

**FLORA AND VEGETATION ASSESSMENT**  
**OF BUSHLAND OCCURRING AT**  
**LOT 193 PINJARRA RD**  
**- RAVENSWOOD -**

|  |                        |
|--|------------------------|
| DEPARTMENT OF ENVIRONMENTAL PROTECTION |                        |
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Prepared for:

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**September 1999**



MATTISKE CONSULTING  
PTY LTD

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## 1. SUMMARY

Mattiske Consulting Pty Ltd was commissioned in May 1999 by the Ministry for Planning to undertake a flora and vegetation assessment of remnant bushland at Lot 193 Pinjarra Road, Ravenswood. This 37 hectare lot was originally zoned for conservation in the Inner Peel Structure Plan (1996), and proposed as Parks and Recreation in the Peel Region Scheme (1999). Lot 193 is owned by New Generation Enterprises Pty Ltd who wish to develop a conference centre, school and housing development in the near future.

In accordance with the proposed management strategy to ensure riparian and remnant vegetation is adequately protected, a vegetation survey was required prior to any development or rezoning of land in the region (WAPC 1999).

A total of 38 families, 89 genera and 121 plant taxa (including varieties and subspecies) was recorded in the survey area (Appendix A). Species representation was greatest among families; Myrtaceae, Proteaceae, Papilionaceae and Cyperaceae, a flora composition typical of the Bassendean Complex - Central and South as described by Heddle *et al.* (1980). Seventeen species of introduced weeds were recorded, some of which are particularly aggressive and may require management. No plant species gazetted as Declared Rare Flora pursuant to subsection (2) of section 23F of the Wildlife Conservation Act (1950) were located in the survey area. In addition, no Priority Flora species as defined by the Department of Conservation and Land Management (1998) were located within the survey area.

Six plant communities were recorded during the survey.

Plant Community One was a Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over *Kunzea ericifolia*, *Dasypogon bromeliifolius*, *Phlebocarya ciliata* and *Conostylis aculeata* subsp. *preissii* in sandy loam soils.

Plant Community Two was an Open Woodland of *Corymbia calophylla* and *Eucalyptus marginata* over *Allocasuarina humilis* and *Bossiaea eriocarpa* in sandy loam soils.

Plant Community Three was defined as a Low Woodland of *Melaleuca raphiophylla* over a Shrubland of *Melaleuca viminea* and *Melaleuca incana* subsp. *incana* and mixed Restionaceae in clay. This community occurred on the shores of Black Lake and is seasonally wet.

Plant Community Four was a Closed Heath of *Pericalymma ellipticum*, *Scholtzia involucrata* and *Acacia saligna* in clay loam soils. As with community three, this community occurred on the shores of Black Lake and is seasonally wet.

Community Five was an Open Heath of *Melaleuca uncinata* and *Melaleuca viminea* over *Cynodon dactylon* with occasional emergent *Melaleuca raphiophylla* and *Eucalyptus rudis* in clay loam soils. As with community three and four, this community occurred on the shores of Black Lake and is seasonally wet.

Community Six occurred as pockets within Community Four on the lake edge and was defined as a Low Open Chenopod Shrubland of *Halosarcia syncarpa* with emergent scattered *Melaleuca pauciflora*.

Despite the occurrence of introduced flora and fauna, dieback, the dumping of rubbish and vehicular activity, Lot 193 supports an area of native vegetation, albeit modified, that is representative of the structure and floristics of the natural vegetation of the Peel region. Its proximity to surrounding land-use activities and its isolation from remnant bushlands, however, lends it vulnerable to hygiene problems associated with weed invasion and disease. These issues will need to be addressed in any management strategy proposed in this area.

## 2. INTRODUCTION

Mattiske Consulting Pty Ltd was commissioned in May 1999 by the Ministry for Planning to undertake a flora and vegetation assessment of remnant bushland at Lot 193 Pinjarra Road, Ravenswood. This 37 ha lot, adjacent to Black Lake and associated Nature Reserve, was zoned as conservation in the Inner Peel Structure Plan (1996), and proposed as Parks and Recreation in the Peel Region Scheme (1999). Lot 193 is owned by New Generation Enterprises who wish to develop a conference centre, school and housing development in the near future.

### 2.1 Flora and Vegetation

The survey area occurs on the Swan Coastal Plain and is part of the Peel-Harvey Catchment as defined by Weaving (1999). Historically, much of the Swan Coastal Plain and catchment has been cleared for agriculture and urbanisation. As a result the remnant vegetation occurs largely as small isolated pockets with varying degrees of degradation. As discussed in Weaving (1999), Beeston *et al.* (1994) surveyed remnant vegetation in the Shires of Harvey, Murray and Waroona and found that the majority of areas of remnant vegetation were less than 20 ha.

Hedde *et al.* (1980) produced a vegetation map at 1:250 000 scale which defined vegetation complexes in relation to the landform-soil units determined by Churchward and McArthur (1980). The survey area at Lot 193 occurs in the Bassendean Complex - Central and South with some influence from the adjacent Herdsman Vegetation Complex as defined by Hedde *et al.* (1980). Within each complex a range of structural formations are recognised. In the Bassendean Complex - Central and South these include a woodland of Jarrah-Sheoak-Banksia on sand dunes, to a low woodland of *Melaleuca* spp. and sedgelands on the moister low-lying depressions and swamps. Vegetation of the Herdsman Vegetation Complex is dominated by sedgelands and a woodland of *Eucalyptus rudis* and *Melaleuca* spp. and is generally associated with swamps and small lakes on the Swan Coastal Plain (Hedde *et al.* 1980). Later work by Gibson *et al.* (1994) provides a more detailed review of the conservation significance of species and communities which occur in remnant vegetation on the Southern Swan Coastal Plain. As a result of its coverage and degree of detail at a regional level, the mapping work of Hedde *et al.* (1980) and the floristic studies of Gibson *et al.* (1994) have been widely used as a means of assessing conservation values of the native vegetation remnants which occur on the Swan Coastal Plain between Gingin and Bunbury.

## 2.2 Topography and Soils

The survey area occurs on the Bassendean Dune System and features wide sandy flats and seasonal swamps interspersed with low dunes. The principal soils are highly leached, grey siliceous sands of aeolian origin, often underlain by an iron-organic hardpan (WAPC 1999). Within the Bassendean Dune System, the Herdsman Unit underlies the larger swamps and lakes, with soils of black organic sands, peaty loams, black clays and peat (WAPC 1999).

The surface drainage of the Peel-Harvey Catchment originates in the headwaters and tributaries of three main rivers, the Serpentine, Murray and Harvey. The bushland area of Lot 193 is situated in the catchment of the Murray River which, with the Serpentine and Harvey Rivers being dammed for drinking and irrigation respectively, forms the major drainage feature of the region (WAPC 1999).

## 3. OBJECTIVES

The general objective was to describe and define the botanical values of the bushland area.

The specific objectives of the flora and vegetation survey were to:

- collect and identify the vascular plant species present in the survey area,
- search for any Declared Rare and/or Priority Flora in the survey area, and
- review the local and regional significance of the vegetation in the context of regional vegetation mapping and also planning schemes.

## 4. METHODS

Lot 193 is located within the Peel-Harvey Catchment on the corner of Pinjarra and Fiegerts Road, Ravenswood. The vegetation was surveyed in June by traversing the area on foot. Detailed survey sites were selected on the basis of the variation in vegetation structure and floristic composition.

### 4.1 Flora

Within each survey site the flora present were systematically recorded and collections made where further identification was required. Selective opportunistic collecting was undertaken at additional sites in plant communities of like structure and floristic composition. Due to the seasonal timing of this survey very few annual species were recorded.

A search for Declared Rare and Priority Flora species known to occur in the region was made using the herbarium database compiled by the Department of Conservation and Land Management (1998). During the field survey, particular attention was directed towards searching for endangered flora.

All plant specimens collected during the field survey were handled and identified in accordance with the requirements of the Western Australian Herbarium. Where required specimens were compared with pressed specimens housed at the Western Australian Herbarium and if necessary, plant taxonomists with specialist skills were consulted. Nomenclature of the species recorded follows Western Australian Herbarium (1999).

#### 4.2 Vegetation

Plant communities occurring within the survey area were described and the relative abundance of each species (dead and alive) was recorded. The use of a standard data collection form ensured the data was collected in a systematic and consistent manner. To ascertain the regional significance of the plant communities recorded, a comparison was made with the most recent regional floristic work on the Swan Coastal Plain carried out by Gibson *et al.* (1994) and English and Blyth (1997).

### 5. RESULTS

The survey area occurred on sandy-loam and clay-loam soils supporting predominantly native vegetation and a wetland habitat adjacent Black Lake. Black Lake is a C-class nature reserve gazetted for the conservation of flora and fauna, under vesting with National Parks and Nature Conservation. A surrounding firebreak is maintained and there is no fencing apart from that associated with an adjacent paddock on the northern boundary. A central east-west vehicle track has allowed public access from Fiegerts Road and the subsequent dumping of car bodies and rubbish was evident (Appendix B). Disturbance in the form of introduced fauna and flora (weeds), disease (*Phytophthora cinnamomi*), vehicle activity and litter was observed, and for the most part concentrated on the surrounding firebreak and access track. Disturbance caused by fire was also recorded in the southern section of the survey area.

#### 5.1 Flora

A total of 38 families, 89 genera and 121 plant taxa was recorded in the survey area (Appendix A). Species representation was greatest among families; Myrtaceae, Proteaceae, Papilionaceae and Cyperaceae, a flora composition typical of the Bassendean Complex - Central and South as described by Heddlie *et al.* (1980).

Of the 121 plant taxa 104 were native and 17 were introduced weed species. Weeds were most abundant in the Asteraceae (4 species) and Poaceae (4 species) families. Several of the introduced species are particularly aggressive and may require active management (Hussey *et al.* 1997, Scheltema and Harris 1995). These include Couch (*Cynodon dactylon*), African Love Grass (*Eragrostis curvula*), Veld Grass (*Erharta calycina*), Watsonia (*Watsonia* sp.), Geraldton Carnation Weed (*Euphorbia terracina*) and Cape Weed (*Arctotheca calendula*).

## 5.2 Conservation Status of the Flora

No plant species gazetted as Declared Rare Flora pursuant to subsection (2) of section 23F of the Wildlife Conservation Act (1950) were located in the survey area. In addition, no Priority Flora species as defined by the Department of Conservation and Land Management (1998) were located within the survey area.

## 5.3 Vegetation

Six plant communities were recorded during the survey.

Wet Plant Community One was a Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over *Kunzea ericifolia*, *Dasypogon bromeliifolius*, *Phlebocarya ciliata* and *Conostylis aculeata* subsp. *preissii* in sandy loam soils.

Wet Plant Community Two was an Open Woodland of *Corymbia calophylla* and *Eucalyptus marginata* over *Allocasuarina humilis* and *Bossiaea eriocarpa* in sandy loam soils.

Wet Plant Community Three was defined as a Low Woodland of *Melaleuca raphiophylla* over a Shrubland of *Melaleuca viminea* and *Melaleuca incana* subsp. *incana* and mixed Restionaceae in clay soils. This community occurred on the shores of Black Lake and is seasonally wet.

BL Plant Community Four was a Closed Heath of *Pericalymma ellipticum*, *Scholtzia involucrata* and *Acacia saligna* in clay loam soils. As with community three, this community occurred on the shores of Black Lake and is seasonally wet.

BL Community Five was an Open Heath of *Melaleuca uncinata* and *Melaleuca viminea* over *Cynodon dactylon* with occasional emergent *Melaleuca raphiophylla* and *Eucalyptus rudis* in clay loam soils. As with community three and four, this community occurred on the shores of Black Lake and is seasonally wet.

BL Community Six occurred as pockets within Community Four on the lake edge and was defined as a Low Open Chenopod Shrubland of *Halosarcia syncarpa* with scattered emergent *Melaleuca pauciflora*.

The species composition and photographic illustrations of these plant communities are presented in Appendices A and B respectively. None of the vegetation communities recorded correspond to those recognised as threatened by Gibson *et al.* (1994).

## 6. DISCUSSION

### 6.1 Review of Conservation Status of the Flora

A total of 38 families, 89 genera and 121 plant taxa was recorded in the survey area (Appendix A). Seventeen introduced (weed) taxa were recorded, some of which are particularly aggressive and could potentially displace native species if left unmanaged (Hussey *et al.* 1997, Scheltema and Harris 1995). The impact of dieback, *Phytophthora cinnamomi*, was evident in some areas of the survey area indicated by the stress and death of susceptible species (in particular, Plant Community Three).

No Declared Rare or Priority Flora were located during this survey. However, within the Peel-Harvey Catchment, 13 species of Declared Rare Flora and 49 species of Priority Flora are known to occur (Appendix C). These species largely occur in remnants of vegetation, often on private land (Weaving 1999).

Species representation was greatest among the families; Myrtaceae, Proteaceae, Papilionaceae and Cyperaceae, a flora composition typical of the Bassendean Complex – Central and South as described by Hedde *et al.* (1980). In addition to Myrtaceae and Proteaceae, many species from the families Papilionaceae, Xanthorrhoeaceae, Epacridaceae and Zamiaceae make up a large component of the understorey and area commonly killed by dieback, resulting in an irreversible decline in the diversity of vegetation in infected areas.

### 6.2 Local and Regional Significance of the Vegetation

Lot 193 supports an area of native vegetation, albeit modified, that is representative of the structure and floristics of the natural vegetation of the Peel region. Its proximity to surrounding land-use activities and its isolation from remnant bushlands, however, lends it vulnerable to hygiene problems associated with weed invasion and disease. These issues are outlined below and will need to be addressed in any management strategies to minimise potential impacts on the native ecosystems in the local area.

The control of weed species at Lot 193 is an important issue. Bushland weeds are disturbance opportunists, which aggressively compete with native plants and can eventually lead to the degradation and simplification of bushland ecosystems (Hussey *et al.* 1997, Weaving 1999). This is of particular concern to Communities One and Two where the relatively open structure and impact of dieback is likely to increase susceptibility to weed invasion and potential infestation. A number of weeds recorded in this survey are particularly aggressive (see section 5.1) and will require further management. The control of weed species is also recognised by Weaving (1999) as an important issue in the management of land-use in the wider Peel-Harvey Catchment area.

The occurrence of dieback, *Phytophthora cinnamomi*, on Lot 193 is also an important management concern. *P. cinnamomi* is a soil-borne pathogen readily dispersed by the movement of infected soil, roots or water and has been linked to watercourses, tracks and roads where human activity is frequent (Podger *et al.* 1986). The impact of dieback on Lot 193 was particularly evident in Community Two with susceptible species (e.g. *Banksia* spp.) either dead or dying. On the wider Swan Coastal Plain, degradation of floristic and structural composition is well documented (e.g. Old 1980, Shearer and Hill 1989, Shearer and Dillon 1995, Podger *et al.* 1996, Shearer and Dillon 1996), however, such changes induced by disease have yet to be quantified, and the associated effects on fauna is poorly understood (Shearer and Dillon 1996). Albeit, the impact of *P. cinnamomi* presents a major threat to the ecology and conservation of susceptible plant communities throughout south-western Australia, the occurrence of which is not specific to land tenure and effective control, ie. detection, research and management, requires the combined efforts of the general public, industries and the federal, state and local government departments (Shearer 1990).

Mediating the possible occurrence and potential spread of both weeds and soil pathogens are tracks. Apart from the mandatory firebreaks only one major track was noted on Lot 193 which appears to be used by the public for not only recreation (e.g. walking, trail-bikes), but also the dumping of rubbish and unwanted property (e.g. cars and electrical goods).

As with the majority of vegetation on the Swan Coastal Plain the natural vegetation of the Bassendean system is heavily cleared and poorly represented in reserves. The representation of this system is discussed in WAPC (1999) which states: "Less than 14% of the original extent of the Bassendean Complex-Central and South ... remain in the Peel Region, and the areas currently reserved within the region are ... less than 0.1% for the Bassendean Complex". Beeston *et al.* (1994) further recognise there are relatively few areas of remnant vegetation greater than 20 ha and only 6% of remnant areas are actually fenced. Although Lot 193 is not fenced it does fall under the 'relatively few' category for areas greater than 20 ha.

The regional significance of vegetation associations containing Flooded Gum (*Eucalyptus rudis*) and Paperbark (*Melaleuca* spp.) is also an important issue. "The Murray River valley supports a Flooded Gum-Swamp Paperbark forest of the Swan Complex. This vegetation has been heavily cleared since the commencement of settlement in the region so that less than 15% of its area remains, mostly as disturbed remnants. None is currently reserved for conservation in this region" (WAPC 1999). Although, this current survey does not extend into the Swan Complex, Communities One, Three, Four, and Five support such associations containing Flooded Gum and/or Paperbark, and although introduced weed species occur, these communities remain relatively undisturbed. This may warrant conservation interest given the status of the vegetation communities recorded is not known within the reserve system of the Swan Coastal Plain (Gibson *et al.* 1994, English and Blythe 1997).

In summary, despite the occurrence of introduced flora and fauna, dieback, dumping of rubbish and vehicular activity, the local and regional significance of Lot 193 is emphasised given it supports an area of native vegetation, albeit modified, that is representative of the structure and floristics of the natural vegetation of the Peel region. Despite being unfenced, it is relatively large (ca. 37 ha), has a conservative perimeter:area ratio (therefore reduced edge-effects), and is continuous with the C-Class Nature Reserve (35283), under vesting with National Parks and Nature Conservation. If the owners of Lot 193 wish to maintain the ecological integrity and conservation significance of the bushland area, it is recommended that a suitable management strategy, which addresses the hygiene concerns of disease and weed invasion is implemented.

## 7. LIST OF PARTICIPANTS

The following personnel of Mattiske Consulting Pty Ltd. were involved with this project:

Principal Ecologist: Dr E Mattiske  
Senior Ecologist: Mr D Bright  
Botanists: Ms Vanessa Clarke

## 8. ACKNOWLEDGEMENTS

The authors would like to thank Ms Marie Ward from the Ministry of Planning for her assistance with this project.

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APPENDIX A : VASCULAR PLANT SPECIES LIST FOR LOT 193 PINJARRA ROAD,  
RAVENSWOOD, 1999

- Community 1 = Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over *Kunzea ericifolia*, *Dasypogon bromeliifolius* and *Phlebocarya ciliata*.  
 Community 2 = Open Woodland of *Corymbia calophylla* and *Eucalyptus marginata* over *Allocasuarina humilis* and *Bossiaea eriocarpa*.  
 Community 3 = Low Woodland of *Melaleuca raphiophylla* over a Shrubland of *Melaleuca viminea* and *Melaleuca incana* subsp. *incana*.  
 Community 4 = Closed Heath dominated by *Pericalymma ellipticum*, *Scholtzia involucrata* and *Acacia saligna*.  
 Community 5 = Open Heath of *Melaleuca uncinata* and *Melaleuca viminea* over *Cynodon dactylon*.  
 Community 6 = Low Open Chenopod Shrubland of *Halosarcia syncarpa* with scattered emergent *Melaleuca pauciflora* on waters edge.

| FAMILY           | SPECIES                                     | Community |   |   |   |   |   |
|------------------|---|-----------|---|---|---|---|---|
|                  |   | 1         | 2 | 3 | 4 | 5 | 6 |
| DENNSTAEDTIACEA  | <i>Pteridium esculentum</i>                 | +         |   |   |   |   |   |
| ZAMIACEAE        | <i>Macrozamia riedlei</i>                   | +         |   |   |   |   |   |
| POACEAE          | * <i>Briza maxima</i>                       | +         | + |   |   | + |   |
|                  | * <i>Cynodon dactylon</i>                   | +         |   |   |   | + |   |
|                  | * <i>Ehrharta calycina</i>                  | +         |   |   |   |   |   |
|                  | * <i>Eragrostis curvula</i>                 | +         |   |   |   |   |   |
| CYPERACEAE       | <i>Cyathochaeta avenacea</i>                |           | + |   |   |   |   |
|                  | <i>Gahnia trifida</i>                       |           |   |   |   | + |   |
|                  | <i>Lepidosperma longitudinale</i>           | +         |   |   |   |   |   |
|                  | <i>Lepidosperma squamatum</i> (narrow form) | +         |   |   |   |   | + |
|                  | <i>Mesomelaena tetragona</i>                | +         | + |   |   |   |   |
|                  | <i>Schoenus curvifolius</i>                 | +         |   |   |   |   |   |
|                  | <i>Schoenus rigens</i>                      |           |   |   |   |   | + |
| RESTIONACEAE     | <i>Chaetanthus aristatus</i>                |           |   |   |   |   |   |
|                  | <i>Desmocladius fasciculatus</i>            |           | + |   |   |   |   |
|                  | <i>Desmocladius flexuosus</i>               | +         | + |   |   |   |   |
|                  | <i>Hypolaena exsulca</i>                    | +         |   | + |   |   | + |
|                  | <i>Lyginia barbata</i>                      | +         | + |   |   |   |   |
|                  | <i>Meeboldina scariosa</i>                  |           |   |   |   |   | + |
| DASYPOGONACEAE   | <i>Dasypogon bromeliifolius</i>             | +         | + |   |   | + |   |
| XANTHORRHOEACEAE | <i>Xanthorrhoea preissii</i>                | +         | + |   |   |   |   |
| PHORMIACEAE      | <i>Dianella revoluta</i>                    | +         |   |   |   |   |   |
| ANTHERICACEAE    | <i>Chamaescilla corymbosa</i>               | +         | + |   |   |   | + |
|                  | <i>Laxmannia squarrosa</i>                  | +         |   |   |   |   |   |
|                  | <i>Lomandra hermaphrodita</i>               | +         |   |   |   |   |   |
|                  | <i>Lomandra nigricans</i>                   | +         |   |   |   |   |   |
|                  | <i>Lomandra preissii</i>                    | +         | + |   |   |   |   |
|                  | <i>Lomandra sonderi</i>                     |           | + |   |   |   |   |
| COLCHIACACEAE    | <i>Burchardia umbellata</i>                 | +         | + |   |   |   |   |

(+) *Cyperus*  
with  
Samp.

APPENDIX A : VASCULAR PLANT SPECIES LIST FOR LOT 193 PINJARRA ROAD,  
RAVENSWOOD, 1999

- Community 1 = Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over *Kunzea ericifolia*, *Dasyogon bromeliifolius* and *Phlebocarya ciliata*.
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- Community 4 = Closed Heath dominated by *Pericalymma ellipticum*, *Scholtzia involucrata* and *Acacia saligna*.
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- Community 6 = Low Open Chenopod Shrubland of *Halosarcia syncarpa* with scattered emergent *Melaleuca pauciflora* on waters edge.

| FAMILY         | SPECIES   | Community |   |   |   |   |   |
|----------------|---|-----------|---|---|---|---|---|
|                |   | 1         | 2 | 3 | 4 | 5 | 6 |
| HAEMODORACEAE  | <i>Anigozanthos</i> sp.                             | +         | + |   |   |   |   |
|                | <i>Conostylis aculeata</i> subsp. <i>preissii</i>   |           | + |   |   |   |   |
|                | <i>Conostylis aculeata</i> subsp. <i>?preissii</i>  | +         |   |   |   |   |   |
|                | <i>Haemodorum spicatum</i>                          | +         |   |   |   |   |   |
|                | <i>Phlebocarya ciliata</i>                          | +         |   |   |   |   |   |
| AMARYLLIDACEAE | <i>Hypoxis occidentalis</i>                         |           | + |   |   |   |   |
| IRIDACEAE      | <i>Patersonia occidentalis</i>                      | +         | + |   |   |   |   |
|                | * <i>Watsonia</i> sp.                               | +         |   |   |   |   | + |
| ORCHIDACEAE    | <i>Caladenia</i> sp.                                | +         |   |   |   |   |   |
|                | <i>Microtis</i> sp.                                 |           |   |   |   | + |   |
|                | <i>Pterostylis vittata</i>                          | +         |   |   |   |   |   |
| CASUARINACEAE  | <i>Allocasuarina fraseriana</i>                     |           |   |   |   | + |   |
|                | <i>Allocasuarina humilis</i>                        | +         | + |   |   |   |   |
| PROTEACEAE     | <i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i>   |           |   |   |   | + |   |
|                | <i>Banksia attenuata</i>                            | +         | + |   |   |   |   |
|                | <i>Banksia grandis</i>                              |           |   |   |   | + |   |
|                | <i>Banksia ilicifolia</i>                           | +         |   |   |   |   |   |
|                | <i>Banksia littoralis</i>                           | +         |   |   |   |   |   |
|                | <i>Dryandra lindleyana</i>                          |           |   |   |   | + |   |
|                | <i>Dryandra sessilis</i>                            | +         |   |   |   |   |   |
|                | <i>Hakea prostrata</i>                              | +         | + |   |   |   |   |
|                | <i>Hakea sulcata</i>                                |           |   |   |   |   | + |
|                | <i>Hakea varia</i>                                  |           |   |   |   |   | + |
|                | <i>Petrophile linearis</i>                          | +         | + |   |   |   |   |
|                | <i>Stirlingia latifolia</i>                         | +         |   |   |   |   |   |
|                | <i>Synaphea petiolaris</i> subsp. <i>petiolaris</i> | +         |   |   | + |   |   |
|                | <i>Xylomelum occidentale</i>                        | +         |   |   |   |   |   |
| LORANTHACEAE   | <i>Nuytsia floribunda</i>                           | +         | + |   |   | + |   |
| POLYGONACEAE   | * <i>Rumex crispus</i>                              |           |   |   | + |   | + |
| CHENOPODIACEAE | <i>Halosarcia syncarpa</i>                          |           |   |   |   |   | + |
|                | <i>Sarcocornia blackiana</i>                        |           |   |   |   |   | + |

APPENDIX A : VASCULAR PLANT SPECIES LIST FOR LOT 193 PINJARRA ROAD,  
RAVENSWOOD, 1999

Community 1 = Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over *Kunzea ericifolia*, *Dasyogon bromeliifolius* and *Phlebocarya ciliata*.

Community 2 = Open Woodland of *Corymbia calophylla* and *Eucalyptus marginata* over *Allocasuarina humilis* and *Bossiaea eriocarpa*.

Community 3 = Low Woodland of *Melaleuca raphiophylla* over a Shrubland of *Melaleuca viminea* and *Melaleuca incana* subsp. *incana*.

Community 4 = Closed Heath dominated by *Pericalymma ellipticum*, *Scholtzia involucrata* and *Acacia saligna*.

Community 5 = Open Heath of *Melaleuca uncinata* and *Melaleuca viminea* over *Cynodon dactylon*.

Community 6 = Low Open Chenopod Shrubland of *Halosarcia syncarpa* with scattered emergent *Melaleuca pauciflora* on waters edge.

| FAMILY        | SPECIES                                       | Community |   |   |   |   |   |
|---------------|---|-----------|---|---|---|---|---|
|               |   | 1         | 2 | 3 | 4 | 5 | 6 |
| AMARANTHACEAE | <i>Alternanthera nodiflora</i>                |           |   |   | + |   |   |
| MOLLUGINACEAE | <i>Macarthuria ?australis</i>                 | +         |   |   |   |   |   |
| LAURACEAE     | <i>Cassytha racemosa</i>                      |           |   |   | + | + |   |
| DROSERACEAE   | <i>Drosera erythrorhiza</i>                   | +         | + |   |   |   |   |
|               | <i>Drosera</i> sp. (climbing)                 | +         |   |   |   |   |   |
| MIMOSACEAE    | <i>Acacia huegelii</i>                        | +         | + |   |   |   |   |
|               | <i>Acacia pulchella</i>                       |           |   | + |   |   |   |
|               | <i>Acacia pulchella</i> var. <i>pulchella</i> | +         |   |   |   |   |   |
|               | <i>Acacia saligna</i>                         | +         | + | + | + | + |   |
|               | <i>Acacia stenoptera</i>                      | +         |   |   |   | + |   |
| PAPILIONACEAE | <i>Bossiaea eriocarpa</i>                     | +         | + |   |   |   |   |
|               | <i>Callistachys lanceolata</i>                | +         |   |   |   |   |   |
|               | <i>Daviesia physodes</i>                      | +         | + |   |   |   |   |
|               | <i>Eutaxia virgata</i>                        |           |   |   |   | + |   |
|               | <i>Gompholobium tomentosum</i>                | +         | + |   |   |   |   |
|               | <i>Hardenbergia comptoniana</i>               | +         |   |   |   |   |   |
|               | <i>Jacksonia furcellata</i>                   | +         |   |   |   |   |   |
|               | <i>Jacksonia sternbergiana</i>                | +         | + |   |   |   | + |
|               | <i>Kennedia prostrata</i>                     | +         | + |   |   |   |   |
|               | * <i>Lupinus angustifolius</i>                | +         |   |   |   |   |   |
|               | <i>Nemcia capitata</i>                        | +         |   |   |   |   |   |
|               | * <i>Trifolium</i> sp.                        |           |   |   |   |   | + |
|               | <i>Viminaria juncea</i>                       |           |   |   | + | + |   |
| OXALIDACEAE   | * <i>Oxalis glabra</i>                        | +         |   |   |   |   |   |
|               | * <i>Oxalis pes-caprae</i>                    | +         |   |   |   |   |   |
| RUTACEAE      | <i>Philotheca spicata</i>                     | +         |   |   |   |   |   |
| EUPHORBIACEAE | * <i>Euphorbia terracina</i>                  | +         |   |   |   |   |   |
|               | <i>Phyllanthus calycinus</i>                  |           |   |   | + |   |   |
| ANACARDIACEAE | * <i>Schinus terebinthifolia</i>              | +         |   |   |   |   |   |
| DILLENIACEAE  | <i>Hibbertia racemosa</i>                     |           |   |   | + |   |   |
|               | <i>Hibbertia vaginata</i>                     | +         | + |   |   |   |   |

APPENDIX A : VASCULAR PLANT SPECIES LIST FOR LOT 193 PINJARRA ROAD,  
RAVENSWOOD, 1999

Community 1 = Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over *Kunzea ericifolia*, *Dasypogon bromelifolius* and *Phlebocarya ciliata*.

Community 2 = Open Woodland of *Corymbia calophylla* and *Eucalyptus marginata* over *Allocasuarina humilis* and *Bossiaea eriocarpa*.

Community 3 = Low Woodland of *Melaleuca raphiophylla* over a Shrubland of *Melaleuca viminea* and *Melaleuca incana* subsp. *incana*.

Community 4 = Closed Heath dominated by *Pericalymma ellipticum*, *Scholtzia involucrata* and *Acacia saligna*.

Community 5 = Open Heath of *Melaleuca uncinata* and *Melaleuca viminea* over *Cynodon dactylon*.

Community 6 = Low Open Chenopod Shrubland of *Halosarcia syncarpa* with scattered emergent *Melaleuca pauciflora* on waters edge.

| FAMILY       | SPECIES  | Community |   |   |   |   |   |
|--------------|--|-----------|---|---|---|---|---|
|              |  | 1         | 2 | 3 | 4 | 5 | 6 |
| MYRTACEAE    | <i>Astartea fascicularis</i>                           | +         |   |   |   |   | + |
|              | <i>Baeckea camphorosmae</i>                            | +         | + |   |   |   |   |
|              | <i>Corymbia calophylla</i>                             | +         | + |   |   |   |   |
|              | <i>Eucalyptus marginata</i>                            | +         | + |   |   |   |   |
|              | <i>Eucalyptus rudis</i>                                | +         |   |   |   |   | + |
|              | <i>Kunzea ericifolia</i>                               | +         | + |   | + |   |   |
|              | <i>Kunzea recurva</i>                                  |           |   |   | + |   |   |
|              | <i>Melaleuca incana</i> subsp. <i>incana</i>           |           |   |   | + |   |   |
|              | <i>Melaleuca pauciflora</i>                            |           |   |   |   |   | + |
|              | <i>Melaleuca preissiana</i>                            | +         |   |   | + |   |   |
|              | <i>Melaleuca raphiophylla</i>                          | +         |   | + |   |   | + |
|              | <i>Melaleuca uncinata</i>                              |           |   |   |   |   | + |
|              | <i>Melaleuca viminea</i>                               |           |   |   | + |   | + |
|              | <i>Pericalymma ellipticum</i>                          |           |   | + | + |   |   |
|              | <i>Regelia ciliata</i>                                 |           |   |   | + |   |   |
|              | <i>Scholtzia involucrata</i>                           | +         | + |   | + |   | + |
| EPACRIDACEAE | <i>Conostephium pendulum</i>                           |           |   | + |   |   |   |
|              | <i>Leucopogon conostephioides</i>                      | +         |   |   |   |   |   |
|              | <i>Leucopogon propinquus</i>                           | +         | + |   |   |   |   |
| LAMIACEAE    | <i>Hemiandra pungens</i>                               | +         | + |   |   |   |   |
| SOLANACEAE   | * <i>Solanum nigrum</i>                                | +         |   |   |   |   |   |
| RUBIACEAE    | <i>Opercularia hispidula</i>                           | +         |   |   |   |   |   |
| GOODENIACEAE | <i>Dampiera ?trigona</i>                               |           |   |   |   | + |   |
| STYLIDIACEAE | <i>Stylidium brunonianum</i>                           | +         |   |   |   |   |   |
|              | <i>Stylidium brunonianum</i> subsp. <i>brunonianum</i> | +         |   |   |   |   |   |
| ASTERACEAE   | * <i>Arctotheca calendula</i>                          | +         |   |   |   |   |   |
|              | * <i>Hypochaeris glabra</i>                            | +         |   |   |   |   |   |
|              | * <i>Sonchus oleraceus</i>                             | +         |   |   |   |   |   |
|              | * <i>Ursinia anthemoides</i>                           | +         | + |   |   |   |   |

APPENDIX B: PHOTOGRAPHIC RECORD OF PLANT COMMUNITIES IN  
THE SURVEY AREA



Photograph 1: Plant Community 1 – Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over *Kunzea ericifolia*, *Dasyogon bromeliifolius*, *Phlebocarya ciliata* and *Conostylis aculeata* subsp. *preissii* in sandy loam soils.



Photograph 2: Plant Community 2 – Open Woodland of *Corymbia calophylla* and *Eucalyptus marginata* over *Allocasuarina humilis* and *Bossiaea eriocarpa* in sandy loam soils.

APPENDIX B: PHOTOGRAPHIC RECORD OF PLANT COMMUNITIES IN  
THE SURVEY AREA



Photograph 3: Plant Community 3 - Low Woodland of *Melaleuca raphiophylla* over a Shrubland of *Melaleuca viminea* and *Melaleuca incana* subsp. *incana* and mixed Restionaceae in clay soils.



Photograph 4: Plant Community 4 - Closed Heath of *Pericalymma ellipticum*, *Scholtzia involucrata* and *Acacia saligna* in clay loam soils.

APPENDIX B: PHOTOGRAPHIC RECORD OF PLANT COMMUNITIES IN  
THE SURVEY AREA



Photograph 5: Plant Community 5 - Open Heath of *Melaleuca uncinata* and *Melaleuca viminea* over *Cynodon dactylon* with occasional emergent *Melaleuca raphiophylla* and *Eucalyptus rudis* in clay loam soils.



Photograph 6: Plant Community 6 - Low Open Chenopod Shrubland of *Halosarcia syncarpa* with scattered emergent *Melaleuca pauciflora*.

APPENDIX B: PHOTOGRAPHIC RECORD OF PLANT COMMUNITIES IN  
THE SURVEY AREA



Photograph 7: Evidence of dumped car bodies and unwanted property..

**APPENDIX C: LIST OF ENDANGERED FLORA FOR THE PEEL-HARVEY CATCHMENT**

**Declared Rare**

*Anthocercis gracilis*  
*Caladenia huegelii*  
*Centrolepis caespitosa*  
*Diuris drummondii*  
*Diuris micrantha*  
*Diuris purdiei*  
*Drakaea elastica*  
*Drakaea micrantha* ms  
*Eucalyptus graniticola* ms  
*Hydatella dioica*  
*Pimelea rara*  
*Tetraria australiensis*  
*Verticordia plumosa* var. *pleiobotrya*

**Priority One**

*Acacia lasiocarpa* var. *bracteolata* long  
 peduncle variant (G.J. Keighery 5026)  
*Aristida ramosa*  
*Caladenia longicauda* subsp. *clivicola*  
*Caladenia uliginosa* subsp. *patulens*  
*Eryngium subdecumbens* ms  
*Haloragis tenuifolia*  
*Schoenus pennisetis*  
*Synaphea odocoileops*  
*Synaphea stenoloba*

**Priority Two**

*Acacia oncinophylla* subsp. *patulifolia*  
*Boronia capitata* subsp. *gracilis*  
*Eryngium pinnatifidum* subsp. *palustre* ms  
*Eucalyptus marginata* subsp. *elegantella*  
*Grevillea manglesii* subsp. *ornithopoda*  
*Trichocline* sp. *treeeton* (B.J. Keighery & N.  
 Gibson 564)

**Priority Three**

*Acacia horridula*  
*Acacia oncinophylla* subsp. *oncinophylla*

*Acacia semitrullata*  
*Baeckea tenuifolia*  
*Blennospora* sp. *Ruabon* (B.J. Keighery &  
 N. Gibson 20)  
*Cyathochaeta teretifolia*  
*Dillwynia dillwynioides*  
*Grevillea prominens*  
*Lambertia multiflora* var. *darlingensis*  
*Myriophyllum echinatum*  
*Phyllota gracilis*  
*Rhodanthe pyrethrum*  
*Sporadanthus rivularis* ms  
*Stylidium longitubum*  
*Stylidium mimeticum*  
*Synaphea acutiloba*  
*Synaphea pinnata*

**Priority Four**

*Acacia flagelliformis*  
*Anthotium junciforme*  
*Aponogeton hexatepalus*  
*Boronia tenuis*  
*Caladenia speciosa*  
*Calothamnus graniticus* subsp. *graniticus*  
*Conostephium minus*  
*Conostylis pauciflora* subsp. *pauciflora*  
*Dodonaea hackettiana*  
*Drosera marchantii* subsp. *marchantii*  
*Microtis media* subsp. *quadrata*  
*Grevillea pimeleoides*  
*Parsonsia diaphanophleba*  
*Schoenus natans*  
*Senecio leucoglossus*  
*Verticordia lindleyi* subsp. *lindleyi*  
*Villarsia submersa*

(Modified from Weaving 1999 with  
 updates from Western Australian  
 Herbarium 1999)



**PEEL REGION SCHEME  
PROPOSED RESERVATIONS AND ZONES**

SUBMISSION NO : 84  
(REFERENCE NO : 2938)



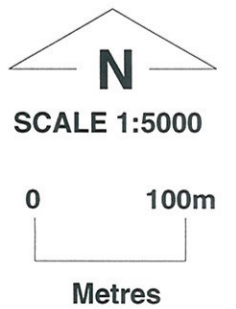
NOTE: All Dimensions are in Metres.  
Produced By Ministry For Planning  
Land Information Branch, Statutory Mapping Section

- RESERVED LANDS**
- REGIONAL OPEN SPACE
  - RAILWAYS
  - STATE FORESTS
  - WATERWAYS
- ROADS :**
- PRIMARY REGIONAL ROADS
  - OTHER REGIONAL ROADS

- PUBLIC PURPOSES - DENOTED AS FOLLOWS :**
- HOSPITAL
  - HIGH SCHOOL
  - PUBLIC UTILITIES
  - SPECIAL USES
  - UNIVERSITY

- ZONES**
- URBAN
  - URBAN DEFERRED
  - REGIONAL CENTRE
  - INDUSTRIAL
  - RURAL
  - PRIVATE RECREATION







- DRAFT STRUCTURE PLAN (R.O.S.)
- FINAL STRUCTURE PLAN (R.O.S.)
- SPECIAL CONTROL AREAS DENOTED AS FOLLOWS :
- WATER CATCHMENTS
- SCHEME BOUNDARY
- SUBJECT LOT



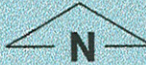


PT. 193

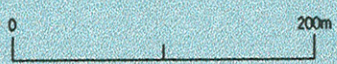
LEGEND

-  CADASTRE
-  PEEL REGION SCHEME BOUNDARIES
-  TOPOGRAPHIC CONTOURS
-  FLOODWAY MANAGEMENT POLICY<sup>1</sup>
-  FLOODWAY
-  FLOOD FRINGE

<sup>1</sup>SOURCE - WATER & RIVERS COMMISSION



SCALE 1:5000



SUBMISSION NO: 84

PEEL REGION SCHEME  
PT LOT 193 FLEGERT ROAD,  
BARRAGUP

AERIAL PHOTOGRAPHY - ORTHO-RECTIFIED  
ORIGINAL PHOTOGRAPHY - DEPARTMENT OF LAND ADMINISTRATION  
FLOWN JANUARY 1999 SCALE 1:20000  
POSITIONAL ACCURACY ± or - 10 metres

