V' shaped steel pegs are left in the ground, being careful to ensure that they point inwards to the quadrat, so if some are later disturbed, the remaining pegs can still indicate the inner location of the quadrat site.

4.3 Recording vegetation structure

Vegetation details are recorded on the relevant section of the work sheets, an example of which (developed by Bronwen Keighery) is on the second worksheet.

As can be see, the sheet lists:

- type of plant (ie tree, sedge, herb, grass or shrub)
- plant cover height
- what area of the quadrat it occupies
- dominant species at each height of the cover.

4.4 Soil and litter cover

The surface and sub-surface soil within the quadrat was examined, assessed and recorded on the survey sheets. Details of ground slope, drainage, and vegetation litter depth and percentage cover were also listed.

4.5 Assessing vegetation quality

Using the scale developed by Keighery a judgement was made of the overall state of the vegetation within the quadrat. Specifically, the group looked for whether the plant communities were relatively intact or the level of obvious disturbance by fire, grazing and human activity. A major indicator was the presence of exotic plants and the degree of vigour of remaining indigenous species.

4.6 Collecting and labelling specimens

As they became more experienced, members of the survey project were able to find more plants in each quadrat. Volunteers became very good at identifying the plants found, but sometimes needed expert assistance with the less common specimens and we are grateful to Bronwen Keighery and Jan Gathe for their occasional on-site assistance.

The method used in collecting specimens was to snip a section of the plant to include as much of the leaf arrangement, flowers and/or fruit as possible. With sedges and rushes it was important to collect whole plants including the root system.

Each specimen was labelled with a watch tag (fig. 5) which included the following information

- date collected
- quadrat site code
- plant name (if known)
- specimen number

As the plants were collected and labelled, a master work sheet (see appendix 1) was completed by recording the details above.

4.7 Identifying and preserving specimens

With experience, the survey group was able to identify a wide range of plants in the field and label them accordingly. A comprehensive library of materials dealing with Western Australian botany was collected by the group and was an invaluable source of information. A number of specimens, however, required expert assistance before they could be clearly identified. Ms Lyn Dunstan, a local botanist, kindly assisted us with some preliminary identification using information from her own extensive herbarium.

Several visits were also made to the Department of Conservation and Land Management's Herbarium in South Perth and help was provided by Herbarium botanists Bronwen Keighery and Jan Gathe.

Preserving specimens taken from the quadrats generally involved pressing them between layers of newspapers and when dry, mounting them, with their labels attached, on clean white paper. Specimens related by family were then filed between a folded A3 sheets of white bond paper and stored in lever-arch files for easy reference and access. All the specimens from a specific quadrat are kept together, which means that each file could contain specimens of a herb or grass (usually exotic) that might be found in every quadrat.



Figure 5 Four specimens from the family Myrtaceae from CAVS01

4.8 Field herbaria

The lever arch files of specimens collected by the above method then formed our field herbaria which are used in subsequent field trips.

5. SURVEY RESULTS

The group identified nine plant communities.

- *Melaleuca preissiana* dampland (sites 9 and 15)
- Jarrah-Banksia woodland (site 10)

- Melaleuca viminia dampland on the eastern edge (sites 6 & 13)
- Eucalyptus rudis stands scattered through the northern end. (site 5)
- Eucalyptus calophylla (Marri) with degraded understory
- Mixed Marri, Jarrah, Banksia, Casuarina mostly on eastern side (site 14)
- Xanthorrhoea grassland mostly at the northern end (exotic grasses dominate)
- Xanthorrhoea- Marri- Melaleuca preissiana mix.
- Marri Banksia

The identification was initially carried out by recording the dominant species in the upper storey of each plant community. This resulted in giving the same name to communities that appeared quite different on closer observation. Including a number of dominant species in the name was the final result. This map gives no indication of the quality of the vegetation found in each plant community.

5.1 Location of plant communities

The map below shows the location of these communities on the base.

Plant Communities

Marri
 Jarrah Banksia
 M. preissiana
 Flooded gum
 Mixed Marri
 M. viminea
 Xanthorrhoea
 Xanthorrhoea-Marri
 Marri Banksia



Figure 6 Plant Communities

5.2 Diversity of plant communities.

The Caversham base is situated on soil classified as Southern River which is described in 1994 North-East Corridor Structure Plan Report as *grey sandplain with low dunes and many intervening swamps; iron and humus podzols clays and peats*. That this soil can support very different types of vegetation can be

shown by examining the following plant lists from sites 9 and 10 which have been chosen because they are both in very good condition:

Site 9

Trees

Melaleuca preissiana

Shrubs

Acacia incurva
Astartea aff fascicularis
Hypocalymma angustifolium
Kunzea limnicola
Melaleuca sp B
Nemera capitata
Pericalymma elliptica
Sphaerolobium viminium
Xanthorrhoea preissii

Grasses

Amphipogon laguroides
*Briza maxima
*Briza minor
*Ehrharta longiflora

Herbs

Burchardia bairdii
Chamaescilla versicolor
*Clover
Drosera gigantea
Drosera glanduligera
Drosera neesii
*Hesperantha falcata
*Homeria flaccida
*Hypochaeris glabra
Lechenaultia expansa
Lobelia alatior
*Lotus angustifolium
*Lupinus
Patersonia occidentalis
*Polypogon
*Romulea rosea
*Sparaxis bulbifera
Stylidium brunonionum
Stylidium guttatum

Site 10

Allocasuarina humilis
Banksia attenuata
Banksia menziesii
Eucalyptus marginata

Bossiaea eriocarpa
Conostephium pendulum
Dasypogon bromelioides
Daviesia trittora
Gompholobium tomentosum
Hibbertia hypericoides
Hibbertia racemosa
hovea trisperma
Hypocalymma robustum
Pericalymma elliptica
Petrophile linearis
Stirlingia latifolia
Xanthorrhoea brunonis?

*Aira caryophyllaea
*Briza maxima
Stipa compressa

Burchardia congesta
Caladenia flavaC
Conostylis juncea
Drosera erythrorhiza
Drosera pallida
Eriochilus dilitatus
*Hypochaeris glabra
Isotropis cuneifolia
Leporella fimbriata
Lomandra caespitosa
Lomandra hermaphrodita
Loganifera huegelii
Patersonia occidentalis
Poranthera microphylla
Pterostylis vittalis
Quinetia urvillei
Sowerbaea laxiflora
Stylidium brunonionum
Thysanotus arbuscula

*Trifolium

Trachymene pilosa
*Ursinia anthemoides
Wahlenbergia preissii

Sedges

Baumea juncea
Cyathochaeta avenacea
Juncus pallidus
Restio stenostachyus
Schoenus rodwaganus

Alexgeorgia nitens
Isolepis marginata
Loxocarya flexuosa

Quadrat site 9 is located on the lower lying water prone land to the north of the base, while site 10 is on higher sandy soil at the southern end. The plant communities are therefore quite different. Even where the same plant appears in both lists for example *Patersonia occidentalis*, the wetland specimen has different characteristics and botanists are considering recognising it as a sub species. Some of the common plants are exotics. Flatweed (*Hypochaeris glabra*) and *Briza maxima* are two examples of introduced plants.

6. CONDITION OF VEGETATION

The map below shows the variation in remnant vegetation conditions in various parts of the base.

**Vegetation
Status**

Very good
Good
Degraded

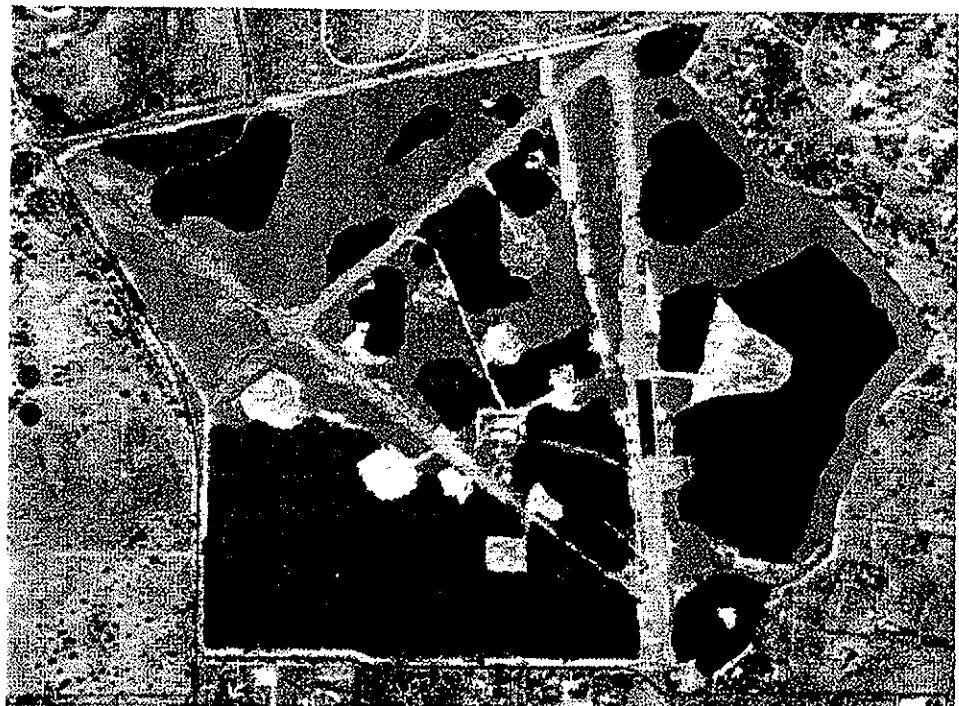


Figure 7 Status of condition of vegetation

6.1 Examples of remnant vegetation in very good condition.

The study showed there were areas with very good samples of remnant vegetation with abundant native species and very few exotics. Two sites, 9 and 15, at the northern end of the base on lower lying, water prone land, were representative of two small patches of shrub. Site 10 was typical of the Jarrah Banksia bush at the southern end of the base. Illustrations and detail on these sites are found below.



Figure 8 Quadrat site 9 looking south

This is a shot of site 9 from its northern edge. It is at the northern boundary of the base in an area identified as remnant vegetation on the PEP map. It is zoned on the Metropolitan Region Scheme as *Urban deferred*. The site is dominated by the shrubs *Hypocalymma angustifolium* and *Pericalymma elliptica* and the sedge-like *Restio sterostachyus*. The neighbouring trees are mostly *Melaleuca* (Paper bark) although there are some scattered *Eucalyptus todtiana* (Prickly bark) on higher ground. The trees in the far background are *Eucalyptus rudis* (Flooded gum) adjacent to the runway and do not feature on the PEP map as remnant vegetation. Forty one different species of plants were identified by Bronwyn Keighery on this site. See list above.



Figure 9 Adjacent to site 9 looking east

The above photograph is taken from the same position north of site 9 looking to the east. The neighbouring *Meiroleuca preissiana* trees are evident.



This shot is taken from site 15 east of site 9, looking east over ground which has no remnant vegetation according to the PEP remnant vegetation map.

The quadrat is covered with the sedge like *Restionaceae*. *Hypocalymma* shrubs are obvious in the centre of the picture and there are *Astartea* to the right. There are also a number of sedges in the quadrat. This area is in the northern edge of the base and is also on land zoned *Urban Retained*.

Figure 10 Quadrat site 15 looking east

The site, surveyed in April 1996, is in a very good condition. The survey group found less than 30 species in the quadrat but expect that a spring survey will yield significantly more. The site could also be classified as a *Meiroleuca preissiana* dampland.

This is a photograph of site 10 showing understory species associated with Jarrah *Banksia* woodland and is typical of the land on the south-west of the base. The ground level vegetation is sparse and its appearance is completely different from site 9 which has very thick vegetation at ground level. Although conditions do not support lush growth,



Figure 11 Quadrat site 10 looking north

there is a very rich diversity of plants. A total of forty eight different species were found on this 10 metre by 10 metre square under the supervision of Bronwen Keighery. The trunk of a large jarrah tree is evident on the right edge of the picture and the other trees are Banksia and Casuarina.

6.2 Examples of remnant bush with many trees and degraded understorey.

This picture is taken from the northern runway (site 7) and the vegetation here is on the remnant vegetation map. The area is dominated by paperbark trees (*Melaleuca preissiana*) which are very visible on the aerial photograph. The understory however is dominated by exotic grasses although you can see kangaroos grazing on a substantial patch of Restionaceae.



Figure 12 Quadrat site 7 looking north

This shot is of vegetation identified as being remnant by PEP. It is a stand of flooded gum (*Eucalyptus rudis*) with a reasonable understorey.

Paperbarks are scattered through the stand particularly along the edge of the runway. The shot is taken from the northern runway looking south at site 8.



Figure 13 Quadrat site 8 looking south

This shot is taken looking west from the northern end of the diagonal runway at an area (background only) marked as remnant vegetation on the PEP map. The area is dominated by *Eucalyptus rudis* and *Metaleuca preissiana*. There is very little understorey because of past recent heavy grazing. The condition of the fence and the state of the understorey would suggest it has been heavily grazed in the past 15 years. It could be very easily revegetated.



Figure 14 Flooded gum (*E. rudis*) in northwest corner

The second photograph is 100 metres to the north of the one above and is another shot of the remnant vegetation identified by PEP in the north west corner of the base. It was taken in April 1996. The understorey, for the most part, is made up of exotic grasses, although there are patches of restioidae, sedges and the occasional native shrub. An old fence around this area suggests that this area was heavily grazed in the last fifteen years. The understorey could be quickly restored with a positive revegetation programme.

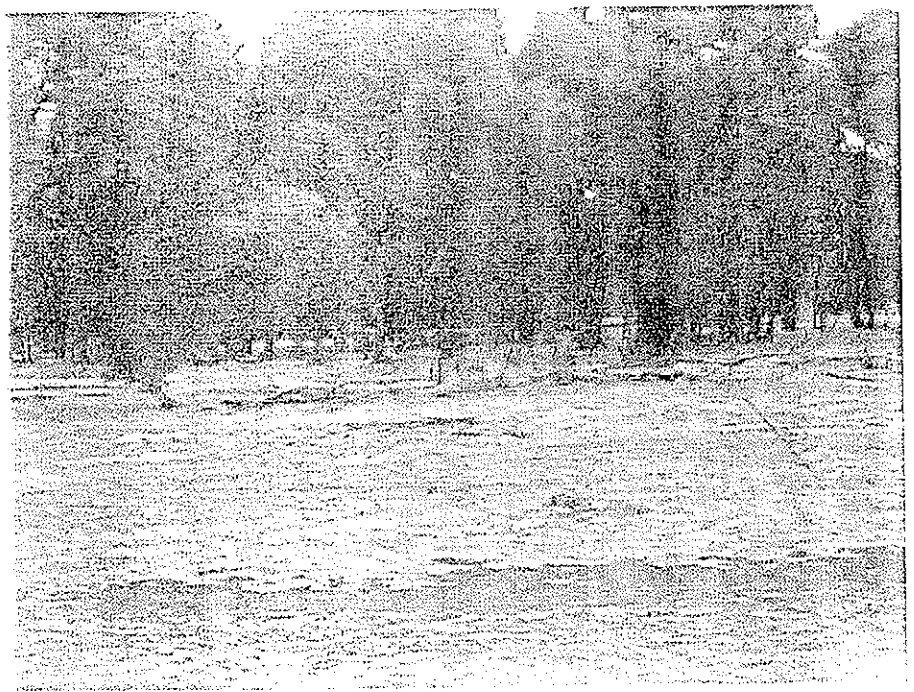


Figure 15 Degraded understorey

This photograph is taken from the old race track on the east of the base. The area is a seasonal wetland and the dominant species is *Melaleuca viminea*. There are many exotic grasses throughout this area. The young flooded gum (*E. rudis*) is typical of the regrowth that is occurring right through the base. Site 13 is some 50 metres into this bush.

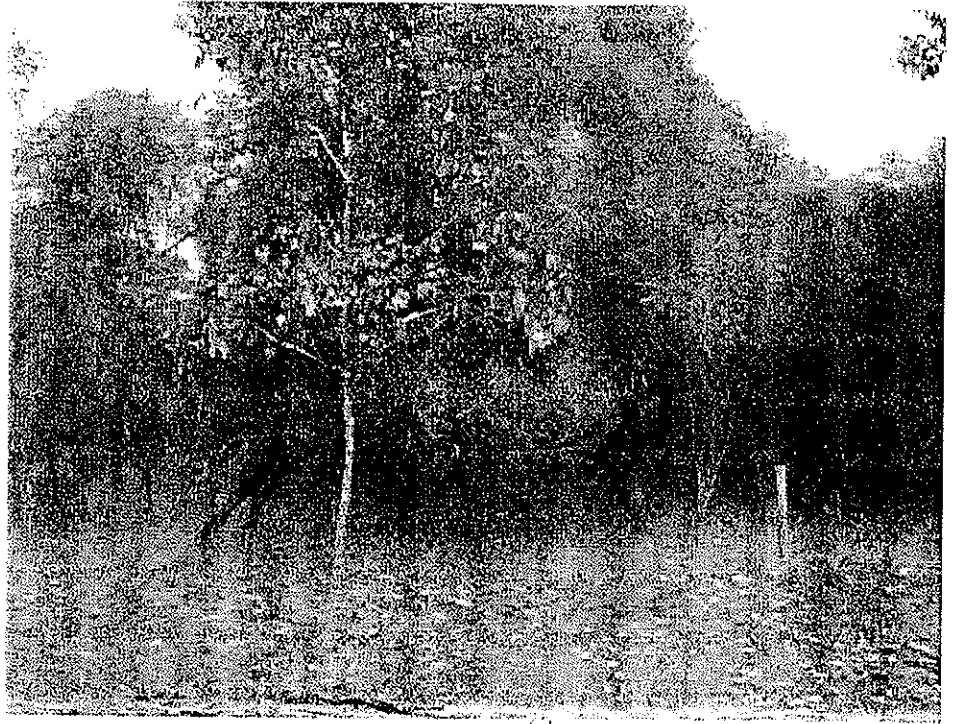


Figure 16 Quadrat site 13 looking west

6.3 Good remnant vegetation not on the PEP map.

This photograph of land south of the northern runway shows shrub and *Melaleuca preissiana* in very good condition. The PEP map indicates there is no remnant vegetation in this area. It is very similar to the vegetation on site 9 and 15 and could be classified as *Melaleuca preissiana* dampland



6.4 Exotic Weeds

This photograph is taken from a point one hundred metres south of site 9 looking south east towards site 7. The PEP map shows this as degraded ground with no remnant vegetation. Certainly the brown areas in the photo are dominated by exotic grasses which have been heavily grazed by kangaroos and rabbits but there is still plenty of native species present and the area is slowly regenerating.



Figure 17 Degraded land not on PEP map.

6.4.1 Grass and herbs

Because the land has been grazed continually for over one hundred years many foreign grasses and herbs have become established. Specimens of the more common exotic grasses and herbs were found on every quadrat examined. Many of these show up in the plant lists with asterisks next to their names.



Figure 18 Exotic grasses in Xanthorrhoea plant community.

This is a photograph of the Xanthorrhoea at the northern end of the base. It is taken from site 15 looking west. The exotic grasses are well established here. Because of the low number of native species present this area was considered to be degraded.

6.4.2 Exotic trees

This picture shows clearly the intrusion of weeds into the Jarrah Banksia remnant vegetation on the south west of the base.



Figure 20 Introduced wattle in Jarrah-Banksia woodland

The wattle is *Acacia longifolia* (Sydney wattle) and it has become established on the edge of the firebreak. The trees to its left and behind are Banksia, while there is a *Eucalyptus tottiana* (Prickly bark) on its right. A jarrah tree can be seen in the distance behind the exotic wattle. Many young specimens of this exotic tree can be found further into the bush. Disturbance appears to favour many exotic species.

Other trees that have been found on the base include the olive tree and eastern states ti tree.

7. SYSTEM SIX UPDATE - PLANTS

Ms Bronwen Keighery has made a submission that the Caversham Airfield base be included in the System 6 conservation area scheme. As evidence to the

submission, the following list drawn from the group's findings was included in her submission.

Site Based Flora List for Caversham Airbase (Cavs01-02, 06-11, B.J. Keighery, 16/4/96)

Department of Environmental Protection System 6 Update in conjunction with Bevan Carter and volunteers: Site Based Flora List Caversham Airbase (Cavs01-02, 06-11, B.J. Keighery, 16/4/96)

Anthericaceae	<i>Chamaescilla versicolor</i>	1
	<i>Sowerbaea laxiflora</i>	2
	<i>Thysanotus arbuscula</i>	3
	<i>Thysanotus manglesianus</i>	4
	<i>Thysanotus thyrsoides</i>	5
	<i>Tricoryne elatior</i>	6
	<i>Tricoryne tenella</i>	7
Apiaceae	<i>Homalosciadium homalocarpum</i>	8
	<i>Trachymene pilosa</i>	9
Asparagaceae	* <i>Myrsiphyllum asparagoides</i>	38
Asteraceae	* <i>Arctotheca calendula</i>	33
	* <i>Conyza</i> sp. seps	32
	10 <i>Gnaphalium sphaericum</i>	
	11 <i>Hyalosperma cotula</i>	
	* <i>Hypochaeris glabra</i>	31
	12 <i>Lagenifera huegelii</i>	
	13 <i>Podolepis gracilis</i>	
	14 <i>Quinetia urvillei</i>	
	15 <i>Siloxerus humifusus</i>	
	* <i>Sonchus oleraceus</i>	30
* <i>Ursinia anthemoides</i>	29	
* <i>Vellereophyton dealbatum</i>	28	
Campanulaceae	* <i>Wahlenbergia capensis</i>	27
	16 <i>Wahlenbergia preissii</i>	
Caryophyllaceae	* <i>Petrorhagia velutina</i>	26
Casuarinaceae	17 <i>Allocasuarina humilis</i>	
Colchicaceae	18 <i>Burchardia bairdiae</i>	

	Burchardia congesta Burchardia multiflora Burchardia umbellata
Cyperaceae	Baumea juncea Cyathochaeta avenacea Cyathochaeta clandestina Isolepis marginata Lepidosperma angustatum Lepidosperma longitudinale
Dasypogonaceae	Dasypogon bromeliifolius Lomandra caespitosa Lomandra hermaphrodita Lomandra suaveolens
Dilleniaceae	Hibbertia huegelii Hibbertia hypericoides Hibbertia racemosa
Droseraceae	Drosera erythrorhiza Drosera gigantea Drosera glanduligera Drosera neesii Drosera nitidula Drosera pallida
Epacridaceae	Conostephium pendulum Conostephium preissii
Euphorbiaceae	Poranthera microphylla
Goodeniaceae	Dampiera linearis Goodenia pulchella Lechenaultia expansa
Haemodoraceae	Anigozanthos humilis Conostylis juncea Haemodorum sp. scps Phlebocarya ciliata Tribonanthes australis
Iridaceae	*Gladiolus caryophyllaceus 25 * Homeria flaccida 24 Patersonia occidentalis

- 19 Patersonia occidentalis (swamp form) sthst
 *Romulea rosea 23
 * Sparaxis bulbifera 22
- Juncaceae** 20 Juncus bufonius
 21 Juncus pallidus
- Lamiaceae** 22 Hemiandra pungens
- Mimosaceae** 23 Acacia huegelii
 24 Acacia incurva
 *Acacia longifolia scps 21
 25 Acacia saligna
 26 Acacia willdenowiana
- Myrtaceae** 27 Astartea aff. fascicularis scps
 28 Calytrix flavescens
 29 Eremaea pauciflora
 30 Eucalyptus calophylla
 31 Eucalyptus marginata
 32 Eucalyptus mdis
 33 Hypocalymma angustifolium
 34 Hypocalymma robustum
 35 Melaleuca preissiana
 36 Melaleuca raphiophylla
 37 Melaleuca sp. B FPR (BJK&NG 054)
 38 Melaleuca viminea
 39 Pericalymma ellipticum
 40 Scholtzia involucrata
 1 Verticordia densiflora
- Oleaceae** * Olea europaea 35
- Orchidaceae** 1 Caladenia flava
 2 Elythranthera brunonis
 3 Eriochilus dilatatus
 4 Leporella fimbriata
 *Monadenia bracteata 20
 5 Pterostylis vittata
- Papilionaceae** 6 Bossiaea eriocarpa
 7 Daviesia triflora
 8 Gompholobium tomentosum
 9 Hovea trisperma
 10 Isotropis cuneifolia

- 1 Jacksonia furcellata
- 2 Jacksonia sternbergiana
 - *Lotus angustissimus 17
 - *Lupinus sp scps J 18
 - *Medicago polymorpha 17
- 4 Nemcia capitata
- 5 Sphaerolobium vimineum
 - *Trifolium campestre 16
 - * Trifolium repens 15
 - * Trifolium sp. scps 15

- Phormiaceae** 6 Dianella divaricata

- Poaceae**
 - *Aira caryophyllea 13
 - * Anthoxanthum odoratum 12
 - * Briza maxima 11
 - * Briza minor 10
 - * Bromus diandns 9
 - 7 Danthonia occidentalis
 - * Ehrharta calycina 8
 - * Ehrhartalongiflora 7
 - * Lolium rigidum 6
 - 8 Microlaena stipoides
 - * Pentaschistis airoides 5
 - * Poa annua 4
 - Stipa compressa
 - *Vulpia bromoides 3
 - * Vulpia myuros 2

- Primulaceae** * Anagallis arvensis 1

- Proteaceae**
 - 9 Banksia attenuata
 - 60 Banksia ilicifolia
 - 1 Banksia menziesii
 - 2 Dryandra nivea
 - 3 Petrophile linearis
 - 4 Stirlingia latifolia

- Restionaceae**
 - 5 Alexgeorgea nitens
 - 6 Hypolaena exsulca
 - 7 Loxocarya fasciculata
 - 8 Loxocarya flexuosa
 - 9 Lyginia barbata
 - 70 Restio stenostachyus

Rutaceae / Eriostemon spicatus

Scrophulariaceae 2 Gratiola peruviana

Stylidiaceae 3 Stylidium brunonianum

✓ Stylidium calcaratum

5 Stylidium carnosum

6 Stylidium guttatum

7 Stylidium repens

Xanthorrhoeaceae 7 Xanthorrhoea brunonis

9 Xanthorrhoea preissii

79 Native Taxa

34 Weeds

The previous list is by no means exhaustive as the limitations of using quadrat surveys means that some significant species may be missed. For example, so other species of Banksia - grandis and littoralis - were also found but they were located outside the selected quadrats. Nor is the very common Eucalyptus todtiana (prickly bark) on this list. It is unknown how many smaller shrubs and herbs may also have been missed.

8. CONCLUSION

The Caversham Airfield Base has been grazed by cattle, sheep and horses from possibly the eighteen forties until the nineteen eighties. Major disturbance occurred during the war when the land was resumed by the Commonwealth and three gravel airstrips were constructed. Considerable deep drainage was laid down during construction. The Caversham Car Club used the eastern side of the base for their activities during the nineteen fifties and sixties.

In spite of this, the vegetation in some sections remains in very good condition and is being regenerated successfully on the worst affected parts. Some of the grasses have certainly taken hold but kangaroos and rabbits have kept them in check and these areas are not a fire hazard.

The whole base is a good example of the diverse vegetation that is found on Southern River soil. There are some degraded areas but most of these have good tree cover and there would be little difficulty in regenerating the poorer portion of the base.

The Department of Planning is proposing to preserve only the southern and eastern edges of the base as a good example of Southern River vegetation by zoning them Parks and Recreation. If this were to happen, however, some of the communities in other sections that could be considered more typical of Southern River soil would be lost.

If the intent is to preserve a sample of typical Southern River vegetation then as much of the whole base as possible should be reserved so that all plant communities associated with Southern River soils can be managed for future generations.

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