

**The vegetation and flora  
of  
Elashgin-Faulkner Road Bushland**



**and  
“Hutchy’s Block”  
Hadlaw Lakes, Cardiff Pastoral Co.**



**Mortlock River East Catchment  
Shire of Wyalkatchem**

by  
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**Bushcare**

Bushcare: The National Vegetation Initiative

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Support was also provided by the Department of Conservation and Land Management*

## SUMMARY & HIGHLIGHTS

- This flora and vegetation survey of wheatbelt bushland represents collaboration between the:
  - Wildflower Society of Western Australia (Inc)
  - Natural Heritage Trust Bushcare Program (funding grant)
  - volunteers (time, travel, experience)
  - Department of Conservation and Land Management (time, expertise, access to WA Herbarium, public liability insurance)
  - Department of Environmental Protection (time, expertise, information)
  - Department of Agriculture (time, expertise, information) and
  - botanists (time, expertise).
- 74 individuals contributed to this project, including 41 local community volunteers and Wildflower Society member volunteers from Wyalkatchem, Merredin, Bodallin and Perth who assisted with the field survey in Spring 2000.

### Elashgin-Faulkner Road Bushland

- Five permanent 10mx10m quadrats have been established in 30ha – which can be used for ongoing monitoring and learning.
- Species richness (native species only) within the 10mx10m quadrats ranged from 31 to 12.
- Five woodland and shrubland communities were distinguished.
- 110 species were recorded both in the survey quadrats and as opportunistic collections across the study area including:
  - 86 native species as 2 trees, 38 shrubs, 3 twiners, 5 grasses, 38 herbs
  - 2 species at the edge of their known geographical range
  - 1 possible new species (*Frankenia* sp. WSWA WYCR01/06 C Keating)
  - 24 species (22%) of introduced/exotic flora, commonly known as weeds
  - 67 species recorded only once (equating to 61% of total flora).
- A two folder 'Elashgin-Faulkner Road Bushland Field Herbarium' that contains an example of most of the 110 species recorded on the block has been compiled and presented to the land owners and catchment group.

### Cardiff Pastoral Co. "Hutchy's" Block (*Hadlaw Lakes Property, Hammond Road*)

- Thirteen permanent 10mx10m quadrats have been established in 40ha – which can be used for ongoing monitoring and learning.
- Species richness within the 10mx10m quadrats ranged from 39 to 9 (with no weed species recorded for nine of the 14 quadrats).
- Twelve mallee and shrubland communities were distinguished.
- 224 species were recorded both in the survey quadrats and as opportunistic collections across the study area (refer Section 8) including:
  - 210 native species as 1 tree, 9 mallees, 107 shrubs, 9 twiners, 8 grasses, 16 sedges and 60 herbs
  - 2 priority flora (*Schoenus griffinianus* and *Leucopogon sulcatus*)
  - 1 species recently removed as a priority species (*Schoenus calcatus*)
  - 1 species locality record for a possible new species (*Triglochin* sp A Flora of Australia GJ Keighery 2477)
  - 2 species with overlapping ranges, previously not previously recorded within the same location (*Chamaexeros fimbriatus* and *C. macranthera*)
  - comparatively high numbers of *Acacia* (16) and *Eucalyptus* (10) species
  - 14 species (6%) of introduced/exotic flora, commonly known as weeds
  - 129 species (57%) recorded only once (equating to of total flora).
- An eight folder 'Hutchy's Field Herbarium' that contains an example of most of the 224 species recorded on the block has been compiled and presented to the land owners and catchment group.

### Overall comments on both study areas

- Although only 30ha and 40ha in size in size, these bushland blocks are now both large and important remnants in the Shire of Wyalkatchem where:
  - only 12% of original bushland remains as a result of extensive clearing, and
  - less than 15% of this original bushland is within areas of greater than 20ha.
- The connection with other remnants, particularly to other significant bushland areas and landscape units adds great value to both the survey areas and the nearby remnants
  - *Elashgin-Faulkner Road Bushland* is an important natural link in the Elashgin Creek wetland chain
  - *Hutchy's Block* together with the adjoining bushland to the east (Referred to as Patch K64 in CSIRO bird survey research by Brooker and Brooker (1997)) combines to be one of the largest remnants in the Shires of Wyalkatchem and Trayning.
- The most serious threats to the condition and conservation values of the bushland are disturbance, weeds and a rising water table causing waterlogging and salinisation.

### Recommendation

- *Elashgin-Faulkner Road Bushland* is Unallocated Crown Land (UCL) and would make a significant contribution to the conservation estate. It is recommended it be vested in the Conservation Commission for the purpose of flora, fauna and landscape protection. Any other areas of UCL in the Elashgin Creek wetland chain should also be added to the conservation estate.

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**ERRATUM C1** – Unfortunately photos 3, 4, 5, 7, & 8 are mirror-images of reality. Take care when using in the field to relocate quadrats.

**ERRATUM C2** – Unfortunately photos 9-17, 19-22 and 25-26 are mirror-images of reality. Take care when using in the field to relocate quadrats.

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## 1. INTRODUCTION

### 1.1 ELASHGIN-FAULKNER ROAD BUSHLAND AND "HUTCHY'S BLOCK"

The Elashgin-Faulkner Road Bushland and "Hutchy's Block" study areas are in the Mortlock River East Catchment and the Shire of Wyalkatchem. "Hutchy's" is a bush block within the property "Hadlaw Lakes" that is owned and managed by the Cardiff Pastoral Company, a Davies family enterprise. Elashgin-Faulkner Road Bushland is Unallocated Crown Land (UCL) adjoining "Hadlaw Lakes" about 20km south-east from Hutchy's Block. Gary and Deb Davies were the hosts of these surveys.

This report provides a vegetation and flora record using the 'Community Bushland Plant Survey' process (Keighery BJ 1994) as developed and managed by the Wildflower Society of Western Australia (Inc).

It was agreed with the Davies and the Elashgin Creek Catchment Group that survey outputs would include a vegetation map, plant species list, brief report, field herbarium (for retention by the land managers, with access by the Catchment Group and others) and a presentation of the Survey Report to the Elashgin Creek Catchment Group.

### 1.2 THE BUSH BLOCKS AND THEIR LAND MANAGERS

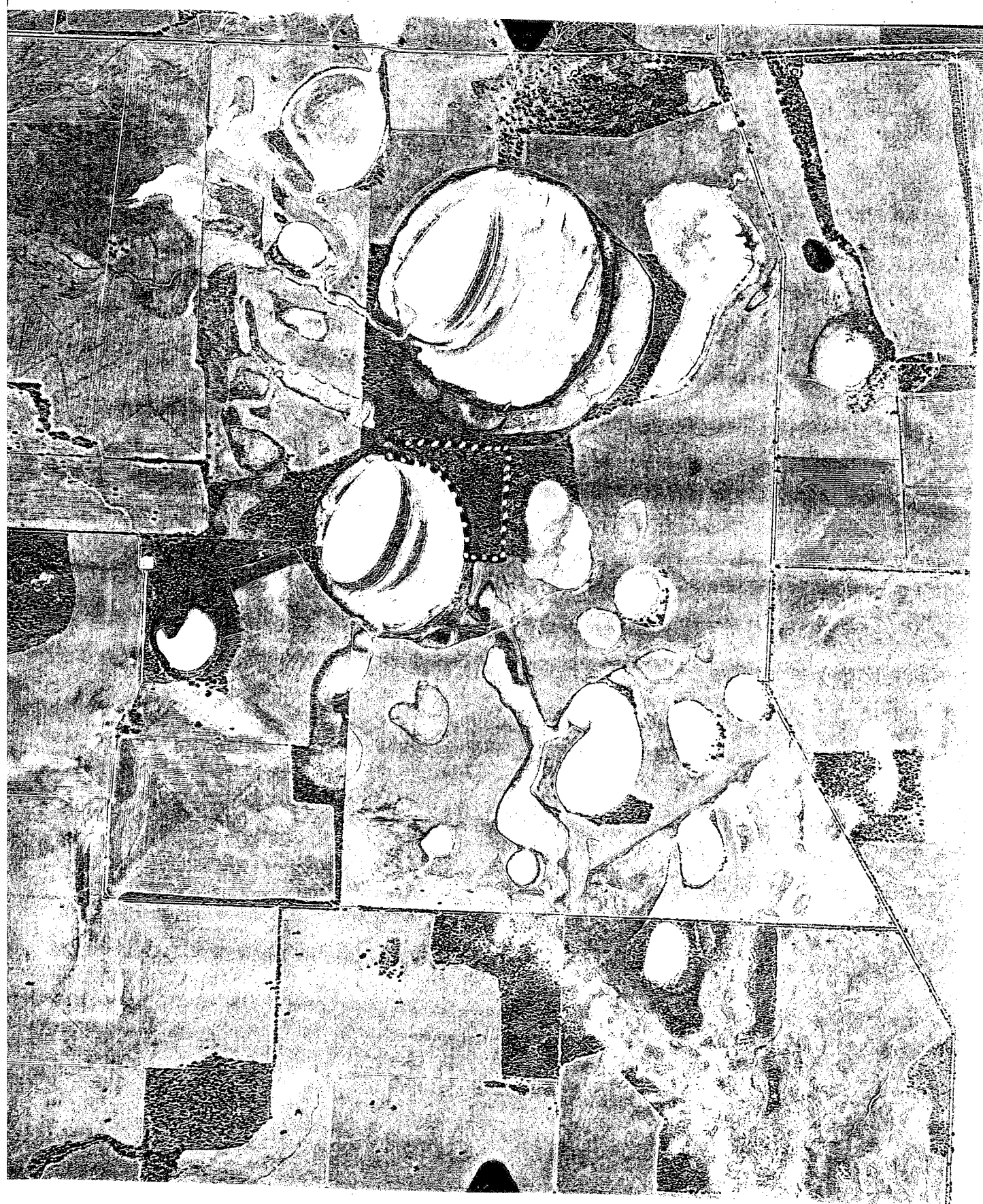
#### Study Area 1: Elashgin-Faulkner Road Bushland

Elashin-Faulkner Road Bushland is a small part of the lake and dune system of the Elashgin Creek wetland chain, which comprises of fresh, brackish and salt water lakes and creeklines. The property is Unallocated Crown Land (UCL) and has been adopted by both the Davies family and the Elashgin Creek Catchment Group as an important conservation area and possible seed source for regeneration projects in the catchment. The adjoining lake to the north is a popular water skiing area.



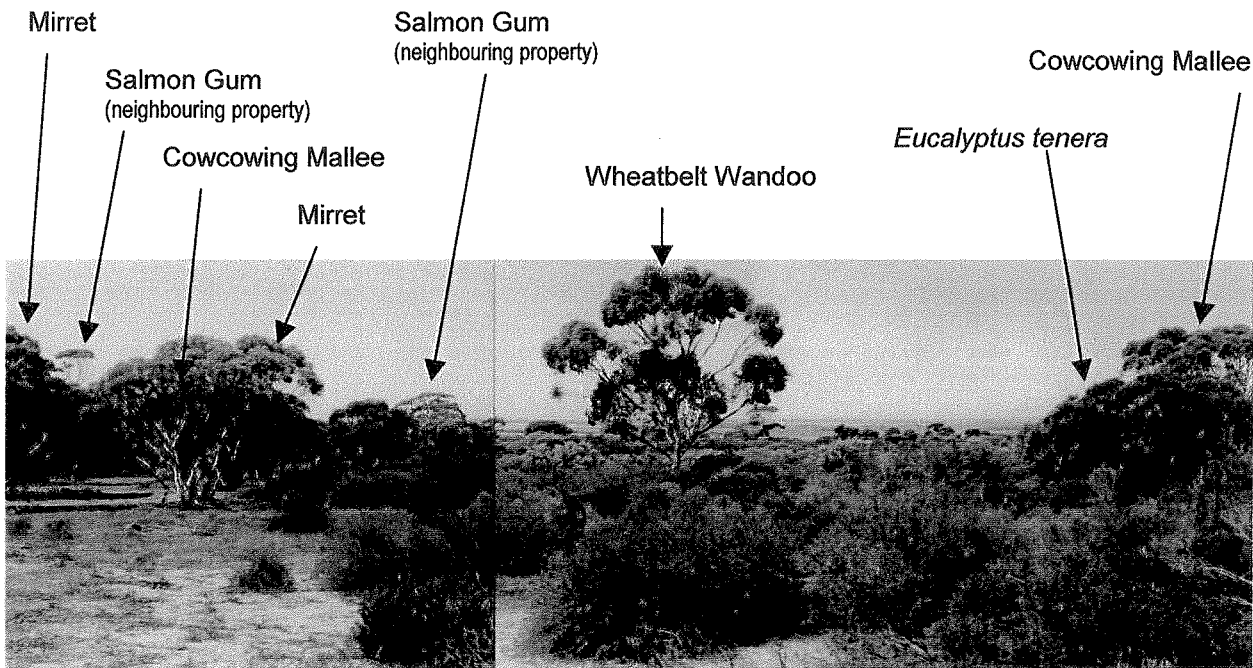
**PHOTO 1A: View of Elashgin-Faulkner Road Bushland from eastern edge of lake, looking upslope and south-east across a *Halosarcia* species (Samphire) plant community to a *Eucalyptus salubris* (Gimlet) plant community. (Photo: C. Keating 11/01)**

**PHOTO 1B:** Aerial view of part of the Elashgin Creek system, showing the study area  
(Ref: DOLA WA3457(c) Dowerin & Extensions Run 12, photo 5400, 2/11/94)



## **Study Area 2: "Hutchy's Block" (part of Hadlaw Lakes)**

Owned and managed by the Cardiff Pastoral Company, "Hadlaw Lakes" was settled by the Davies family in 1910-1920 when the first areas of bushland were being cleared for agriculture. Today stud rams, sheep and wheat are the major farming enterprises. "Hadlaw Lakes" totals 10,000ha, of which 200ha (or 2%) are bush. "Hutchy's", the 40ha 'bush block' surveyed is the largest remnant on the property.



**PHOTO 2A: View of "Hutchy's Bush Block", from northern boundary, looking south-east across the bushland to the adjoining farmland (Photo: C. Keating 11/01)**

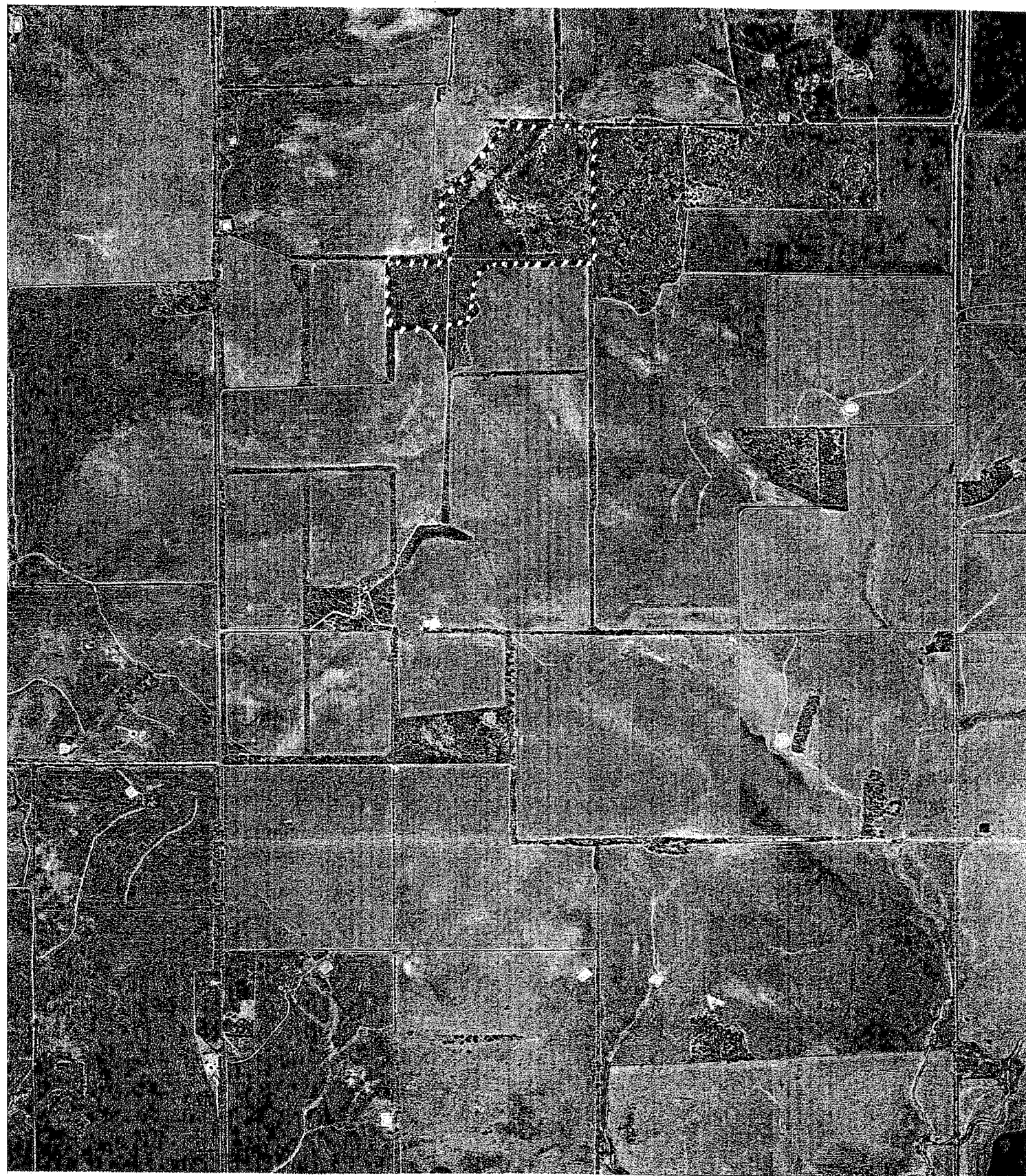
In addition to this *Bushland Plant Survey* other conservation, education and research activities involving the Davies and "Hutchy's" bush block include:

- *Bird surveys* by CSIRO (Lesley and Michael Brooker) since 1993, as part of 'Patch K64' (Brooker & Brooker, 1997) – Refer Photo 2B.
- *Remnant Vegetation Protection Scheme* (RVPS) and associated 30 year conservation covenant sponsored by the Soil and Land Conservation Council, administered by WA Department of Agriculture.
- The *Wyalkatchem-Perth Landcare Exchange Program* – involving Year 10 students from Wyalkatchem High School and Perth schools in the survey and management of the bush block.
- The *Land for Wildlife* program coordinated by the Department of Conservation and Land Management and sponsored by the State Government and the Natural Heritage Trust. *Land for Wildlife* is a voluntary scheme that aims to encourage and assist private landholders in Western Australia to provide habitats for wildlife on their property, even though the property may be managed for other purposes.

The 'bush block' has been fenced for over 50 years (with recent upgrading from RVPS grant), has not been logged for over 40 years and in recent times has not been used for firewood collecting or rubbish dumping. Gravel extraction in the north-west corner of the block is no longer active. Gary Davies has no recollection of either grazing or fire in this bushland in his lifetime.



**PHOTO 2B:** Aerial view of “Hutchy’s Block”. Showing the study area, the adjoining bushland (which together with Hutchy’s = Patch K64 in CSIRO Bird Survey Project (Brooker & Brooker 1997)) and linkages to other remnant vegetation.  
(Ref: DOLA WA4388(c) Trayning, Run 8, photo 5090, 27/10/99)



### 1.3 THE BUSHLAND PLANT SURVEY PROJECT

The Wildflower Society's *Bushland Plant Survey Project* is a community-based project that has been in existence since 1988. It combines **understanding plants in the bushland** (ie working with living plants), **learning through involvement** and **bushland conservation** through the specific objectives:

- To foster cooperation, understanding and city-rural links between experienced volunteers and the broader community, towards the ongoing conservation and management of bushland.
- To introduce the community to bushland plant survey techniques, in particular recognition of native plants and plant communities.
- To survey remnant vegetation which meets the selection criteria in order to provide baseline flora and vegetation information for managing and monitoring bushland.
- To help landowners and managers interpret this information as an aid in land management planning, particularly with respect to protecting remnant vegetation and developing revegetation programs.

The need to protect remnant vegetation is a premise of the project. The Wildflower Society conducts survey projects at sites where the landholders have demonstrated that past and future protection measures have been taken, particularly fencing and no grazing.

#### *Coordination, management and resources*

Whilst coordinated and managed by the Wildflower Society of Western Australia (Inc) the *Bushland Plant Survey Project* receives essential support from the Natural Heritage Trust (NHT) – Bushcare, the Department of Conservation and Land Management (CALM) and the Wildflower Society of WA.

#### *Participants*

One of the most valued elements of the survey approach is participation and the associated action learning – participation of the community (both local and distant) and the participation of 'experts'. Across all aspects of this project, from field survey, through pressing plant specimens, sorting specimens, identifying specimens, confirming identifications, collating field herbarium, updating field survey sheets, correcting specimen tags and photographing quadrats – volunteers have been significant contributors. Section 7 acknowledges in greater detail the 74 individuals who contributed directly to this survey. The cover photographs show some of the volunteers recording information during the September 2000 Field Survey.

The role of the botanists is to coordinate the project, complete the plant identifications, ensure the work is completed to a scientific standard, prepare the vegetation map and accompanying vegetation and flora report, and to return to the catchment group and land manager to present the findings of the survey.

### 1.4 TERMINOLOGY OF BUSHLAND PLANT SURVEY

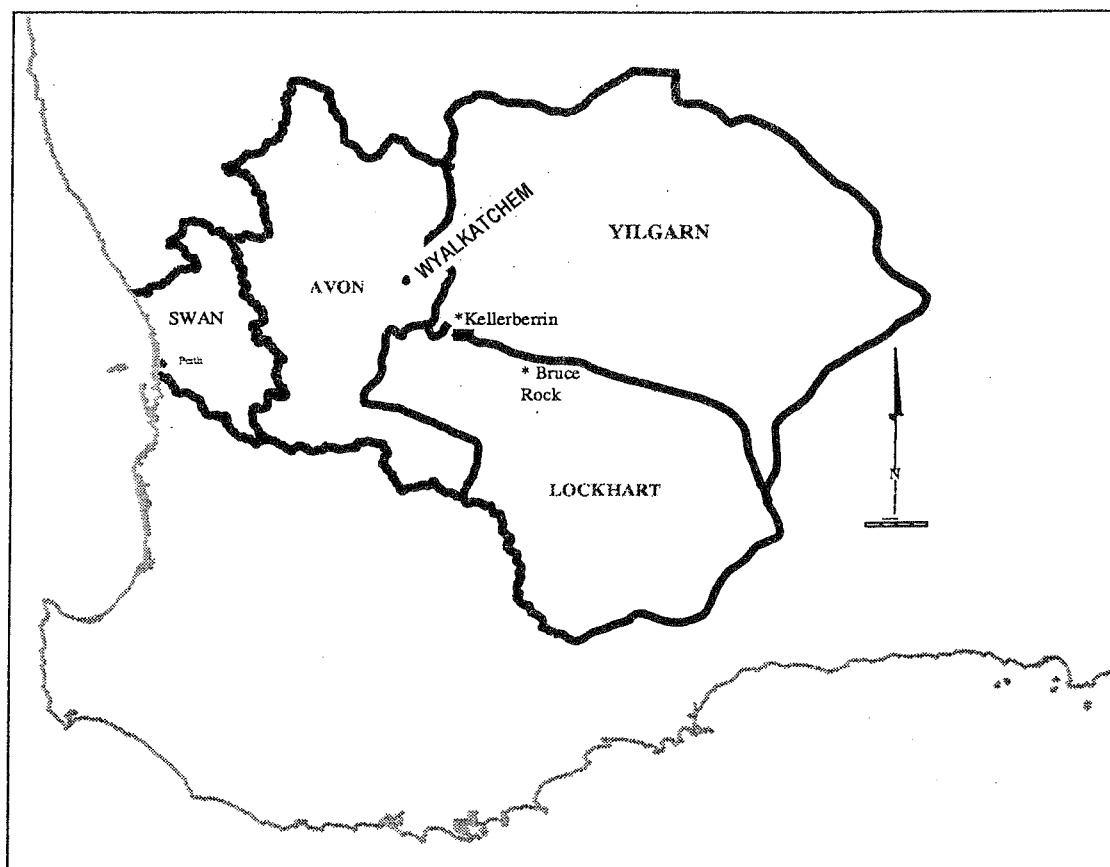
Bushland plant survey involves a range of old and new concepts, methods and language. Although the words are shared, there may be different understandings of what they mean – a common understanding reduces ambiguity and assists with communication. Appendix A defines some of the terms used in the *Bushland Plants Survey* process, this report and bushland management in general.

## 2. STUDY AREA AND BACKGROUND INFORMATION

### 2.1 LOCATION

Elashgin-Faulkner Road Bushland and Hutchy's Block, the subjects of this report are blocks of remnant bush in the Shire of Wyalkatchem. Wyalkatchem is approximately 280km east, north-east of Perth. The study areas are approximately 25km south and 24km east, south-east of the Wyalkatchem Townsite respectively. Both sub-catchments are part of the **Mortlock River East Catchment**, which is nestled in the **Avon Catchment** which in turn is one of the four Catchments which make up the **Swan-Avon Catchment/Drainage Basin** (Refer Map 1). Elashgin-Faulkner Road Bushland is within the **Elashgin Creek Sub-Catchment**.

**MAP 1: Avon, Yilgarn, Swan and Lockhart Catchments of the Swan-Avon Catchment / Drainage Basin and location of Elashgin-Faulkner Bushland and "Hutchy's" survey areas** (Penny & McKane 1999)



### 2.2 CLIMATE

The climate of the Wyalkatchem study area which is characterised by cool wet winters (April to September) and warm dry summers (October to March) falls into the 'Mediterranean Climatic Regime'. Mediterranean climates can be further classified on the length of the dry season. Using this method the study area is 'Dry Warm Mediterranean' (ie in contrast to the Cape Naturaliste area which is 'Moderate Mediterranean'). The following rainfall and temperature data is extracted from the Commonwealth Bureau of Meteorology (2000) Climate Information Website for the closest Official Weather Recording Station to the study area, the Town of Wyalkatchem (Station No. 010140).

#### 2.2.1 Rainfall

Rainfall for the study area is strongly seasonal, with somewhat reliable winter rains, whilst although rain in summer is unreliable, there can be sporadic heavy falls from thunderstorms (see figures for January below).



The mean average rainfall for Wyalkatchem is 336mm, of which 197.4mm (>58%) falls during the four month period May to August, over 8-12 wet days per month. 154mm (>45%) falls during the three winter months of May, June and July over 9-13 days per month.

The driest months are November to January with monthly averages ranging from 10.3mm to 14.4 mm, received over 2-2.8 days per month. Summer thunderstorms have been responsible for heavy downpours, for example although the mean average rainfall for the month of March is 20.6mm, the record from 90 years of recording is 165.5mm received in 1971. The highest daily fall on record of 90.9mm was from another late summer thunderstorm on 19<sup>th</sup> March 1917.

### 2.2.2 Temperature

The average maximum temperature at Wyalkatchem ranges from 33.9°C in January to 16°C in July. Average minimum temperatures range from 17.7°C in January to 6.1°C in August.

Wyalkatchem experiences a cool winter, with a mean daily temperature of 16.6°C (ranging from 16°C to 17°C). Summer is mild to hot with a mean daily temperature of 33.2°C (ranging from 32.4°C to 33.9°C). January is consistently the hottest month with a mean daily maximum of 33.9°C, and a mean average of 3.2 days >40°C and 24.4 days >30°C. The highest maximum recorded of 44°C is also for January.

## 2.3 TOPOGRAPHY, GEOLOGY, HYDROGEOLOGY AND SALINITY

### 2.3.1 Geology and Topography (extracted from Penny & McKane 1999 and Weaving 1994)

The study area and the Shire of Wyalkatchem fall into the Avon Catchment, part of the Swan-Avon Catchment or Drainage System (Refer Map 1), where the present day landscape is a result of geomorphological processes. The landscape that is now present has gently undulating low relief, with slopes that are long and gentle. The drainage divides are wide and convex, with the main valley wider and containing fresh water streams and salt lakes. These are extensive in the areas of sandplain – and include the Elashgin Creek area. Significant features in the landscape include part of Lake Wallambin (which falls to the north of the Shire and the study area), Carribin Rock and Derdibin Rock.

The Catchment lies on the Yilgarn Block, which is the area east of the Darling Fault (Map 2). The Yilgarn Block is a mass of granite<sup>1</sup> and gneiss<sup>2</sup> from the Archaen Age, some sections being 4,600 to 3,000 million years old.

Wyalkatchem is underlain by granitic rocks covered by alluvia in the major valleys. Mainly the rock is deeply weathered and covered by the “pallid zone”<sup>3</sup>, capped by soil or massive laterite<sup>4</sup> ironstone gravels or sand. Locally, massive granite, which is resistant to weathering, approaches the surface or crops out to form rock domes and tors.

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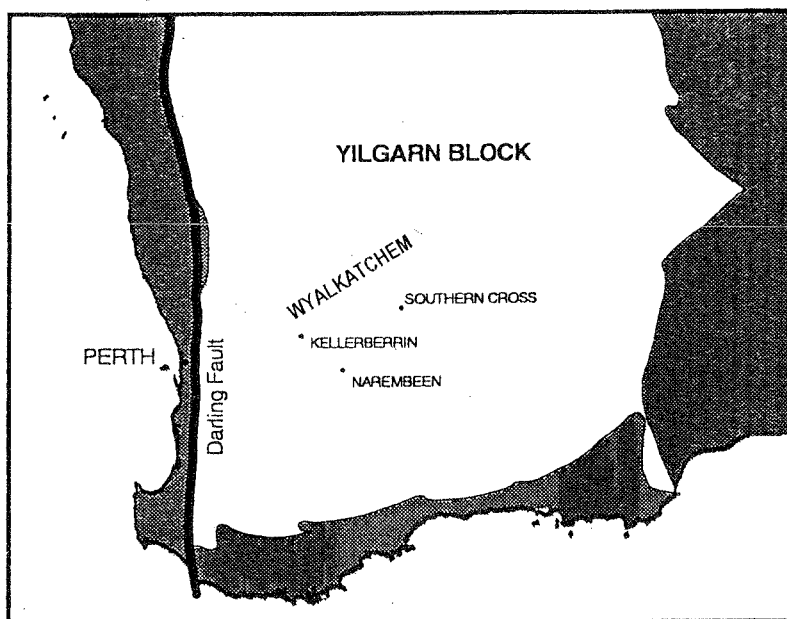
<sup>1</sup> **granite** = a coarse grained igneous rock, its composition is approximately 30% quartz (clear grains), 60% feldspar (opaque creamy white) and 10% mica (black plate-like material).

<sup>2</sup> **gneiss** = a metamorphic rock, generally made up of bands which differ in colour and composition, some bands being rich in feldspar and quartz, others rich in hornblende or mica.

<sup>3</sup> **pallid zone** = The lower portion of a lateritic soil profile, comprising a near-white kaolin-rich clay, with few mottles, but often showing some fabric of the parent rock into which it merges through a transition below.

<sup>4</sup> **laterite** = A product of rock weathering, formed under warm and moist climatic conditions, usually with strongly defined alternating periods of drying and wetting of the soil profile. This process concentrates alumina and iron oxide in the near surface soil horizons, thus giving a red-brown colour and leading to the development of a hard duricrust or ‘cap rock’ on prolonged dehydration of the soil profile.

**MAP 2: Showing the location of the Yilgarn Block in South-Western Australia** (Penny & McKane 1999)



### 2.3.2 Hydrogeology and Salinity (extracted from Penny & McKane 1999, Government of WA 1999)

Interplay of geomorphic and geologic factors governs the movement of water from the time it reaches the land surface until the time of leaving it. Geomorphic features control in large measure the distribution of rainfall and the amount of rainfall that contributes to run-off and ground-water recharge. The nature, distribution and structure of geologic formations control the occurrence, movement, quality and availability of ground-water.

The water-table represents the ground-water reservoir level and changes in its level represent change in ground-water storage. Diurnal or semi-diurnal fluctuations in the water-table are mainly caused by barometric pressure. Water-table fluctuations are also caused by:

- Evapotranspiration – controlled mainly by climate and vegetation (type, density, stage of growth)
- soil permeability
- proximity of the water-table to the ground surface.

**Primary salinity** develops naturally, mainly in areas where rainfall is insufficient to leach salts from the soil profile and evapotranspiration is high. Over thousands of years salt slowly accumulated beneath the south-west of WA, causing changes in biological systems and landscape form and function.

**Secondary salinity** (which takes the form of dryland or irrigation salinities) is the result of clearing of native vegetation and replacing it with shallow-rooted crops and pasture that use less water, causing changes to the hydrology of the landscape. Much of the indigenous vegetation of Australia is perennial and deep rooted, well adapted to surviving both floods and drought and effective in its use of water. Annual crops and pastures do not use as much of the incoming rainfall and this unused water either runs-off or infiltrates beyond the root zone and accumulates as ground-water (recharge). Much of the land in the south-west agricultural region was prone to salinity prior to clearing. It has been estimated that the region has an average of about 2,000 tonnes of salt stored below every hectare in the soil profile between the surface and the bedrock, with as little as 300t/ha in uplands and as much as 10,000t/ha in saline valleys. In many areas this accumulation of salt has become mobilised with the rise in ground-water levels, emerging where water is forced to the land surface.

As saline ground-water comes close to the surface, salt enters the plant root zone leading to the death of native plants, crops and pastures that are not salt tolerant. Plants also suffer from increased waterlogging. Saline ground-waters discharge at the soil surface and are concentrated by evaporation, damaging soils on site and down slopes, eventually draining into streams, rivers and lakes, degrading wetland habitats and

water resources. Seepage areas and scalds are the surface expression of salinity, although salt can also be present in areas where only marginal reductions in plant vigour and crop yield can be seen.

### 2.3.3 Soils (extracted from Lantzke & Fulton 1992, Weaving 1994)

The Shire of Wyalkatchem falls within **The Zone of Ancient Drainage** – with characteristic landforms, vegetation and soils. The landscape consists of a gently undulating plateau, with wide divides, long gentle slopes and broad valleys that contain salt lakes and wetland chains at their lowest points.

Within this **Zone** are ten **Soil Landscape Units** (SLU) that differ mainly in their position within the topographic profile and form a mosaic of soil landscapes. The Shire, which has eight of these SLUs has been surveyed as part of two projects (McArthur 1992, Grealish in Weaving 1994), each using different Soil Landscape Units (Refer Table 1).

**TABLE 1: Soil Landscape Units (SLU) associated with the lateritic plateau within the Zone of Ancient Drainage – illustrating occurrence for the study areas**

Soil Landscape Units [McArthur 1992, Grealish <i>IN</i> Weaving 1994]	o c c u r r e n c e		
	Wyalkatchem Shire	Elashgin - Faulkner Road	Hutchy's Block
<b>Sandplain Soils</b> • Ulva SLU [Yelbeni SLU]	✓		✓
<b>Hillside Soils</b> <i>Units developed on weathered, mottled and pallid zone materials</i> • Booraan SLU [Nembudding SLU] • Collgar SLU [Nungarin SLU] <i>Units developed on fresh rock</i> • Danberrin SLU [Kwelkan SLU]	✓ ✓ ✓		✓
<b>Valley Floor Soils</b> • Baandee SLU [Wallambin SLU] • Merredin SLU [Wyalkatchem SLU] • Merredin (saline) SLU • Belka SLU • Belka (saline) SLU • Kununoppin SLU [Nangeenan SLU]	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓	

The “Elashgin-Faulkner Road” study area is contained within two **valley floor** Soil Landscape Units:

- Merredin SLU – broad, flat to gently inclined terrain on major valley floors, where the chief soils are:
  - red-brown sandy loam over clay
  - red and grey valley soil and/or
  - grey to brown cracking clay.
- Merredin (saline) SLU – that contains the Merredin SLU – but affected by salinity.

The “Hutchy’s” study area crosses between **sandplain** and **hillside** Soil Landscape Units

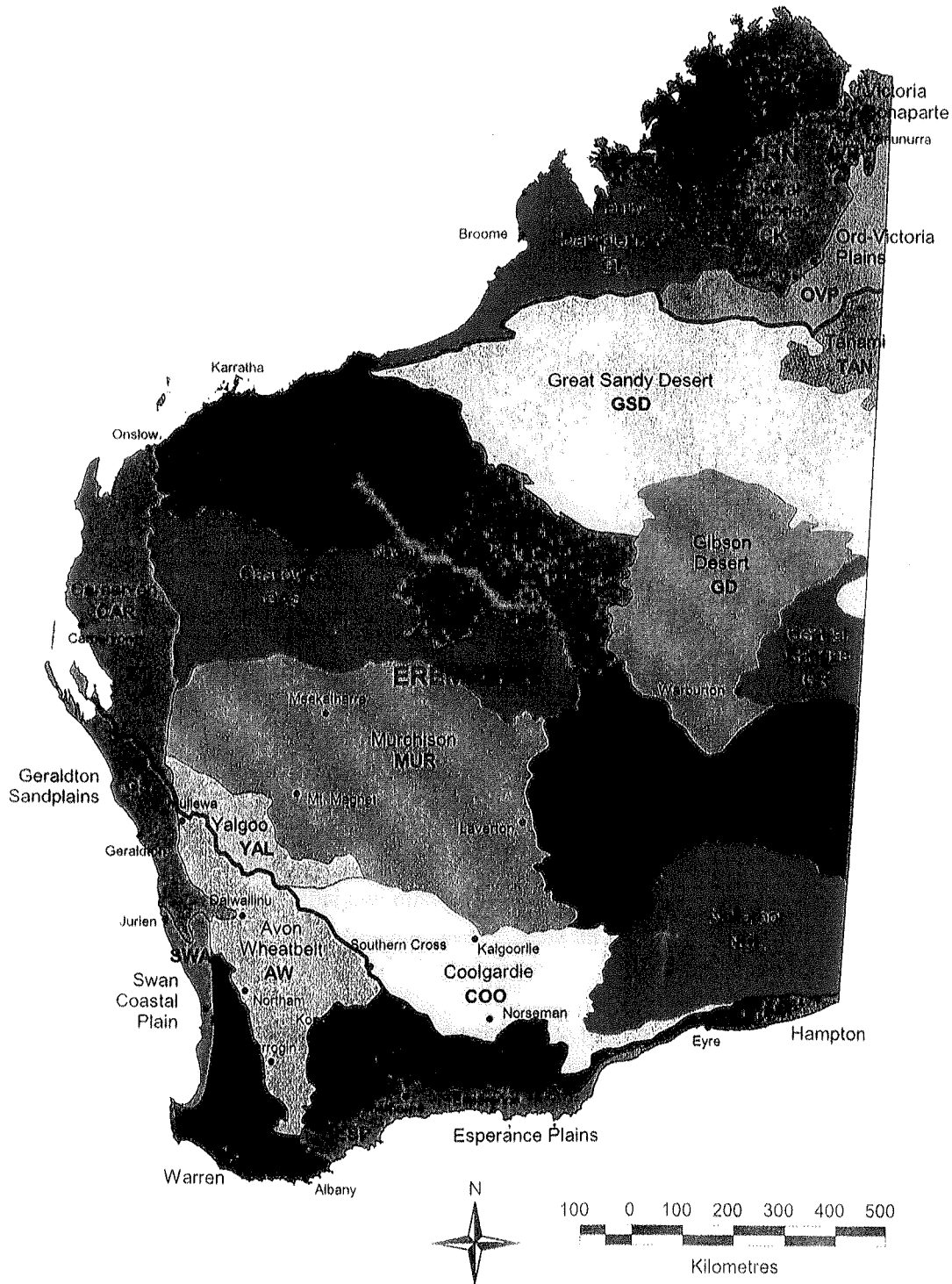
- Sandplain: Ulva SLU – is characterised by upland areas and divides with long gentle slopes, where the chief soils are:
  - deep pale sand
  - deep yellow sand
  - yellow gradational loamy sand
  - deep yellow acid sand, and /or
  - pale sand over gravel.
- Hillside: Booraan/Nembudding SLU – is characterised by long hill slopes often below the Ulva SLU, separated by a breakaway, where the chief soils are:
  - hardsetting grey to brown sandy loam over mottled yellow and brown clay and/or
  - loamy sand over clay.

## 2.4 NATIVE VEGETATION and BIODIVERSITY

### 2.4.1 Phytogeographical and Biogeographical Regions

The study areas and the Wyalkatchem Shire fall in the Avon Phytogeographical Region of Beard (Beard 1980). The Avon Phytogeographical Region corresponds to the **Avon Wheatbelt Region** (Refer Map 3) as mapped in the Interim Biogeographic Regionalisation of Australia<sup>5</sup> (Thackway and Creswell 1995).

**MAP 3:** Interim Biogeographic Regions of Western Australia, including the Avon Wheatbelt (AW)  
(Thackway & Creswell 1995, extracted from Paczkowska & Chapman 2000)



Map by Paul Giele Western Australian Herbarium

<sup>5</sup> The Interim Biogeographic Regionalisation of Australia identifies biogeographic units across Australia (Thackway and Creswell 1995). Eighty Interim Biogeographic Regions (commonly called IBRA Regions) were mapped in Australia, with 26 in WA. In Western Australia the boundaries broadly match those of the Phytogeographical Regions in Beard (1980, 1981). The South West of WA encompasses seven IBRA regions – the Geraldton Sandplains, Swan Coastal Plain, Jarrah Forest, Avon Wheatbelt, Mallee, Jarrah Forest, Warren and Esperance Plains.

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<b>Valley Floor Soils</b> • Baandee SLU [Wallambin SLU] • Merredin SLU [Wyalkatchem SLU] • Merredin (saline) SLU • Belka SLU • Belka (saline) SLU • Kununoppin SLU [Nangeenan SLU]	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓	

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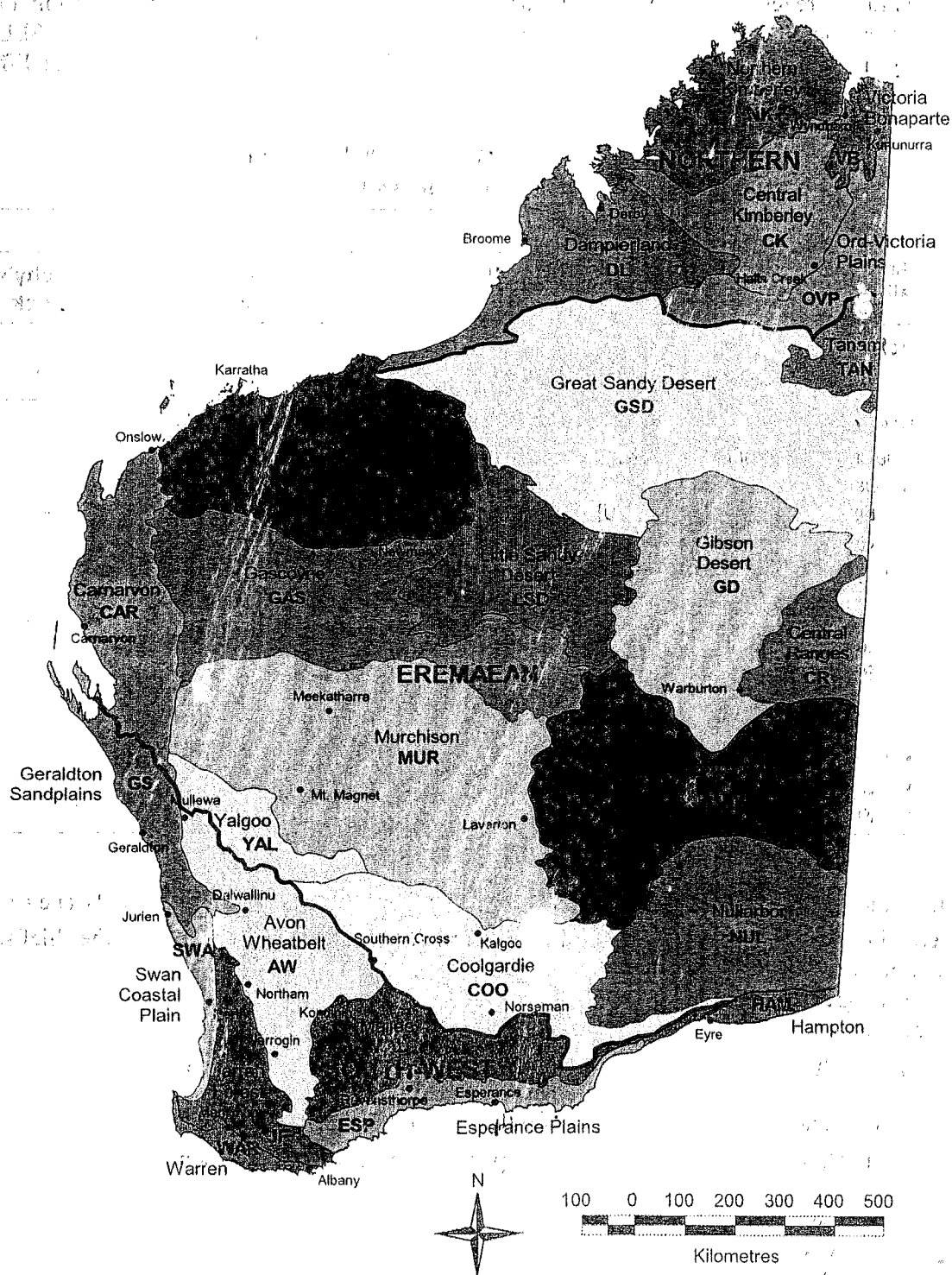
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## 2.4 NATIVE VEGETATION and BIODIVERSITY

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**MAP 3:** Interim Biogeographic Regions of Western Australia, including the Avon Wheatbelt (Thackway & Creswell 1995, extracted from Paczkowska & Chapman 2000)



Map by Paul Giola, Western Australian Herbarium

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Each of the Phytogeographical Regions contains a series of vegetation systems. Both Elashgin-Faulkner Road and Hutchy's study areas fall in the **Mount Caroline System** (Beard 1980, Weaving 1994). The characteristic landscape and vegetation units identified in this system are:

- gently undulating landscape, consisting mainly of plains underlain by hard setting loams
- small remnants of residual sandplains remain, their dissection and removal having exposed granite domes and tors, forming some conspicuous features
- woodlands of Salmon Gum (*Eucalyptus salmonophloia*) and Gimlet (*Eucalyptus salubris*) – with soil most favourable to these species being sandy loam over clay
- Kwongan communities of different species in mixed thicket and scrub-heath according to soil types.
  - *Casuarina campestris* (Tamma) thickets on ironstone gravel
  - Mixed thicket and scrub heath corresponding to the adjoining **Jibberding System** – usually dominated by species from the Myrtaceae, Proteaceae and Casuarinaceae and often with two distinct structural layers
  - Scrub-heath of the “*Banksia-Xylomelum* Association”
  - *Melaleuca uncinata* (Broom Bush) thicket on poorly drained sand
  - *Leptospermum erubescens* (Roadside Tea-tree) thickets and heath – usually in outcrop areas receiving run-off
  - a single occurrence of a *Melaleuca scabra* – *Acacia leptospermoides* association.
- salt flats with York Gum (*Eucalyptus loxophleba*) with an understorey of Broom Bush (*Melaleuca uncinata*) bordering samphire (*Halosarcia* spp.) communities.

### Comparison of vegetation cover over time

Maps 4 and 5 provide a graphic contrast of the expected (pre-settlement) and existing vegetation cover of the area. Note the more fertile soils that supported Wheatbelt Wandoo, York Gum, Salmon Gum, Morrel and Gimlet have been the most extensively cleared.

### 2.4.2 Biodiversity and Landscape Management

**Overview** (extracted from Environmental Protection Authority 1999)

Western Australia is both unusual and special in terms of both the environmental processes acting at the landscape level as well as in biodiversity. Biodiversity is important not only because of the plants and animals as species but because of the ecological functions they perform. Reduction in biodiversity or removal of species can therefore lead to significant effects at the level of how ecological systems function.

The particular geological and climatic history and the naturally nutrient depauperate status of the soils have provided somewhat extreme conditions to which WA's native plants have become adapted. This, combined with a long period of isolation from other land masses, has provided an extended period of time in which subtle adaptations to the extreme conditions could take place, resulting in the very high level of biodiversity of plant species in Western Australia, particularly in the South West region. The South West is frequently referred to as a mega-biodiverse region on a world scale. Much of the region has species numbers commonly in the order of 80-100 species per hundred square metres. This compares with values regarded as high in other parts of the world in the order of 30 species per hundred square metres. Furthermore, adding to the south west's complexity – although the number of species may remain the same over distance, the actual species represented can alter.

We do know that in agricultural areas the removal of biodiversity has already been too much and agricultural practices have not been able to mimic the ecological function performed by the former native plant communities. Starting again with the wisdom of hindsight we would need a very cautious approach to such mass clearing and removal of biodiversity. In terms of hydrological function alone, most of the agricultural area would need to retain deep-rooted vegetation at a level in the order of 60-70% cover. Recent figures from Tom Hatton (CSIRO Land and Water) suggest that to have a chance of restoring hydrological function in catchments the figure for planting deep-rooted vegetation would need to be in the order of 85% catchment cover, because of the hysteresis effect (when you push a natural system too far then you have to go even further to bring about a rebound and return it to close to the previous position, if this is possible at all).



**Stocktake and systematic survey** (extracted from Safstrom 1999 and Keighery GJ 2000)

The Avon Working Group contracted Environs Consulting in association with other specialists (Safstrom 1999) to collate information on 'The Current State of Biodiversity in the Avon River Basin'. The consultants brought together in one document a range of information relating to:

- the wide range of zonings and classifications around which understanding is gained and decisions are made (eg water catchments, Shire boundaries, natural resource zones, biogeographic regions)
- physical characteristics
- biodiversity – its evolution, original occurrences and distribution
- past impacts of European settlement
- current occurrence, distribution and condition of biodiversity
- Rare and Threatened Species and Threatened Ecological Communities
- threats to biodiversity and management of threats
- values people place on ecological communities
- gaps in information, and
- trends relating to biodiversity in the region.

Highlights of this information are also available on the Avon Integrated Catchment Management (ICM) Website (Avon Catchment Working Group 2000).

Under the banner of the State Salinity Strategy (Government of WA 2000b), and in response to salinity – the greatest environmental threat facing Western Australia – a four year systematic survey of the wheatbelt terrestrial and aquatic plants and animals is being undertaken by the Department of Conservation and Land Management's CALMScience Biological Survey Group, together with a range of agencies and specialists.

In an update of this work Greg Keighery, Principal Research Scientist and Leader of the Program, highlighted some of the background and findings (Keighery GJ 2000):

"The wheatbelt of WA stretches from Kalbarri to east of Esperance. It contains all or significant parts of six (Geraldton Sandplains, Swan Coastal Plain, Avon Wheatbelt, Jarrah Forest, Mallee and Esperance Sandplains) of the eight biogeographic regions recognised in temperate WA (NOTE: Refer Map 3, this report).

Rising saline groundwater – the result of clearing – threatens about 30% of the agricultural area of WA. This will have major impacts on the region's native plants and animals.

The agricultural zone has an estimated 4,000 species of flowering plants, and more than 60% of these grow nowhere else. The region is the centre of diversity for many of the species-rich genera of trees and shrubs (such as *Acacia*, *Dryandra*, *Eucalyptus*, *Grevillea* and *Verticordia*) that characterise the south west of Western Australia.

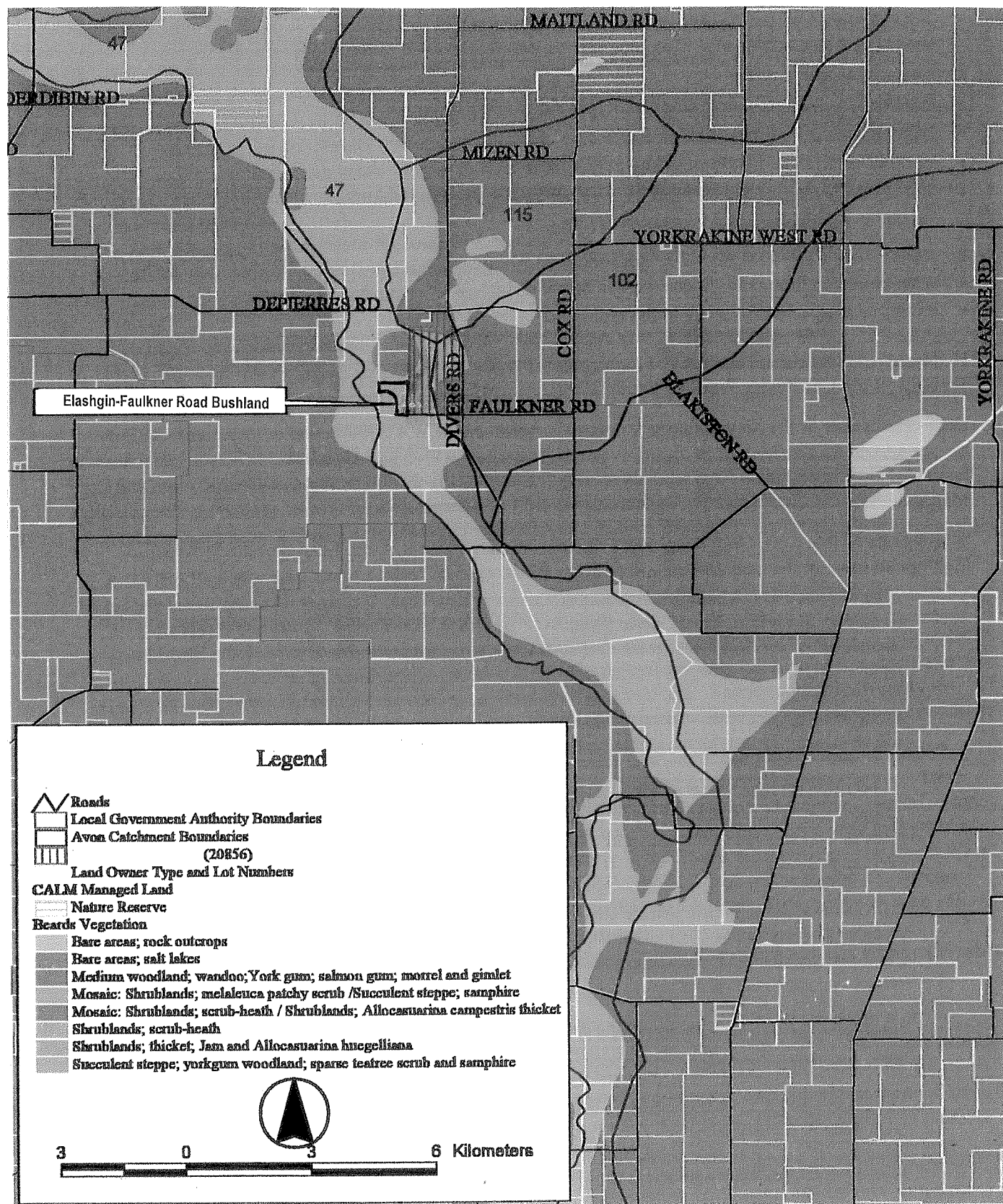
It is already abundantly clear that the biodiversity of the agricultural zone is much higher than was previously thought. For example the small Quairading Shire Reserve (surveyed by community volunteers under the *Bushland Plant Survey Project* coordinated by the Wildflower Society of WA) has more than 500 plant species including two that are new to science and the largest populations of two critically endangered taxa.

Quadrats in the agricultural zone contain at least 20 and sometimes 90 species, the equal to most heathland areas, normally considered the most species-rich sites.

More than 1,500 of the 4,000 species in the agricultural zone grow low in the landscape, in riverine valleys, fresh water or primary saline lands. Of these 450 grow only in the wheatbelt and are in grave danger of extinction as a result of encroaching salt. .... Areas affected by Secondary salinisation also show major declines in biodiversity. Rich and complex plant communities are replaced by a few succulents and weeds. Most lowland communities including tall woodlands, mallee and melaleuca shrublands, fresh water and naturally saline wetlands, will be lost unless remedial action is taken. The wheatbelt will lose much of its landscape character with the loss of these communities and paddock trees."

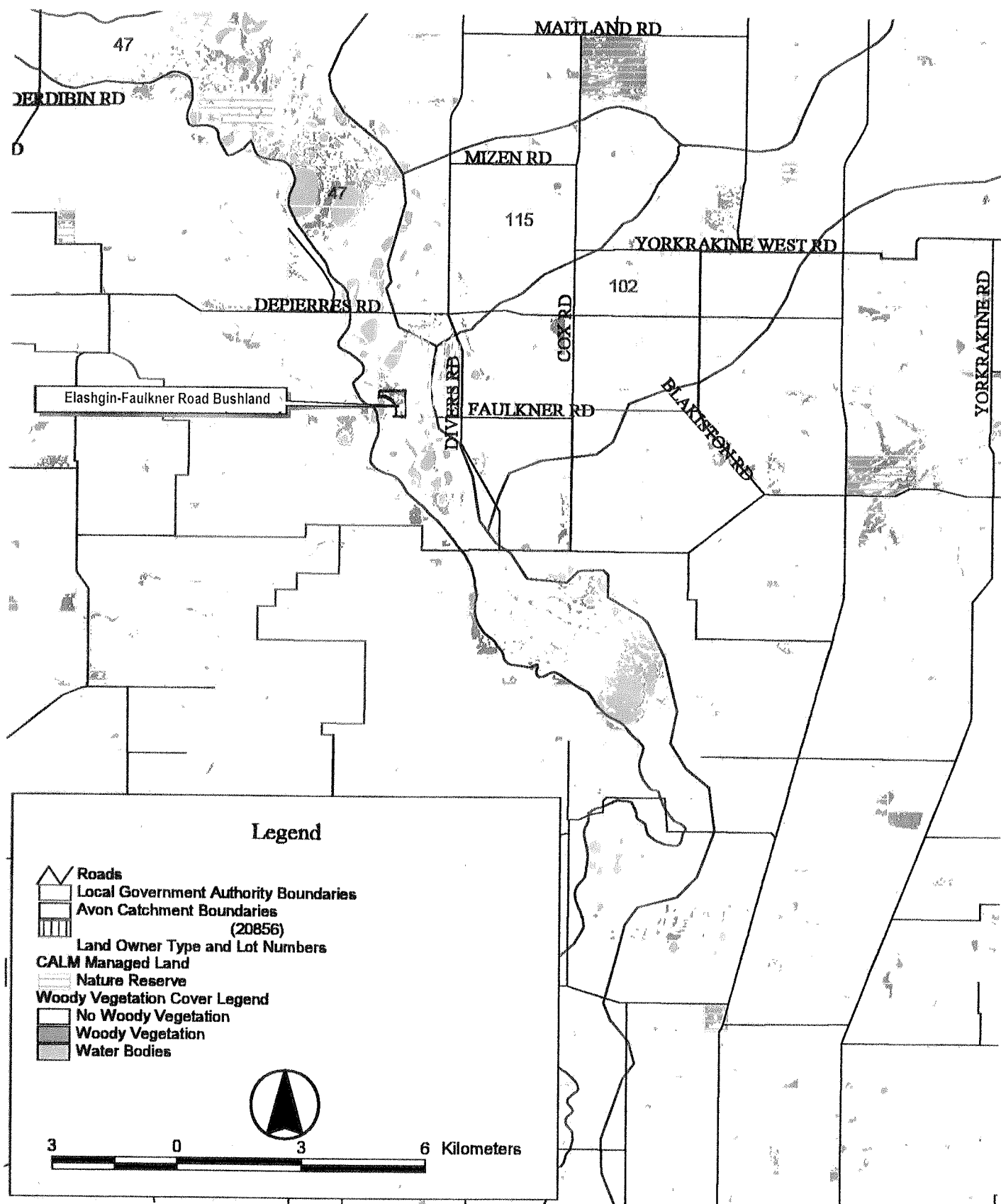


**MAP 4A:** Projection of Beard vegetation types as would have been expected prior to agricultural settlement and associated clearing – showing anticipated vegetation for Elashgin-Faulkner Road Bushland as **Succulent steppe; York Gum woodland, sparse teatree scrub and samphire** (Prepared by the Department of Environmental Protection, with permission from the Land Monitor Project<sup>6</sup>)



<sup>6</sup> The information contained in this map is necessarily based in part upon assumptions and predictions. The Land Monitor Project [comprising the WA State Govt. agencies (Dept of Agriculture, Dept of Environmental Protection, Dept of Land Administration, Main Roads and Water & Rivers Commission) and the Commonwealth agency (CSIRO Mathematical & Information Science)] accepts no responsibility for any inaccuracies in this map and persons relying on this map do so at their own risk.

**MAP 4B: Existing woody vegetation cover – illustrating the importance of Elashgin-Faulkner Road Bushland** (Prepared by the Department of Environmental Protection, with permission from the Land Monitor Project<sup>7</sup>)



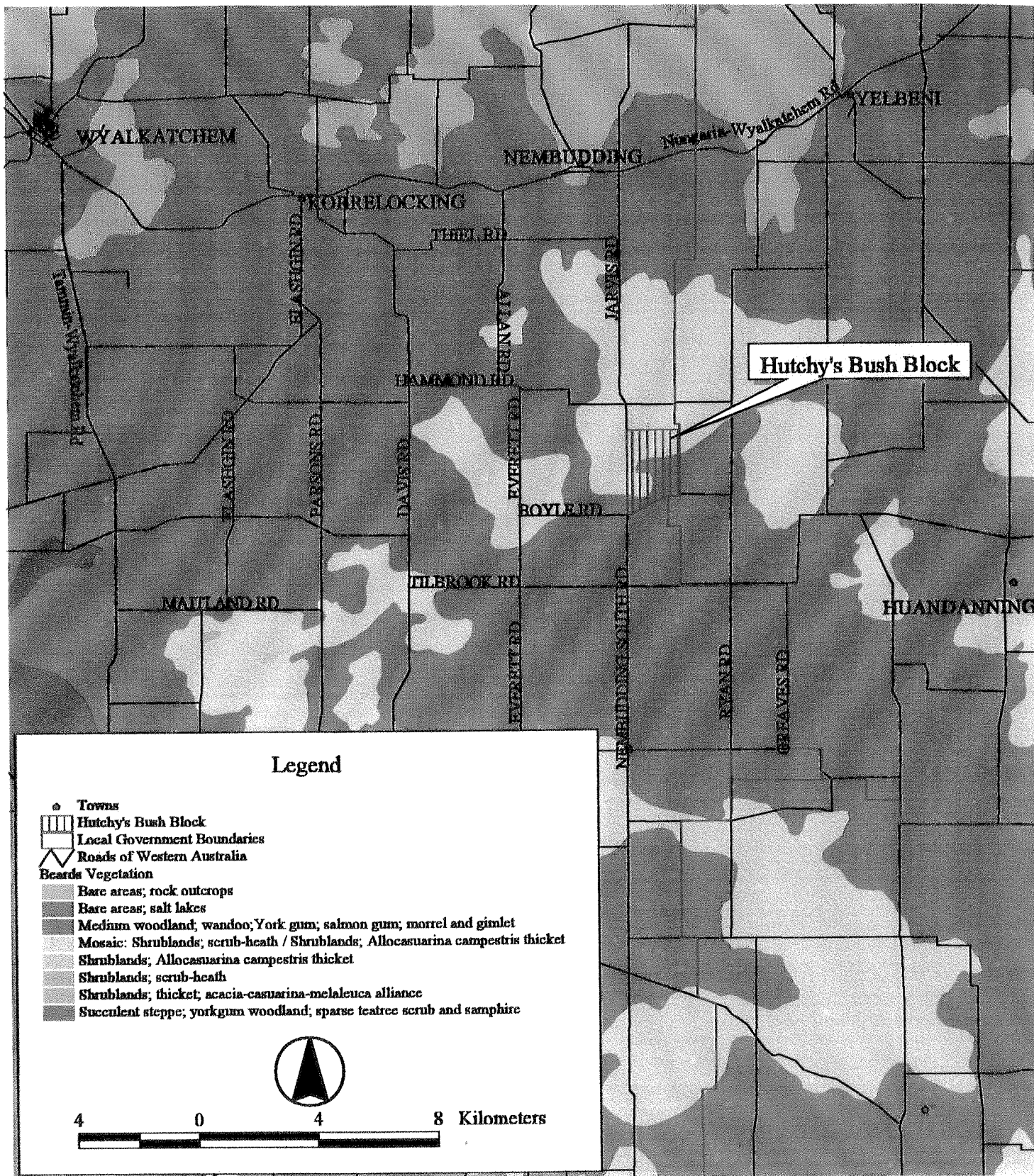
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**MAP 4C:** Projection of Beard vegetation types as would have been expected prior to agricultural settlement and associated clearing – showing anticipated vegetation for Hutchy's Block as

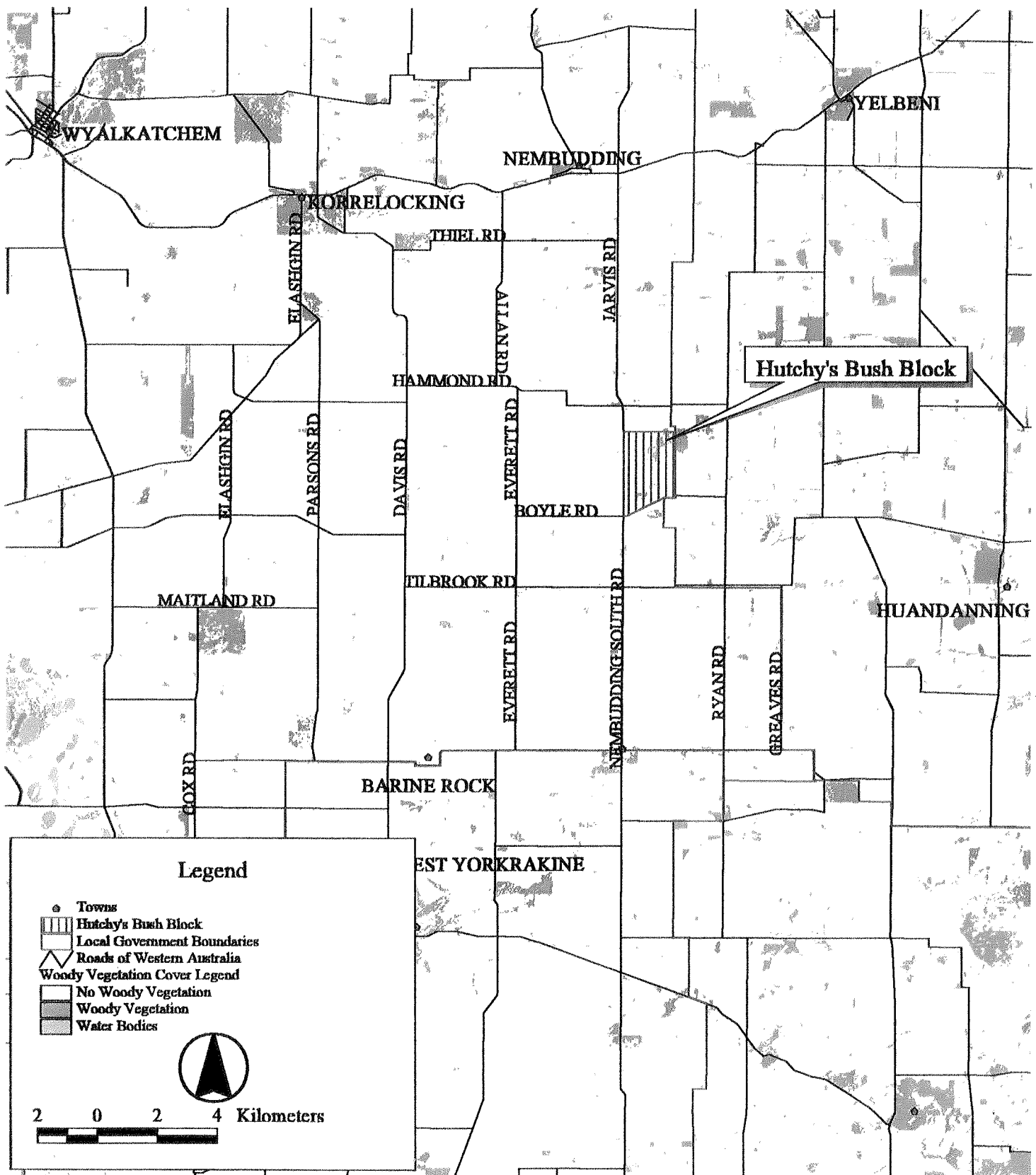
- Medium woodland; Wandoo, York Gum, Salmon Gum, Morrel and Gimlet
- Mosaic: Shrublands; scrub-heath/shrublands; *Allocasuarina campestris* thicket.

(Prepared by the Department of Environmental Protection, with permission from the Land Monitor Project<sup>8</sup>)



<sup>8</sup> The information contained in this map is necessarily based in part upon assumptions and predictions. The Land Monitor Project [comprising the WA State Govt. agencies (Dept of Agriculture, Dept of Environmental Protection, Dept of Land Administration, Main Roads and Water & Rivers Commission) and the Commonwealth agency (CSIRO Mathematical & Information Science)] accepts no responsibility for any inaccuracies in this map and persons relying on this map do so at their own risk.

**MAP 4D: Existing woody vegetation cover – illustrating the importance of Hutchy's bushland**  
(Prepared by the Department of Environmental Protection, with permission from the Land Monitor Project<sup>9</sup>)



<sup>9</sup> The information contained in this map is necessarily based in part upon assumptions and predictions. The Land Monitor Project [comprising the WA State Govt. agencies (Dept of Agriculture, Dept of Environmental Protection, Dept of Land Administration, Main Roads and Water & Rivers Commission) and the Commonwealth agency (CSIRO Mathematical & Information Science)] accepts no responsibility for any inaccuracies in this map and persons relying on this map do so at their own risk.

### 2.4.3 Active and passive clearing of native vegetation (incl extracts from Safstrom 1999 and Weaving 1994)

#### *Western Australia wheatbelt*

Approximately 93% of the wheatbelt area of Western Australia has been cleared, mainly for agriculture in the last 100 years (Beard 1990). Broadscale clearing for agriculture since the 1940s has meant only 12.85% of the Shire of Wyalkatchem still retains original native vegetation.

Most of the remaining vegetation surviving in the wheatbelt is as scattered patches on private farmlands and in public reserves. In addition to clearing for production, grazing by livestock and rabbits, weed invasion, rising soil salinity and landuse pressures all contribute to the degradation of the remaining native vegetation.

#### *Avon River Basin*

The native vegetation in the Avon River Basin has been progressively modified and cleared, where the majority of land clearing in the Shire of Wyalkatchem has been for agriculture. In the early days of settlement, the woodlands provided grazing and then the heavy valley floors were cleared for crops. Later with the advent of fertilisers and trace elements it was possible to develop the lighter soils. When clearing was at its height, and machinery alleviated more labour intensive practises, nearly all the vegetation was removed, often as guided by government instructions. Towards the end of broadscale clearing, wider road reserves and reserves for conservation were left. We thus have a differentiated clearing pattern across the agricultural areas of the Avon River Basin.

Map 5 shows the extent of clearing in the Mortlock River East Sub-catchment and the Shire – indicating also the location of the study areas south and south-east the Wyalkatchem Townsite.

#### *Shire of Wyalkatchem*

The Shire of Wyalkatchem was settled late in the nineteenth century by Europeans. Initially most of the land was held under pastoral lease, with two main periods of clearing in this area; 1900-1930 and 1950-1980 after World War II during Soldier Settlement. The Government set aside areas of native vegetation as crown reserves for townsites, water catchments and gravel extraction and many of these patches of vegetation were designated as nature reserves in the 1960s and 1970s including Wallambin Nature Reserve. Some vegetation associations have been more widely cleared than others, for example areas of York Gum, Salmon Gum, Gimlet and Morrel woodlands were considered indicators of first class agricultural land by early settlers and therefore extensively cleared. Most of the remaining vegetation surviving in this wheatbelt Shire is as scattered patches on private farmlands and in public reserves. Table 2 shows the Clearing statistics for the Shire of Wyalkatchem.

It is also important to note that these statistics provide no indication of the condition, or vigour of the remaining remnants, nor any current or potential threats.

**TABLE 2: Clearing statistics for the Shire of Wyalkatchem** (Beeston *et al.* 1994)

Area (ha) of Shire of Wyalkatchem	% of Shire with remnant* vegetation on public and private land	% of Shire with remnant* vegetation on private land	% of remnant* vegetation in areas of less than 20ha
158 004ha	12.85%	4.68%	85%

NOTE: For these statistics 'remnant vegetation' has been calculated by also including modified vegetation. Modified vegetation is degraded understorey with reduced number of native species and includes weeds; obvious human disturbance including clearing, mining, grazing and weeds; salt affect as well as narrow corridors of vegetation which are more likely to be affected by edge effect (Weaving 1999).

Thus, the assessment of the Shire of Wyalkatchem is:

- 12.85% of the Shire's 158,004ha has remnant and modified native vegetation
- this remaining vegetation is within 291 individual remnants –
- of which 85% are smaller than 20ha
- the 12.85% can be further classified (refer legend above) as:
  - 98% of what remains is 'remnant vegetation'
  - 2% of what remains is 'modified vegetation'.

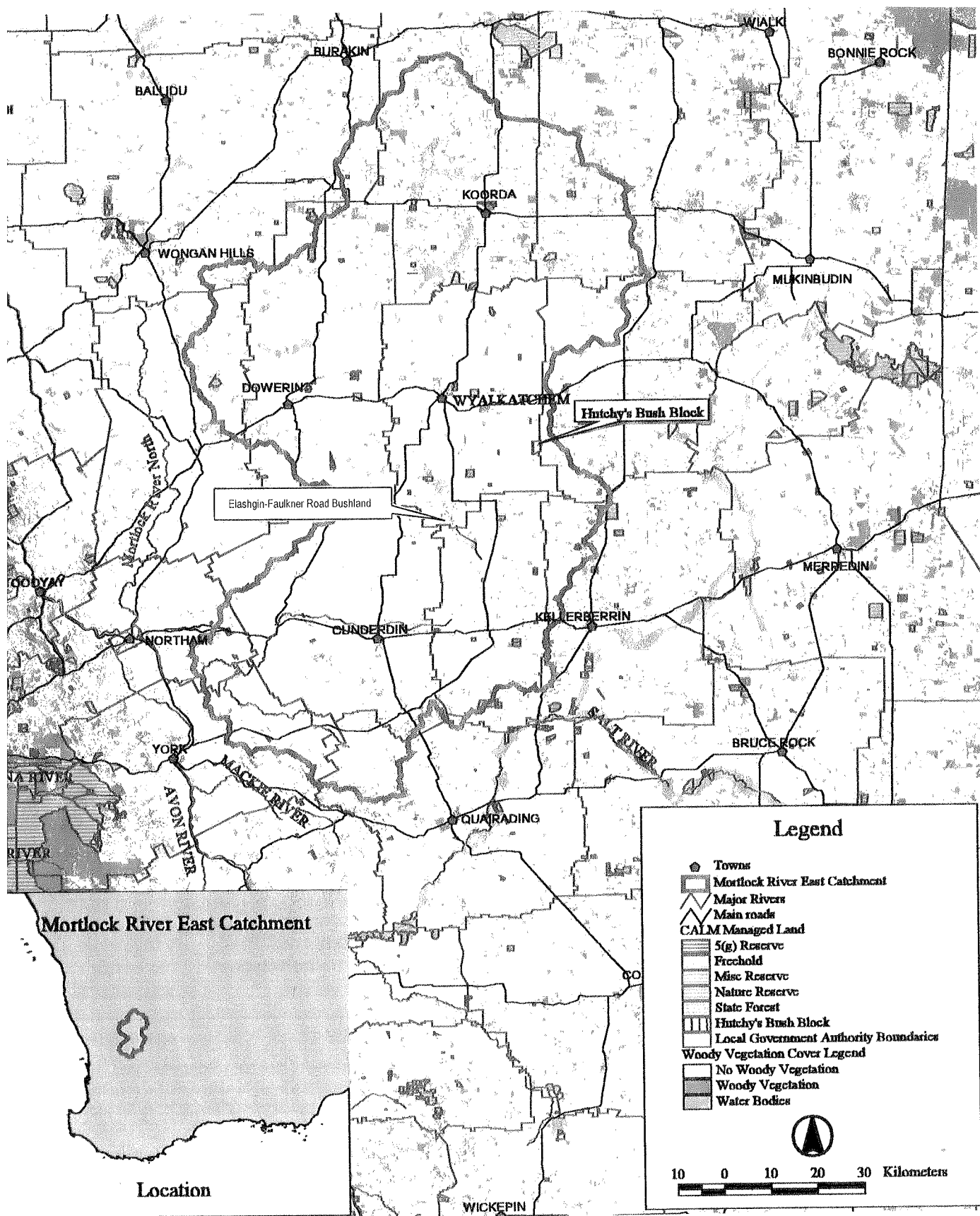
### ***Memorandum of Understanding***

In 1997 a Memorandum of Understanding (MOU) (Government of WA 1997) was developed between the Commissioner for Soil and Land Conservation, the Environmental Protection Authority, Department of Environmental Protection, Agriculture Western Australia, Department of Conservation and Land Management and Water and Rivers Commission. Under this MOU (which works in conjunction with the Commissioner's Notice of Intent to Clear Process) land clearing may only be considered for Shires where there is greater than 20% remnant vegetation, provided there is greater than 20% native or deep rooted perennial vegetation in the catchment and on the property, and subject to a comprehensive environmental assessment process.

This MOU also introduced the need for applications to be assessed against loss of nature conservation values, and is no longer limited to land degradation considerations only.

**MAP 5: Existing woody vegetation cover within the Mortlock River East Sub-catchment and the Shire of Wyalkatchem (Refer Table 2)**

(Prepared by the Department of Environmental Protection, with permission from the Land Monitor Project<sup>10</sup>)



<sup>10</sup> The information contained in this map is necessarily based in part upon assumptions and predictions. The Land Monitor Project [comprising the WA State Govt. agencies (Dept of Agriculture, Dept of Environmental Protection, Dept of Land Administration, Main Roads and Water & Rivers Commission) and the Commonwealth agency (CSIRO Mathematical & Information Science)] accepts no responsibility for any inaccuracies in this map and persons relying on this map do so at their own risk.



### 3. METHODOLOGY AND LIMITATIONS

#### 3.1 AIMS

The aims or purpose of the flora and vegetation survey were:

- To collect, identify and list as much as possible of the flora of the study area.
- To document populations of rare, priority and geographically restricted flora.
- To produce a map showing the broad plant communities (vegetation units) of the study area, with accompanying descriptions of each unit and comments on their distribution.

#### 3.2 METHODS

The Survey techniques are well described in the Wildflower Society publication '*Bushland Plant Survey for the Community*' (Keighery BJ 1994). The methods have proved most successful for volunteer and community participation whilst ensuring scientific rigour is maintained. The quadrats and data sheets provide a systematic procedure for the collection of information and avoid concentrating on just common and obvious species. They provide the baseline information for the plant species and plant community descriptions. The following is a brief outline of the methodology used.

##### 3.2.1 Initial Site Selection

As with all properties surveyed as part of the *Bushland Plant Survey Project*, the Land Manager or local Catchment Group responded to an initial open invitation from the Wildflower Society to participate in the Project. Many bush blocks met the selection criteria (Refer Table 3), but unfortunately due to a combination of limited resources and pressures on volunteers only a small number of surveys could be done each year.

**TABLE 3: Selection criteria for participation in *Bushland Plant Survey Project***

Selection of properties was made on:

- Land ownership – may be either privately owned, local government land or vested crown reserve. National Parks and Nature Reserves cannot be included in this program
- Degree of disturbance – the least disturbance, ranked higher priority
- Current level of knowledge about the site – if poor then there is a greater need for the survey work to be done, thus ranked higher priority
- Level of community participation – by the local community
- Conservation value of the bushland – in a local and regional context
- Accessibility to the site – given the limited time and the involvement of volunteers
- Size of the site – preferable to conduct the initial field survey over a one or two day period
- Protection of the site – the bushland needs to have long term security
- Conservation commitment – a demonstrated commitment by the land owner and/or community group to manage the bushland for conservation
- Written submission and site visit.

##### 3.2.2 Field Survey

The vegetation mapping was based on the interpretation of 1:25,000 scale coloured aerial photographs of the study area. Areas of similar colour and texture were outlined on the photographs as an anticipated reflection of similar vegetation and soil types. This photo-interpretation was then assessed in the field during the initial visit (4/9/00) and vegetation units were further defined and boundaries altered where necessary. In order to sample the range of plant communities, survey quadrats or recording sites were selected within each of these major vegetation units.

Survey work on both Elashgin-Faulkner Road Bushland and Hutchy's Block was conducted by groups of volunteers during the 2000 early Spring flowering (16/9/00 + 17/9/00). Each group was led by a botanist or experienced volunteer. A later visit (28/11/01 + 29/11/01) enabled collection of species that were in flower and/or fruit later in the season, thus assisting with the identifications and boosting the knowledge of the area. It also enabled the vegetation descriptions to be further checked.



Five (Elashgin-Faulkner Road Bushland) and thirteen (Hutchy's) 10 metre x 10 metre quadrats were located and described within each of the pre-determined vegetation units for these areas. The quadrat markers have been left in position so that the landholders can revisit the sites, and changes over time can be monitored. In addition survey information was also recorded throughout the areas, to complement the quadrat information. Copies of the quadrat data sheets are given back to the landholders. Photographic records made of each quadrat at the time of the survey provide another useful monitoring tool (Refer Appendix C). Additional colour slides compliments of Brian Moyle also accompany this report.

### **Plant Collections and Identification**

In the field, specimens were collected and tagged with a Quadrat Specific Code (eg WYCR04, WYCH17) as well as an individual specimen number (eg sp. #17). Opportunistic collections of species either not recorded 'in' or 'adjacent' to quadrats, or specimens with better diagnostic features (eg bud, flower, fruit) were also made as the participants moved through the "bush block". On the evening of the first field day, some identifications were done both as a way to introduce newcomers to the ways of plant identification, as well as to best utilise the skills of the field team.

Following the survey, specimens were dried (to preserve) and frozen (to kill any insects and disease) at the Western Australian Herbarium, in South Perth.

The initial Reference Herbarium Session (11/10/00) was used to do a first sort of the collections into Family and Genus and where possible Species. Following this, volunteers, botanists and the survey coordinator/botanist carried out plant identifications in regular sessions at the WA Reference Herbarium. Where necessary additional verifications were made in the WA Herbarium Main Collection and flora specialists assisted with identifications in their specialist field (Refer Acknowledgments, Section 7).

### **Field Herbariums**

Elashgin-Faulkner Road Bushland and Hutchy's Field Herbaria were prepared, largely with the assistance of volunteers. They are presented in two and eight arch-lever files (respectively) on card in clear plastic sleeves. To assist with further developing knowledge of plants and to make it easier for identifications to be made in the field, the Field Herbarium organises the plant specimens into a number of groupings:

- Firstly, **Growth Forms** (climbers, grasses, herbs, sedges/rushes, shrubs and trees/mallees)
- Secondly, **Plant Families** (eg Asteraceae, Proteaceae, Myrtaceae) with a several species per page for ease of comparison
- Thirdly, into alphabetical order of **Plant Genera** (within these Family Groupings), for example:  
Asteraceae = *Brachyscome*, *Rhodanthe* and *Waitzia*  
Proteaceae = *Grevillea*, *Hakea* and *Persoonia*  
Myrtaceae = *Baeckea*, *Eucalyptus* and *Melaleuca*.

**Weeds** were grouped together (within their Family Groupings) regardless of Growth Form.

The Field Herbarium was photocopied for easier use in the field, allowing space also for notes on flower colour and flower/seed time etc to be added. It also ensures the quality of the Field Herbarium proper is maintained.

### **3.3 Vegetation Descriptions**

The vegetation was mapped applying the Vegetation Structural Classification from Keighery (1994)<sup>11</sup> (Refer Table 4) on the basis of a combination of its:

- **life form and height** and
- **crown cover** (percentage cover of total area under an imaginary line bounded by the extremities of the plants in each group described).

Plant communities were further distinguished by their **floristics** (composition of plant species).

<sup>11</sup> The Vegetation Structural Classification Model of Keighery was originally developed by Specht (1970) and then modified by Muir (1977), Aplin (1979) and Keighery (1994).

A practical advantage of the *Bushland Plant Survey Sheets* (Keighery BJ 1994) is that the surveyors/field recorders are guided to collect vegetation within these categories.

**TABLE 4: Vegetation Structural Classification** (Keighery B.J. 1994)

Life Form/ Height Class		Trees >30m	Trees 10-30m	Trees <10m	Mallee >8m	Mallee <8m
c c a o n v o e p r y .	71-100% DENSE	Tall Closed Forest	Closed Forest	Low Closed Forest	Closed Tree Mallee	Closed Shrub Mallee
	31-70% MID-DENSE	Tall Open Forest	Open Forest	Low Open Forest	Tree Mallee	Shrub Mallee
	11-30% SPARSE	Tall Woodland	Woodland	Low Woodland	Open Tree Mallee	Open Shrub Mallee
	2-10% VERY SPARSE	Tall Open Woodland	Open Woodland	Low Open Woodland	Very Open Tree Mallee	Very Open Shrub Mallee

Life Form/ Height Class		Shrubs >2m	Shrubs 1-2m	Shrubs <1m
c c a o n v o e p r y .	71-100% DENSE	Tall Closed Scrub	Closed Heath	Low Closed Heath
	31-70% MID-DENSE	Tall Open Scrub	Open Heath	Low Open Heath
	11-30% SPARSE	Tall Shrubland	Shrubland	Low Shrubland
	2-10% VERY SPARSE	Open Tall Shrubland	Open Shrubland	Low Open Shrubland

Life Form/ Height Class		Grasses	Herbs	Sedges
c c a o n v o e p r y .	71-100% DENSE	Closed Grassland	Closed Herbland	Closed Sedgeland
	31-70% MID-DENSE	Grassland	Herbland	Sedgeland
	11-30% SPARSE	Open Grassland	Open Herbland	Open Sedgeland
	2-10% VERY SPARSE	Very Open Grassland	Very Open Herbland	Very Open Sedgeland

Appendix B shows how this Vegetation Structural Classification was applied to the field survey data.

### 3.3.1 Vegetation Condition (extracted from Keighery BJ 1994, page 54)

#### *Vegetation Condition Scale*

An assessment of disturbance in relation to the ability of the bushland to maintain itself has been used as the basis for condition rating of plant communities (Refer Table 5 below). The condition is related to the vegetation structure; that is the impact of disturbance on each of these layers and consequently on the ability of the natural plant community to regenerate. To determine a condition rating it is not necessary to be able to define each disturbance factor. However, defining the disturbance factor does become necessary in the management of bushland.

**TABLE 5: Vegetation Condition Scale** (Keighery B.J. 1994 page 27)

<b>1</b>	<b>Pristine</b> Pristine or nearly so, no obvious signs of disturbance.
<b>2</b>	<b>Excellent</b> Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. <i>For example:</i> <ul style="list-style-type: none"> <li>• damage to trees caused by fire</li> <li>• the presence of non-aggressive weed species</li> <li>• occasional vehicle tracks</li> </ul>
<b>3</b>	<b>Very Good</b> Vegetation structure altered, obvious signs of disturbance. <i>For example:</i> <ul style="list-style-type: none"> <li>• disturbance to vegetation structure caused by repeated fires</li> <li>• the presence of some more aggressive weeds</li> <li>• partial clearing, dieback, and/or grazing</li> </ul>
<b>4</b>	<b>Good</b> Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. <i>For example:</i> <ul style="list-style-type: none"> <li>• disturbance to vegetation structure caused by very frequent fires</li> <li>• the presence of some very aggressive weeds at high density</li> <li>• partial clearing, dieback and/or grazing</li> </ul>
<b>5</b>	<b>Degraded</b> Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. <i>For example:</i> <ul style="list-style-type: none"> <li>• disturbance to vegetation structure caused by very frequent fires</li> <li>• the presence of some very aggressive weeds</li> <li>• partial clearing, dieback and/or grazing</li> </ul>
<b>6</b>	<b>Completely Degraded</b> The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. <i>These areas are often described as 'parkland cleared' with the flora comprising weed or crop species, with isolated native trees or shrubs.</i>

### Weeds

Weeds are plants which are not native to bushland and/or commonly invade areas of natural vegetation following disturbance such as flooding, grazing, fire and soil disturbance. They can be exotic species or non-local native species. Weeds are generally what are called 'colonising species', plants that establish in bare areas quickly. Weed diversity and density are among the most useful guides in assessing condition, as the density of weeds increases as a result of general disturbance. Undisturbed vegetation will resist weed establishment in the understorey.

Weeds can be categorised by their severity of impact on the vegetation structure or ability for plants to regenerate, as:

- Non-aggressive Weeds – having apparently little impact on the vegetation structure or ability to regenerate – generally annuals (eg *\*Aira* spp.)
- Aggressive Weeds – having impact on the vegetation structure or ability to regenerate – generally perennial species (eg *\*Avena barbata* (Wild Oats) an annual grass species).

### **3.4 LIMITATIONS**

The limitations of the flora and vegetation survey were:

- The survey was conducted over one flowering season. It included a preliminary visit and a revisit later in the season when extra species were noted. Recording over several seasons and times of the year would be necessary to document the full complement of species.
- The sampling of flora is biased towards the quadrats (ie WYCR and WYCH vegetation recording sites) due to the objectives of the survey, restricted time available and size of the study area.
- Species that were not in flower at the times that the quadrats were visited were less likely to have been collected.
- No attempt was made to collect fungi, lichens, liverworts, mosses or stoneworts, such survey would add considerably to the knowledge of the area.
- Soil descriptions are based on only basic field observations without any analysis.

#### 4. VEGETATION SURVEY

Vegetation can be described at different levels, depending on levels of scale. At a very coarse level the bush blocks could be divided into two and three types:

- Woodland (Elashgin-Faulkner Road and Hutchy's)
- Mallee (Hutchy's)
- Shrubland (Elashgin-Faulkner Road and Hutchy's)

This correlates very closely to John Beard's broadscale (1:250,000) **Mount Caroline System** vegetation mapping of the area (1980). At this scale the vegetation:

1. Elashgin-Faulkner Road Bushland is within 'salt country' dominated by Eucalypts, tea-trees and samphires and would fall into two categories:

**E6/8Mr:m5Sc** Thicket with scattered trees of *Eucalyptus loxophleba* (York Gum), and  
**m5Sc3Ci** Succulent steppe.

2. Hutchy's would fall into three categories:

**C3Sc** *Casuarina campestris* (Tamma) Thicket  
**xSZc** undifferentiated Kwongan Community Scrub-Thicket, and  
**e8/34Mi** *Eucalyptus salmonophloia* (Salmon Gum) and *Eucalyptus salubris* (Gimlet) Woodlands.

As a broadscale survey Beard's work provides a significant contribution to understanding the original vegetation and associated soils and landscape and 22+ years after publication continues to be used extensively as a resource.

Using the detailed data collected from the survey quadrats, the aerial photograph and more general observations of the bushland vegetation the vegetation can be subdivided within Woodlands, Mallee, Shrubland/Heaths to a finer scale into:

- five plant communities for Elashgin-Faulkner Road Bushland and
- twelve plant communities for Hutchy's Bushland.

The plant communities<sup>12</sup> of Elashgin-Faulkner Road Bushland and Hutchy's study areas (Refer Maps 6 and 7 respectively) reflect variations in underlying rock, topography, soil type, aspect, drainage and fire history. The vegetation mapping units each contain a range of plant communities with the same dominants in the upper stratum and where there were significant differences in the understoreys, a further division was made. The at times considerable range of vegetation within a unit needs to be borne in mind when using the maps to ensure an over simplistic interpretation of the vegetation is not made. To avoid this the maps should be read in conjunction with the accompanying text descriptions.

<sup>12</sup> The term 'plant community' is interchangeable with 'vegetation unit' and/or 'vegetation association'.

#### 4.1 PLANT COMMUNITIES – ELASHGIN-FAULKNER ROAD BUSHLAND

The plant communities occurring at Elashgin-Faulkner Road Bushland formed very distinct zonation with distance from the lake, as illustrated diagrammatically in Figure 1. This was a reflection of changes in both salinity levels and soil moisture content with distance from the lake. The units on the edge of the lakebed were salt tolerant and moisture tolerant Samphires [*Halosarcia* spp.] and *Melaleuca* species. Further upslope York Gum [*Eucalyptus loxophleba* ssp. *lissophloia*] and Gimlet [*Eucalyptus salubris*] woodlands occurred on the more elevated dunes near the lake and then wattle [*Acacia*] and saltbush [*Atriplex* species and *Enchylaena* species.] shrublands dominated areas furthestmost from the lake's edge. In addition many species were present in both the woodland and shrubland communities, with variations recorded for the number of individual plants, the canopy cover and the canopy height.

Five plant communities were mapped and described for Elashgin-Faulkner Road Bushland.

##### WOODLAND

- **OW** *Eucalyptus salubris* [Gimlet] Open Woodland
- **W-OW** *Eucalyptus loxophleba* ssp. *lissophloia* (York Gum) Woodland to Open Woodland

##### SHRUBLAND

- **TSh-TCSc** *Melaleuca* Tall Shrubland to Tall Closed Scrub
- **TOSh** *Acacia nyssophylla* and *Templetonia smithiana* [Centipede Bush] Tall Open Shrubland
- **LOH-LCH** *Halosarcia doleiformis* [Samphire], *H. aff. pergranulata* [Blackweed Samphire] and *H. undulata* [Samphire] Low Open Heath to Low Closed Heath.

More detailed descriptions follow.

#### Woodland

##### **OW** *Eucalyptus salubris* [Gimlet] Open Woodland [Quadrat WYCR05]

This Gimlet plant community occurred on the upper ridge towards the southern end of the study area on coarse sandy-clay sands over a grey clay with many fine granite and quartz particles scattered on the surface.

- *Eucalyptus salubris* [Gimlet] **Open Woodland** over *Atriplex stipitata* [Mallee Saltbush] **Low Shrubland** with occasional emergent shrubs of *Lycium australe* [Australian Boxthorn] over *Podolepis capillaris* [Wiry Capillaris] and *Senecio glossanthus* [Slender Groundsel] **Herbland.** (WYCR05, Photo 3 – Page 69)

##### **W-OW** *Eucalyptus loxophleba* ssp. *loxophleba* [York Gum] Woodland to Open Woodland [Quadrats WYCR02 and WYCR03]

This York Gum unit occurred on the dune ridge above the lake edge on coarse sandy-clays over grey clay, with many fine granite and quartz particles scattered on the surface. The York Gum is the most distinguishing characteristic of this unit which is not uniform and has smaller distinct sub-units (which cannot be distinguished in the aerial photograph) including:

- *Eucalyptus loxophleba* ssp. *loxophleba* [York Gum] **Woodland** over *Acacia nyssophylla* **Tall Shrubland** over *Exocarpos aphyllus* [Leafless Ballart] and *Lycium australe* [Australian Boxthorn] **Open Shrubland** over *Atriplex stipitata* [Mallee Saltbush] **Low Open Shrubland** over **Very Open Grassland** and *Sclerolaena diacantha* [Grey Copperburr] **Herbland.** (WYCR03, Photo 4 – Page 69)
- *Eucalyptus loxophleba* ssp. *loxophleba* [York Gum] **Open Woodland** over *Acacia nyssophylla* and *Pittosporum phylliraeoides* ssp. *microcarpa* [Weeping Pittosporum] **Tall Shrubland** over *Atriplex stipitata* [Mallee Saltbush] **Shrubland** over *Halosarcia indica* ssp. *bidens* [Samphire] **Low Shrubland** over **Very Open Grassland** and **Very Open Herbland.** (WYCR02, Photo 5 – Page 70)

## Shrubland

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### **TSh-TCSc**      *Melaleuca* species Tall Shrubland to Tall Closed Scrub

This *Melaleuca* plant community occurred on pale grey sands in the north west corner of the study area where a flow-line moves into the lake as part of the link with the Elashgin Creek. The *Melaleucas* formed dense isolated stands, growing up to 4m tall.

- *Melaleuca uncinata* (Broom Bush) **Tall Shrubland to Tall Closed Scrub** (Photo 6 – page 70)
- *Melaleuca* species **Tall Closed Scrub**.

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### **TOSH**      *Acacia nyssophylla* and *Templetonia smithiana* [Centipede Bush] Tall Open Shrubland [Quadrat WYCR04]

This shrubland plant community occurred on the eastern boundary of the study area on pale-brown clayey sands to depth. Bare open ground was a feature of this unit that shared many shrub species with the adjoining York Gum Woodland (Unit *ETW-OW*).

- *Acacia nyssophylla* and *Templetonia smithiana* [Centipede Bush] **Tall Open Shrubland** over *Atriplex stipitata* [Mallee Saltbush] and *Enchylaena tomentosa* [Barrier Saltbush] **Low Open Shrubland** over *Podolepis capillaris* [Wiry Capilaris] **Very Open Herbland** with **Occasional Grasses**. (WYCR04, Photo 7 – Page 71)

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### **LOH-LCH**      *Halosarcia doleiformis* [Samphire], *H. aff pergranulata* [Blackweed Samphire] and *H. undulata* [Samphire] Low Open Heath to Low Closed Heath [Quadrat WYCR01]


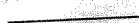
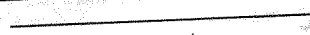
This samphire unit occurred on the lake's edge. The low growth habit, succulent form and foliage cover of the dominants gave this unit its unique appearance. Scattered through the unit were stags of dead *Melaleuca* bushes that could be an indication of an increase in the salt level and thus the death of freshwater *Melaleucas* and the establishment of salt tolerant *Halosarcia* and *Frankenia* species.

- *Halosarcia doleiformis* [Samphire], *H. aff pergranulata* [Blackweed Samphire] and *H. undulata* [Samphire] **Low Open Heath** over *\*Spergularia diandra* [Lesser Sand Spurry] **Very Open Herbland**. (WYCR01, Photo 8 – Page 71)



MAP 6A: Aerial Photograph of  
Elashgin-Faulkner Road Bushland,  
Wyalkatchem

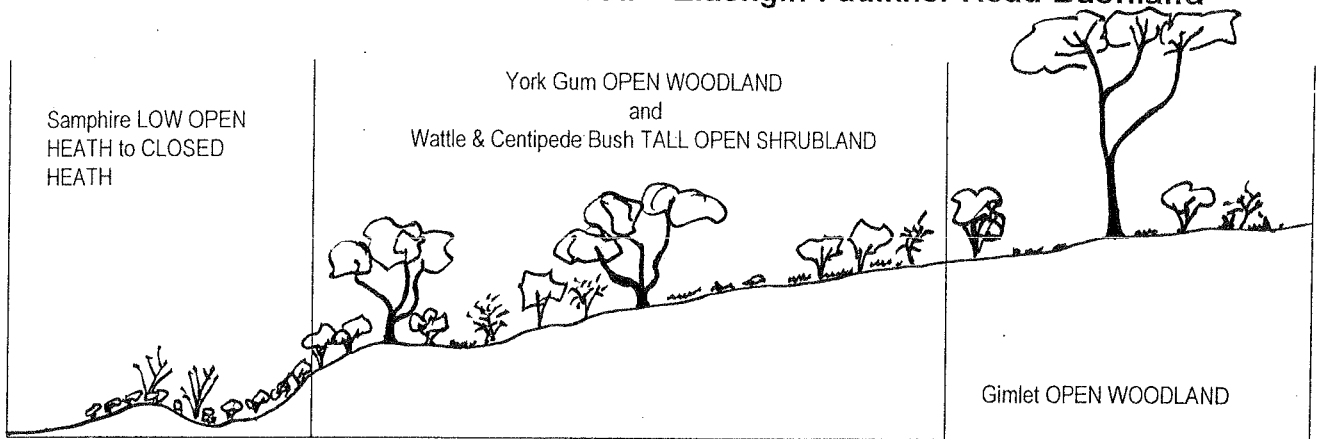
LEGEND

	Bushland Survey Boundary
	Plant Community Boundary
DOLA Aerial Photo	WA 3457(c) DOWERIN & EXTENSIONS RUN 4 (5024-5040) FRAME 5032 1:25000 2-NOV-82
Scale	0  metres





**FIGURE 1: Diagrammatic sequence showing change in plant communities with distance from the lake bed – Elashgin-Faulkner Road Bushland**



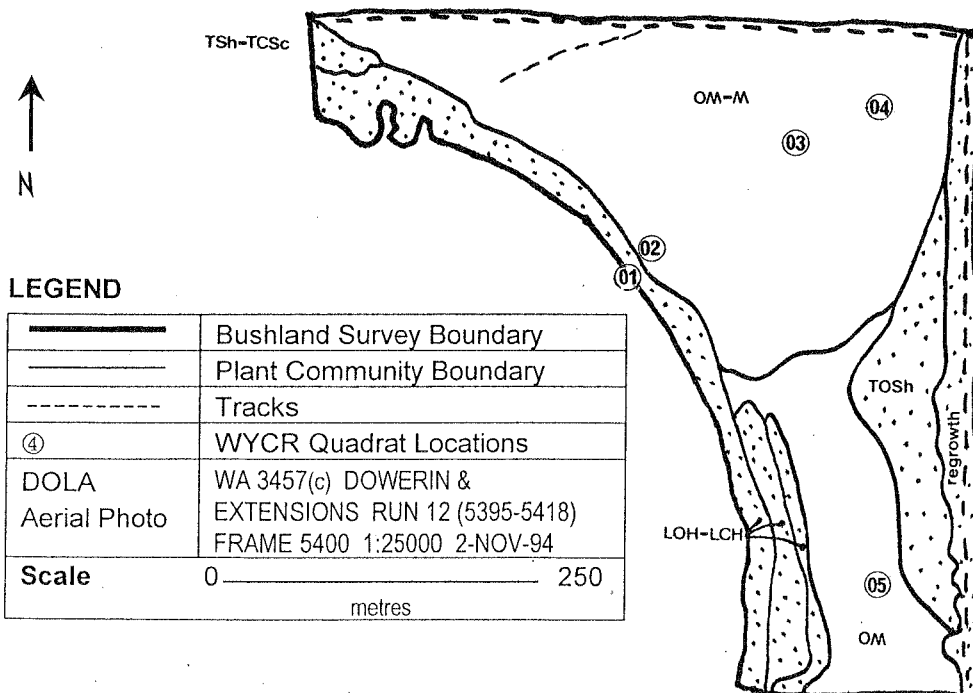
**MAP 6B: Plant Communities of Elashgin-Faulkner Road Bushland, Wyalkatchem**

**Woodland Plant Communities**

OW	<i>Eucalyptus salubris</i> (Gimlet) OPEN WOODLAND
OW-W	<i>Eucalyptus loxophleba</i> ssp. <i>loxophleba</i> (York Gum) OPEN WOODLAND to WOODLAND

**Scrub/Shrubland and Heath Plant Communities**

TSh-TCS	<i>Melaleuca</i> TALL SHRUBLAND to TALL CLOSED SCRUB
TOSh	<i>Acacia nyssophylla</i> and <i>Templetonia smithiana</i> [Centipede Bush] TALL OPEN SHRUBLAND
LOH-LCH	<i>Halosarcia doleiformis</i> [Samphire], <i>H. aff pergranulata</i> [Blackweed Samphire] and <i>H. undulata</i> [Samphire] LOW OPEN HEATH to LOW CLOSED HEATH



**NOTE: Map to be used in conjunction with plant community descriptions (Refer Section 4.1)**

## 4.2 PLANT COMMUNITIES – “HUTCHY’S” BLOCK

In contrast with the Elashgin-Faulkner Road Bushland the plant communities recorded at “Hutchy’s” are not uniform. They are a complex mosaic of smaller units reflecting a number of variables including changes in soil type, soil moisture content and/or aspect, as well as plant competition and fire history (refer Figure 2). Within the study area variations in the canopy cover of the dominant species were recorded from predominantly 10-30% to distinct patches of 30-70%. Often this mosaic which is very obvious on the ground, is not sufficiently distinctive to be clearly identified on the aerial photograph – nor for the purpose of this report is it useful to dissect the natural changes in vegetation communities to such a fine scale.

Twelve (12) plant communities were described for Hutchy’s Block.

### MALLEE – Tree Mallee

- OTM *Eucalyptus celastroides* ssp. *virella* (Mirret) Open Tree Mallee.

### MALLEE – Shrub Mallee

- OM-M Open Mallee to Mallee complex (including *Eucalyptus brachycorys* (Cowcowing Mallee), *E. erythronema* ssp. *marginata* (Red-flowered Mallee), *E. flocktoniae* (Merrit), *E. oldfieldii* (Oldfield's Mallee), *E. pluricaulis* ssp. *pluricaulis* and *E. tenera*)
- OM<sup>1</sup> *Eucalyptus tenera* and *E. erythronema* var. *marginata* (Red-Flowered Mallee) Open Mallee
- OM<sup>2</sup> *Eucalyptus incrassata* (Lerp Mallee) and *E. pluricaulis* ssp. *pluricaulis* Open Mallee-Mallee.
- VOM *Eucalyptus oldfieldii* (Oldfield's Mallee) and *E. flocktoniae* (Merrit) Very Open Mallee

### SHRUBLAND

- TSh-TCS Sc *Allocasuarina acutivalvis* (Black Tamma) Tall Closed Scrub with Mallees
- TOSc *Allocasuarina campestris* ssp. *campestris* (Tamma) and *Hakea scoparia* Tall Open Scrub
- TOSh *Leptospermum erubescens* (Roadside Tea-tree) Tall Open Shrubland
- Sh *Leptospermum erubescens* (Roadside Tea-tree) Shrubland
- CH-OH *Allocasuarina campestris* ssp. *campestris* (Tamma) Closed Heath – Open Heath
- OH *Allocasuarina campestris* ssp. *campestris* (Tamma) and *Daviesia nematophylla* Open Heath

### GRASSLAND/HERBLAND

- G+H *Aristida contorta* (Wind Grass) Grassland with Mixed Herbland.

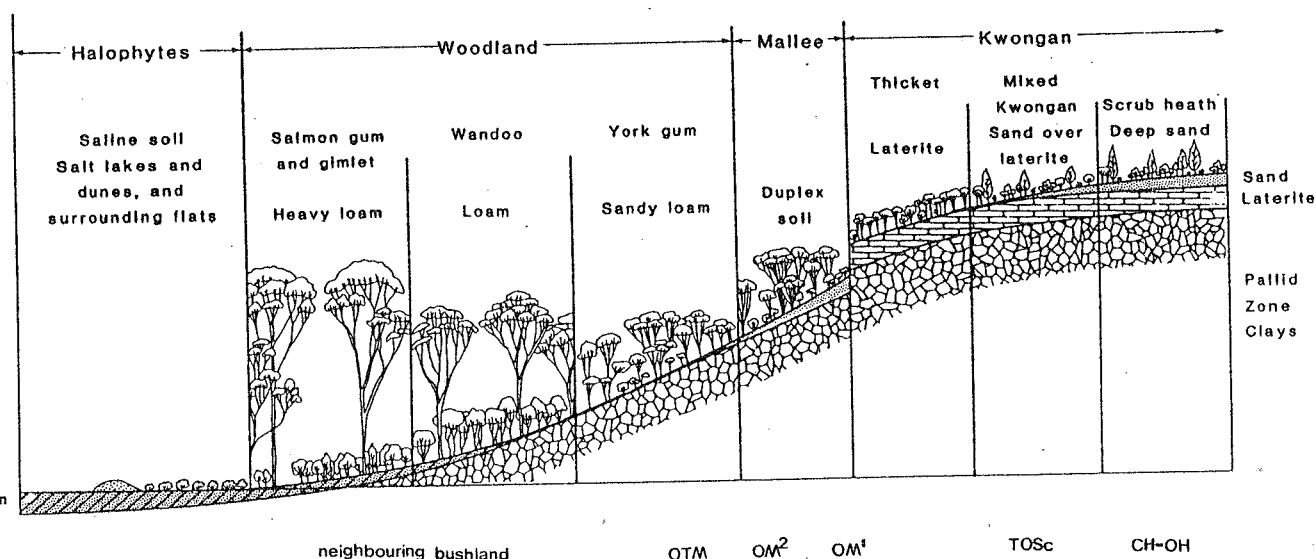


FIGURE 2: Diagrammatic catenary sequence for the Wheatbelt Region showing idealised relationship of vegetation and soils (Beard 1990, page 116) and Hutchy’s block

## Tree Mallee

### OTM *Eucalyptus celastroides* ssp. *virella* (Mirret) Open Tree Mallee [Quadrat WYCH17]

This Mirret plant community occurred on the gentle east-facing slope that runs from the base of the lateritic breakaway (Refer Unit OM) to the eastern boundary of the study area, as well as the north-eastern corner of the study area. The pink-brown sandy clay soils with quartzite and fragments of decomposing granite scattered on the surface – have developed as the breakaway weathers. Drainage appeared to be moderate-poor, with accumulation of litter against obstructions as an indicator of sheet-water movement across the unit during medium to heavy rain events.

Distinguishing features include the open understorey (often patchy in occurrence) and wide spreading, heavy looking mallees (Refer Photos 9 and 26). This unit stands out very clearly on the aerial photograph from the more dense adjoining units and individual Mirrets can be identified against the open reflective surface (Refer Map 7A – Page 30). The structure as well as understorey composition, resembled many York Gum woodlands with the main difference being the dominant gum and the position in the landscape. Variations include:

- *Eucalyptus celastroides* ssp. *virella* (Mirret) **Open Mallee** over *Acacia erinacea* (Spiny Wattle) and *Daviesia nematophylla* **Open Shrubland** over *Maireana carnososa* (Cottony Bluebush) **Low Open Shrubland** over *Podolepis capillaris* (Wiry Capillaris) **Open Herbland** with **Occasional Grasses**. (WYCH17, Photo 9 – Page 72)
- *Eucalyptus celastroides* ssp. *virella* (Mirret) **Open Mallee** with occasional mallees of *Eucalyptus brachycorys* (Cowcowing Mallee) and *E. tenera* over occasional scattered shrubs of *Acacia acuarria*, *Gastrolobium triangulare* (Triangular Poison) and *Melaleuca uncinata* (Broom Bush).
- *Eucalyptus celastroides* ssp. *virella* (Mirret) **Open Mallee** over scattered shrubs and grasses.  
NOTE: The understorey of this unit was very open and patchy – with shrubs often in concentrations around the mallees and canopy cover ranging within these isolated patches from from 2-10% to 10-30%.
- *Eucalyptus brachycorys* (Cowcowing Mallee) and *E. celastroides* ssp. *virella* (Mirret) **Open Shrub Mallee** over occasional shrubs including *Acacia erinacea*, *A. hemiteles* and *Templetonia sulcata* and occasional tall grasses of *Austrostipa elegantissima*.
- *Eucalyptus celastroides* ssp. *virella* (Mirret) **Mallee** with *E. brachycorys*, *E. erythronema* ssp. *marginata*, *E. pluricaulis* ssp. *pluricaulis* over occasional low shrubs of *Acacia merrallii* (Merrall's Wattle). NOTE: vegetation changes to east on neighbouring property where *Eucalyptus salmonophloia* (Salmon Gum) emerges through the mallee stratum.

## Shrub Mallee

### OM-M Open Mallee to Mallee complex [Quadrats WYCH12, WYCH18 and WYCH20]

Nine (9) shrub mallees were recorded in the study area and differing combinations of these mallees formed seven (7) Shrub Mallee Plant Communities that were distinguished in the field. However, many of these were not so easily distinguished on the aerial photograph and as such although more detailed descriptions have been prepared, some have been mapped as a Shrub Mallee Complex (OM-M). Occurrences included:

#### *Eucalyptus flocktoniae* (Merri) Mallee over *Melaleuca uncinata* [Quadrat WYCH12]

This Merri Mallee unit occurred on the gentle east-facing slope above the breakaway on loamy yellow sands with some laterite scattered on the surface. Rock was found at depths of 50-70cm. Although Merri was present throughout most of the unit, other mallees including *E. pluricaulis* ssp. *pluricaulis* and *Eucalyptus incrassata* (Ridge-fruited Malle) also occurred. Distinguishing features included the mallee layer as well as the tall shrub layer often dominated by *Melaleuca uncinata* (Broom Bush)

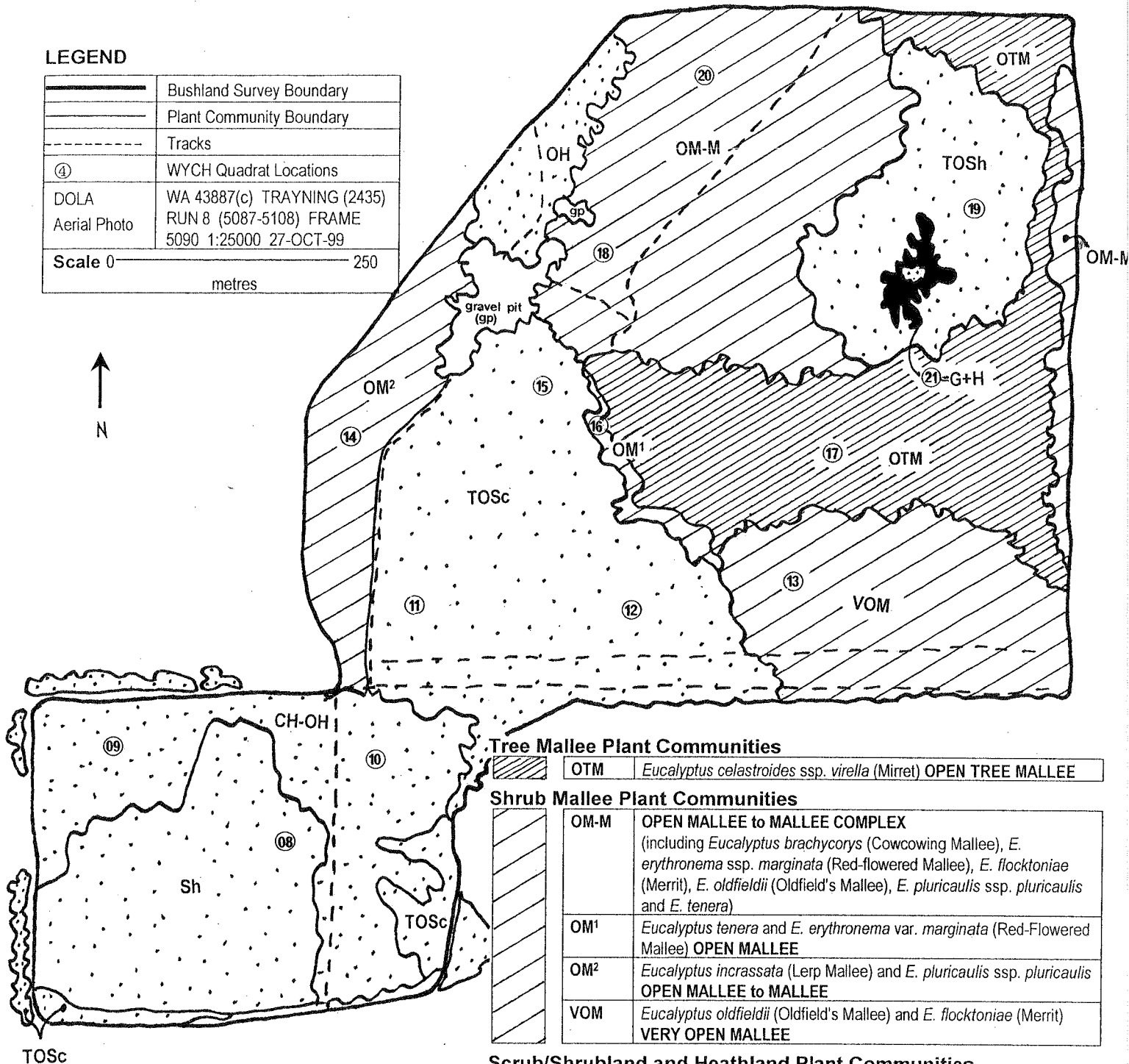


BUSHBROOK DRIVE  
Tracks  
WA 438500 - WAYNIE  
RUN 3 (500' S) PLAIN  
12000 27 OCT 99  
DATE 2 1999

**MAP 7B: "Hutchy's Block", Cardiff Pastoral Company, Hammond Road, Wyalkatchem**

**LEGEND**

	Bushland Survey Boundary
	Plant Community Boundary
	Tracks
④	WYCH Quadrat Locations
DOLA	WA 43887(c) TRAYNING (2435)
Aerial Photo	RUN 8 (5087-5108) FRAME 5090 1:25000 27-OCT-99
Scale 0	250 metres



**Tree Mallee Plant Communities**

	OTM	<i>Eucalyptus celastroides</i> ssp. <i>virella</i> (Mirret) OPEN TREE MALLEE
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**Shrub Mallee Plant Communities**

	OM-M	OPEN MALLEE to MALLEE COMPLEX (including <i>Eucalyptus brachycorys</i> (Cowcowing Mallee), <i>E. erythronema</i> ssp. <i>marginata</i> (Red-flowered Mallee), <i>E. flocktoniae</i> (Merrit), <i>E. oldfieldii</i> (Oldfield's Mallee), <i>E. pluricaulis</i> ssp. <i>pluricaulis</i> and <i>E. tenera</i> )
	OM <sup>1</sup>	<i>Eucalyptus tenera</i> and <i>E. erythronema</i> var. <i>marginata</i> (Red-Flowered Mallee) OPEN MALLEE
	OM <sup>2</sup>	<i>Eucalyptus incrassata</i> (Lerp Mallee) and <i>E. pluricaulis</i> ssp. <i>pluricaulis</i> OPEN MALLEE to MALLEE
	VOM	<i>Eucalyptus oldfieldii</i> (Oldfield's Mallee) and <i>E. flocktoniae</i> (Merrit) VERY OPEN MALLEE

**Scrub/Shrubland and Heathland Plant Communities**

	TSh-TCSc	<i>Allocasuarina acutivalvis</i> (Black Tamma) TALL CLOSED SCRUB with Mallees
	TOSc	<i>Allocasuarina campestris</i> ssp. <i>campestris</i> (Tamma) and <i>Hakea scoparia</i> TALL OPEN SCRUB
	TOSh	<i>Leptospermum erubescens</i> (Roadside Tea-tree) TALL OPEN SHRUBLAND
	Sh	<i>Leptospermum erubescens</i> (Roadside Tea-tree) SHRUBLAND
	CH-OH	<i>Allocasuarina campestris</i> ssp. <i>campestris</i> (Tamma) CLOSED HEATH to OPEN HEATH
	OH	<i>Allocasuarina campestris</i> ssp. <i>campestris</i> (Tamma) and <i>Daviesia nematophylla</i> OPEN HEATH

**Grassland/Herbland Plant Communities**

	G+H	<i>Aristida contorta</i> (Wind Grass) GRASSLAND with MIXED HERBLAND
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NOTE: Map to be used in conjunction with plant community descriptions (Refer Section 4.2)



which made this unit quite dense and difficult to move through. Sub-units that show the variation include:

- *Eucalyptus flocktoniae* (Merrit) **Mallee** with occasional mallees of *Eucalyptus tenera* over *Melaleuca uncinata* (Broom Bush) **Tall Shrubland–Tall Open Scrub** over *Phebalium filifolium* **Shrubland**. Note: Exposed laterite on soil surface.
- *Eucalyptus flocktoniae* (Merrit) and *E. pluricaulis* ssp. *pluricaulis* **Open Mallee** over *Hakea multilinata* (Bottle-brush) and *Melaleuca uncinata* (Broom Bush) **Tall Open Shrubland** over *Phebalium filifolium* (Slender Phebalium) **Open Heath** over **Occasional Grasses**. (WYCH12, Photo 10 – Page 72)
- *Eucalyptus flocktoniae* (Merrit) **Very Open Mallee** with occasional mallees of *Eucalyptus incrassata* (Ridge-fruited Malle) and *E. pluricaulis* ssp. *pluricaulis* over *Allocasuarina acutivalvis* (Black Tamma) and *Melaleuca uncinata* (Broom Bush) **Tall Shrubland–Tall Open Scrub** over *Phebalium filifolium* **Shrubland**. Note: Scattered laterite on soil surface.
- *Melaleuca uncinata* (Broom Bush) **Tall Open Scrub** with occasional emergent mallees of *Eucalyptus flocktoniae* (Merrit) and *E. pluricaulis* ssp. *pluricaulis*.

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***Eucalyptus tenera* Mallee** [Quadrat WYCH18]

This *Eucalyptus tenera* mallee plant community occurred along the edges of the track linking the centre of the northern boundary of the block to the breakaway. It occurred in dense stands and when flowering both the colour and form of the elegant ‘witches fingernail’ bud caps easily distinguishes this mallee. Some of the occurrences are intergrades with adjoining plant communities and include:

- *Eucalyptus tenera* **Mallee** over *Melaleuca uncinata* (Broombush) **Tall Open Shrubland** over **Mixed Grassland** over *Trachymene cyanopetala* **Herbland**. (WYCH18, Photo 11 – Page 73)
- *Eucalyptus tenera* **Mallee** with occasional emergent mallees of *Eucalyptus hypochlamydea* ssp. *ecdysiastes* over *Melaleuca uncinata* (Broombush) **Tall Shrubland**.
- *Eucalyptus tenera* **Open Mallee** with occasional emergent mallees of *Eucalyptus celastroides* ssp. *virella* (Mirret) over *Acacia densiflora* **Open Shrubland** with occasional scattered shrubs of *Acacia acuaria* and *Melaleuca uncinata*. Note: Grey-pink sand with scattered quartz pebbles on surface.
- *Eucalyptus tenera* **Mallee** with occasional emergent trees of *Eucalyptus capillosa* ssp. *capillosa* (Wheatbelli Wandoo).
- *Eucalyptus hypochlamydea* ssp. *ecdysiastes* **Open Mallee** over *Melaleuca uncinata* (Broom Bush) **Tall Open Scrub** over *Beaufortia interstans*, *Gastrolobium parviflorum* and *Westringia cephalantha* **Shrubland**.

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***Eucalyptus brachycorys*, *E. erythronema* ssp. *marginata* and *E. pluricaulis* ssp. *pluricaulis* Very Open Mallee to Mallee**

This mallee unit occurred along the eastern strip of the study area and appeared to be an intergrade between the mallee and shrubland units of “Hutchy’s Block” and the adjoining vegetation to the east where Salmon Gum [*Eucalyptus salmonophloia*] occurred over mallee. These plant communities are now separated by a firebreak/property boundary track.

- *Eucalyptus brachycorys*, *E. erythronema* ssp. *marginata* and *E. pluricaulis* ssp. *pluricaulis* **Very Open Mallee to Mallee** over *Melaleuca uncinata* (Broom Bush) **Shrubland**.

The occurrence and density of the mallees changed along the north-south alignment and an interesting feature was the occurrence of both the yellow and red inflorescence forms of *Eucalyptus erythronema* ssp. *marginata* (Red-Flowered Mallee). Note: the Field Herbarium has examples of both variants.

**OM<sup>1</sup>** *Eucalyptus tenera* and *E. erythronema* ssp. *marginata* **Open Mallee** [Quadrat WYCH16]

This *Eucalyptus tenera* and Red-Flowered Mallee unit occurred on the east facing slopes of the lateritic breakaway. The slope is scattered with medium-large boulders (30-100cm) as well as loose and conglomerate orange-red laterite. The combination of location in the landscape, glaucous colour and low, flat-topped form of the *Melaleuca coronicarpa* together with the light stems of the mallees gives this unit its distinctive appearance on the ground. This clear distinction is in contrast with the aerial photograph where delineation of this thin unit is difficult. Both the upper storey and understorey have small variations across the breakaway as described:

- *Eucalyptus tenera* and *E. erythronema* ssp. *marginata* [Red-flowered Mallee] **Open Shrub Mallee** with occasional tall shrubs of *Grevillea huegelii* and *Melaleuca uncinata* over *Melaleuca coronicarpa* and *Westringia cephalantha* **Open Shrubland**. Note: occasional tall shrubs of *Allocasuarina acutivalvis* (Black Tamma) on the top of the breakaway.
- *Eucalyptus tenera* **Open Shrub Mallee** over *Melaleuca coronicarpa* **Shrubland** over **Occasional Grasses and Herbs**. (WYCH16, Photo 12 – Page 73)

**OM<sup>2</sup>** *Eucalyptus incrassata* (Lerp Mallee) and *E. pluricaulis* ssp. *pluricaulis* **Open Mallee - Mallee** [Quadrat WYCH14]

This mixed Mallee unit occurred on the deeper sands above and to the west of the breakaway. The sands were cream over yellow at depth and had a light scattering of laterite on the surface. The gravel pit to the north indicated that laterite gravel could be within 50-100cm of the surface. The open and patchy understorey gave this unit a mottled appearance on the aerial photograph. Sub-units include:

- *Eucalyptus incrassata* (Lerp Mallee) and *E. pluricaulis* ssp. *pluricaulis* **Mallee** over *Gastrolobium spinosum* ssp. *spinosum* (Prickly Poison) and *Phebalium filifolium* (Slender Phebalium) **Shrubland** over **Mixed Open Grassland** with **Occasional Herbs**. (WYCH14, Photo 14 – Page 74)
- *Eucalyptus flocktoniae*, *E. incrassata* and *E. pluricaulis* ssp. *pluricaulis* **Open Mallee** over occasional shrubs including *Acacia acuaria*, *Daviesia nematophylla* and *Melaleuca uncinata* (Broom Bush).
- Patches of mallee including *Eucalyptus flocktoniae* (Merrit), *E. hypochlamydea* ssp. *ecdysiastes*, *E. incrassata* (Lerp Mallee) and *E. pluricaulis* ssp. *pluricaulis* occur on the edge of the gravel pit.

**VOM** *Eucalyptus oldfieldii* (Oldfield's Mallee) and *E. flocktoniae* (Merrit) **Very Open Mallee** [Quadrat WYCH13]

This unit occurred on the gentle north-facing slopes towards the south-east corner of the study area on yellow loamy sands over pink-brown loamy sands at depth, with moderate drainage. The surface had a scattering of small lateritic pebbles. The unit had a high proportion of bare ground (45-55%) with natural litter settling on 15-25% of the soil surface. Distinguishing features of this unit are the exposed yellow surface soils, the relatively open appearance with distinctive structural layers (each of a low canopy cover), the presence of tall rushes/sedges and termite mounds. Occurrences include:

- *Eucalyptus oldfieldii* (Oldfield's Mallee) and *E. flocktoniae* (Merrit) **Very Open Mallee** over *Melaleuca uncinata* (Broombush) **Tall Open Shrubland** over *Acacia acuaria* and *Baeckea megaflorea* **Shrubland** over *Olearia dampieri* var. *eremicola* ms **Low Open Shrubland** over *Austrostipa elegantissima* (Feather Speargrass) **Very Open Grassland** with **Occasional Herbs and Sedges**. (WYCH13, Photo 13 – Page 74)
- *Acacia acuaria* **Shrubland** with occasional emergent mallees of *Eucalyptus brachycorys* (Cowcowing Mallee), *E. pluricaulis* ssp. *pluricaulis* and *E. tenera* over *Dodonaea viscosa*, *Grevillea paniculata* and *Olearia dampieri* var. *eremicola* ms **Low Open Heath** with **Occasional Herbs and Sedges**. Note: community changes to *Leptospermum erubescens* (Roadside Tea-tree) **Tall Closed Scrub** with emergent mallees.
- *Acacia stereophylla* and *Allocasuarina acutivalvis* (Black Tamma) **Tall Shrubland** with occasional emergent mallees of *Eucalyptus oldfieldii* (Oldfield's Mallee) over *Hibbertia* sp., *Beaufortia interstans* and *Baeckea megaflorea* **Shrubland** over *Ecdeiocolea monostachya* **Very Open Sedgeland**.

## Shrubland

### TSh-TCSc

***Allocasuarina acutivalvis* (Black Tamma) Tall Closed Scrub with Mallees** [Quadrats WYCH15, WYCH20]

This dense Black Tamma plant community occurred on the upper eastern flats and slopes of the study area. The Black Tamma is of considerable age and formed dense stands of tall shrubs and/or small trees – often as a single species. This habit is an indicator of considerable time since fire, such that the Black Tamma has developed to a substantial height as well as out-competed other plants (refer to Table 7C, Page 47 for comparison of species numbers in quadrats).

Variations in the unit include the occurrence of mallees and occasional emergent trees of Wheatbelt Wandoo (*Eucalyptus capillosa* ssp. *capillosa*):

- *Allocasuarina acutivalvis* (Black Tamma) and *Melaleuca uncinata* (Broom Bush) **Tall Closed Scrub** with occasional mallees of *Eucalyptus flocktoniae* (Merri) over **Occasional Low Shrubs**. Occasional climbers of *Thysanotus patersonii* (Twining Fringe Lily) also occur through the lower layers. (WYCH15, Photo 15 – Page 75)
- *Allocasuarina acutivalvis* (Black Tamma) and *Allocasuarina campestris* ssp. *campestris* (Tamma) **Tall Closed Scrub** with *Eucalyptus incrassata* (Lerp Mallee) **Open Mallee** over *Acacia fragilis*, *A. heteroneura* var. *heteroneura* and *Grevillea hookeriana* (Red Tooth Brushes) **Open Heath** over *Hibbertia eatoniae* and *Melaleuca conothamnoides* **Low Open Heath** over *Ecdeiocolea monostachya* **Very Open Tall Sedgeland** over **Occasional Grasses and Herbs**. (WYCH20, Photo 16 – Page 75)
- *Allocasuarina acutivalvis* (Black Tamma) **Tall Shrubland** with occasional emergent mallees of *Eucalyptus hypochlamydeia* ssp. *ecdysiastes* over *Daviesia nematophylla*, *Hakea erecta*, *Leptospermum erubescens* (Roadside Tea-tree) and *Verticordia eriocephala* **Shrubland** over *Ecdeiocolea monostachya* and *Lepidosperma* sp. A2 Island Flat (GJ Keighery 7000) **Open Sedgeland**. NOTE: good regeneration of *Persoonia quinquenervis* 28/11/01).
- Small isolated patches (5-10m<sup>2</sup>) of *Melaleuca uncinata* (Broom Bush) **Tall Closed Scrub** surrounded by Black Tamma Tall Closed Scrub.

A variant of the Black Tamma plant community occurred on the deeper creamy-yellow sands on the edges of the southern heath block of Hutchy's. From both adjoining vegetation (ie not part of the study area) and the narrowness of this unit it can be assumed that it extended into the immediate areas now cleared and used for cropping. Black Tamma with its large fruits, the height and density of the shrub layer and occasional emergent mallees are distinguishing features of this unit. Occurrences include:

- *Allocasuarina acutivalvis* (Black Tamma) **Tall Shrubland** with occasional emergent mallees of *Eucalyptus hypochlamydeia* ssp. *ecdysiastes* and *E. oldfieldii* (Merri).
- *Allocasuarina acutivalvis* (Black Tamma) **Tall Closed Scrub** over occasional mallees of *Eucalyptus oldfieldii* (Oldfield's Mallee) and shrubs of *Dryandra purdieana*, *Melaleuca scabra* and *Petrophile shuttleworthiana*.
- *Allocasuarina acutivalvis* (Black Tamma) and *Dryandra purdieana* **Tall Open Shrubland** over *Beaufortia interstans* and *Melaleuca* sp. **Shrubland**.

### TOSc

***Allocasuarina campestris* ssp. *campestris* (Tamma) and *Hakea scoparia* Tall Open Scrub** [Quadrat WYCH11]

This Tamma plant community occurs in the centre of the deeper sands above the breakaway and grades into a mallee plant community to the west. There was a lot of variation in the species composition and canopy cover, including the occurrence of mallees changing over the unit. The dominance of the Tamma is reflected in colour and texture on aerial photograph. This unit is distinguished from other Tamma units by its height (greater than 2m).

- *Allocasuarina campestris* ssp. *campestris* (Tamma) and *Hakea scoparia* **Tall Open Scrub** with occasional Emergent Mallees of *Eucalyptus brachycorys* (Cowcowing Mallee) over *Melaleuca uncinata*

(Broom Bush) **Open Shrubland** over *Baeckea megaflorea* **Low Open Shrubland** over **Occasional Grasses, Herbs and Sedges**. (WYCH11, Photo 22 – Page 78)

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**TOSh**      *Leptospermum erubescens* (Roadside Tea-tree) **Tall Open Shrubland** [Quadrat WYCH19]

This Tea-tree plant community occurred in the north-eastern portion of the study area on gentle south, south-west facing slope with light-brown sandy loams to a depth of at least 1m, where laterite occurred. This unit was distinguished by the mix of shrubs and the high occurrence of herbs with 37% of all herbs recorded for Hutchy's Block recorded in (14 species) or adjacent (13 species) to WYCH19. In addition to the high occurrence of herbs within the quadrat, there are also small herbland/grasslands (Unit G&H, Refer Photo 23) through this unit, which although distinctive in the field, are too small to separate out on the map. Distinctive plants of this unit included *Leptospermum* (pale purple flowers and soft grey-green foliage), *Persoonia* (masses of yellow seed pods late spring to early summer) and *Lomandra collina* (hummocky growth form). Variations across this unit include:

- *Leptospermum erubescens* (Roadside Tea-tree) **Tall Open Shrubland** over *Acacia acuaria*, *Baeckea megaflorea* and *Olearia dampieri* var. *eremicola* ms **Open Heath** over *Platysace maxwellii* (Karno) **Low Open Shrubland** over *Aristida contorta* (Wind Grass) **Very Open Grassland** with **Occasional Herbs, Sedges and Rushes**. (WYCH19, Photo 17 – Page 76)
- *Acacia acuaria* and *Leptospermum erubescens* (Roadside Tea Tree) **Open Heath** over occasional shrubs of *Daviesia nudiflora* ssp. *drummondii*, *Grevillea paniculata*, *Olearia dampieri* ssp. *eremicola* ms and tall grasses of *Austrostipa elegantissima* (Feather Speargrass).
- *Acacia acuaria* **Shrubland** with occasional emergent trees and mallees of *Eucalyptus capillosa* ssp. *capillosa* (Weatbelt Wandoo), *E. tenera* and *E. brachycorys* (Cowcowing Mallee) over *Dodonaea viscosa*, *Grevillea paniculata* and *Olearia dampieri* var. *eremicola* ms **Low Open Heath**. Changes to *Leptospermum erubescens* (Roadside Tea-tree) **Tall Closed Scrub**.

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**Sh**      *Leptospermum erubescens* (Roadside Tea-tree) **Shrubland** [Quadrat WYCH08]

This Tea-tree plant community occurred over much of "Hutchy's Heath" – the south-west block of the study area. The soils appeared to be well drained and ranged from creamy-grey surface sand, with a light scattering of lateritic pebbles to orange-red lateritic soils at depth. Distinguishing features of this unit included the low height, the density of the vegetation and the distinctive forms of Proteaceae shrubs including *Dryandra conferta*, *D. purdieana*, *Grevillea hookeriana* (Toothbrushes) and *Petrophile shuttleworthiana* (Refer Photo 18 – page 76). Variations across the unit include:

- *Leptospermum erubescens* (Roadside Teatree) **Shrubland** over *Dryandra purdieana* and *Melaleuca conothamnoides* **Low Open Heathland** over **Occasional Herbs, Sedges and Grasses**. (WYCH08, Photo 19 – Page 77) Note: occasional emergent patches of *Eucalyptus oldfieldii* (Oldfield's Mallee) occurred.
- *Leptospermum erubescens* (Roadside Tea-tree) and *Melaleuca scabra* **Open Heath** with occasional emergent mixed mallees and shrubs of *Allocasuarina acutivalvis* (Black Tamma) over occasional tall sedges of *Lepidosperma tenue* and low sedges of *Schoenus griffinianus*.
- *Eucalyptus hypochlamydea* ssp. *ecdysiastes* **Very Open Mallee** over *Dryandra purdieana*, *Hakea scoparia*, *Leptospermum erubescens* (Roadside Tea-tree) and *Melaleuca scabra* **Open Heath** with occasional emergent shrubs of *Allocasuarina acutivalvis* (Black Tamma).

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**CH-OH**      *Allocasuarina campestris* ssp. *campestris* (Tamma) **Closed Heath – Open Heath** [Quadrat WYCH09 + WYCH10]

This Tamma plant community occurred in the south-western portion of the study area on fawn coloured sands to depth. The surface and subsoil had a scattering of small lateritic pebbles. Characteristics of this unit included the density of the heath as well as occurrence of tall sedges. Variations included:

- *Allocasuarina campestris* ssp. *campestris* (Tamma) **Open Heath** with occasional emergent shrubs of *Allocasuarina acutivalvis* (Black Tamma).
- *Allocasuarina campestris* ssp. *campestris* (Tamma) **Closed Heath** over *Leptospermum erubescens* (Roadside Tea-tree) **Low Open Shrubland** over *Ecdeiocolea monostachya* and *Lepidosperma brunonianum* **Very Open Tall Sedge/Rushland** with **Occasional Herbs**. (WYCH09, Photo 20 – Page 77)
- *Allocasuarina campestris* ssp. *campestris* (Tamma) and *Daviesia nematophylla* **Open Heath** over occasional rushes of *Ecdeiocolea monostachya*.
- *Allocasuarina campestris* ssp. *campestris* (Tamma), *Dryandra conferta* var. *conferta* and *Hakea scoparia* **Open Shrubland** with **Occasional Emergent Mallees** of *Eucalyptus oldfieldii* (Oldfield's Mallee) over *Beaufortia interstans*, *Leptospermum erubescens* (Roadside Tea-tree) and *Melaleuca conothamnoides* **Low Open Heath** over **Mixed Very Open Sedgeland** with **Occasional Herbs and Grasses**. (WYCH10, Photo 21 – Page 78)

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**OH**                      *Allocasuarina campestris* ssp. *campestris* (Tamma) and *Daviesia nematophylla* **Open Heath**

This Tamma plant community occurred on the deeper cream-coloured sands to the north-west of the study area. It is distinguished from the other Tamma units by its lower height (1-1.5m), the mix of Myrtaceous and Proteaceous shrubs, as well as the general openness of the unit. The adjoining gravel pit to the south indicated that laterite would be within 50-100cm of the surface.

- *Allocasuarina campestris* ssp. *campestris* (Tamma) and *Daviesia nematophylla* **Open Heath** with occasional emergent tall shrubs of *Allocasuarina acutivalvis* (Black Tamma) and *Hakea multilineata* (Bottle Brush).

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**Grassland / Herbland Plant Communities**

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**G+H**                      *Aristida contorta* (Wind Grass) **Grassland with Mixed Herbland** [Site WYCH21]

This grassland/herbland plant community occurred as isolated patches within the study area, particularly within the *Leptospermum erubescens* (Roadside Tea-tree) Tall Open Shrubland. Although some of the occurrences were visible on the aerial photograph, many were not. WYCH21 was not established as a 10x10m quadrat, but a site description was made using the Survey Sheets.

- *Aristida contorta* (Wind Grass) **Grassland** and *Lomandra collina* (Pale Mat Rush), *Podolepis capillaris* (Wiry Podolepis) and *Stachhouisia monogyna* **Herbland** with occasional emergent shrubs of *Dodonaea viscosa* ssp. *angustissima* (Sticky Hop Bush), *Melaleuca scabra* (Wurru Bush) and *Platysace maxwellii* (Karno). (site WYCH21, Photo 23 – Page 79).



## 5. FLORA SURVEY

As noted in the methods section, the *Bushland Plants Survey* process ensures that each structural layer and each species is observed and recorded. Consistently whenever people are first introduced to the survey technique, there is an expression of surprise at the number of species that can be found in such a small, defined area (10mx10m). It is so easy for us to overlook the less obvious, but they are all an important part of the diverse natural system.

It is considered that the survey will have recorded 80-90% of the plants species in both of the remnants, and although no attempt was made to collect fungi, lichens, liverworts, mosses or stoneworts – lichens and fungi were observed during the survey. It is also anticipated that following a good season, there would be more annuals recorded for these areas. The 2000 year was a relatively dry year and many surveys in the wheatbelt showed a reduction in annuals recorded compared to other years.

### 5.1 ELASHGIN-FAULKNER ROAD BUSHLAND

#### 5.1.1 Overview

The total indigenous or native flora recorded for the 30ha study area was 86 vascular plant taxa from 30 plant Families and the total weed or exotic taxa recorded was 24 vascular plant taxa from 8 plant Families (Refer Appendices E1 and F1).

Some interesting statistics (Refer to Tables 6A and 6B for detail) include:

- Three of the 33 plant families contributed almost half (49%) of the taxa
- The Asteraceae family contributed 22% of the total (native and exotic) flora
- The Families with the greatest number of Genera recorded were Asteraceae (Daisies) with 21 genera (including 14 native) and Poaceae (Grasses) with 11 genera (including 2 native)
- The Families with the greatest number of native species recorded were Asteraceae (Daisies) with 19 Chenopodiaceae (Saltbushes, Bluebushes, Samphires) with 14 species
- The Genus with the greatest number of species was *Halosarcia* (Samphires) with 5 species
- Annual native herbs made up 31% of the total flora, whilst perennial native shrubs made up 34% of the total
- *Eucalyptus* trees and mallees made up 2% of the total flora
- Weed species in Asteraceae (Daisies) and Poaceae (grasses) made up 14% of the total flora (and 67% of the total weed taxa)
- 67 (61%) of the total 110 taxa were recorded only once, 59 in or adjacent to the WYCR quadrats and 8 from opportunistic collections made whilst wandering through the bush.

TABLE 6A: Summary of the three families and associated genera that contributed 49% of the taxa

Plant Family • Genera = No. Species	No. Native Species	No. Weed Species	Total No. Species
<b>Asteraceae</b> (daisies) • <i>Actinobole</i> = 1 • <i>*Arctotheca</i> = 1 • <i>Argyrolottis</i> = 1 • <i>Blennospora</i> = 1 • <i>Brachyscome</i> = 1 • <i>Calotis</i> = 1 • <i>*Cotula</i> = 1 • <i>Erymophyllum</i> = 1 • <i>Hyalosperma</i> = 1 • <i>*Hypochoeris</i> = 1 • <i>Millotia</i> = 1 • <i>Olearia</i> = 1 • <i>*Osteospermum</i> = 1 • <i>Podolepis</i> = 2 • <i>Podotheca</i> = 2 • <i>Pogonolepis</i> = 1	19	6	25

\* = weed

Plant Family • Genera = No. Species	No. Native Species	No. Weed Species	Total No. Species
<ul style="list-style-type: none"> <li>• <i>Rhodanthe</i> = 2</li> <li>• <i>Senecio</i> = 1</li> <li>• <i>Siloxerus</i> = 1</li> <li>• *<i>Sonchus</i> = 2</li> <li>• <i>Waitzia</i> = 1</li> </ul>			
<b>Poaceae</b> (grasses) <ul style="list-style-type: none"> <li>• *<i>Aira</i> = 1</li> <li>• <i>Austrodanthonia</i> = 3</li> <li>• <i>Austrostipa</i> = 2</li> <li>• *<i>Avena</i> = 1</li> <li>• *<i>Bromus</i> = 1</li> <li>• *<i>Hordeum</i> = 1</li> <li>• *<i>Lamarckia</i> = 1</li> <li>• *<i>Lolium</i> = 2</li> <li>• *<i>Parapholis</i> = 1</li> <li>• *<i>Phalaris</i> = 1</li> <li>• *<i>Vulpia</i> = 1</li> </ul>	5	10	15
<b>Chenopodiaceae</b> <ul style="list-style-type: none"> <li>• <i>Atriplex</i> = 2</li> <li>• <i>Enchylaena</i> = 2</li> <li>• <i>Halosarcia</i> = 5</li> <li>• <i>Maireana</i> = 2</li> <li>• <i>Rhagodia</i> = 2</li> <li>• <i>Sclerolaena</i> = 1</li> </ul>	14	-	14

\* = weed

TABLE 6B: Summary of the growth forms and life forms recorded

PLANT Growth Form	% of TOTAL	TOTAL SPECIES	NATIVE SPECIES		*WEED SPECIES	
			ANNUAL	PERENNIAL	*annual	*perennial
Climbers	3%	3	-	3	-	-
Ferns	-	-	-	-	-	-
Grasses	14%	15	-	5	10	-
Sedges/Rushes	-	-	-	-	-	-
Herbs	47%	52	34	4	14	-
Shrubs	34%	38	-	38	-	-
Mallees	1%	1	-	1	-	-
Trees	1%	1	-	1	-	-
<b>TOTALS</b>	<b>100%</b>	<b>110</b>	<b>34</b>	<b>52</b>	<b>24</b>	<b>0</b>

The high number of annual herbs (Refer Table 6B) reflects the vegetation communities present in the bush block, being the woodland communities rather than heaths or shrublands.

### 5.1.2 Species Diversity of Plant Communities

The number of species found in each 10m x 10m quadrat varied from a minimum of 16 species (12 natives, 4 weeds – Quadrat WYCR01) to a maximum of 36 species (31 natives, 5 weeds – Quadrat WYCR02).

Table 6C summarises the species richness or species diversity recorded for each of the Quadrats. It also shows the number and type of structural layers. Almost half the species richness in the Open Woodland (WYCR02) and Woodland (WYCR05 and WYCR03) quadrats was contributed by herbs. This is a common occurrence in wheatbelt woodlands, as the open canopy often to allow sufficient light to penetrate through to ground.

**TABLE 6c: Showing species diversity (decreasing order) for each WYCR quadrat**

Elashgin-Faulkner Rd Quadrat	No. of native species	No. of *weed species	No. of structural layers	Plant Community Structural Layers
WYCR02	31	*5	6	Open Woodland / Tall Shrubland / Shrubland / Low Shrubland / Very Open Grassland / Very Open Herbland
WYCR05	21	*8	3	Woodland / Low Shrubland / Herbland
WYCR04	21	*6	3	Tall Open Shrubland / Low Open Shrubland / Very Open Herbland
WYCR03	19	*5	6	Woodland / Tall Shrubland / Open Shrubland / Low Open Shrubland / Very Open Grassland / Herbland
WYCR01	12	*4	2	Low Open Heath / Very Open Herbland

### 5.1.3 Significant Flora – Species of Special Interest

The occurrence and distribution of species that have been collected throughout the State and incorporated into the collection of the Western Australian Herbarium is recorded on FloraBase (WA Herbarium 1998). Field experience combined with this information enables a picture of species to be developed.

The information provided here is current at the time of writing, however, as more survey work is carried out in Western Australia, the knowledge of species occurrences will continue to change. For example, results from the CALMSscience Biological Survey of the wheatbelt, will doubtless increase the number of recordings and locations of many flora.

#### *Populations of species at the ends of the plant's known range*

The survey recorded two species near the limits of their previously known range:

#### **Fabaceae**

##### *Templetonia smithiana* (Centipede Bush)

A newly recognised and poorly known shrub, that grows around salt lakes that is often confused with *Templetonia sulcata*. This species has been recorded from Wongan Hills, Manmanning east to Yellowdine, west to Hines Hill and south to Corrigin.

#### **Solanaceae**

##### *Cyphanthera microphylla*

A low much branched shrub that grows around salt lakes in the Goldfields and Wheatbelt. The population at Elashgin-Faulkner Road is near the western margin of the species range.

### *New species*

The survey recorded one collection as a possible new species:

#### **Frankeniaceae**

*Frankenia* species A WSWA WYCR01/5 (C Keating)

A low shrub recorded from the edges of the salt lake where it co-occurred with *Frankenia pauciflora* (Seaheath).

### *Plants of general interest*

Often we overlook the importance and/or interest of species that are considered ‘common’ and/or species that do not fall into the category of Declared Rare Flora or Priority Flora. However, many of these have importance for a variety of reasons, not least their aesthetics, their modified characteristics or their contribution to ‘sense of place’.

#### **Chenopodiaceae**

*Halosarcia* species or Samphires have special characteristics that enable them to thrive in seasonally waterlogged and saline areas. They have a very distinct ‘fleshy-bobble’ appearance species and are often much maligned or ignored because they do not have showy flowers and are considered ‘less than attractive’ by many. This is possibly compounded by their occurrence in landscapes that can be harsh and are often not considered aesthetically pleasing.

#### **Myrtaceae**

*Eucalyptus* species

The very distinctive wheatbelt trees *Eucalyptus salubris* (Gimlet) and *Eucalyptus loxophleba* ssp. *loxophleba* (Gimlet) are present across the block. These woodlands once characterised much of the western Wheatbelt and maintaining remnants like these retains a sense of place for this landscape.

*Melaleuca* species

*Melaleuca halmaturorum* and *Melaleuca adenostyla* are of interest as they are species associated with saline areas, often growing in floodways and depressions.

## 5.2 "HUTCHY'S BLOCK"

### 5.2.1 Overview

The total indigenous or native flora recorded for the 40ha study area was 213 vascular plant taxa from 53 plant Families and the total weed or exotic taxa recorded was 14 vascular plant taxa from 4 plant Families (Refer Appendices E2 and F2).

Some interesting statistics (Refer to Tables 7A and 7B for detail) include:

- Seven of the 55 plant families contributed more than half (56%) of the taxa
- The Myrtaceae family contributed 13% of the total (native and exotic) flora with 30 different species being recorded
- The Families with the greatest number of Genera recorded were Asteraceae (14 genera) and Myrtaceae (10 genera)
- The Genera with the greatest number of species were *Acacia* (Wattles) with 16 species and *Eucalyptus* (Gums) with 10 species
- Annual native herbs made up 18% of the total flora, whilst perennial native shrubs made up 48% of the total
- Weed species in Asteraceae (Daisies) and Poaceae (Grasses) made up 5% of the total flora (and 85% of the total weed taxa)
- 129 (57%) of the total 224 taxa were recorded only once, 109 in or adjacent to the WYCH quadrats and 20 from opportunistic collections made whilst wandering through the bush.

**TABLE 7A: Summary of the seven families and associated genera that contributed 56% of the taxa**

Plant Family • Genera = No. Species	No. Native Species	No. Weed Species	Total No. Species
<b>Myrtaceae</b> (myrtles) • <i>Astartea</i> = 1 • <i>Baeckea</i> = 1 • <i>Beaufortia</i> = 1 • <i>Calytrix</i> = 1 • <i>Chamelaucium</i> = 2 • <i>Eucalyptus</i> = 10 • <i>Leptospermum</i> = 1 • <i>Melaleuca</i> = 7 • <i>Micromyrtus</i> = 1 • <i>Verticordia</i> = 5	30	-	30
<b>Asteraceae</b> (daisies) • <i>Actinobole</i> = 1 • <i>*Arctotheca</i> = 1 • <i>Blennospora</i> = 1 • <i>Brachyscome</i> = 2 • <i>Ceratogyne</i> = 1 • <i>*Cotula</i> = 1 • <i>Erymophyllum</i> = 1 • <i>Gnephosis</i> = 1 • <i>Hyalosperma</i> = 2 • <i>*Hypochoeris</i> = 1 • <i>Millotia</i> = 1 • <i>Olearia</i> = 1 • <i>Podolepis</i> = 3 • <i>Podotrocha</i> = 2 • <i>Pogonolepis</i> = 1 • <i>Rhodanthe</i> = 1 • <i>*Sonchus</i> = 1 • <i>*Ursinia</i> = 1 • <i>Waitzia</i> = 1	19	5	24

\* = weed

Plant Family • Genera = No. Species	No. Native Species	No. Weed Species	Total No. Species
<b>Proteaceae</b> • <i>Dryandra</i> = 2 • <i>Grevillea</i> = 6 • <i>Hakea</i> = 5 • <i>Isopogon</i> = 1 • <i>Persoonia</i> = 4 • <i>Petrophile</i> = 1 • <i>Synaphea</i> = 1	20	-	20
<b>Mimosaceae</b> (wattles) • <i>Acacia</i> = 16	16	-	16
<b>Poaceae</b> (grasses) • * <i>Aira</i> = 1 • <i>Aristida</i> = 1 • <i>Austrodanthonia</i> = 3 • <i>Austrostipa</i> = 3 • * <i>Bromus</i> = 1 • * <i>Ehrharta</i> = 1 • <i>Neurachne</i> = 1 • * <i>Pentaschistis</i> = 1 • * <i>Vulpia</i> = 3	8	7	15
<b>Cyperaceae</b> (sedges) • <i>Lepidosperma</i> = 4 • <i>Mesomelaena</i> = 1 • <i>Schoenus</i> = 7	12	-	12
<b>Papilionaceae</b> (peas) • <i>Daviesia</i> = 4 • <i>Gastrolobium</i> = 4 • <i>Mirbelia</i> = 1 • <i>Templetonia</i> = 2	11	-	11

\* = weed

TABLE 7B: Summary of the growth forms and life forms

PLANT Growth Form	% of TOTAL	TOTAL SPECIES	NATIVE SPECIES		*WEED SPECIES	
			ANNUAL	PERENNIAL	*annual	*perennial
Climbers	3.5%	8	-	8	-	-
Ferns	-	-	-	-	-	-
Grasses	6.6%	15	-	8	7	-
Sedges/Rushes	7.0%	16	3	13	-	-
Herbs	30.8%	70	40	23	7	-
Shrubs	47.6%	108	-	108	-	-
Mallees	4.0%	9	-	9	-	-
Trees	0.4%	1	-	1	-	-
<b>TOTALS</b>	<b>100%</b>	<b>227</b>	<b>43</b>	<b>140</b>	<b>14</b>	<b>0</b>

The high number of perennial shrubs (Refer Table 7B) reflects the most commonly occurring plant communities present in the bush block, being heaths or shrublands.

### 5.2.2 Species Diversity of Vegetation Units

The number of species found in each 10m x 10m quadrat varied from a minimum of 9 species (all natives – Quadrat WYCH09) to a maximum of 39 species (all natives – Quadrat WYCH10). Table 7c summarises the species richness or species diversity recorded for each of the Quadrats. It also shows the number and type of structural layers.



In general, as the structure of the vegetation increased in complexity (ie as the number of layers increased), combined with a low % crown cover for each layer – the number of species at a recording site increased, often a reflection of competition for light, ie the greater the cover, the less light through to each of the structural layers. For example:

- WYCH15 recorded 9 species with only one defined structural layer (note shrub canopy had a crown cover of 30-70% – Refer Photo 15, page 75)
- WYCH20 recorded 38 species with 6 defined structural layers (note each of the layers had a crown cover of either 2-10% or 10-30% – Refer Photo 16, page 75).

An exception was WYCH10 which recorded 39 native species with only three defined structural layers. Note, the second layer had a crown cover of 30-70% (Refer Photo 21, page 78), thus possibly the competition for light was too great.

**TABLE 7C: Showing species diversity (decreasing order) for each WYCH quadrat**

Hutchy's Quadrat	No. of native species	No. of *weed species	No. of structural layers	Plant Community Structural Layers
WYCH10	39	-	3	Open Shrubland / Low Open Heath / Very Open Sedgeland
WYCH20	38	-	6	Low Open Woodland / Open Mallee/ Tall Shrubland / Low Open Heath / Very Open Tall Sedgeland
WYH08	31	*1	2	Shrubland / Low Open Heath
WYCH19	27	*5	4	Tall Open Shrubland / Open Heath / Low Open Shrubland / Very Open Grassland
WYCH17	24	*5	4	Open Tree Mallee / Open Shrubland / Low Open Shrubland / Open Herbland
WYCH13	23	*1	5	Very Open Mallee / Tall Open Shrubland / Shrubland / Low Open Shrubland / Very Open Grassland
WYCH14	21	*2	3	Mallee / Shrubland / Open Grassland
WYCH18	19	*4	4	Mallee / Tall Open Shrubland / Grassland / Herbland
WYCH09	18	*2	3	Closed Heath/ Low Open Shrubland / Very Open Tall Sedgeland
WYCH12	17	-	3	Open Mallee / Tall Open Shrubland / Open Heath
WYCH11	15	-	3	Tall Open Scrub / Open Shrubland / Low Open Shrubland
WYCH16	12	*1	2	Open Mallee / Open Shrubland
WYCH15	9	-	1	Tall Closed Scrub

### 5.2.3 Significant Flora – Species of Special Interest

The occurrence and distribution of species that have been collected throughout the State and incorporated into the collection of the Western Australian Herbarium is recorded on FloraBase (WA Herbarium 1998). Field experience combined with this information enables a picture of species to be developed.

The information provided here is current at the time of writing, however, as more survey work is carried out in Western Australia, the knowledge of species occurrences will continue to change. For example, results from the CALMSscience Biological Survey of the wheatbelt, will doubtless increase the number of recordings and locations of many flora.

### ***Declared Rare and Priority Flora***

Rare and Threatened species are protected under the *Wildlife Conservation Act 1950* and their management falls under the jurisdiction of the Department of Conservation and Land Management (CALM). Priority taxa are those which have are those which have uncertain conservation status. A 'Declared Rare Flora and Priority Flora List' is published each year by CALM (Atkins 2000). The various categories relating to threatened flora and their meanings are summarised in Table 8.

**TABLE 8: Definitions of Declared Rare Flora and Priority Flora** (after CALM 1997 and Atkins 2000)

#### **'Declared Rare Flora**

**'Declared Rare Flora — Extant Taxa (R):** Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been declared under section 23F of the *Wildlife Conservation Act 1950* to be "rare flora".

**'Declared Rare Flora — Presumed Extinct Taxa (X):** Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been declared under section 23F of the *Wildlife Conservation Act 1950* to be "rare flora".

**Priority Flora** are taxa that are under consideration for declaration as 'rare flora' but are in need of further survey or continued monitoring. The list recognises four categories of Priority Flora:

**'Priority One — Poorly Known Taxa (1):** Taxa which are known from one or a few (generally < 5) populations which are under threat, either due to small population size, or being on lands under immediate threat (e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc). May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as "rare flora", but are in urgent need of further survey.

**'Priority Two — Poorly Known Taxa (2):** Taxa which are known from one or a few (generally < 5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as "rare flora", but are in urgent need of further survey.

**'Priority Three — Poorly Known Taxa (3):** Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as "rare flora", but are in urgent need of further survey.

**'Priority Four — Rare Taxa (4):** Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.'

### **Priority Flora**

Two rare taxa (priority taxa, that is taxa in consideration for declaration as Declared Rare Flora) were located in "Hutchy's" bushland. Voucher material has been submitted to the Western Australian Herbarium.

#### **Cyperaceae**

##### *Schoenus griffinianus*

A priority two (P2) species, which is known mainly from the Eneabba area, but has also been recorded from Perth and Wongan Hills. This is a significant range extension for this species. This plant was recorded at Quadrats WYCH09 and WYCH10.

#### **Epacridaceae**

##### *Leucopogon sulcatus*

A priority three (P3) species. This species has been recorded from Merredin, Southern Cross, west to Bruce Rock and Corrigin, then south to Lake Grace and east to Hyden and Hatters Hill. Within the study area it was recorded in Quadrat WYCH20 and north of the gravel pit.

### *New species*

The survey recorded another locality for a new species, described in Flora of Australia:

#### **Juncaginaceae**

*Triglochin* sp. A Flora of Australia GJ Keighery 2477

A tufted upright to decumbent annual herb. 0.1cm-1cm tall. Flowers June to December, flower white, green.

### *Significant species co-occurrences*

At times some species are difficult to tell apart, as they appear quite similar. This may be because they are closely related or have evolved in a similar way. The co-occurrence of such species with no intermediates is good evidence that they are distinct species.

#### **Dasypogonaceae**

*Chamaexeros fimbriatus* and *Chamaexeros macranthera* were recorded from the bush block as an opportunistic collection and at Quadrat WYCH20, respectively. Although these species have overlapping ranges, they have not previously been recorded together.

#### **Mimosaceae and Myrtaceae**

There are high numbers of *Acacia* (16) and *Eucalyptus* (10) species recorded from the block.

### *Plants of general interest*

Often we overlook the importance and/or interest of species that are considered 'common' and/or species that do not fall into the category of Declared Rare Flora or Priority Flora. However, many of these have importance for a variety of reasons, not least their aesthetics or their contribution to 'sense of place'.

#### **Myrtaceae**

*Eucalyptus* species. Ten species of *Eucalyptus* occurred across the block, including nine mallees (Refer Appendix C, Photos 10-14, 16, 22 and 23).

The size and form of *Eucalyptus celastroides* ssp. *virella* (Mirret) was of interest. The wide spreading 'heavy-looking' mallees indicated that they are of considerable age, possibly due to lack of fire. Their form resembled mature York Gum (Refer Photo 9 – Page 72) and they formed the dominant plant community for a significant portion of the bushland (Refer to Map 7B).

Both the yellow and red flowering forms of *Eucalyptus erythronema* ssp. *marginata* (Red Flowered Mallee) occurred in the bush block, towards the eastern boundary.

#### **Proteaceae**

The columnar growth habit of *Dryandra conferta* and *Dryandra purdieana* provided an unusual appearance to the heaths and shrublands. (Refer Photo 18 – page 76).

As further survey work is done and new populations of plants are recorded the Declared Rare Flora and Priority Flora List are revised under the *Wildlife Conservation Act 1950*. The status of one species recorded in the study has altered recently.

#### **Cyperaceae**

*Schoenus calcatus*

Previously listed as a priority species (P3), but recently removed from the list. This unusual cushion forming sedge rarely flowers and changes colour as it becomes summer dormant. It grows on deep yellow sands in the central and southern Wheatbelt from Dallwallinu, south to Lake King and west to Beverley. *S. calcatus* (Refer Photo 24 – Page 79) was recorded in Quadrat WYCH10, near WYCH13 as well as in the Very Open Mallee plant community to the north-west of the study area.

### 5.3 COMPARISON OF BOTH STUDY AREAS

Interesting features of the flora of both study areas include:

- 110 species from 33 families were recorded for the 30ha Elashgin-Faulkner Road Bushland, whilst 224 species from 55 families were recorded for 40 hectare Hutchy's Block.
- The species richness was very similar with Elashgin-Faulkner Road Bushland recording 36 species per 10x10m quadrat whilst Hutchy's recorded 39 for the same area (Refer Tables 6C and 7C).
- Elashgin-Faulkner Road Bushland had a higher proportion of weed species to Hutchy's Block, 22% and 6% respectively. This may be explained by Elashgin-Faulkner Road Bushland having the combination of:
  - a higher perimeter to area ratio
  - proximity to more tracks
  - the Elashgin Creek Wetland system being a vector for distributing more weeds
  - the plant communities being more open, and thus more available to penetration by weed seeds, and
  - the plant communities being of a slightly lower condition rating, thus demonstrating the importance of healthy bush in withstanding weed invasion (Refer to Section 3).
- The number of species from the Asteraceae (Daisies) family was almost identical for both areas with 19 native species and 5 or 6 weed species (Refer Tables 6A and 7A).
- Shrubland species differed between the study areas. Proteaceae, Mimosaceae (Wattle) and Myrtaceae (Myrtle) families contributed two, one and five species respectively to the recorded flora of the Elashgin-Faulkner Road Bushland in contrast to 20, 16 and 20 species respectively for Hutchy's Block – reflecting the greater occurrence of heath and shrubland plant communities at Hutchy's Block.
- The Tamma (*Allocasuarina campestris* ssp. *campestris*) and Black Tamma (*Allocasuarina acutivalvis*) were dominant species in the Hutchy's block and were not recorded in Elashgin-Faulkner Road Bushland, whilst the Samphires (*Halosarcia* species) had the opposite occurrence.

## 6. DISCUSSION

### 6.1 NATURE CONSERVATION VALUES<sup>13</sup>

The values of the study areas can be explored through a series of factors that contribute to the conservation values of bushland areas, which clearly illustrate that both of the "bush blocks" are highly significant natural heritage areas of outstanding nature conservation value.

#### *Habitat or plant communities typical and representative of the region*

A principal aim of conservation is to keep, in each local area and region, representations of the communities and species typical of, and associated with, the local area regardless of their rarity at a regional level. It is this typical bushland that contributes to each place's 'sense of locality' (Keighery and Gray 1993).

Elashgin-Faulkner Road Bushland and Hutchy's Block have significant value as they contain communities typical of the area and region, including the Mt Caroline Vegetation System and vegetation associated with the Sandplain, Hillside and Valley Floor Soil Landscape Units. They also contain populations of many plants that represent a significant number of the known individuals of the taxon in the region and/or populations of a mixture of different-aged individuals — mature adults to seedlings.

Amplifying this is the paucity of such flora and plant communities in the conservation reserve system.

#### *Remnant size, shape and location* (including extracts from Government of WA 1998)

The natural processes occurring in ecosystems are complex and poorly understood though it is generally accepted that large consolidated areas are best options for viable conservation of natural ecosystems and populations. Thus the larger the remnant, the lower the perimeter to area ratio, the less the disturbance, the more connectivity with other bushland — then the greater the conservation value of the remnant.

Within the Avon Wheatbelt there are few large areas available for conservation with many of the existing Reserves being relatively small in size and isolated from other natural bushland areas. Issues of particular concern in fragmented ecosystems are:

- the requirement of vertebrates (such as some bird and mammal species) and many invertebrates of a large area for their home range and hence their survival
- the movement of animals being essential to maintaining genetic diversity in plant communities by moving pollen from one remnant to another
- the populations of plants and animals being effectively isolated from other populations, leaving populations susceptible to local extinction
- the loss of genetic diversity through inbreeding.

**Size of remnants** — The "bush blocks" of 30 hectares (Elashgin-Faulkner Road Bushland) and 40 hectares (Hutchy's) are now large remnants within the Shire of Wyalkatchem, where less than 15% of the remaining bushland is within areas greater than or equal to 20ha. The Elashgin-Faulkner Road Bushland is larger in size than six of the 13 nature reserves in the Shire (which range from 8.1ha to 22.7ha), whilst Hutchy's Block is larger than seven of these nature reserves.

**Perimeter to area ratio** — Overall the "bush blocks" have compact shapes and only limited internal tracks. Compact shapes have lower area to edge ratios making them less prone to degrading edge effects such as fertiliser drift, increased water run-off (often nutrient enriched), exposure to wind and weed invasion. The results of the Hutchy's flora survey (Refer Section 5.2) highlighted the lack of weeds recorded in this block and the ability of native vegetation in good vigour to resist invasion by weeds.

The perimeter to area ratio of both study areas is magnified as they are not isolated bush blocks — but adjoin significant bushland areas greater than their size:

<sup>13</sup> These are based on a framework used in the Wildflower Society of WA's (WSWA) *Bushland Plant Survey Reports* contributed to by Ann Gunness (WSWA), Bronwen Keighery (WSWA & Department of Environmental Protection), Greg Keighery (WSWA & Department of Conservation & Land Management (CALM)) and Neil Gibson (WSWA & CALM) some of which are linked back to the MOU framework (Government of WA 1997).

- Elashgin-Faulkner Road Bushland is an integral part of the Elashgin Creek wetland chain that crosses the valley floor for about 35kms (north south) and 1-4kms (east west). This wetland chain has a mix of freshwater flow-lines and salt, brackish and freshwater lakes.
- “Hutchy’s” adjoins a larger block of remnant bushland to the east. Together they total 144ha and form one of the largest blocks of remnant bushland in the Wyalkatchem and Trayning Shires – and one of the largest areas of privately owned bushland. Known as Patch K64 they have been part of the CSIRO bird population research since 1993 (Brooker and Brooker 1997 – Refer Photo 2B – page 4).

**Linkage** The more connected a remnant is to other bushland the more probable that fauna will be able to move between the blocks and or use them for feeding, nesting, breeding and or resting sites and the more probable that genetic diversity and vigour of the plants can be maintained. The continued maintenance of these connections is an integral part of maintaining the biodiversity and habitat values of the bushland and the fauna which depend on it.

As noted above under remnant size, both Elashgin-Faulkner Road Bushland and “Hutchy’s Block” have significant and important linkages to adjoining bushland (Refer also to Maps 6A and 7A). In addition, “Hutchy’s Block” has other good corridor linkages to remnant blocks to the south and north as well as linkages to other paddock edge corridors.

### ***Diversity of plant communities and flora***

Five plant communities were mapped and 86 native plants were recorded for Faulkner Road, whilst 12 plant communities and 213 native plants were recorded for Hutchy’s Block – demonstrating that both areas support a diverse assemblage of plant communities and native plants.

It is anticipated that if the areas had been surveyed over a longer period of time, the number of species recorded would have increased in particular with the addition of annuals. Added to this, the 2000 winter and spring were drier than usual, resulting in an overall reduction in the number of annual species sighted and/or recorded across the wheatbelt.

### ***Plant communities not well conserved elsewhere***

The Shire of Wyalkatchem has a number of small reserves with the primary purpose for conservation of natural values, flora and fauna, with most of these vested in the Conservation Commission and managed by the Department of Conservation and Land Management.

Due to the lack of survey information for the surrounding remnants it is not possible to determine how unique the plant communities recorded for the study area are.

### ***Presence of rare, threatened or significant species***

The presence of rare, threatened and significant species contribute to the heightened conservation value of the bushland in which they occur.

Elashgin-Faulkner Road Bushland recorded one previously undescribed species (*Frankenia* species WSWA WYCR01/05) and two species at the edge of their known geographical range (*Templetonia smithiana* (Centipede Bush) and *Cyphanthera microphylla*).

Hutchy’s Block recorded two Priority Flora (*Schoenus griffinianus* [P2] and *Leucopogon sulcatus* [P3]), two species as interesting co-occurrences (*Chamaexeros fimbriatus* and *C. macranthera*), another locality for a new species (*Triglochin* sp. A Flora of Australia GJ Keighery2477) and one species recently removed from the Priority Flora list (*Schoenus calcatus*).

### ***Presence of threatened ecological communities*** (including extracts from Government of WA 1998)

In addition to Rare and Priority Flora, considerable work by CALM’s WA Threatened Species and Communities Unit (WATSCU), with financial assistance from Environment Australia has been done on the identification of ‘threatened ecological communities’ (English and Blyth 1997). Ecological communities are defined as ‘naturally occurring biological assemblages that occur in a particular type of habitat’. Information on the geographic extent of each ecological community and the threatening



processes that may be operating on the community is used to determine if an ecological community is 'threatened'.

Threatened ecological communities are those that have been assessed and assigned to one of four categories related to the status of the threat to the community:

- Presumed Totally Destroyed
- Critically Endangered
- Endangered
- Vulnerable.

Two further categories are also distinguished:

- Data Deficient – usually communities with poorly known distributions that are suspected of belonging to one of the threatened categories
- Lower Risk – describes communities that are well enough known and surveyed and not considered to be under threat.

At this stage there is insufficient regional information on the Wheatbelt to generally recognise threatened ecological communities in this bush block. Communities that may be of significance are the York Gum Woodlands (Hopkins *et al* 1996). The completion of the detailed regional floristic survey of the Wheatbelt being conducted by the Department of Conservation and Land Management as part of the Salinity Action Plan (Refer Section 2.4.2) will allow for the definition of the threatened ecological communities in the region.

### ***Condition of the plant communities***

The better the condition of natural plant communities, the higher their value conservation value as well as the more able they are to withstand invasion by weeds.

The condition of the plant communities in Elashgin-Creek Road Bushland ranged from good to excellent, whilst the condition in Hutchy's Block was excellent or pristine. The presence of weeds was very low in Hutchy's (6%) with six (46%) of the 13 quadrats recording no weeds (Refer Table 7c). The presence of weeds in Elashgin-Faulkner Road Bushland was moderate (22%).

Comparison to other recent wheatbelt surveys (Wildflower Society of WA's *Bushland Plant Survey Program*) of remnant vegetation in Wyalkatchem, East Yornaning, Woodanilling, Konnongorring, Wickpin and Quairading show recorded weed levels of 10-15%. These figures highlight the excellent weed reduced status of Hutchy's. Exposure to the movement of weed seed by water, along the Elashgin Creek wetland chain into Elashgin-Faulkner Road Bushland could contribute the higher weed presence in this survey area. Canopy density may also have contributed, as Hutchy's consistently recorded a much higher level than in Elashgin-Faulkner Road Bushland – in effect reducing opportunities for airborne seed to reach exposed ground.

### ***Other special attributes***

**Sense of Place, Western Australian Wheatbelt** – There has been an increasing awareness, understanding and promotion of the notion of 'sense of place' or 'sense of locality' and how it contributes to both personal and community/social wellbeing. The mallee, heaths, shrublands, woodlands, breakaways and lakes are all recognised natural elements of Western Australia's sense of place. The Wyalkatchem Shire was assessed as having retained only 12% of its original native vegetation (Refer Table 2). This figure highlights the significant contribution these remaining bushland areas make to the Shire's and the region's 'sense of Western Australian Wheatbelt'.

**Habitat** – Another layer to be added to this is the habitat value, both for resident fauna as well as other animals such as birds which may use the site for feeding, whilst breeding in other bush blocks. Fauna which are observed in the bush blocks included:

- birds (foraging, resting and nesting – September '00 and November '01)
- kangaroos (foraging and resting – September '00 and November '01)
- lizards and skinks (foraging, resting and burrowing – September '00 and November '01)

- ants, spiders, insects (general activity of foraging, nest building and resting – September '00 and November '01)

The fauna also contribute to 'sense of place'.

### *Role in sustainable land management*

In addition to their intrinsic value as natural areas, it is now widely recognised (Government of WA 2000b) that these remnants play a vital role in contributing to sustainable agriculture and to managing salinity by managing the water-table. The value of good quality remnant vegetation such as the study area in keeping water-tables at acceptable levels to maintain agriculture, infrastructure and to maintain other nearby remnants should not be underestimated. Remnant vegetation utilises water in and out of season, is already established, and capable of using maximum water volumes now and in the future. Native plants have the ability to change and adapt their water use depending on water availability (Southwell 1995). Hussey 1995, Wallace 1995, Southwell 1995 and Brown and Holt 2000 provide some greater discussion of this issue as well as some practical ideas for managing bushland both for nature conservation aims and for enhancing agricultural production.

## **6.2 CONCLUDING COMMENTS**

The remaining native vegetation in the Shire of Wyalkatchem and the Avon catchment is minimal, fragmented and vulnerable. From natural capital and conservation value perspectives both Elashgin-Faulkner Road Bushland and Hutchy's Block are very significant and unique areas of remnant bushland. They are important areas of high conservation value at various scales including – the Shire Wyalkatchem, the Mortlock River East Sub-catchment, the Avon Catchment and the Western Australia wheatbelt. As discussed above, aspects that contribute to this significance include:

- size of the remnants (30ha and 40ha) – providing significant contribution to the extremely low level (only 12 %) of remnant vegetation remaining in the Wyalkatchem Shire, with only 15% of the remnants being more than 20ha in size (Weaving 1999)
- compact shape of the remnants – thus less prone to degrading edge effects
- connections of the remnants – particularly adjoining other significant remnants
  - the position of Hutchy's as part of a very large (144ha) privately owned block of remnant vegetation within the Wyalkatchem and Trayning Shires significantly increases the importance of this bushland, as it improves the likelihood of sustaining the natural systems of the remnant
  - the role of Elashgin-Faulkner Road Bushland in the Elashgin Creek wetland chain
  - the corridors of vegetation which help link the survey area to nearby as well as trackside vegetation also contribute to the importance of this remnant.
- health/condition of the remnant – generally excellent to pristine, with almost half of the Hutchy's quadrats recording nil weed species
- variety of plant communities – with five mapped for Elashgin-Faulkner Road Bushland (Woodlands and Shrublands) and twelve mapped for Hutchy's Block (Tree Mallee, Shrub Mallees, Shrublands and Grassland/Herbland)
- contribution the remnant can make to lessening the threats of 'salinity' – to this remnant, surrounding remnants, properties and infrastructure
- natural values of the bush – the use and enjoyment by the land manager, wildflower/fauna/landscape enthusiasts, tourists and researchers
- total flora recorded – with 86 native plant taxa (Elashgin-Faulkner Road Bushland) and 213 native plant taxa (Hutchy's Block)
- species diversity/richness per 10m x 10m area – it is anticipated the recording of 36 native plant taxa (Elashgin-Faulkner Road Bushland) and 39 native plant taxa (Hutchy's Block) would be increased in more favourable (wetter) years
- sense of place – with flora, plant communities, fauna and landscape typical of the Western Australian Wheatbelt.

It is now well understood, accepted and promoted that the retention of existing remnant vegetation is of vital importance in supporting private and public efforts to control land degradation and biodiversity loss.

All remaining remnants are valuable resources for the maintenance of biodiversity and command a high priority for conservation. Added to our better understanding of the role remnants play in our wheatbelt environment are the findings of the Native Vegetation Working Group (Government of WA 2000a) which included:

"The true value of standing vegetation is generally far more than the market or financial values of the land, and in WA the definable costs of clearing so outweigh the benefits, that more detailed analysis is unnecessary".

In concert with this, Western Australia is now accepting of the salinity problem and supportive of the State Salinity Strategy – implementation of which should result in the retention of all remnant vegetation in the Western Australian wheatbelt, for reasons including, but not limited to biodiversity.

### ***Final reflections & recommendation***

Both the Elashgin-Faulkner Road Bushland and Hutchy's Block are wonderful remnants in our eastern wheatbelt, whose plant communities, flora, fauna and landscapes have been enjoyed by many, in particular the land owners Deb and Gary Davies, the Elashgin Creek Catchment Group and the CSIRO bird survey groups. Added to this, the Davies family has been active in fencing 'Hutchy's Block' with assistance from the State Government *Remnant Vegetation Protection Scheme* in joining the *Land for Wildlife* program and in welcoming the Wildflower Society and associated volunteers in an attempt to getting to know the areas even more.

The connectivity of both remnants, in that they are not isolated, but part of larger natural bushland areas and landscapes adds significantly to their uniqueness and natural ecosystem value.

Because of the nature conservation values of the Elashgin-Faulkner Road Bushland, combined with its role in the Elashgin Creek wetland chain, it is recommended that this Unallocated Crown Land (UCL) be added to the conservation estate. This can be achieved through vesting with the Conservation Commission for the purpose of flora, fauna and landscape protection. It is further recommended that any other areas of UCL in the Elashgin Creek wetland chain also be added to the conservation estate.

In reflecting on this project, one of the highlights has been working with the land managers and other volunteers within the key guiding values of the *Bushland Plant Survey Process* of:

- **understanding plants in the bushland** (ie working with the living plants where they grow)
- **learning through involvement** (such as field survey, plant identifications and peoples generosity in sharing) and
- **bushland conservation** (with the intent of understanding and managing the bush block for nature conservation).

We thank the land managers Deb and Gary Davies for including "Hutchy's" and the Elashgin-Faulkner Road Bushland in the *Bushland Plant Survey Project* and wish you well as you continue to manage your bushland with nature conservation as the primary objective.

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- valuable contribution to this flora and vegetation survey
- infectious enjoyment and enthusiasm whilst being amongst bushland plants (both flourishing in Wyalkatchem and dried between sheets of newspaper in the Herbarium)
- company and willingness to share their time and their knowledge.

### Assistance with information

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- Anthony Langdon (Department of Environmental Protection)
- Ben Carr (Department of Environmental Protection)
- Brendon Ward (Department of Environmental Protection)
- Damien Shepherd (Department of Agriculture – South Perth)
- Deb Davies (Property Owner – Wyalkatchem)
- Greg Beeston (Department of Agriculture – South Perth)
- Heather Adamson (Land for Wildlife – CALM Merredin)
- Karen Clarke (Coordinator, Wildflower Society – Bushland Plant Survey Project)
- Lindsay Bourke (Department of Environmental Protection)
- Lyn Tyler (Friends of Wyalkatchem Reserves – Wyalkatchem)
- Nicole O'Sullivan (Community Landcare Coordinator – Wyalkatchem)
- Rod Safstrom (Environs Consulting)

### Application Assessment Site Visit (5/00)

- Brian Moyle (Perth – Bushland Plant Survey Project Management Committee)
- Deb Davies (Property Owner – Wyalkatchem)
- Gary Davies (Property Owner – Wyalkatchem)
- Karen Clarke (Wildflower Society – Bushland Plant Survey Project Coordinator)
- Nicole O'Sullivan (Community Landcare Coordinator – Wyalkatchem)

### Pre-Survey Visit (4/9/00)

- Brian Moyle (Perth – Attadale)
- Deb Davies (Property Owner – Wyalkatchem)
- Lyn Tyler (Friends of Wyalkatchem Reserves – Wyalkatchem)

### Field Survey (15/9/00 – 17/9/00)

- Amy Day (Year 10 Student – Wyalkatchem)
- Barb Garner (Wyalkatchem)
- Brian Moyle (Perth – Attadale)
- Bridget Hyder-Griffiths (Perth – Wilson)
- Buddy Kent (Bodallin)
- Damian Staude (Perth – Kensington)
- Deb Davies (Wyalkatchem – Property Owner)
- Diane Matthews (Perth – Shelley)
- Dianne Whincop (Perth – Bedfordale)
- Diedre Lebbon (Perth – Subiaco)
- Elizabeth George (Perth – Alexander Heights)
- Gary Davies (Wyalkatchem – Property Owner)
- Gary Matthews (Perth – Shelley)
- Grecian Sandwell (Perth – Shelley)
- Heather Adamson (CALM Land for Wildlife – Merredin)
- Heinz Boden (Wyalkatchem)
- Helen Godfrey (Wyalkatchem)
- Jeff Faulkner (Perth – Wembley)
- Jennifer Hawkes (Perth – Carine)
- Jenny Crisp (Perth)
- Judy McArthur (Perth)
- Kate Brown (Perth – Shenton Park)
- Kim McGrath (Wyalkatchem)

<ul style="list-style-type: none"> <li>• Kris Brooks (Perth – Mosman Park)</li> <li>• Kristin McKeig (Year 10 Student – Wyalkatchem)</li> <li>• Laura Davies (Year 10 Student – Perth – Landcare Exchange Program)</li> <li>• Lyn Tyler (Wyalkatchem)</li> <li>• Margaret Collins (Perth – Melville)</li> <li>• Margaret Phillips (Perth)</li> <li>• Mary Bremner (Perth – Wembley)</li> <li>• Nora Crisp (Perth – Mount Pleasant)</li> <li>• Noreen Boden (Wyalkatchem)</li> <li>• Phill Hyder-Griffiths (Perth – Wilson)</li> <li>• Rita Brookes (Wyalkatchem)</li> <li>• Sandra Santich (Perth – Wilagee)</li> <li>• Robert Bucholz (Year 10 Student – Wyalkatchem)</li> <li>• Rosie Jasper (Perth – Bull Creek)</li> <li>• Rosemary Graham (Perth – Mahogany Creek)</li> <li>• Suzie Lintern (Perth)</li> <li>• Tom Phillips (Year 10 Student – Perth – Landcare Exchange Program)</li> <li>• Zach Davies (Year 7 Student &amp; family member of Survey Hosts – Wyalkatchem)</li> </ul>
<p>Initial specimen sorting and plant identification - WA Herbarium (11/10/00)</p> <ul style="list-style-type: none"> <li>• Andrew Thomson (Perth – Waterford)</li> <li>• Ann Gunness (Perth – Karnup)</li> <li>• Damian Staude (Perth – Kensington)</li> <li>• Diane Matthews (Perth – Shelley)</li> <li>• Dianne Whincop (Perth – Bedfordale)</li> <li>• Elizabeth George (Perth – Alexander Heights)</li> <li>• Gary Matthews (Perth – Shelley)</li> <li>• Gerald Krygsman (Perth – High Wycombe)</li> <li>• Grecian Sandwell (Perth – Shelley)</li> <li>• Margaret Phillips (Perth)</li> <li>• Patricia Wenham (Perth)</li> <li>• Sandra Santich (Perth – Willagee)</li> <li>• Sylvia Garlick (Perth – Sawyers Valley)</li> </ul>
<p>Plant Identification, including specialist plant groups (11/10/00 – 31/1/02)</p> <ul style="list-style-type: none"> <li>• Alice Stubber - general</li> <li>• Andrew Brown (CALMSscience) – Orchids</li> <li>• Andrew Thomson – weeds</li> <li>• Ann Gunness – general</li> <li>• Barbara Rye (WA Herbarium) – <i>Euryomyrtus</i></li> <li>• Brian Moyle – <i>Eucalyptus</i> + general</li> <li>• Damian Staude – general</li> <li>• Dorothy Perret – general</li> <li>• Elizabeth George – <i>Verticordia</i> + general</li> <li>• Gerald Krygsman – general</li> <li>• Malcolm Trudgen – <i>Baeckea</i> + <i>Micromyrtus</i> + <i>Rinzia</i> + <i>Thryptomene</i></li> <li>• Mike Hislop (WA Herbarium) – Epacridaceae + <i>Melaleuca</i> + general</li> <li>• Neil Gibson – <i>Eucalyptus</i> + general</li> <li>• Patricia Wenham – general</li> <li>• Paul Wilson (WA Herbarium) – Chenopodiaceae</li> <li>• Rob Davies – general</li> <li>• Stan Webster – <i>Acacia</i></li> <li>• Sylvia Garlick – general</li> </ul>
<p>Transcribing data, updating Survey Sheets and Collecting Tags (11/10/01 – 13/3/02)</p> <ul style="list-style-type: none"> <li>• Alice Stubber (Perth – Wanneroo)</li> <li>• Andrew Thomson (Perth – Waterford)</li> <li>• Anne Bellman (Perth – Cooeloongup)</li> </ul>
<p>Preparing Field Herbarium (1/7/01 – 9/3/02)</p> <ul style="list-style-type: none"> <li>• Colin Kennedy (Perth – Claremont)</li> <li>• Grecian Sandwell (Perth – Shelley)</li> <li>• Norah Sandwell (Perth – Shelley)</li> </ul>

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- Mike Hislop – Reference Herbarium and general project support
- Phil Spencer – specimen management and general support

Review of Draft Report – Wildflower Society – Bushland Plant Survey Management Committee

- Ann Gunness
- Brian Moyle
- Bronwen Keighery
- Mary Gray



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## APPENDICES

### APPENDIX A: TERMINOLOGY OF BUSHLAND PLANT SURVEY

Bushland Plant Survey involves a range of old and new concepts, methods and language. Although the words are shared, there may be different understandings of what they mean. A common understanding reduces ambiguity and assists with communication. This table defines some of the terms used both in the *Bushland Plant Survey Process*, this report and bushland management in general.

<b>biodiversity or biological diversity</b>	The variety of all life forms – the different plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part. It is not static, but constantly changing – it is increased by genetic change and evolutionary processes and reduced by processes such as habitat degradation, population decline and extinction. The concept emphasises the interrelatedness of the biological world. <sup>1</sup>
<b>climber / creeper / scrambler</b>	Plants often in need of other plants or objects to be supported. Woody and non-woody.
<b>condition</b> (of vegetation)	Rating given to bushland to categorise disturbance related to human and associated activities. The rating refers to the degree of change in the structure, density and species present in the bushland, in relation to undisturbed bushland of the same type. It gauges the impact of disturbance on each of the vegetation layers and consequently on the ability of the natural plant community to regenerate. <sup>4</sup>
<b>dicotyledon / dicot</b>	Woody or non-woody flowering plant with 2 seed leaves (cotyledons), leaf veins in a network (reticulate), flower parts mainly in 4s or 5s, and a single main root (tap root) with lesser side branches (eg eucalypts, grevilleas, pea flowers, sundews, trigger plants). <sup>4</sup>
<b>ecosystem</b>	A dynamic complex of plant, animal, fungal and micro-organism communities and the associated non-living environment interacting as an ecological unit. <sup>1</sup>
<b>Family</b> (in plant classification)	The level where all similar genera are grouped together. . The beginning of the name is often taken from one of the Genera and the ending '-aceae' indicates a family name when discussing plants (eg Droseraceae, Goodeniaceae, Santalaceae). <sup>5</sup>
<b>grasses</b>	Non-woody plants that have inconspicuous individual flowers that are pollinated by wind (and are all in the plant family POACEAE). <sup>4</sup> These can be further described by their growth form [eg tussock grasses or bunch grasses] or by their height [eg tall or low grasses].
<b>growth form</b>	How a plant grows - its shape and ability to lay down woody tissue (eg tree, mallee, shrub, grass, sedge, rush, grass, herb, creeper) <sup>4</sup>
<b>habitat</b>	The place or type of site in which an organism naturally occurs. <sup>1</sup>
<b>herb/s</b>	Non-woody plants with stems, generally under 0.5m tall, that are not grasses, sedges or rushes. <sup>4</sup>
<b>life form</b>	For this report, it refers to whether the plant has an annual, bi-annual or perennial life span.
<b>lignotuber</b>	Swollen wood tissue (mallee-root), at or just under the ground from which stems arise. Serves as food reserve and is capable of putting forth new stems at intervals, eg after bushfires, and repeating this performance seemingly indefinitely, in some case for over a century. <sup>2</sup>
<b>mallee/s</b>	Plants with many trunks arising from a lignotuber (eg <i>Eucalyptus leptopoda</i> , <i>Eucalyptus subangusta</i> ssp. <i>subangusta</i> ). <sup>4</sup> For the purpose of vegetation classification, mallees are divided into categories based on their height and stem no. Mallee [>8m, with <5 trunks] or Shrub Mallee [<8m, with >5 trunks]
<b>monocotyledon / monocot</b>	Non-woody flowering plant with 1 seed leaf (cotyledon), leaf veins parallel, flower parts in 3s, and a fibrous root system where all roots are of equal importance (eg. grasses, sedges, orchids, lilies). <sup>4</sup>
<b>perennial</b>	Refer to life form
<b>plant names</b> ( <i>Genus species</i> )	The binomial or 'two word' nomenclature was developed by Linnaeus. The first word is the 'Genus' name, meaning Latin for 'kind'. The second name is the 'descriptive' or 'trivial' name and indicates which particular species it is. Both words are Latin or Latinized Greek or Latin forms of other words. (Note: Genus

	is spelt with a capital letter, the species, usually an adjective is spelt with a small letter. Scientific names are either presented in <i>italics</i> or <u>underlined</u> . <sup>5</sup>
<b>Plant Community or Vegetation Type/Unit/Association</b>	<p>Pattern in the way plants grow together. The particular assemblage of plants in each community is determined by the plant species, soil, water, light and temperature. Different plant communities may form wherever one of these factors alters. These factors are continuous variables, so the assemblage of plants in the community also changes in this way.</p> <p>In an attempt to understand the diversity of plant communities and to be able to compare one with another, botanists have developed many ways of describing plant communities. A simplistic order is imposed on the continually changing communities that describes an 'average' assemblage of plants from a community.<sup>4</sup></p>
<b>plant taxon (plural = taxa)</b>	<p>The named classification unit to which individuals or sets of species are assigned following logical taxonomic sorting (or systematics) such as kingdom, phyla, class, order, family, genus and species (also for some plants, sub-species, varieties &amp;/or affinities).<sup>1</sup> The scientific names given to plant species.</p> <p>For example, for the 'Jam Wattle':</p> <p>Kingdom = Plant  Phylum = Tracheophyta (vascular plants)  Class = Angiospermae (flowering plants)  Sub-class = Magnoliopsida (Dicotyledon)  Family = Mimosaceae  Genus = <i>Acacia</i>  Species = <i>acuminata</i>  ..thus Plant Taxon = <i>Acacia acuminata</i></p>
<b>rushes</b>	Refer sedge/s + rush/es
<b>scramblers</b>	Refer climber
<b>sedge/s + rush/es</b>	<p>Non-woody, tufted or spreading plants. Most have inconspicuous flowers that are pollinated by wind.</p> <p><u>Sedges</u> come from the plant family CYPERACEAE</p> <p><u>Rushes</u> come from the plant families ECDEIOCOLEACEAE, JUNCACEAE, RESTIONACEAE, TYPHACEAE and XYRIDACEAE</p>
<b>shrub/s</b>	Woody plants with one or many woody stems, foliage all or part of the total height of the plant. <sup>4</sup> For the purpose of vegetation classification, shrubs are divided in to categories based on their height Tall [>2m], Medium [1-2m] and Low [<1m].
<b>species (in plant classification)</b>	A group of plants capable of interbreeding freely with each other to produce vigorous, fertile seed. In classification terms, indicates a 'unit of sameness'. (Refer also to plant names and taxon)
<b>species richness</b>	The number of species in a given area (eg Quadrat WYHO09 recorded 59 species, and is richer than WYHO12 which recorded 27 species).
<b>taxon (plural = taxa)</b>	Refer to plant taxon
<b>tree/s</b>	<p>Woody plants with a trunk and canopy, the canopy is less than or equal to 2/3 of the height of the trunk, no lignotuber apparent.<sup>4</sup></p> <p>For the purpose of vegetation classification, trees are divided into categories based on their height Tall [&gt;30m], Medium [10-30m] and Low [&lt;10m].</p>
<b>Vegetation Unit/Type</b>	Refer to Plant Community
<b>weed/s</b>	Plants which are not native to bushland and/or commonly invade areas of natural vegetation following disturbance such as flooding, grazing, fire and soil disturbance. They can be exotic species or non-local native species. Undisturbed vegetation will resist weed establishment in the understorey. <sup>4</sup>

<sup>1</sup> Commonwealth of Australia (1996); <sup>2</sup> Gardner CA (1979); <sup>3</sup> Government of WA (1998); <sup>4</sup> Keighery BJ (1994); <sup>5</sup> Morgan *et al* (1973)

**APPENDIX B: EXAMPLE OF APPLYING THE 'VEGETATION STRUCTURAL CLASSIFICATION MODEL' (Refer Table 4 – page 23)**

As a quick demonstration of how the classification is applied, the following Table shows the information or data collected in the field (using the *Bushland Plant Survey Sheets*) and the resultant vegetation unit or plant community description later determined in the office, using the Vegetation Structural Classification Model (Refer Table 4 – page 23).

In applying this model even if there are species within a life form or height class (eg Shrubs 1-2m), if the Canopy Cover is not more than or equal to 2%, it is considered not of sufficient density to form a distinct vegetation structural layer. The plants are still important and can be recorded in the vegetation description as 'occasionals' or, where appropriate, 'emergents'.

FIELD SURVEY INFORMATION COLLECTED			VEGETATION DESCRIPTION (using Keighery BJ 1994)
Life Form/ Height Class	Dominant Plant Species	Canopy Cover	
Trees >30m	<i>Eucalyptus salmonophloia</i>	31-70%	<i>Eucalyptus salmonophloia</i> <b>Tall Open Forest</b> , over <i>Eriochilus dilatatus</i> and <i>Lawrencella rosea</i> <b>Very Open Herbland</b>
Shrubs 1-2m	<i>Melaleuca acuminata</i> + <i>Daviesia nematophylla</i>	<2	
Herbs	<i>Eriochilus dilatatus</i> + <i>Lawrencella rosea</i>	2-10%	
Trees >30m	<i>Eucalyptus salmonophloia</i>	<2%	<i>Olearia muelleri</i> and <i>Rhagodia preissii</i> <b>Low Shrubland</b> , with <b>Occasional Emergent Trees</b> of <i>Eucalyptus salmonophloia</i> over <i>Eriochilus dilatatus</i> and <i>Lawrencella rosea</i> <b>Very Open Herbland</b>
Shrubs <2m	<i>Olearia muelleri</i> + <i>Rhagodia preissii</i>	11-30%	
Herbs	<i>Eriochilus dilatatus</i> + <i>Lawrencella rosea</i>	2-10%	
Shrubs >2m	<i>Acacia stereophylla</i> + <i>Allocasuarina acutivalvis</i>	2-10%	<i>Acacia stereophylla</i> and <i>Allocasuarina acutivalvis</i> <b>Tall Open Shrubland</b> over <i>Baeckea crispiflora</i> , <i>Calothamnus gilesii</i> and <i>Thryptomene kochii</i> <b>Open Heath</b> over <i>Neurachne alopecuroidea</i> <b>Very Open Grassland</b>
Shrubs 1-2m	<i>Baeckea crispiflora</i> + <i>Calothamnus gilesii</i> + <i>Thryptomene kochii</i>	31-70%	
Grasses	<i>Neurachne alopecuroidea</i>	2-10%	



**APPENDIX C1: PHOTOGRAPHS OF THE WILDFLOWER SOCIETY OF WESTERN AUSTRALIA BUSHLAND PLANTS SURVEY OF THE "ELASHGIN-FAULKNER ROAD", WYALKATCHEM**

ERRATUM C1 – Unfortunately photos 3, 4, 5, 7, & 8 are mirror-images of reality. Take care when using in the field to relocate quadrats.



**Photo 3: *Eucalyptus salubris* [Gimlet] Open Woodland [OW]** which occurred on the upper ridge towards the southern end of the study area on coarse sandy-clay sands over a grey clay with many fine granite and quartz particles scattered on the surface.

– **Quadrat WYCR05** recorded 21 native species and 8 weed species (Photo: B. Moyle 9/00)



**PHOTO 4: *Eucalyptus loxophleba* ssp. *loxophleba* (York Gum) Woodland to Open Woodland [W-OW]** occurred on the dune ridge, just above the lake edge, on coarse sandy-clays over a grey clay with many fine granite and quartz particles scattered on the surface.

– **Quadrat WYCR03** recorded 19 native species and 5 weed species (Photo: B. Moyle 9/00)



**PHOTO 5:** *Eucalyptus loxophleba* ssp. *loxophleba* [York Gum] Woodland to Open Woodland [**W-OW**] which occurred on the dune upslope from the lake edge.  
– Quadrat WYCR02 recorded 31 native species and 5 weed species (Photo: B. Moyle 9/00)



**PHOTO 6:** *Melaleuca* species Tall Shrubland to Tall Closed Scrub [**TSh-TCSc**] occurred on the pale grey sands in the north-west corner of the study area where a flow-line moves into the lake. In places, *Melaleuca uncinata* (Broom Bush) formed dense stands up to 4m tall.  
(Photo: C. Keating 11/01)



**PHOTO 7:** *Acacia nyssophylla* and *Templetonia smithiana* [Centipede Bush] Tall Open Shrubland [**TOSH**] which occurred on the eastern boundary of the study area on pale-brown clayey sands to depth. Bare open ground was a feature of this unit that shared many shrub species with the adjoining York Gum Woodland (Unit W-OW).  
– Quadrat **WYCR04** recorded 21 native species and 6 weed species (Photo: B. Moyle 9/00)



**PHOTO 8:** *Halosarcia doleiformis* [Samphire], *H. aff. pergranulata* [Blackweed Samphire] and *H. undulata* [Samphire] Low Open Heath to Low Closed Heath [**LOH-LCH**] occurred on the lake edge. The low growth habit, succulent form and foliage cover of the dominants gave this unit its unique appearance. Scattered through the unit were stags of dead *Melaleuca* bushes that could be an indication of an increase in the salt level and thus the death of freshwater *Melaleucas* and the establishment of salt tolerant *Halosarcia* and *Frankenia* species.  
– Quadrat **WYCR01** recorded 12 native species and 4 weed species (Photo: B. Moyle 9/00)



**APPENDIX C2: PHOTOGRAPHS OF THE WILDFLOWER SOCIETY OF WESTERN AUSTRALIA BUSHLAND PLANTS SURVEY OF 'HUTCHY'S BLOCK', CARDIFF PASTORAL COMPANY, WYALKATCHEM**



**PHOTO 9:** *Eucalyptus celastroides* ssp. *virella* (Mirret) Open Mallee [OTM] which occurred on the gentle east-facing slope that runs from the base of the lateritic breakaway (Refer Unit OM) to the eastern boundary of the study area, as well as the north-eastern corner of the study area. Distinguishing features of this plant community included the open understorey (often patchy in occurrence) and wide spreading, heavy looking mallees.

– Quadrat WYCH17 recorded 24 native species and 5 weed species (Photo: B. Moyle 9/00)



**PHOTO 10:** *Eucalyptus flocktoniae* (Merri) Mallee over *Melaleuca uncinata* [OM-M] occurred on the gentle east-facing slope above the breakaway on loamy yellow sands with some laterite scattered on the surface. Although Merri was present through out most of the unit, other mallees including *E. pluricaulis* ssp. *pluricaulis* and *E. incrassata* (Ridge-fruited Malle) also occurred.

– Quadrat WYCH12 recorded 17 native species and no weed species (Photo: B. Moyle 9/00)



**PHOTO 11:** *Eucalyptus tenera* Mallee [OM-M'] which occurred along the edges of the track linking the centre of the northern boundary of the block to the breakaway. It occurred in dense stands and both the colour and form of the elegant 'witches fingernail' bud caps easily distinguished this mallee from others.

– Quadrat WYCH18 recorded 19 native species and 4 weed species (Photo: B. Moyle 9/00)



**PHOTO 12:** *Eucalyptus tenera* and *E. erythronema* ssp. *marginata* [Red-flowered Mallee] Open Mallee [OM] occurred on the east facing slopes of the lateritic breakaway. The slope is scattered with medium-large boulders (30-90cm) as well as loose and conglomerate orange-red laterite. The combination of location in the landscape, glaucous colour and low, flat-topped form of the *Melaleuca coronicarpa* together with the light stems of the mallees gives this unit its distinctive appearance on the ground.

– Quadrat WYCH16 recorded 12 native species and 1 weed species (Photo: B. Moyle 9/00)





**PHOTO 13:** *Eucalyptus oldfieldii* (Oldfield's Mallee) and *E. flocktoniae* (Merrit) Very Open Mallee [VOM] which occurred on the gentle north-facing slopes towards the south-east corner of the study area on yellow loamy sands over pink-brown loamy sands at depth with moderate drainage. Distinguishing features of this unit are the exposed yellow surface soils, the relatively open appearance with distinctive structural layers (each of a low canopy cover), the presence of tall rushes/sedges and termite mounds.

– Quadrat WYCH13 recorded 23 native species and 1 weed species (Photo: B. Moyle 9/00)



**PHOTO 14:** *Eucalyptus incrassata* (Ridge-fruited Mallee) and *E. pluricaulis* ssp. *pluricaulis* Open Mallee - Mallee [OM-M<sup>2</sup>] occurred on the deeper sands above and to the west of the breakaway. The sands are cream over yellow at depth and have a light scattering of laterite on the surface. The gravel pit to the north indicates that the laterite gravel could be within 50-100cm of the surface. The open and patchy understorey gives this unit a mottled appearance on the aerial photograph.

– Quadrat WYCH14 recorded 21 native species and 2 weed species (Photo: B. Moyle 9/00)





**PHOTO 15:** *Allocasuarina acutivalvis* (Black Tamma) and *Melaleuca uncinata* (Broom Bush) Tall Closed Scrub with occasional mallees of *Eucalyptus flocktoniae* (Merrit) over Occasional Low Shrubs [TSh - TCSc] which occurred on the eastern plateau above the breakaway. The Black Tamma is of considerable age and forms dense stands of tall shrubs and/or small trees – often as a single species. This habit is an indicator of considerable time since fire, such that the Black Tamma has developed to a substantial height as well as outcompeted other plants – note the low number of plant species, combined with high canopy cover. – Quadrat WYCH15 recorded 9 native species and no weed species (Photo: B. Moyle 9/00)



**PHOTO 16:** *Allocasuarina acutivalvis* (Black Tamma) and *Allocasuarina campestris* ssp. *campestris* (Tamma) Tall Closed Scrub with *Eucalyptus incrassata* (Ridge-fruited Mallee) Open Mallee [TSh - TCSc] occurred on the gentle south-east facing slopes in the north-western portion of the study area. – Quadrat WYCH20 recorded 38 native species and no weed species (Photo: B. Moyle 9/00)



**PHOTO 17: *Leptospermum erubescens* (Roadside Tea-tree) Tall Open Shrubland [TOSH]**

occurred in the north-eastern portion of the study area on gentle south-south west facing slope with light-brown sandy loams to a depth of at least 1m, where laterite occurs. This unit is distinguished by the mix of shrubs and the high occurrence of herbs with 37% of all herbs recorded for Hutchy's Block recorded in or adjacent to this unit.

– **Quadrat WYCH19** recorded 27 native species and 5 weed species (Photo: B. Moyle 9/00)



**PHOTO 18: *Leptospermum erubescens* (Roadside Tea-tree) Shrubland [Sh]** occurred towards the most southerly portion of the study area. Distinguishing features of this unit included the low height, the density of the vegetation and the distinctive forms of Proteaceae shrubs including *Dryandra conferta*, *D. purdieana*, *Grevillea hookeriana* (Toothbrushes) and *Petrophile shuttleworthiana*.

(Photo: C. Keating 11/01)



**PHOTO 19:** *Leptospermum erubescens* (Roadside Tea-tree) Shrubland [Sh] which occurred over most of Hutchy's Heath – towards the south western portion of the study area. Distinguishing features of this unit included the low height, the density of the vegetation and the distinctive forms of Proteaceae shrubs. (refer also photo 18)  
– Quadrat WYCH08 recorded 31 native species and 1 weed species (Photo: B. Moyle 9/00)



**PHOTO 20:** *Allocasuarina campestris* ssp. *campestris* (Tamma) Closed Heath over *Leptospermum erubescens* (Roadside Tea-tree) Low Open Shrubland over *Ecdeiocolea monostachya* and *Lepidosperma brunonianum* Very Open Tall Sedge/Rushland [OH-CH] occurred on the north-western corner of Hutchy's Heath. Characteristics of this unit include the density of the heath as well as occurrence of tall sedges  
– Quadrat WYCH09 recorded 18 native species and 2 weed species (Photo: B. Moyle 9/00)





**PHOTO 21:** *Allocasuarina campestris* ssp. *campestris* (Tamma), *Dryandra conferta* var. *conferta* and *Hakea scoparia* Open Shrubland with Occasional Emergent Mallees of *Eucalyptus oldfieldii* (Oldfield's Mallee) [CH-OH] which occurs in the south-western portion of the study area on fawn coloured sands to depth. Characteristics of this unit include the density of the heath as well as occurrence of tall sedges.

– Quadrat WYCH10 recorded 39 native species and no weed species (Photo: B. Moyle 9/00)



**PHOTO 22:** *Allocasuarina campestris* ssp. *campestris* (Tamma) and *Hakea scoparia* Tall Open Scrub with occasional Emergent Mallees of *Eucalyptus brachycorys* (Cowcowing Mallee) over *Melaleuca uncinata* (Broom Bush) Open Shrubland [TOSc] occurred on the very gentle south-west facing slopes, on deep sands in the centre of the study area.

– Quadrat WYCH11 recorded 15 native species and no weed species (Photo: B. Moyle 9/00)



**PHOTO 23:** *Aristida contorta* (Wind Grass) Grassland and Mixed Herbland [G+H] which occurred as isolated patches within the study area, particularly within the *Leptospermum erubescens* (Roadside Tea-tree) Tall Open Shrubland [TOSh]. Note the red-brown fruiting spikelets of *Aristida contorta*, cream flowers of *Stackhousia monogyna* and purple flowers of *Dampiera lavandulacea*.

– Quadrat WYCH21 recorded 16 native species and 0 weed species (Photo: C.Keating 9/00)



**PHOTO 24:** *Schoenus calcatus* recently removed from the Priority Flora list – recorded twice in the study area (WYCH10 and WYCH13). A dense, cushion forming perennial sedge (can grow to to 50cm across). Flowers Oct-Nov. (Photo: C. Keating 11/01)



**PHOTO 25:** A briefing session with some of the 41 volunteers who assisted with the field survey of both the Elashgin-Faulkner Road Bushland and “Hutchy’s Block”. Volunteers came from Wyalkatchem, Perth, Merredin and Bodallin. An additional 33 individuals contributed to this project. (Photo: B. Moyle 9/00)



**PHOTO 26:** Volunteers surveying quadrat WYCH17 *Eucalyptus celastroides* ssp. *virella* (Mirret) Open Tree Mallee [OTM] in “Hutchy’s Block”. (Photo: B. Moyle 9/00)



**APPENDIX D1: WYCR QUADRAT DESCRIPTIONS** (including location, site details and plant community structural layers, species composition and condition rating)
**LEGEND** (Refer also Appendix A for explanation of terminology)

WYCR QUADRATS = the five 10mx10m quadrats surveyed (and adjacent to the Quadrat, but same plant community)

Open Mallee [OM] = plant community description (Refer Section 4.1) and reference on vegetation map (Map 6B)

**bold** = dominant species

\* = introduced plant / weed

▲ = priority flora (Refer Section 5)

ms = manuscript name (recently described species, awaiting acceptance)

**WYCR01****Low Open Heath to Low Closed Heath [LOH-LCH]****Location:** Lat: 31°24.447"S Long: 117°23.477"E**Aspect:** very, very gentle west facing slope**Soil:** grey-brown sandy clay over grey brown clay to depth**Drainage:** poor [note: wet during winter/spring]**Bare Ground:** 40% cover**Litter:** 5% cover**No. Plant Species:** 16 (12 native + 4 \*weed)**Condition Rating:** very good [note: no weeds, some vegetation loss from water logging and salinity]

*Halosarcia doleiformis* [Samphire], *H. aff. pergranulata* [Blackweed Samphire] and *H. undulata* [Samphire] **Low Open Heath** over *\*Spergularia diandra* [Lesser Sand Spurry] **Very Open Herbland**

**WYCR01 Structural layers and plant species**

Shrubs	<i>Atriplex holocarpa</i>	Pop Saltbush
	<i>Atriplex stipitata</i>	Mallee Saltbush
	<i>Frankenia</i> species WSWA WYCR01/5 (C Keating)	
	<b><i>Halosarcia doleiformis</i></b>	<b>Samphire</b>
	<i>Halosarcia pergranulata</i>	Samphire
	<b><i>Halosarcia aff. pergranulata</i></b>	<b>Blackweed Samphire</b>
	<b><i>Halosarcia undulata</i></b>	<b>Samphire</b>
	(parasitic) <i>Lysiana casuarinae</i>	Mistletoe
	<i>Melaleuca halmaturorum</i>	
Herbs	<i>Calandrinia granulifera</i>	Pygmy Purslane
	<i>Daucus glochidiatus</i>	Small Pennywort
	<i>Triglochin mucronata</i>	Arrowgrass
WEEDS - Grasses	<i>*Lolium sp.</i>	Ryegrass
	<i>*Vulpia myuros</i>	Rat's Tail Fescue
WEEDS - Herbs	<i>*Mesembryanthemum nodiflorum</i>	Iceplant
	<b><i>*Spergularia diandra</i></b>	<b>Lesser Sand Spurry</b>

**Plants adjacent to WYCR01**

Shrubs	<i>Comesperma integerrimum</i>	
Herbs	<i>Actinobole uliginosum</i>	Flannel Cudweed
	<i>Bulbine semibarbata</i>	Leek Lily
	<i>Calotis hispidula</i>	Bindy Eye
	<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	
	<i>Gunniopsis septifraga</i>	
	<i>Menkea australis</i>	Fairy Spectacles
WEEDS - Grasses	<i>*Lolium rigidum</i>	Wimmera Ryegrass
	<i>*Phalaris minor</i>	Rat's Tail Fescue
WEEDS - Herbs	<i>*Anagallis arvensis</i>	Pimpernel
	<i>*Arctotheca calendula</i>	Capeweed

* <i>Cotula bipinnata</i>	Ferny Cotula
* <i>Hypochaeris glabra</i>	Flatweed
* <i>Osteospermum clandestinum</i>	Stinking Roger

**WYCR02**
**Woodland to Open Woodland [W-OW]**

**Location:** Lat: 31°24.404"S Long: 117°23.467"E

**Aspect:** gentle west facing slope

**Soil:** light-brown sand to loamy-sand over orange-brown loamy sand

**Drainage:** moderate

**Bare Ground:** 10%

**Litter:** 60% cover to depth of 1cm

**No. Plant Species:** 36 ( 31 native + 5 \*weed)

**Condition Rating:** good [note: weedy, water table rising]

*Eucalyptus loxophleba* ssp. *loxophleba* [York Gum] **Open Woodland** over *Acacia nyssophylla* and *Pittosporum phylliraeoides* ssp. *microcarpa* [Weeping Pittosporum] **Tall Shrubland** over *Atriplex stipitata* [Mallee Saltbush] **Shrubland** over *Halosarcia indica* ssp. *bidens* [Samphire] **Low Shrubland** over **Very Open Grassland** and **Very Open Herbland**.

**WYCR02**
**Structural layers and plant species** [bold = dominant]

Trees	<i>Eucalyptus loxophleba</i> ssp. <i>loxophleba</i>	<b>York Gum</b>
Shrubs	<i>Acacia nyssophylla</i>	
	<i>Atriplex stipitata</i>	Mallee Saltbush
	<i>Clematis delicata</i>	
	<i>Enchylaena tomentosa</i>	Barrier Saltbush
	<i>Eremophila decipiens</i> ssp. <i>decipiens</i>	Slender Fuschia
	<i>Halosarcia indica</i> ssp. <i>bidens</i>	<b>Samphire</b>
	<i>Lycium australe</i>	Australian Boxhorn
	<i>Maireana trichoptera</i>	Pink-seeded Bluebush
	<i>Olearia muelleri</i>	Dusky Daisybush
	<i>Pittosporum phylliraeoides</i> var. <i>microphylla</i>	<b>Weeping Pittosporum</b>
	<i>Rhagodia drummondii</i>	
	<i>Templetonia smithiana</i>	
Grasses	<i>Austrostipa elegantissima</i>	Feather Speargrass
	<i>Austrostipa</i> sp.	
Herbs	<i>Actinobole uliginosum</i>	Flannel Cudweed
	<i>Argyrolottis turbinata</i>	
	<i>Arthropodium curvipes</i>	
	<i>Brachyscome iberidifolia</i>	
	<i>Calandrinia granulifera</i>	Pygmy Purslane
	<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop
	<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	
	<i>Hydrocotyle medicaginoides</i>	Small Pennywort
	<i>Parietaria debilis</i>	
	<i>Podotheca angustifolia</i>	Sticky Longheads
	<i>Podotheca gnaphalioides</i>	Golden Longheads
	<i>Rhodanthe corymbosa</i>	
	<i>Senecio glossanthus</i>	Slender Groundsel
	<i>Siloxerus pygmaeus</i>	
	<i>Waitzia acuminata</i> ssp. <i>acuminata</i>	Orange Immortelle
Sedges	<i>Schoenus nanus</i>	
WEEDS - Grasses	* <i>Lolium</i> sp.	Ryegrass
	* <i>Vulpia myuros</i>	Rat's Tail Fescue

	<i>*Vulpia</i> sp.	Fescue
WEEDS - Herbs	<i>*Brassica tournefortii</i>	Wild Turnip
	<i>*Trifolium</i> sp.	Clover

**Plants adjacent to WYCR02**

Shrubs	<i>Frankenia pauciflora</i>	Seaheath
	<i>Melaleuca halmaturorum</i>	
Herbs	<i>Podolepis canescens</i>	Bright Podolepis
(twiner)	<i>Thysanotus patersonii</i>	Twining Fringe Lily
	<i>Triglochin minutissima</i> var. <i>elongatum</i>	Prickly Arrowgrass
WEEDS - Grasses	<i>*Aira caryophyllea/cupaniana</i>	Silvery Hairgrass
	<i>*Avena barbata</i>	Wild Oat, Bearded Oat
	<i>*Bromus rubens</i>	Soft Brome
	<i>*Parapholis incurva</i>	Curly Barb Grass
WEEDS - Herbs	<i>*Anagallis arvensis</i>	Pimpernel
	<i>*Arctotheca calendula</i>	Capeweed
	<i>*Parentucellia latifolia</i>	Sticky Bartsia
	<i>*Petrorhagia velutina</i>	Velvet Pink
	<i>*Sonchus oleraceus</i>	Common Sowthistle

**WYCR03****Woodland to Open Woodland [W-OW]**

Location: Lat: 31°24.340"S Long: 117°23.547"E

Aspect: very, very gentle south-west facing slope

Soil: light-brown sandy loam over light-brown sandy loam to depth

Drainage: well

Bare Ground: 10-30%

Litter: 31-70% cover to depth of 1-2cm

No. Plant Species: 24 ( 19 native + 5 \*weed)

Condition Rating: very good

*Eucalyptus loxophleba* ssp. *loxophleba* [York Gum] **Woodland** over *Acacia nyssophylla* **Tall Shrubland** over *Exocarpos aphyllus* [Leafless Ballart] and *Lycium Australe* [Australian Boxhorn] **Open Shrubland** over *Atriplex stipitata* [Mallee Saltbush] **Low Open Shrubland** over **Very Open Grassland** and *Sclerolaena diacantha* [Grey Copper Burr] **Herbland**.

**WYCR03****Structural layers and plant species** [bold = dominant]

Trees	<b><i>Eucalyptus loxophleba</i> ssp. <i>loxophleba</i></b>	<b>York Gum</b>
Shrubs	<i>Acacia nyssophylla</i>	
	<i>Atriplex stipitata</i>	<b>Mallee Saltbush</b>
	<i>Enchylaena tomentosa</i>	Barrier Saltbush
	<i>Exocarpos aphyllus</i>	<b>Leafless Ballart</b>
	<i>Lycium australe</i>	<b>Australian Boxhorn</b>
	<i>Maireana carnosa</i>	Cottony Bluebush
	<i>Rhagodia drummondii</i>	
	<b><i>Sclerolaena diacantha</i></b>	<b>Grey Copper Burr</b>
Grasses	<i>Austrostipa elegantissima</i>	Feather Speargrass
Herbs	<i>Calandrinia eremaea</i>	Twining Purslane
	<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	
	<i>Erymophyllum ramosum</i>	
	<i>Hydrocotyle medicaginoides</i>	Small Pennywort
	<i>Hypoxis</i> sp.	
	<i>Lepidium rotundum</i>	Veined Peppergrass

	<i>Podolepis capillaris</i>	Wiry Podolepis
	<i>Pogonolepis stricta</i>	
	<i>Rhodanthe pygmaea</i>	Pink Sunray
WEEDS - Grasses	* <i>Hordeum leporinum</i>	Barley Grass
	* <i>Vulpia myuros</i>	Rat's Tail Fescue
WEEDS - Herbs	* <i>Cotula bipinnata</i>	Ferny Cotula
	* <i>Hypochaeris glabra</i>	Flatweed
	* <i>Sonchus oleraceus</i>	Common Sowthistle

**Plants adjacent to WYCR03**

Herbs	<i>Bulbine semibarbata</i>	Leek Lily
	<i>Hyalosperma glutinosum</i> ssp. <i>glutinosum</i>	
WEEDS - Herbs	* <i>Mesembryanthemum nodiflorum</i>	Iceplant
	* <i>Osteospermum clandestinum</i>	Stinking Roger

**WYCR04****Tall Open Shrubland [TOSh]**

**Location:** Lat: 31°24.310S Long: 117°23.615"E  
**Aspect:** flat  
**Soil:** beige clay over beige clay to depth  
**Drainage:** poor [note: anticipate soil saturated in winter]  
**Bare Ground:** 30-70%  
**Litter:** 2-10% cover to depth of <0.5cm  
**No. Plant Species:** 27 (21 native + 6 \*weed)  
**Condition Rating:** excellent

*Acacia nyssophylla* and *Templetonia smithiana* [Centipede Bush] **Tall Open Shrubland** over *Atriplex stipitata* [Mallee Saltbush] and *Enchylaena tomentosa* [Barrier Saltbush] **Low Open Shrubland** over *Podolepis capillaris* [Wiry Capillaris] **Very Open Herbland** with **Occasional Grasses**.

**WYCR04 Structural layers and plant species [bold = dominant]**

Shrubs	<i>Acacia nyssophylla</i>	
	<i>Atriplex stipitata</i>	Mallee Saltbush
	<i>Enchylaena tomentosa</i>	Barrier Saltbush
	<i>Frankenia pauciflora</i>	Seaheath
	<i>Grevillea hakeoides</i> ssp. <i>hakeoides</i>	
	<i>Lycium australe</i>	Australian Boxhorn
	<i>Maireana carnosa</i>	Cottony Bluebush
	<i>Ptilotus divaricatus</i>	Climbing Ptilotus
	<i>Rhagodia drummondii</i>	
	<i>Templetonia smithiana</i>	
Grasses	<i>Austrodanthonia setacea</i>	Small Flower Wallaby Grass
	<i>Austrodanthonia</i> sp.	Wallaby Grass
	<i>Austrostipa elegantissima</i>	Feather Speargrass
Herbs	<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop
	<i>Dampiera lavandulacea</i>	
	<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	
	<i>Hyalosperma glutinosum</i> ssp. <i>glutinosum</i>	
	<i>Parietaria debilis</i>	Pellitory
	<i>Podolepis capillaris</i>	Wiry Capillaris
	<i>Pogonolepis stricta</i>	
	<i>Wahlenbergia preissii</i>	
WEEDS - Grasses	* <i>Avena barbata</i>	Wild Oat, Bearded Oat
	* <i>Bromus rubens</i>	Soft Brome

	<i>*Lamarckia aurea</i>	Golden Top
	<i>*Lolium</i> sp.	Ryegrass
WEEDS - Herbs	<i>*Cotula bipinnata</i>	Ferny Cotula
	<i>*Mesembryanthemum nodiflorum</i>	Iceplant

**Plants adjacent to WYCR04**

Shrubs	<i>Melaleuca lateriflora</i> ssp. <i>lateriflora</i>	
	<i>Melaleuca radula</i>	Graceful Honeymyrtle
	<i>Santalum acuminatum</i>	Quandong
Herbs	<i>Thysanotus britanii</i>	Fringe Lily

**WYCR05****Open Woodland [OW]**

**Location:** Lat: 31°24.572"S Long: 117°23.585"E

**Aspect:** gentle west facing slope

**Soil:** pinky-brown sandy loam over pinky-brown sandy loam

**Drainage:** well

**Bare Ground:** 2-10%

**Litter:** 10-30% cover to depth of <1cm

**No. Plant Species:** 29 ( 21 native + 8 \*weed)

**Condition Rating:** very good

*Eucalyptus salubris* [Gimlet] **Open Woodland** over *Atriplex stipitata* [Mallee Saltbush] **Low Shrubland** with occasional emergent shrubs of *Lycium australe* [Australian Boxhorn] over *Podolepis capillaris* [Wiry Capillaris] and *Senecio glossanthus* [Slender Groundsel] **Herbland**.

**WYCR05 Structural layers and plant species** [bold = dominant]

Trees	<i>Eucalyptus salubris</i>	<b>Gimlet</b>
Shrubs	<i>Atriplex stipitata</i>	<b>Mallee Saltbush</b>
	<i>Enchylaena tomentosa</i>	Barrier Saltbush
	<i>Lycium australe</i>	Australian Boxhorn
	<i>Rhagodia preissii</i> ssp. <i>preissii</i>	
	<i>Sclerolaena diacantha</i>	Grey Copper Burr
Grasses	<i>Austrodanthonia setacea</i>	Small Flower Wallaby Grass
	<i>Austrostipa elegantissima</i>	Feather Speargrass
	<i>Austrostipa</i> sp. Hairy Leaves WSWA WYCH14/26	
Herbs	<i>Bulbine semibarbata</i>	Leek Lily
	<i>Calandrinia eremaea</i>	Twining Purslane
	<i>Calandrinia granulifera</i>	Pygmy Purslane
	<i>Daucus glochidiatus</i>	Small Pennywort
	<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	
	<i>Erodium cygnorum</i>	Blue Storksbill
	<i>Goodenia pusilliflora</i>	Smallflower Goodenia
	<i>Hydrocotyle medicaginoides</i>	Small Pennywort
	<i>Millotia myosotidifolia</i>	
	<i>Podolepis capillaris</i>	<b>Wiry Capillaris</b>
	<i>Pogonolepis stricta</i>	
	<i>Senecio glossanthus</i>	<b>Slender Groundsel</b>
WEEDS - Grasses	<i>*Bromus rubens</i>	Soft Brome
	<i>*Hordeum leporinum</i>	Barley Grass
	<i>*Lolium</i> sp.	Ryegrass
WEEDS - Herbs	<i>*Brassica tournefortii</i>	Wild Turnip

* <i>Osteospermum clandestinum</i>	Stinking Roger
* <i>Sonchus oleraceus</i>	Common Sowthistle
* <i>Trifolium</i> sp.	Clover
* <i>Trifolium subterraneum</i>	Subterranean Clover

Plants adjacent to WYCR05

Twiners	<i>Clematis delicata</i>	
Herbs	<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop

**APPENDIX D2: WYCH QUADRAT DESCRIPTIONS** (including location, site details and plant community structural layers, species composition and condition rating)
**LEGEND** (Refer also Appendix A for explanation of terminology)

WYCH QUADRATS = the thirteen 10mx10m quadrats surveyed (and adjacent to the Quadrat, but same plant community)

Shrubland [Sh] = plant community description (Refer Section 4.2) and reference on vegetation map (Map 7B)

**bold** = dominant species

\* = introduced plant / weed

▲ = priority flora (Refer Section 5.2)

ms = manuscript name (recently described species, awaiting acceptance)

NOTE: there were no sites WYCH01– WHCH07, they were omitted to avoid any confusion with WYCR quadrats.

**WYCH08****Shrubland [Sh]****Location:** Lat: 31°16.605"S Long: 117°35.782"E**Aspect:** flat area, with no dominant aspect**Soil:** creamy-grey sand with scattered surface laterite over orange-red laterite**Drainage:** well [note: anticipate saturated soil in winter]**Bare Ground:** 10-30%**Litter:** 2-10% cover to depth of <1cm**No. Plant Species:** 32 (31 native + 1 \*weed)**Condition Rating:** excellent

*Leptospermum erubescens* [Roadside Teatree] **Shrubland** over *Dryandra purdieana* and *Melaleuca conothamnoides* **Low Open Heath** over **Occasional Herbs, Sedges and Grasses.**

**WYCH08 Structural layers and plant species** [bold = dominant]

Shrubs	<i>Acacia phaeocalyx</i>	
	<i>Allocasuarina acutivalvis</i>	Black Tamma
	<i>Allocasuarina campestris</i> ssp. <i>campestris</i>	Tamma
	(parasitic twiner) <i>Cassytha melantha</i>	Dodder
	(twiner) <i>Comesperma scoparium</i>	Broom Milkwort
	<b><i>Dryandra purdieana</i></b>	<b>Dryandra</b>
	<i>Gompholobium obcordatum</i>	
	<i>Grevillea hookeriana</i>	Red Tooth Brushes
	<i>Hakea incrassata</i>	Marble Hakes
	<i>Hibbertia exasperata</i>	
	<b><i>Leptospermum erubescens</i></b>	<b>Roadside Teatree</b>
	<i>Leucopogon ? sulcatus</i>	
	<i>Lysinema ciliatum</i>	Curry Plant
	<b><i>Melaleuca conothamnoides</i></b>	
	<i>Melaleuca orbicularis</i>	
	<i>Persoonia quinquenervis</i>	
	<i>Psammomoya choretroides</i>	
	<i>Synaphea interioris</i>	
Grasses	<i>Neurachne alopecuroides</i>	Foxtail Mulga Grass
Herbs	<i>Conostylis teretifolia</i> ssp. <i>teretifolia</i>	
	<i>Drosera androsacea</i>	Cone Sundew
	<i>Drosera glanduligera</i>	Pimpernel Sundew
	(twiner) <i>Drosera macrantha</i> ssp. <i>macrantha</i>	Bridal Rainbow
	<i>Opercularia vaginata</i>	
	<i>Patersonia drummondii</i> ssp. <i>borealis</i>	Drummond's Native Iris
	<i>Xanthorrhoea ? nana</i>	Blackboy
Sedges	<i>Lepidosperma tenue</i>	
	<i>Mesomelaena preissii</i>	
	<i>Schoenus clandestinus</i>	
	<i>Schoenus hexandrus</i>	



	<i>Schoenus</i> aff. <i>hexandrus</i>	
WEEDS - Grasses	* <i>Vulpia</i> ? <i>myuros</i>	Rat's Tail Fescue

**Plants adjacent to WYCH08**

Shrubs	<i>Acacia nigripilosa</i> ssp. <i>nigripilosa</i>	
	<i>Astroloma serratifolium</i> ssp. <i>horridulum</i>	Cankerry, Kondrung
	<i>Calytrix violacea</i>	
	<i>Dryandra conferta</i> var. <i>conferta</i>	Dryandra
	<i>Isopogon scabriusculus</i>	
	<i>Mirbelia trichocalyx</i>	
	<i>Verticordia chrysantha</i>	Featherflower
	<i>Verticordia eriocephala</i>	Featherflower
Herbs	<i>Dampiera sacculata</i>	
	<i>Stachystemon brachyphyllus</i>	
Sedges	<i>Lepidosperma</i> sp A2 Island Flat (Keighery 7000)	

**WYCH09****Open Heath to Closed Heath [OH-CH]**

Location: Lat: 31°16.549"S Long: 117°35.683"E

Aspect: flat area with no dominant aspect

Soil: fawn coloured sand with occasional pisolites over deep fawn coloured sand

Drainage: well

Bare Ground: 40-50%

Litter: 30-70% cover to depth of 1-2cm

No. Plant Species: 20 ( 18 native + 2 \*weed)

Condition Rating: excellent

*Allocasuarina campestris* ssp. *campestris* [Tamma] **Closed Heath** over *Leptospermum erubescens* [Roadside Teatree] **Low Open Shrubland** over *Ecdeiocolea monostachya* and *Lepidosperma brunonianum* **Very Open Tall Sedgeland with Occasional Herbs.**

**WYCH09 Structural layers and plant species [bold = dominant]**

Mallees	<i>Eucalyptus brachycorys</i>	Cowcowing Mallee
Shrubs	<i>Acacia stereophylla</i> var. <i>stereophylla</i>	
	<b><i>Allocasuarina campestris</i> ssp. <i>campestris</i></b>	<b>Tamma</b>
	<i>Astroloma serratifolium</i> ssp. <i>horridulum</i>	Cankerry, Kondrung
	<i>Exocarpos aphyllus</i>	Leafless Ballart
	<i>Grevillea hookeriana</i>	Red Tooth Brushes
	<b><i>Leptospermum erubescens</i></b>	<b>Roadside Teatree</b>
	<i>Leucopogon obtusatus</i>	
	<i>Melaleuca conothamnoides</i>	
Sedges/Rushes	<i>Verticordia brachypoda</i>	Featherflower
	<b><i>Ecdeiocolea monostachya</i></b>	
	<b><i>Lepidosperma brunonianum</i></b>	
Herbs	▲ <span style="background-color: yellow;">                    </span>	
	<i>Actinobole uliginosum</i>	Flannel Cudweed
	<i>Ceratogyne obionoides</i>	Wingwort
	(twiner) <i>Drosera macrantha</i> ssp. <i>macrantha</i>	Bridal Rainbow
	<i>Millotia tenuifolia</i>	Soft Millotia
	<i>Stylidium dichotoma</i>	Pins-and-Needles
WEEDS - Grasses	* <i>Vulpia</i> ? <i>myuros</i>	Rat's Tail Fescue
WEEDS - Herbs	* <i>Hypochaeris glabra</i>	Flatweed

## Plants adjacent to WYCH09

Shrubs	<i>Acacia multispicata</i>	
	<i>Acacia phaeocalyx</i>	
	<i>Dampiera lavandulacea</i>	
	<i>Hibbertia exasperata</i>	
Herbs	<i>Borya laciniata</i>	Pincushions
	<i>Caladenia roei</i>	Ant Orchid
	<i>Podotheca gnaphalioides</i>	
Sedges	<i>Schoenus clandestinus</i>	
WEEDS - Herbs	* <i>Arctotheca calendula</i>	Capeweed

## WYCH10

## Closed Heath to Open Heath [CH-OH]

Location: Lat: 31°16.549"S Long: 117°35.843"E

Aspect: flat area with no dominant aspect

Soil: pale yellow loamy sand with scattered surface laterite over pale yellow sand with laterite at ~50cm

Drainage: well

Bare Ground: 30%

Litter: 10% cover to depth of &lt;1cm

No. Plant Species: 39 (39 native + 0 \*weed)

Condition Rating: pristine

*Allocasuarina campestris* ssp. *campestris* [Tamma], *Dryandra conferta* var. *conferta* and *Hakea scoparia*  
**Open Shrubland with Occasional Emergent Mallees** of *Eucalyptus burracoppinensis* [Burracoppin Mallee]  
 over *Beaufortia interstans*, over *Leptospermum erubescens* [Roadside Teatree] and *Melaleuca*  
*conothamnoides* **Low Open Heath** over **Very Open Sedgeland with Occasional Herbs and Grasses.**

## WYCH10 Structural layers and plant species [bold = dominant]

Shrubs	<i>Allocasuarina campestris</i> ssp. <i>campestris</i>	Tamma
	<i>Beaufortia interstans</i>	
	<i>Calytrix violacea</i>	
(parasitic twiner)	<i>Cassytha flava</i>	Dodder
(parasitic twiner)	<i>Cassytha melantha</i>	Dodder
	<i>Chamelaucium</i> aff. <i>pauciflorum</i>	
(twiner)	<i>Comesperma scoparium</i>	
	<i>Daviesia hakeoides</i> ssp. <i>subnuda</i>	
	<i>Daviesia nudiflora</i> ssp. <i>drummondii</i>	
	<b><i>Dryandra conferta</i> var. <i>conferta</i></b>	
	<i>Dryandra purdieana</i>	
	<i>Gompholobium obcordatum</i>	
	<i>Hakea scoparia</i>	
	<i>Hibbertia polystachya</i>	
	<i>Isopogon scabriusculus</i>	
	<b><i>Leptospermum erubescens</i></b>	Roadside Teatree
	<b><i>Melaleuca conothamnoides</i></b>	
	<i>Persoonia trinervis</i>	
	<i>Psammomoya choretroides</i>	
	<i>Verticordia chrysantha</i>	
Sedges/Rushes	<i>Lepidosperma viscidum</i>	
	▲ <span style="background-color: yellow;">                    </span>	
	<i>Schoenus hexandrus</i>	
	<i>Ecdeiocolea monostachya</i>	
	<i>Lepidobolus preissianus</i> ssp. <i>preissianus</i>	
	<i>Schoenus calcatus</i>	

Herbs		<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop
	(twiner)	<i>Drosera macrantha</i> ssp. <i>macrantha</i>	Bridal Rainbow
		<i>Halgania lavandulacea</i>	
		<i>Millotia tenuifolia</i>	Soft Millotia
		<i>Opercularia vaginata</i>	
		<i>Patersonia drummondii</i> ssp. <i>borealis</i>	
		<i>Patersonia drummondii</i> ssp. <i>drummondii</i>	
		<i>Rhodanthe laevis</i>	Smooth Sunray
	(twiner)	<i>Thysanotus patersonii</i>	Twining Fringe Lily
		<i>Trachymene</i> sp.	Spongefruit
Grasses		<i>Xanthorrhoea</i> ? <i>nana</i>	Blackboy
		<i>Austrostipa elegantissima</i>	Feather Speargrass
		<i>Neurachne alopecuroidea</i>	Foxtail Mulga Grass

**Plants adjacent to WYCH10**

Mallees		<i>Eucalyptus burracoppinensis</i>	Burracoppin Mallee
		<i>Eucalyptus oldfieldii</i>	Oldfield's Mallee
Shrubs		<i>Grevillea hookeriana</i>	
		<i>Hakea scoparia</i>	
		<i>Hibbertia exasperata</i>	
		<i>Lysinema ciliatum</i>	Curry Plant
		<i>Melaleuca orbicularis</i>	
		<i>Melaleuca scabra</i>	
		<i>Olearia dampieri</i> var. <i>eremicola</i> ms	
		<i>Phebalium tuberculatum</i>	
		<i>Stenanthemum pomaderroides</i>	
Herbs		<i>Synaphea interioris</i>	
		<i>Conostylis teretifolia</i> ssp. <i>teretifolia</i>	

**WYCH11****Tall Open Scrub [TOSc]**

Location: Lat: 31°16.495"S Long: 117°35.860"E

Aspect: very gentle north-west facing slope

Soil: creamy-yellow sand over orange laterite

Drainage: well

Bare Ground: 2-10%

Litter: 70% cover to depth of 1cm

No. Plant Species: 15 ( 15 native + 0 \*weed)

Condition Rating: pristine

Other comments: 2 ant hills in quadrat

*Allocasuarina campestris* ssp. *campestris* [Tamma] and *Hakea scoparia* **Tall Open Scrub** with Occasional **Emergent Mallees** of *Eucalyptus brachycorys* [Cowcowing Mallee] over *Melaleuca uncinata* [Broom Bush] **Open Shrubland** over *Baeckea megaflorea* over **Low Open Shrubland** over Occasional Grasses, Herbs and Sedges.

**WYCH11 Structural layers and plant species** [bold = dominant]

Trees	<i>Eucalyptus brachycorys</i>	Cowcowing Mallee
Shrubs	<i>Acacia nigripilosa</i> ssp. <i>nigripilosa</i>	
	<i>Allocasuarina campestris</i> ssp. <i>campestris</i>	Tamma
	<i>Baeckea megaflorea</i>	
	<i>Hakea scoparia</i>	
	<i>Hibbertia exasperata</i>	
	<i>Melaleuca scabra</i>	Wurru Bush
	<i>Melaleuca uncinata</i>	Broom Bush

	<i>Petrophile shuttleworthiana</i>	
	<i>Phebalium filifolium</i>	Slender Phebalium
Grasses	<i>Neurachne alopecuroidea</i>	Foxtail Mulga Grass
Herbs	<i>Blennospora drummondii</i>	
	<i>Erymophyllum ramosum</i>	
	<i>Millotia tenuifolia</i>	Soft Millotia
Sedges	<i>Schoenus nanus</i>	Tiny Bog Rush

**Plants adjacent to WYCH11**

Mallees	<i>Eucalyptus hypochlamydea</i> ssp. <i>ecdysiastes</i>	
	<i>Eucalyptus incrassata</i>	Lerp Mallee
	<i>Eucalyptus pluricaulis</i> ssp. <i>pluricaulis</i>	
Shrubs	<i>Allocasuarina acutivalvis</i>	Black Tamma
	<i>Astartea heteranthera</i>	
	<i>Brachyloma preissii</i>	
(parasitic twiner)	<i>Cassytha pomiformis</i>	Dodder
	<i>Gastrolobium spinosum</i> ssp. <i>spinosum</i>	
	<i>Grevillea hakeoides</i> ssp. <i>stenophylla</i>	
	<i>Grevillea petrophiloides</i>	Poker Grevillea
	<i>Isopogon scabriusculus</i>	
	<i>Melaleuca conothamnoides</i>	
	<i>Micromyrtus obovata</i>	
	<i>Phebalium tuberculatum</i>	
	<i>Psammomoya choretroides</i>	
	<i>Santalum acuminatum</i>	Quandong
	<i>Stenanthemum pomaderroides</i>	
Sedges	<i>Lepidosperma tenue</i>	
	<i>Lepidosperma</i> species A2 Island Flat GJ Keighery 7000	
Herbs	<i>Caesia alfordii</i>	
	<i>Conostylis teretifolia</i> ssp. <i>teretifolia</i>	
	<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop
	<i>Dichopogon ? fimbriatus</i>	
(twiner)	<i>Drosera macrantha</i> ssp. <i>macrantha</i>	Bridal Rainbow
	<i>Podolepis capillaris</i>	
	<i>Podotheca angustifolia</i>	
(twiner)	<i>Thysanotus patersonii</i>	Twining Fringe Lily
	<i>Waitzia acuminata</i> ssp. <i>acuminata</i>	Orange Immortelle

**WYCH12****Open Mallee to Mallee [OM-M]**

**Location:** Lat: 31°16.512"S Long: 117°35.986"E

**Aspect:** gentle east facing slope

**Soil:** yellow loamy sand over yellow loamy sand to laterite at >50cm depth

**Drainage:** well

**Bare Ground:** 25%

**Litter:** 75% cover to depth of 1.5cm

**No. Plant Species:** 17 ( 17 native + 0 \*weed)

**Condition Rating:** pristine

*Eucalyptus capillosa* ssp. *capillosa* [Wheatbelt Wandoo] and *E. flocktoniae* [Meirrit] **Open Mallee** over *Hakea multilineata* [Bottle-brush] and *Melaleuca uncinata* [Broom Bush] **Tall Open Shrubland** over *Phebalium filifolium* [Slender Phebalium] **Open Heath** over **Occasional Grasses**.

**WYCH12 Structural layers and plant species** [bold = dominant]

Mallees	<i>Eucalyptus flocktoniae</i> ssp. <i>flocktoniae</i>	<b>Merrit</b>
	<i>Eucalyptus pluricaulis</i> ssp. <i>pluricaulis</i>	
Shrubs	<i>Acacia acuarina</i>	
	<i>Acacia nigripilosa</i> ssp. <i>nigripilosa</i>	
	<i>Allocasuarina acutivalvis</i>	Black Tamma
	<i>Astroloma serratifolium</i> ssp. <i>horridulum</i>	Cankerberry, Kondrung
	<i>Baeckea megaflorea</i>	
	<i>Daviesia benthamii</i> ssp. <i>benthamii</i>	
	<i>Hakea multilineata</i>	<b>Bottle-Brush</b>
	<i>Hibbertia exasperata</i>	
	<i>Melaleuca uncinata</i>	<b>Broom Bush</b>
	<i>Phebalium filifolium</i>	<b>Slender Phebalium</b>
	<i>Stenanthemum pomaderroides</i>	
Herbs	<i>Platysace maxwellii</i>	Karno
	<i>Trachymene cyanopetala</i>	
Grasses	<i>Austrostipa tenuifolia</i>	
	<i>Austrostipa</i> sp. Hairy Leaves	
	WSWA WYCH14/26	

**Plants adjacent to WYCH12**

Mallees	<i>Eucalyptus incrassata</i>	Lerp Mallee
Shrubs	<i>Dodonaea bursariifolia</i>	Hop Bush
	<i>Melaleuca conothamnoides</i>	

**WYCH13****Very Open Mallee [VOM]**

Location: Lat: 31°16.485"S Long: 117°35.122"E

Aspect: gentle north-east facing slope

Soil: yellow loamy-sand with lateritic pebbles scattered on surface (~5% cover) over pink-brown loamy sand to depth

Drainage: moderate

Bare Ground: 55%

Litter: 20% cover

No. Plant Species: 24 (23 native + 1 \*weed)

Condition Rating: very good to excellent

*Eucalyptus oldfieldii* [Oldfield's Mallee] and *E. flocktoniae* ssp. *flocktoniae* [Merrit] **Very Open Mallee** over *Melaleuca uncinata* [Broom Bush] **Tall Open Shrubland** over *Acacia acuarina* and *Baeckea megaflorea* **Shrubland** over *Olearia dampieri* var. *eremicola* ms **Low Open Shrubland** over *Austrostipa elegantissima* [Feather Speargrass] **Very Open Grassland** with Occasional Herbs and Sedges.

**WYCH13 Structural layers and plant species** [bold = dominant]

Mallees	<i>Eucalyptus flocktoniae</i> ssp. <i>flocktoniae</i>	<b>Merrit</b>
	<i>Eucalyptus oldfieldii</i>	<b>Oldfield's Mallee</b>
Shrubs	<i>Acacia acuarina</i>	
	<i>Acacia yorkrakinesis</i> ssp. <i>acrita</i>	Yorkrakine Wattle
	<i>Baeckea megaflorea</i>	
(twiner)	<i>Comesperma volubile</i>	Love Creeper
	<i>Grevillea paniculata</i>	
	<i>Hibbertia exasperata</i>	
	<i>Melaleuca uncinata</i>	<b>Broom Bush</b>
	<i>Olearia dampieri</i> var. <i>eremicola</i> ms	
	<i>Westringia cephalantha</i>	
Grasses	<i>Austrodanthonia setacea</i>	Small Flower Wallaby Grass

	<i>Austrodanthonia</i> sp.	Wallaby Grass
	<i>Austrostipa elegantissima</i>	Feather Speargrass
Herbs	<i>Hyalosperma demissum</i>	Tiny Sunray
	<i>Lomandra effusa</i>	Scented Mat Rush
	<i>Millotia tenuifolia</i>	Soft Millotia
	<i>Patersonia drummondii</i> ssp. <i>drummondii</i>	Drummond's Native Iris
	<i>Podolepis capillaris</i>	Wiry Capillaris
(twiner)	<i>Thysanotus patersonii</i>	Twining Fringe Lily
	<i>Trachymene cyanopetala</i>	
	<i>Waitzia acuminata</i> ssp. <i>acuminata</i>	Orange Immortelle
Sedges/Rushes	<i>Ecdeiocolea monostachya</i>	
WEEDS - Herbs	* <i>Cotula bipinnata</i>	Ferny Cotula

**Plants adjacent to WYCH13**

Shrubs	(twiner)	<i>Billardiera coriacea</i>	
		<i>Daviesia benthamii</i> ssp. <i>benthamii</i>	
		<i>Gastrolobium parviflorum</i>	Berry Poison
		<i>Phebalium tuberculosum</i>	
Sedges/Rushes		<i>Lepidosperma</i> sp. A2 Island Flat	
		GJ Keighery 7000	
Herbs		<i>Conostylis teretifolia</i> ssp. <i>teretifolia</i>	
		<i>Lomandra collina</i>	Pale Mat Rush

**WYCH14****Open Mallee to Mallee<sup>2</sup> [OM-M<sup>2</sup>]**

**Location:** Lat: 31°16.430"S Long: 117°35.816"E

**Aspect:** very, very gentle north facing slope

**Soil:** cream sand with scattered laterite over yellow sand to depth

**Drainage:** well [note: soil probably more saturated during winter]

**Bare Ground:** 10%

**Litter:** 80-90% cover to depth of 2-3cm

**No. Plant Species:** 23 (21 native + 2 \*weed)

**Condition Rating:** excellent

*Eucalyptus incrassata* [Lerp Mallee] and *E. tenera* [Yellow Mallee] **Mallee** over *Gastrolobium spinosum* ssp. *spinosum* [Prickly Poison] and *Phebalium filifolium* [Slender Phebalium] **Shrubland** over **Mixed Open Grassland** with **Occasional Herbs**.

**WYCH14 Structural layers and plant species [bold = dominant]**

Mallees	<i><b>Eucalyptus incrassata</b></i>	<b>Lerp Mallee</b>
	<i>Eucalyptus pluricaulis</i> ssp. <i>pluricaulis</i>	
	<i><b>Eucalyptus tenera</b></i>	
Shrubs	<i>Allocasuarina acutivalvis</i>	Black Tamma
	<i>Enchylaena lanata</i>	
	<i><b>Gastrolobium spinosum</b></i> ssp. <i>spinosum</i>	<b>Prickly Poison</b>
	<i><b>Phebalium filifolium</b></i>	<b>Slender Phebalium</b>
	<i>Stenanthemum pomaderroides</i>	
Grasses	<i>Austrostipa elegantissima</i>	Feather Speargrass
	<i>Austrostipa tenuifolia</i>	
	<i>Austrostipa</i> sp. Hairy Leaves	
	WSWA WYCH14/26	
Herbs	<i>Blennospora drummondii</i>	
	<i>Calandrinia eremaea</i>	Twining Purslane
	<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop

	<i>Lepidium</i> sp.	Peppercress
	<i>Lobelia ? tenue</i>	
	<i>Podolepis capillaris</i>	Wiry Capillaris
	<i>Rhodanthe laevis</i>	Smooth Sunray
(twiner)	<i>Thysanotus patersonii</i>	Twining Fringe Lily
	<i>Trachymene cyanopetala</i>	
	<i>Wahlenbergia preissii</i>	
	<i>Waitzia acuminata</i> ssp. <i>acuminata</i>	Orange Immortelle
WEEDS - Herbs	* <i>Hypochaeris glabra</i>	Flatweed
	* <i>Ursinia anthemoides</i>	Ursinea

**Plants adjacent to WYCH14**

Shrubs	<i>Acacia acutaria</i>	
	<i>Acacia fragilis</i>	
	<i>Acacia nigripilosa</i> ssp. <i>nigripilosa</i>	
	<i>Baeckea megaflorea</i>	
	<i>Hibbertia exasperata</i>	
	<i>Melaleuca uncinata</i>	Broom Bush
	<i>Olearia dampieri</i> var. <i>eremicola</i> ms	
	<i>Platysace maxwellii</i>	
Herbs	<i>Dianella revoluta</i>	Blueberry Lily
	<i>Dichopogon ? fimbriatus</i>	
	<i>Goodenia berardiana</i>	
	<i>Opercularia vaginata</i>	
	<i>Thysanotus</i> sp.	Fringe Lily
Sedges	<i>Lepidosperma</i> sp. A2 Island Flat GJ Keighery 7000	
WEEDS - Herbs	* <i>Parentucellia latifolia</i>	Sticky Bartsia

**WYCH15****Tall Shrubland to Tall Closed Scrub [TSh-TCS]**

**Location:** Lat: 31°16.384"S Long: 117°35.947"E

**Aspect:** very gentle west facing slope

**Soil:** yellow-cream sandy loam over yellow loamy sand with laterite pebbles through sub-surface profile – laterite at 15-20cm

**Drainage:** well

**Bare Ground:** 10-20%

**Litter:** 80% cover to depth of 2-3cm

**No. Plant Species:** 9 (9 native + 0 \*weed)

**Condition Rating:** excellent to pristine

**Other comments:** unused gravel pit adjacent

*Allocasuarina acutivalvis* (Black Tamma) and *Melaleuca uncinata* (Broom Bush) **Tall Closed Scrub** with occasional mallees of *Eucalyptus flocktoniae* (Merritt) over **Occasional Low Shrubs**. Occasional climbers of *Thysanotus patersonii* (Twining Fringe Lily) also occur through the lower layers.

**WYCH15 Structural layers and plant species [bold = dominant]**

Mallee	<i>Eucalyptus flocktoniae</i> ssp. <i>flocktoniae</i>	Merritt
Shrubs	<i>Allocasuarina acutivalvis</i>	<b>Black Tamma</b>
	<i>Baeckea megaflorea</i>	
(parasitic twiner)	<i>Cassytha melantha</i>	Dodder
	<i>Dodonaea bursariifolia</i>	Hop Bush
	<i>Hakea multilineata</i>	
	<i>Melaleuca uncinata</i>	Broom Bush
	<i>Micromyrtus obovata</i>	



*Phebalium filifolium*

Slender Phebalium

**Plants adjacent to WYCH15**

Shrubs	<i>Astartea heteranthera</i>	
	<i>Daviesia benthamii</i> ssp. <i>benthamii</i>	
	<i>Dryandra conferta</i> var. <i>conferta</i>	
	<i>Grevillea huegelii</i>	
	<i>Hakea scoparia</i>	
	<i>Leptomeria preissiana</i>	
Grasses	<i>Maireana georgei</i>	
	<i>Austrostipa mollis</i>	
Herbs	<i>Trachymene cyanopetala</i>	
	(twiner) <i>Thysanotus patersonii</i>	Twining Fringe Lily

**WYCH16****Open Mallee [OM]****Location:** Lat: 31°16.386"S Long: 117°35.968"E**Aspect:** steep north east facing slope, on breakaway**Soil:** pink-grey sandy clay with scattered laterite (70%) over orange-grey sandy clay over laterite rock**Drainage:** moderate**Bare Ground:** 30-70%**Litter:** 2-10% cover to depth of cm**No. Plant Species:** 13 (12 native + 1 \*weed)**Condition Rating:** very good [note immediate surrounds are more disturbed]

*Eucalyptus tenera* **Open Mallee** over *Melaleuca coronicarpa* **Shrubland** over **Occasional Grasses and Herbs.**

**WYCH16 Structural layers and plant species** [bold = dominant]

Mallee	<i>Eucalyptus tenera</i>	
Shrubs	<i>Gastrolobium triangulare</i>	
	<i>Grevillea huegelii</i>	
	<i>Maireana carnosus</i>	Cottony Bluebush
	<i>Melaleuca coronicarpa</i>	
Grasses	<i>Austrodanthonia setacea</i>	Small Flower Wallaby Grass
	<i>Austrostipa elegantissima</i>	Feather Speargrass
	<i>Austrodanthonia</i> sp. Hairy Leaves	
	WSWA WYCH14/26	
Herbs	<i>Hydrocotyle rugulosa</i>	
	<i>Podolepis tepperi</i>	
	<i>Rhodanthe laevis</i>	Smooth Sunray
	(twiner) <i>Thysanotus patersonii</i>	Twining Fringe Lily
WEEDS - Grasses	* <i>Vulpia myuros</i>	Rat's Tail Fescue

**Plants adjacent to WYCH16**

Trees	<i>Eucalyptus capillosa</i> ssp. <i>capillosa</i>	Wheatbelt Wandoo
Shrubs	<i>Daviesia benthamii</i> ssp. <i>benthamii</i>	
	<i>Melaleuca uncinata</i>	Broom Bush
	<i>Westringia cephalantha</i>	
Herbs	<i>Blennospora drummondii</i>	
	<i>Goodenia berardiana</i>	

**WYCH17****Open Tree Mallee [OTM]****Location:** Lat: 31°16.418"S Long: 117°36.016" or 116E**Aspect:** gentle east facing slope**Soil:** pink-brown-salmon coloured sandy clay with scattered quartz and granite gravel over slightly darker sandy clay sub-surface soil**Drainage:** moderate to poor [note: water sheeting evident]**Bare Ground:** 20%**Litter:** 40% cover to depth of 2-5cm**No. Plant Species:** 29 (24 native + 5 \*weed)**Condition Rating:** very good to excellent

*Eucalyptus loxophleba* ssp. *loxophleba* [York Gum] **Low Woodland** over *Acacia erinacea* [Spiny Wattle] and *Daviesia nematophylla* **Open Shrubland** over *Maireana carnosae* [Cottony Bluebush] **Low Open Shrubland** over *Podolepis capillaris* [Wiry Capillaris] **Open Herbland** with **Occasional Grasses**.

**WYCH17 Structural layers and plant species** [bold = dominant]

Mallees	<i>Eucalyptus celastroides</i> ssp. <i>virella</i>	<b>Mirret</b>
	<i>Eucalyptus erythronema</i> var. <i>marginata</i>	Red Flowered Mallee
Shrubs	<i>Acacia</i> aff. <i>bidentata</i>	
	<i>Acacia erinacea</i>	<b>Spiny Wattle</b>
	<i>Acacia hemiteles</i>	Tan Wattle
	<i>Acacia merrallii</i>	Merrall's Wattle
	<i>Daviesia nematophylla</i>	
	<i>Maireana carnosae</i>	<b>Cottony Bluebush</b>
	<i>Maireana marginata</i>	
	<i>Sclerolaena diacantha</i>	
Grasses	<i>Templetonia sulcata</i>	
	<i>Austrodanthonia setacea</i>	Small Flower Wallaby Grass
Herbs	<i>Austrostipa elegantissima</i>	Feather Speargrass
	<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop
	<i>Erymophyllum ramosum</i>	
	<i>Goodenia berardiana</i>	
	<i>Goodenia pusilliflora</i>	
	<i>Hydrocotyle medicaginoidea</i>	Small Pennywort
	<i>Podolepis canescens</i>	Bright Podolepis
	<i>Podolepis capillaris</i>	
	<i>Pogonolepis stricta</i>	
	<i>Ptilotus spathulatus</i>	
	<i>Triglochin</i> sp. A Flora of Australia	Arrowgrass
	GJ Keighery 2477	
	<i>Velleia cynopotamica</i>	
WEED - Grasses	* <i>Bromus rubens</i>	
	* <i>Vulpia myuros</i>	Rat's Tail Fescue
WEED - Herbs	* <i>Arctotheca calendula</i>	Capeweed
	* <i>Mesembryanthemum nodiflorum</i>	Iceplant
	* <i>Sonchus oleraceus</i>	Common Sowthistle

**Plants adjacent to WYCH17**

Mallees	<i>Eucalyptus hypochlamydeae</i>	
	ssp. <i>ecdysiastes</i>	
Shrubs	<i>Olearia dampieri</i> var. <i>eremicola</i> ms	
WEED - Herbs	* <i>Parentucellia latifolia</i>	

**WYCH18****Open Mallee to Mallee<sup>1</sup> [OM-M<sup>1</sup>]****Location:** Lat: 31°16.335"S Long: 117°35.973"E**Aspect:** gentle south-east facing slope**Soil:** cream-brown sand with scattered lateritic pebbles over orange laterite coloured sands**Drainage:** well**Bare Ground:** 11-30%**Litter:** 31-70% cover to depth of 1cm**No. Plant Species:** 23 (19 native + 4\*weed)**Condition Rating:** excellent

*Eucalyptus tenera* **Mallee** over *Melaleuca uncinata* [Broombush] **Tall Open Shrubland** over **Mixed Grassland** over *Trachymene cyanopetala* **Herbland**.

**WYCH18****Structural layers and plant species** [bold = dominant]

Mallees	<i>Eucalyptus tenera</i>	
Shrubs	<i>Acacia fragilis</i>	
	<i>Boronia crenulata</i>	
(twiner)	<i>Comesperma volubile</i>	Love Creeper
	<i>Dodonaea bursariifolia</i>	
	<i>Gastrolobium parviflorum</i>	
	<i>Gastrolobium triangulare</i>	
	<i>Melaleuca uncinata</i>	<b>Broom Bush</b>
	<i>Westringia cephalantha</i>	
Grasses	<i>Austrodanthonia setacea</i>	<b>Small Flower Wallaby Grass</b>
	<i>Austrostipa elegantissima</i>	<b>Feather Speargrass</b>
Herbs	<i>Actinobole uliginosum</i>	Flannel Cudweed
	<i>Blennospora drummondii</i>	
	<i>Calandrinia calypttrata</i>	Pink Purslane
	<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop
	<i>Hydrocotyle rugulosa</i>	
	<i>Podolepis capillaris</i>	
	<i>Trachymene cyanopetala</i>	
	<i>Wahlenbergia preissii</i>	
WEED - Grasses	* <i>Aira caryophyllea/cupaniana</i>	Silvery Hairgrass
	* <i>Pentastichis airoides</i>	False Hairgrass
	* <i>Vulpia myuros</i>	Rat's Tail Fescue
WEED - Herbs	* <i>Hypochaeris glabra</i>	Flatweed

**Plants adjacent to WYCH18**

Trees	<i>Eucalyptus capillosa</i> ssp. <i>capillosa</i>	Wheatbelt Wandoo
Shrubs	<i>Acacia ? verricula</i>	
	<i>Dodonaea divaricata</i>	Hop Bush
	<i>Olearia dampieri</i> var. <i>eremicola</i> ms	
Herbs	<i>Patersonia drummondii</i> ssp. <i>drummondii</i>	
	<i>Pterostylis sargentii</i>	

**WYCH19****Tall Open Shrubland [TOSh]****Location:** Lat: 31°16.418"S Long: 117°36.115"E**Aspect:** gentle south, south-east facing slope**Soil:** light brown sandy loam over light brown sandy loam with laterite rock at depths of >100cm**Drainage:** well**Bare Ground:** 15%**Litter:** 60% cover to depth of <1cm**No. Plant Species:** 32 (27 native + 5 \*weed)**Condition Rating:** excellent

*Leptospermum erubescens* [Roadside Teatree] **Tall Open Shrubland** over *Acacia acuaria*, *Baeckea megaflorea* and *Olearia dampieri* var. *eremicola* ms **Open Heath** over *Platysace maxwellii* [Karno] **Low Open Shrubland** over *Aristida contorta* [Wind Grass] **Very Open Grassland** with **Occasional Herbs, Sedges and Rushes.**

**WYCH19****Structural layers and plant species** [bold = dominant]

Shrubs	<i>Acacia acuaria</i>	
	<i>Baeckea megaflorea</i>	
	<i>Dodonaea viscosa</i> ssp. <i>angustissima</i>	Sticky Hop Bush
	<i>Grevillea paniculata</i>	
	<i>Leptospermum erubescens</i>	Roadside Teatree
(twiner)	<i>Muehlenbeckia adpressa</i>	
	<i>Olearia dampieri</i> var. <i>eremicola</i> ms	
	<i>Platysace maxwellii</i>	Karno
Grasses	<i>Aristida contorta</i>	
	<i>Austrodanthonia setacea</i>	Small Flower Wallaby Grass
	<i>Austrostipa elegantissima</i>	Feather Speargrass
Herbs	<i>Caladenia roei</i>	Ant Orchid
	<i>Centrolepis pilosa</i>	
	<i>Crassula colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop
	<i>Drosera glanduligera</i>	Pimpernel Sundew
	<i>Goodenia berardiana</i>	
	<i>Hyalosperma demissum</i>	Tiny Sunray
	<i>Lomandra collina</i>	
	<i>Millotia tenuifolia</i>	Soft Millotia
	<i>Podolepis canescens</i>	Bright Podolepis
	<i>Podolepis capillaris</i>	
	<i>Stackhousia monogyna</i>	
	<i>Trachymene cyanopetala</i>	
	(twiner) <i>Thysanotus patersonii</i>	Twining Fringe Lily
	<i>Waitzia acuminata</i> ssp. <i>acuminata</i>	Orange Immortelle
Sedges/Rushes	<i>Desmocladius flexuosus</i>	
	<i>Lepidosperma tenue</i>	
WEED - Grasses	* <i>Aira caryophyllea</i> /cupaniana	Silvery Hairgrass
	* <i>Ehrharta longiflora</i>	Annual Veldt Grass
	* <i>Lolium</i> sp.	
WEED - Herbs	* <i>Hypochaeris glabra</i>	Flatweed
	* <i>Ursinia anthemoides</i>	

**Plants adjacent to WYCH19**

Shrubs	(twiner)	<i>Comesperma integerrimum</i>	
		<i>Gastrolobium parviflorum</i>	
		<i>Melaleuca radula</i>	Graceful Honeymyrtle
		<i>Melaleuca uncinata</i>	Broom Bush
		<i>Persoonia coriacea</i>	

	<i>Templetonia aculeata</i>	
Grasses	<i>Austrostipa tenuifolia</i>	
Herbs	<i>Actinobole uliginosum</i>	Flannel Cudweed
	<i>Borya sphaerocephala</i>	Pincushions
	<i>Brachyscome iberidifolia</i>	
	<i>Caladenia flava</i>	Cowslip Orchid
	<i>Dampiera lavandulacea</i>	
	<i>Erymophyllum ramosum</i>	
	<i>Glischrocaryon aureum</i> var. <i>aureum</i>	
	<i>Hyalosperma glutinosum</i> ssp. <i>glutinosum</i>	
	<i>Podotheca gnaphalioides</i>	
	<i>Ptilotus polystachyus</i> var. <i>polystachyus</i>	
	<i>Ptilotus spathulatus</i>	
	<i>Velleia cynopotamica</i>	
WEED - Herbs	<i>*Parentucellia latifolia</i>	

**WYCH20****Tall Shrubland to Tall Closed Scrub [TSh-TCSc]**

**Location:** Lat: 31°16.216"S Long: 117°36.055"E

**Aspect:** gentle west facing slope

**Soil:** greyish-brown sandy loam over greyish brown sandy loam to depth

**Drainage:** well

**Bare Ground:** 10-30%

**Litter:** 30-70% cover to depth of 1cm

**No. Plant Species:** 38 (38 native + 0 \*weed)

**Condition Rating:** excellent

*Allocasuarina acutivalvis* [Black Tamma] **Low Open Woodland** with *Eucalyptus incrassata* [Lerp Mallee] **Open Mallee** over *Allocasuarina campestris* ssp. *campestris* [Tamma] **Tall Shrubland** over *Acacia fragilis*, *A. heteroneura* var. *heteroneura* and *Grevillea hookeriana* [Red Tooth Brushes] **Open Heath** over *Hibbertia eatoniae* and *Melaleuca conothamnoides* **Low Open Heath** over *Ecdeiocolea monostachya* **Very Open Tall Sedgeland** over **Occasional grasses and Herbs.**

**WYCH20****Structural layers and plant species** [bold = dominant]

Mallees	<i>Eucalyptus incrassata</i>	Lerp Mallee
Shrubs	<i>Acacia fragilis</i>	
	<i>Acacia heteroneura</i> var. <i>heteroneura</i>	
	<i>Acacia nigripilosa</i> ssp. <i>nigripilosa</i>	
	<i>Allocasuarina acutivalvis</i>	Black Tamma
	<i>Allocasuarina campestris</i> ssp. <i>campestris</i>	Tamma
	<i>Astartea heteranthera</i>	
	<i>Brachyloma</i> sp.	
	<i>Drummondita hassellii</i>	
	<i>Enchylaena tomentosa</i>	Barrier Saltbush
	<i>Grevillea hookeriana</i>	
	<i>Hakea erecta</i>	
	<i>Hakea scoparia</i>	
	<i>Hibbertia exasperata</i>	
	<i>Isopogon scabriusculus</i>	
	<i>Leptospermum erubescens</i>	Roadside Teatree
	<i>Leucopogon sulcatus</i> ms	
	<i>Lysinema ciliatum</i>	Curry Plant
	<i>Melaleuca conothamnoides</i>	
	<i>Melaleuca scabra</i>	
	<i>Micromyrtus obovata</i>	

	<i>Persoonia saundersiana</i>	
	<i>Psammomoya choretroides</i>	
	<i>Verticordia chrysantha</i>	
Sedges/Rushes	<b><i>Ecdeiocolea monostachya</i></b>	
	<i>Lepidobolus preissianus</i> ssp. <i>preissianus</i>	
	<i>Lepidosperma</i> sp. A2 Island Flat (Keighery 7000)	
	<i>Schoenus nanus</i>	Tiny Bog Rush
	<i>Schoenus</i> sp.	Gimlet Bog Rush
Grasses	<i>Neurachne alopecuroidea</i>	Foxtail Mulga Grass
Herbs	<i>Chamaexeros macranthera</i>	
	<i>Conostylis teretifolia</i> ssp. <i>teretifolia</i>	
(twiner)	<i>Drosera macrantha</i> ssp. <i>macrantha</i>	Bridal Rainbow
	<i>Millotia tenuifolia</i>	Soft Millotia
	<i>Platysace trachymenioides</i>	
	<i>Podolepis capillaris</i>	
(twiner)	<i>Thysanotus patersonii</i>	Twining Fringe Lily
	<i>Wahlenbergia preissii</i>	

## Plants adjacent to WYCH20

Herbs	<i>Platysace maxwellii</i>	
(shrub-like)	<i>Xanthorrhoea ? nana</i>	Blackboy/Grass Tree

## Description of area WYCH21

## Grassland with Herbland [G + H]

Location: Lat: 31°16."S Long: 117°35."E

Aspect: very gentle south, south east facing slope

Soil: greyish-brown sandy loam over greyish brown sandy loam to depth

Drainage: moderate

Bare Ground: 15-40%

Litter: 10% cover to depth of 0.5cm

No. Plant Species: 16 (16 native + 0 \*weed)

Condition Rating: excellent

*Aristida contorta* [Wind Grass] **Grassland** and *Lomandra collina* [Pale Mat Rush], *Podolepis capillaris* [Wiry Podolepis], *Dampiera lavandulacea* and *Stackhousia monogyna* **Herbland** with occasional emergent shrubs of *Dodonaea viscosa* ssp. *angustissima* [Sticky Hop Bush], *Melaleuca scabra* [Wurru Bush] and *Platysace maxwellii* [Karno].

## WYCH21 Structural layers and plant species [bold = dominant]

Shrubs	<i>Dodonaea viscosa</i> ssp. <i>angustissima</i>	Sticky Hop Bush
	<i>Guichenotia micrantha</i>	
	<i>Lysiosepalum hexandrum</i>	
	<i>Melaleuca scabra</i>	
	<i>Platysace maxwellii</i>	
Grasses	<b><i>Aristida contorta</i></b>	<b>Wind Grass</b>
	<i>Austrostipa</i> Sp Hairy Leaves	
	WSWA WYCH19/H	
Herbs	<i>Borya sphaerocephala</i>	Pincushions
	<b><i>Dampiera lavandulacea</i></b>	
	<i>Drosera glanduligera</i>	Pimpernel Sundew
	<b><i>Lomandra collina</i></b>	<b>Pale Mat Rush</b>
	<i>Podolepis canescens</i>	Bright Podolepis
	<b><i>Podolepis capillaris</i></b>	<b>Wiry Podolepis</b>
	<i>Podothea angustifolia</i>	



**APPENDIX E1: FLORA RECORDED FOR "ELASHGIN-FAULKNER ROAD BUSHLAND", WYALKATCHEM**  
**- SHOWING OCCURRENCE IN WYCR QUADRATS - by Plant Family Order** (Recordings and collections made 4/9/00, 16/9/00 and/or 27/1/01)

**LEGEND** (Refer also Appendix A for explanation of terminology)

- FAMILY, GENUS, SPECIES = PLANT TAXA
- NO. = Plant Family Reference Number, as used in classification by WA Herbarium
- LIFE FORM = 'A' for annual + 'P' for perennial
- GROWTH FORM = shape & ability of plant to lay down woody tissue
- WYCR QUADRATS = the 12 10mx10m quadrats surveyed (a = adjacent to the Quadrat, but same plant community)
- OPPO = opportunistic collection (ie not in or adjacent to WYCR Quadrats)
- \* = introduced plant / weed
- ▲ = priority flora (Refer Section 5)
- ms = manuscript name (recently described species, awaiting acceptance)
- aff. = affinity
- sp. = species
- ssp. = subspecies
- var. = variety
- x = hybrid

FAMILY	NO.	GENUS	SPECIES (Botanical Name)	COMMON NAME	FORMS LIFE GROWTH	WYCR	QUADRATS	OPPO
JUNCAGINACEAE	26	<i>Triglochin</i>	<i>minutissima</i> var. <i>elongatum</i>	Prickly Arrowgrass	A herb	2a		
JUNCAGINACEAE	26	<i>Triglochin</i>	<i>mucronata</i>	Arrowgrass	A herb	1		
POACEAE	31	* <i>Aira</i>	<i>caryophyllea/cupaniana</i>	Silvery Hairgrass	A grass weed	2a		
POACEAE	31	<i>Austrodanthonia</i>	<i>setacea</i>	Small Flower Wallaby Grass	grass	4 5		
POACEAE	31	<i>Austrodanthonia</i>	sp. Hairy Leaves WSWA WYCH14/26		P grass	5		
POACEAE	31	<i>Austrodanthonia</i>	sp.		grass	4		
POACEAE	31	<i>Austrostipa</i>	<i>elegantissima</i>	Feather Speargrass	P grass	2 3 4 5		
POACEAE	31	<i>Austrostipa</i>	sp.		P grass	2		
POACEAE	31	* <i>Avena</i>	<i>barbata</i>	Wild Oat	A grass weed	2a 4		
POACEAE	31	* <i>Bromus</i>	<i>rubens</i>		A grass weed	2a 4 5		
POACEAE	31	* <i>Hordeum</i>	<i>leporinum</i>	Barley Grass	A grass weed	3 5		
POACEAE	31	* <i>Lamarckia</i>	<i>aurea</i>		A grass weed	4		
POACEAE	31	* <i>Lolium</i>	<i>rigidum</i>	Wimmera Ryegrass	A grass weed	1a		
POACEAE	31	* <i>Lolium</i>	sp.	Ryegrass	A grass weed	1 2 4 5		
POACEAE	31	* <i>Parapholis</i>	<i>incurva</i>		A grass weed	2a		
POACEAE	31	* <i>Phalaris</i>	<i>minor</i>		A grass weed	1a		
POACEAE	31	* <i>Vulpia</i>	<i>myuros</i>	Rat's Tail Fescue	A grass weed	1 2 3		
POACEAE	31	* <i>Vulpia</i>	sp.		A grass weed	2		
CYPERACEAE	32	<i>Schoenus</i>	<i>humilis</i>		A sedge	2		

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	FORMS LIFE GROWTH	WYCR	QUADRATS	OPPO
ANTHERICACEAE	54F	<i>Arthropodium curvipes</i>			P herb	2		
ANTHERICACEAE	54F	<i>Thysanotus britanii</i>		Fringe Lily	P herb		4a	
ANTHERICACEAE	54F	<i>Thysanotus patersonii</i>		Twining Fringe Lily	P climber	2a		
ASPHODELACEAE	54G	<i>Bulbine semibarbata</i>		Leek Lily	A herb	1a	3a 5	
HYPOXIDACEAE	56A	<i>Hypoxis</i> sp.			A herb		3	
URTICACEAE	88	<i>Parietaria debilis</i>			A herb	2	4	
PROTEACEAE	90	<i>Grevillea hakeoides</i> ssp. <i>hakeoides</i>			P shrub		4	
PROTEACEAE	90	<i>Hakea kippistiana</i>			P shrub			✓
SANTALACEAE	92	<i>Exocarpos aphyllus</i>		Leafless Ballart	P shrub		3	
SANTALACEAE	92	<i>Santalum acuminatum</i>		Quandong	P shrub		4a	
LORANTHACEAE	97	<i>Amyema preissii</i>		Mistletoe	P Parasitic shrub			✓
LORANTHACEAE	97	<i>Lysiana casuarinae</i>		Mistletoe	P Parasitic shrub	1		
CHENOPODIACEAE	105	<i>Atriplex holocarpa</i>			P shrub	1		
CHENOPODIACEAE	105	<i>Atriplex stipitata</i>			P shrub	1	2 3 4 5	
CHENOPODIACEAE	105	<i>Enchylaena lanata</i>			P shrub	2		
CHENOPODIACEAE	105	<i>Enchylaena tomentosa</i>		Barrier Saltbush	P shrub	2	3 4 5	
CHENOPODIACEAE	105	<i>Halosarcia</i> aff. <i>pergranulata</i>			P shrub	1		
CHENOPODIACEAE	105	<i>Halosarcia doleiformis</i>			P shrub	1		
CHENOPODIACEAE	105	<i>Halosarcia indica</i> ssp. <i>bidens</i>			P shrub	2		
CHENOPODIACEAE	105	<i>Halosarcia pergranulata</i>			P shrub	1		
CHENOPODIACEAE	105	<i>Halosarcia undulata</i>			P shrub	1		
CHENOPODIACEAE	105	<i>Maireana carnosa</i>		Cottony Bluebush	P shrub		3 4	
CHENOPODIACEAE	105	<i>Maireana trichoptera</i>			P shrub	2		
CHENOPODIACEAE	105	<i>Rhagodia drummondii</i>			P shrub	2	3 4	
CHENOPODIACEAE	105	<i>Rhagodia preissii</i> ssp. <i>preissii</i>			P shrub		5	
CHENOPODIACEAE	105	<i>Sclerolaena diacantha</i>			P shrub		3	5
AMARANTHACEAE	106	<i>Ptilotus divaricatus</i>			A herb		4	
AIZOACEAE	110	* <i>Mesembryanthemum nodiflorum</i>		Iceplant	A/B herb weed	1	3a 4	
AIZOACEAE	110	<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>			A herb	1a	2 3 4 5	

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	FORMS LIFE	GROWTH	WYCR	QUADRATS	OPPO
AIZOACEAE	110	<i>Gunnipopsis septifraga</i>					1a		
PORTULACACEAE	111	<i>Calandrinia eremaea</i>			A	herb		3	5
PORTULACACEAE	111	<i>Calandrinia granulifera</i>		Pygmy Purslane	A	herb	1	2	5
CARYOPHYLLACEAE	113	* <i>Petrorhagia velutina</i>			A	herb weed		2a	
CARYOPHYLLACEAE	113	* <i>Spergula diandra</i>		Lesser Sand Spurry	A	herb weed	1		
RANUNCULACEAE	119	<i>Clematis delicata</i>			P	shrub		2	5a
BRASSICACEAE	138	* <i>Brassica tournefortii</i>		Wild Turnip	A	herb weed		2	5
BRASSICACEAE	138	<i>Lepidium rotundum</i>		Veined Peppergrass	A	herb		3	
BRASSICACEAE	138	<i>Menkea australis</i>		Fairy Spectacles	A	herb		1a	
CRASSULACEAE	149	<i>Crassula colorata</i> ssp. <i>acuminata</i>		Dense Stonecrop	A	herb		2	4
								5a	
PITTOSPORACEAE	152	<i>Pittosporum phylliraeoides</i> var. <i>microphylla</i>			P	shrub		2	
MIMOSACEAE	163	<i>Acacia nyssophylla</i>			P	shrub		2	3
PAPILIONACEAE	165	<i>Templetonia smithiana</i>			P	shrub		2	4
PAPILIONACEAE	165	* <i>Trifolium</i> sp.		Clover	A	herb weed		2	5
PAPILIONACEAE	165	* <i>Trifolium subterraneum</i>		Clover	A	herb weed			5
GERANIACEAE	167	<i>Erodium cygnorum</i>		Blue Storkbill	P	herb			5
ZYGOPHYLLACEAE	173	<i>Zygophyllum eremaeum</i>			A	herb			
FRANKENIACEAE	236	<i>Frankenia pauciflora</i>			P	shrub		2a	4
FRANKENIACEAE	236	<i>Frankenia</i> sp. WSWA WYCR0115 (C Keating)			P	shrub		1	
MYRTACEAE	273	<i>Eucalyptus loxophleba</i> ssp. <i>lissophloia</i>		York Gum	P	tree		2	3
MYRTACEAE	273	<i>Eucalyptus salubris</i>		Gimlet	P	tree			5
MYRTACEAE	273	<i>Melaleuca adenostyla</i>			P	shrub			
MYRTACEAE	273	<i>Melaleuca halmaturorum</i>			P	shrub		1	2a
MYRTACEAE	273	<i>Melaleuca lateriflora</i> ssp. <i>lateriflora</i>			P	shrub			4a
MYRTACEAE	273	<i>Melaleuca radula</i>		Graceful Honeymyrtle	P	shrub			4a
MYRTACEAE	273	<i>Melaleuca uncinata</i>		Broom Bush	P	shrub			
APIACEAE	281	<i>Daucus glochidiatus</i>		Small Pennywort	A	herb		1	5
APIACEAE	281	<i>Hydrocotyle medicaginoidea</i>		Small Pennywort	A	herb		2	3
PRIMULACEAE	293	* <i>Anagallis arvensis</i>		Pimpernel	A	herb weed		1a	2a
SOLANACEAE	315	<i>Cyphanthera microphyllum</i>			P	shrub			

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	FORMS LIFE GROWTH	WYCR	QUADRATS	OPPO
SOLANACEAE	315	<i>Lycium australe</i>			P shrub	2 3 4 5		
SCROPHULARIACEAE	316	* <i>Parentucellia latifolia</i>			A herb weed	2a		
MYOPORACEAE	326	<i>Eremophila decipiens</i> <i>ssp. decipiens</i>		Slender Fuschia	P shrub	2		
MYOPORACEAE	326	<i>Eremophila deserti</i>			P shrub			✓
CAMPANULACEAE	339	<i>Wahlenbergia preissii</i>			A herb	4		
GOODENIACEAE	341	<i>Dampiera lavandulacea</i>			herb	4		
GOODENIACEAE	341	<i>Goodenia affinis</i>			herb			✓
GOODENIACEAE	341	<i>Goodenia pusilliflora</i>			herb	5		
ASTERACEAE	345	<i>Actinobole uliginosum</i>		Flannel Cudweed	A herb	1a 2		
ASTERACEAE	345	* <i>Arctotheca calendula</i>		Capeweed	A herb weed	1a 2a		
ASTERACEAE	345	<i>Argyroglossis turbinata</i>			A shrub	2		
ASTERACEAE	345	<i>Brachyscome iberidifolia</i>			A herb	2		
ASTERACEAE	345	<i>Calotis hispidula</i>		Bindy Eye	A herb	1a		
ASTERACEAE	345	* <i>Cotula bipinnata</i>			A herb weed	1a 3 4		
ASTERACEAE	345	<i>Erymophyllum ramosum</i>			A herb	3		
ASTERACEAE	345	<i>Hyalosperma glutinosum</i> <i>ssp. glutinosum</i>			A herb	3a 4		
ASTERACEAE	345	* <i>Hypochaeris glabra</i>		Flatweed	A herb weed	1a 3		
ASTERACEAE	345	<i>Millotia myosotidifolia</i>			A herb	5		
ASTERACEAE	345	<i>Olearia muelleri</i>		Dusky Daisybush	P hrub	2		
ASTERACEAE	345	* <i>Osteospermum clandestinum</i>		Stinking Roger	A herb weed	1a 3a 5		
ASTERACEAE	345	<i>Podolepis canescens</i>		Bright Podolepis	A herb	2a		
ASTERACEAE	345	<i>Podolepis capillaris</i>			A herb	3 4 5		
ASTERACEAE	345	<i>Podotheca angustifolia</i>			A herb	2		
ASTERACEAE	345	<i>Podotheca gnaphalioides</i>			A herb	2		
ASTERACEAE	345	<i>Pogonolepis stricta</i>			A herb	3 4 5		
ASTERACEAE	345	<i>Rhodanthe corymbosa</i>			A herb	2		
ASTERACEAE	345	<i>Rhodanthe pygmaea</i>		Pink Sunray	A herb	3		
ASTERACEAE	345	<i>Senecio glossanthus</i>		Slender Groundsel	A herb	2 5		
ASTERACEAE	345	<i>Siloxerus pygmaeus</i>			A herb	2		
ASTERACEAE	345	* <i>Sonchus oleraceus</i>		Common Sowthistle	A herb weed	2a 3 5		
ASTERACEAE	345	* <i>Sonchus tenerrimus</i>		Clammy Sowthistle	A herb weed	5		
ASTERACEAE	345	<i>Waltzia acuminata</i> <i>ssp. acuminata</i>		Orange Immortelle	A herb	2		

## APPENDIX E2: FLORA RECORDED FOR "HUTCHY'S" BLOCK, CARDIFF PASTORAL CO., WYALKATCHEM

- SHOWING OCCURRENCE IN WYCH QUADRATS - Plant Family Order (Recordings and collections made 4/9/00, 16/9/00, 17/9/00 and/or 28/11/01)

## LEGEND (Refer also Appendix A for explanation of terminology)

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- NO. = Plant Family Reference Number, as used in classification by WA Herbarium
- LIFE FORM = 'A' for annual + 'P' for perennial
- GROWTH FORM = shape & ability of plant to lay down woody tissue
- WYCH QUADRATS = the 12 10mx10m quadrats surveyed (a = adjacent to the Quadrat, but same plant community)
- OPPO = opportunistic collection (ie not in or adjacent to WYCH Quadrats)
- \* = introduced plant / weed
- ▲ = priority flora (Refer Section 5)
- ms = manuscript name (recently described species, awaiting acceptance)

FAMILY	NO.	GENUS	SPECIES (Botanical Name)	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH QUADRATS												OPPO
JUNCAGINACEAE	26	<i>Triglochin</i> sp. A	Flora of Australia GJ Keighery 2477	Arrowgrass	A	herb	17												
POACEAE	31	* <i>Aira caryophyllea</i> / <i>cupaniana</i>		Silvery Hairgrass	A	grass weed	18	19											
POACEAE	31	<i>Aristida conforta</i>			P	grass	19												
POACEAE	31	<i>Austrodanthonia setacea</i>		Small Flower Wallaby Grass		grass	13	16	17	18	19								
POACEAE	31	<i>Austrodanthonia</i> sp. Hairy Leaves WSWA WYCH14/26			P	grass	12	14	16										
POACEAE	31	<i>Austrodanthonia</i> sp. Hairy Leaves WSWA WYCH19/H			P	grass													21
POACEAE	31	<i>Austrodanthonia</i> sp.				grass	13												
POACEAE	31	<i>Austrostipa elegantissima</i>		Feather Speargrass	P	grass	10	13	14	16	17	18	19						
POACEAE	31	<i>Austrostipa mollis</i>			P	grass				15a									
POACEAE	31	<i>Austrostipa tenuifolia</i>			P	grass	12	14					19a						
POACEAE	31	* <i>Bromus rubens</i>			A	grass weed				17									
POACEAE	31	* <i>Ehrharta longiflora</i>		Annual Veldt Grass	A	grass weed							19						
POACEAE	31	* <i>Lolium</i> sp.			A	grass weed							19						
POACEAE	31	* <i>Pentaschistis airoides</i>		False Hairgrass	A	grass weed							18						
POACEAE	31	* <i>Vulpia myuros</i>		Rat's Tail Fescue	A	grass weed			16	17	18								
POACEAE	31	* <i>Vulpia ? myuros</i>		Rat's Tail Fescue	A	grass weed	8	9											

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH QUADRATS					OPPO
POACEAE	31	*Vulpia sp.	Fescue		A	grass weed						✓
POACEAE	31	Neurachne alopecuroides	Foxtail Mulga Grass		P	grass	8	10	11			
CYPERACEAE	32	Lepidosperma brunonianum			P	sedge	9				20	
CYPERACEAE	32	Lepidosperma tenue			P	sedge	8		11a		19	
CYPERACEAE	32	Lepidosperma viscidum			P	sedge		10				
CYPERACEAE	32	Lepidosperma sp. A2 Island Flat (Keighery 7000)			P	sedge	8a	11a	13a	14a	20	
CYPERACEAE	32	Mesomelaena preissii			P	sedge	8					
CYPERACEAE	32	Schoenus aff. hexandrus			P	sedge	8					
CYPERACEAE	32	Schoenus calcatus			A	sedge		10				
CYPERACEAE	32	Schoenus clandestinus			A	sedge	8	9a				
CYPERACEAE	32	▲ Schoenus griffinianus			A	sedge	9	10				
CYPERACEAE	32	Schoenus hexandrus			P	sedge	8	10				
CYPERACEAE	32	Schoenus nianus	Tiny Bog Rush		A	sedge		11			20	
CYPERACEAE	32	Schoenus sp.	Gimlet Bog Rush		A	sedge					20	
RESTIACEAE	39	Desmodiulus flexuosus			P	rush					19	
RESTIACEAE	39	Lepidobolus preissianus ssp. preissianus			P	rush		10			20	
ECDEIOCOLEACEAE	39A	Ecdiocollea monostachya			P	rush	9	10		13		
CENTROLEPIDACEAE	40	Centrolepis pilosa			A	herb					19	
XANTHORRHOACEAE	54B	Xanthorrhoea ? nana			P	herb	8	10			20a	
DASYPOGONACEAE	54C	Chamaexeros fimbriata			P	herb						
DASYPOGONACEAE	54C	Chamaexeros macranthera			P	herb					20	
DASYPOGONACEAE	54C	Lomandra collina			P	herb				13a	19	21
DASYPOGONACEAE	54C	Lomandra effusa			P	herb				13		
ANTHERICACEAE	54F	Caesia alfordii			P	herb		11a				
ANTHERICACEAE	54F	Dichopogon ? fimbriatus			P	herb				14a		
ANTHERICACEAE	54F	Thysanotus patersonii	Twining Fringe Lily		P	climber	10	11a	13	14	15a	16
ANTHERICACEAE	54F	Thysanotus sp.	Fringe Lily		P	herb				14a		
BORYACEAE	54L	Borya laciniata	Pincushions		P	herb		9a				
BORYACEAE	54L	Borya sphaerocephala	Pincushions		P	herb					19a	21
HAEMODORACEAE	55	Conostylis teretifolia ssp. teretifolia			P	herb	8	10a	11a	13a		
IRIDACEAE	60	Patersonia drummondii ssp. borealis			P	herb	8					



FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH QUADRATS							OPPO
IRIDACEAE	60	<i>Paterosnia drummondii</i> <i>ssp. drummondii</i>			P	herb	10	13				18a		
ORCHIDACEAE	66	<i>Caladenia flava</i>		Cowslip Orchid	P	herb							19a	
ORCHIDACEAE	66	<i>Caladenia roei</i>		Ant Orchid	P	herb	9a						19	
ORCHIDACEAE	66	<i>Pterostylis sargentii</i>			P	herb							18a	
CASUARINACEAE	70	<i>Allocasuarina acutivalvis</i>		Black Tamma	P	shrub	8	11a	12	14	15			
CASUARINACEAE	70	<i>Allocasuarina campestris</i> <i>ssp. campestris</i>		Tamma	P	shrub	8	9	10	11			20	
PROTEACEAE	90	<i>Dryandra conferta</i> <i>var. conferta</i>			P	shrub	8a	10				15a		
PROTEACEAE	90	<i>Dryandra purdieana</i>			P	shrub	8	10						
PROTEACEAE	90	<i>Grevillea didymobotrya</i> <i>ssp. didymobotrya</i>			P	shrub								✓
PROTEACEAE	90	<i>Grevillea hakeoides</i> <i>ssp. stenophylla</i>			P	shrub		11a						
PROTEACEAE	90	<i>Grevillea hookeriana</i>			P	shrub	8	9	10a				20	
PROTEACEAE	90	<i>Grevillea huegelii</i>			P	shrub					15a	16		
PROTEACEAE	90	<i>Grevillea paniculata</i>			P	shrub				13			19	
PROTEACEAE	90	<i>Grevillea petrophiloides</i>		Poker Grevillea	P	shrub		11a						
PROTEACEAE	90	<i>Hakea erecta</i>			P	shrub							20	
PROTEACEAE	90	<i>Hakea incrassata</i>			P	shrub	8							
PROTEACEAE	90	<i>Hakea multiflora</i>			P	shrub				12		15		
PROTEACEAE	90	<i>Hakea recurva</i>			P	shrub								✓
PROTEACEAE	90	<i>Hakea scoparia</i>			P	shrub			10a	11		15a		
PROTEACEAE	90	<i>Isopogon scabrusculus</i>			P	shrub	8a	10	11a				20	
PROTEACEAE	90	<i>Persoonia coriacea</i>			P	shrub							19a	
PROTEACEAE	90	<i>Persoonia quinquerivis</i>			P	shrub	8							
PROTEACEAE	90	<i>Persoonia saundersiana</i>			P	shrub							20	
PROTEACEAE	90	<i>Persoonia trinervis</i>			P	shrub		10						
PROTEACEAE	90	<i>Petrophile shuttleworthiana</i>			P	shrub				11				
PROTEACEAE	90	<i>Synaphea interioris</i>			P	shrub	8		10a					
SANTALACEAE	92	<i>Exocarpos aphyllus</i>		Leafless Ballart	P	shrub		2						✓
SANTALACEAE	92	<i>Leptomeria preissiana</i>			P	shrub						15a		
SANTALACEAE	92	<i>Santalum acuminatum</i>		Quandong	P	shrub				11a				
POLYGONACEAE	103	<i>Muehlenbeckia adpressa</i>			P	climber							19	
CHENOPODIACEAE	105	<i>Enchylaena lanata</i>			P	shrub					14			

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH QUADRATS				OPPO			
CHENOPODIACEAE	105	<i>Enchylaena tomentosa</i>		Barrier Saltbush	P	shrub					20			
CHENOPODIACEAE	105	<i>Maireana carnosae</i>		Cottony Bluebush	P	shrub			16	17				
CHENOPODIACEAE	105	<i>Maireana georgei</i>			P	shrub			15a					
CHENOPODIACEAE	105	<i>Maireana marginata</i>			P	shrub				17				
CHENOPODIACEAE	105	<i>Sclerolaena diacantha</i>			P	shrub				17				
AMARANTHACEAE	106	<i>Ptilotus polystachyus</i> var. <i>polystachyus</i>			A	herb					19a			
AMARANTHACEAE	106	<i>Ptilotus spathulatus</i>			P	herb				17	19a			
AIZOACEAE	110	<i>*Mesembryanthemum nodiflorum</i>		Iceplant	A/B	herb weed				17				
PORTULACACEAE	111	<i>Calandrinia calypttrata</i>		Pink Purslane	A	herb					18			
PORTULACACEAE	111	<i>Calandrinia eremaea</i>			A	herb			14					
LAURACEAE	131	<i>Cassytha flava</i>		Dodder	P	twiner			10					
LAURACEAE	131	<i>Cassytha melantha</i>		Dodder	P	twiner			8	10	15			
LAURACEAE	131	<i>Cassytha pomiformis</i>		Dodder	P	twiner			11a					
BRASSICACEAE	138	<i>Lepidium</i> sp.		Peppercress	A	herb			14					
DROSERACEAE	143	<i>Drosera androsacea</i>			A	herb			8					
DROSERACEAE	143	<i>Drosera glanduligera</i>		Pimpernel Sundew	A	herb			8		19	21		
DROSERACEAE	143	<i>Drosera macrantha</i> ssp. <i>macrantha</i>		Bridal Rainbow	P/A	herb climber			8	9	10	11a	20	
CRASSULACEAE	149	<i>Crassula colorata</i> ssp. <i>acuminata</i>		Dense Stonecrop	A	herb			10	11a	14	17	18	19
PITTOSPORACEAE	152	<i>Billardiera coriacea</i>			P	climber			13a					
MIMOSACEAE	163	<i>Acacia acutaria</i>			P	shrub			12	13	14a			19
MIMOSACEAE	163	<i>Acacia</i> aff. <i>bidentata</i>			P	shrub						17		
MIMOSACEAE	163	<i>Acacia densiflora</i>			P	shrub								
MIMOSACEAE	163	<i>Acacia erinacea</i>		Spiny Wattle	P	shrub						17		
MIMOSACEAE	163	<i>Acacia fragilis</i>			P	shrub					14a		18	20
MIMOSACEAE	163	<i>Acacia hemiteles</i>		Tan Wattle	P	shrub						17		
MIMOSACEAE	163	<i>Acacia heteroneura</i> var. <i>heteroneura</i>			P	shrub							20	
MIMOSACEAE	163	<i>Acacia jacksonioides</i>			P	shrub								
MIMOSACEAE	163	<i>Acacia lasiocalyx</i>			P	shrub								
MIMOSACEAE	163	<i>Acacia merrallii</i>		Merrall's Wattle	P	shrub						17		
MIMOSACEAE	163	<i>Acacia multispicata</i>			P	shrub				9a				
MIMOSACEAE	163	<i>Acacia nigripilosa</i>			P	shrub			8a	11	12	14a		20

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH QUADRATS					OPPO
			<i>ssp. nigripilosa</i>									
MIMOSACEAE	163	<i>Acacia phaeocalyx</i>			P	shrub	8	9a				
MIMOSACEAE	163	<i>Acacia stereophylla</i> var. <i>stereophylla</i>			P	shrub		9				
MIMOSACEAE	163	<i>Acacia ? verrucula</i>			P	shrub					18a	
MIMOSACEAE	163	<i>Acacia yorkakinensis</i> <i>ssp. acrita</i>		Yorkakine Wattle	P	shrub		13				
CAESALPINIACEAE	164	<i>Senna artemisioides</i> <i>ssp. artemisioides</i>			P	shrub						✓
PAPILIONACEAE	165	<i>Daviesia benthamii</i> <i>ssp. benthamii</i>			P	shrub	12	13a	15a	16a		
PAPILIONACEAE	165	<i>Daviesia hakeoides</i> <i>ssp. subnuda</i>			P	shrub	10					
PAPILIONACEAE	165	<i>Daviesia nematophylla</i>			P	shrub				17		
PAPILIONACEAE	165	<i>Daviesia nudiflora</i> <i>ssp. drummondii</i>			P	shrub	10					
PHORMIACEAE	165	<i>Dianella revoluta</i>		Blueberry Lily	P	herb		14a				
PAPILIONACEAE	165	<i>Gastrolobium parviflorum</i>			P	shrub		13a		18	19a	
PAPILIONACEAE	165	<i>Gastrolobium spinosum</i> <i>ssp. spinosum</i>			P	shrub		11a	14			
PAPILIONACEAE	165	<i>Gastrolobium triangulare</i>			P	shrub			16	18		
PAPILIONACEAE	165	<i>Gompholobium obcordatum</i>			P	shrub	8	10				
PAPILIONACEAE	165	<i>Mirbelia trichocalyx</i>			P	shrub	8a					
PAPILIONACEAE	165	<i>Templetonia aculeata</i>			P	shrub				19a		
PAPILIONACEAE	165	<i>Templetonia sulcata</i>		Centpede Bush	P	shrub			17			
GERANIACEAE	167	<i>Erodium cygnorum</i>		Storksbill		herb				18		
RUTACEAE	175	<i>Boronia crenulata</i>			P	shrub					20	
RUTACEAE	175	<i>Drummondita hassellii</i>			P	shrub						
RUTACEAE	175	<i>Phebalium filifolium</i>		Slender Phebalium	P	shrub		11	12	14	15	
RUTACEAE	175	<i>Phebalium tuberculosum</i>			P	shrub	10a	11a	13a		19a	
POLYGALACEAE	183	<i>Comesperma integerrimum</i>			P	Shrub twiner						
POLYGALACEAE	183	<i>Comesperma scoparium</i>			P	shrub	8	10				
POLYGALACEAE	183	<i>Comesperma volubile</i>		Love Creeper	P	climber		13		18		
EUPHORBIACEAE	185	<i>Stachystemon</i>				herb	8a					

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH QUADRATS										OPPO
brachyphyllus																	
CELASTRACEAE	199	Psammomoya	choretroides		P	shrub	8	10	11a							20	
STACKHOUSIACEAE	202	Stackhousia	monogyna		A	herb										19	21
SAPINDACEAE	207	Dodonaea	bursariifolia		P	shrub			12a	15						18	
SAPINDACEAE	207	Dodonaea	divaricata	Hop Bush	P	shrub										18a	
SAPINDACEAE	207	Dodonaea	viscosa	Sticky Hop Bush	P	shrub										19	21
ssp. angustissima																	
RHAMNACEAE	215	Stenanthemum			P	shrub		10a	11a	12		14					
pomaderroides																	
STERCULIACEAE	223	Guichenotia	micrantha		P	shrub											21
STERCULIACEAE	223	Lysiosepalum	hexandrum		P	shrub											21
DILLeniACEAE	226	Hibbertia	exasperata		P	shrub	8	9a	10a	11	12	13	14a			20	
DILLeniACEAE	226	Hibbertia	polystachya		P	shrub		10									
VIOLACEAE	243	Hybanthus	floribundus		A	herb											✓
ssp. adpressa																	
MYRTACEAE	273	Astartea	heteranthera		P	shrub			11a				15a			20	
MYRTACEAE	273	Baeckea	megaflorea		P	shrub			11	12	13	14a	15			19	
MYRTACEAE	273	Beaufortia	interstans		P	shrub		10									
MYRTACEAE	273	Calytrix	violacea		P	shrub	8a	10								20	
MYRTACEAE	273	Chamelaucium	aff. pauciflorum		P	shrub		10									
MYRTACEAE	273	Chamelaucium	drummondii		P	shrub											✓
ssp. hallii																	
MYRTACEAE	273	Eucalyptus	brachycorys	Cowcowing Mallee	P	mallee		9a	11								
MYRTACEAE	273	Eucalyptus	capillosa	Wheatbelt Wandoo	P	tree							16a			18a	
ssp. capillosa																	
MYRTACEAE	273	Eucalyptus	celastroides	Mirret	P	mallee										17	
ssp. virella																	
MYRTACEAE	273	Eucalyptus	erythronema	Red Flowered Mallee	P	mallee										17	
var. marginata																	
MYRTACEAE	273	Eucalyptus	flocktoniae	Merrit	P	mallee				12	13	14					
ssp. flocktoniae																	
MYRTACEAE	273	Eucalyptus	hypochlamydeae		P				11a			14a				17a	
ssp. ecdysiastes																	
MYRTACEAE	273	Eucalyptus	incrassata	Lerp Mallee	P	mallee			11a	12a		14				20	
MYRTACEAE	273	Eucalyptus	oldfieldii	Oldfield's Mallee	P	mallee		10a				13					

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH QUADRATS										OPPO
MYRTACEAE	273	<i>Eucalyptus pluricaulis</i> <i>ssp. pluricaulis</i>		-	P	mallee	11a	12	14								
MYRTACEAE	273	<i>Eucalyptus tenera</i>			P	mallee			14	16	18						
MYRTACEAE	273	<i>Leptospermum erubescens</i>	Roadside Teatree		P	shrub	8	9	10			19	20				
MYRTACEAE	273	<i>Melaleuca conothamnoides</i>			P	shrub	8	9	10	11a	12a						
MYRTACEAE	273	<i>Melaleuca coroncarpa</i>			P	shrub					16						
MYRTACEAE	273	<i>Melaleuca lateriflora</i> <i>ssp. lateriflora ms</i>	Gorada		P	shrub											✓
MYRTACEAE	273	<i>Melaleuca orbicularis</i>			P	shrub	8		10a								
MYRTACEAE	273	<i>Melaleuca radula</i>	Graceful Honeymyrtle		P	shrub									19a		
MYRTACEAE	273	<i>Melaleuca scabra</i>			P	shrub	10a	11							20	21	
MYRTACEAE	273	<i>Melaleuca uncinata</i>	Broom Bush		P	shrub	11	12	13	14a	15	16a	18	19a			
MYRTACEAE	273	<i>Micromyrtus obovata</i>			P	shrub	11a				15				20		
MYRTACEAE	273	<i>Verticordia acerosa</i> <i>var. preissii</i>			P	shrub											✓
MYRTACEAE	273	<i>Verticordia brachypoda</i>			P	shrub	9										
MYRTACEAE	273	<i>Verticordia chrysantha</i>			P	shrub	8a		10						20		
MYRTACEAE	273	<i>Verticordia eriocephala</i>			P	shrub	8a										
MYRTACEAE	273	<i>Verticordia picta</i>			P	shrub											✓
HALORAGACEAE	276	<i>Glischrocaryon aureum</i> <i>var. aureum</i>			A	herb									19a		
APIACEAE	281	<i>Hydrocotyle medicaginoide</i>	Small Pennywort		A	herb									17		
APIACEAE	281	<i>Hydrocotyle rugulosa</i>			A	herb				16							
APIACEAE	281	<i>Platysace maxwellii</i>			A	herb		12		14a			19	20a	21		
APIACEAE	281	<i>Platysace trachymenioides</i>			A	herb									20		
APIACEAE	281	<i>Trachymene cyanopetala</i>	Spongefruit		A	herb		12	13	14	15a		18	19			
APIACEAE	281	<i>Trachymene sp.</i>			A	herb			10								
EPACRIDACEAE	288	<i>Astroloma serratifolium</i> <i>ssp. horridulum</i>	Cankerry, Kondrung		P	shrub	8a	9		12							
EPACRIDACEAE	288	<i>Brachyloma preissii</i>			P	shrub			11a								
EPACRIDACEAE	288	<i>Brachyloma sp.</i>			P	shrub									20		
EPACRIDACEAE	288	<i>Leucopogon ? insularis</i>			P	shrub	8										
EPACRIDACEAE	288	<i>Leucopogon obtusatus</i>			P	shrub		9									
EPACRIDACEAE	288	▲ <i>Leucopogon sulcatus</i> ms			P	shrub									20		
EPACRIDACEAE	288	<i>Lysinema ciliatum</i>	Curry Plant		P	shrub	8		10a						20		

FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH QUADRATS					OPPO	
BORAGINACEAE	310	<i>Halgania lavandulacea</i>				herb	10						
LAMIACEAE	313	<i>Westringia cephalantha</i>			P	shrub		13	16a	18			
SCROPHULARIACEAE	316	<i>*Parentucellia latifolia</i>			A	herb weed		14a	17a	19a			
MYOPORACEAE	326	<i>Eremophila drummondii</i>			P	shrub						✓	
RUBIACEAE	331	<i>Opercularia vaginata</i>			A	herb	8	10	14a				
CAMPANULACEAE	339	<i>Wahlenbergia preissii</i>			A	herb			14	18	20		
GOODENIACEAE	341	<i>Dampiera lavandulacea</i>			herb	9a				19a	21		
GOODENIACEAE	341	<i>Dampiera sacculata</i>			herb	8a							
GOODENIACEAE	341	<i>Dampiera wellsi</i>			herb								
GOODENIACEAE	341	<i>Goodenia berardiana</i>			herb			14a	16a	17	19		
GOODENIACEAE	341	<i>Goodenia pinifolia</i>			herb								
GOODENIACEAE	341	<i>Goodenia pusilliflora</i>			herb				17				
LOBELIACEAE	341	<i>Lobelia ? tenue</i>			A	herb		14					
GOODENIACEAE	341	<i>Velleia cynopotamica</i>			A	herb			17	19a			
STYLIDIACEAE	343	<i>Stylidium dichotoma</i>			A	herb	9						
ASTERACEAE	345	<i>Actinobole uliginosum</i>		Flannel Cudweed	A	herb	9			18	19a		
ASTERACEAE	345	<i>*Arctotheca calendula</i>		Capeweed	A	herb weed	9a			17			
ASTERACEAE	345	<i>Blennospora drummondii</i>			A	herb	11	14	16a	18			
ASTERACEAE	345	<i>Brachyscome exilis</i>			A	herb					19a		
ASTERACEAE	345	<i>Brachyscome perpusilla</i>		Tiny Daisy	A	herb							
ASTERACEAE	345	<i>Ceratogyne obionoides</i>		Wingwort	A	herb	9						
ASTERACEAE	345	<i>*Cotula bipinnata</i>			A	herb weed		13					
ASTERACEAE	345	<i>Erymophyllum ramosum</i>			A	herb	11		17	19a			
ASTERACEAE	345	<i>Gnephosis drummondii</i>			A	herb							
ASTERACEAE	345	<i>Hyalosperma demissum</i>		Tiny Sunray	A	herb		13		19			
ASTERACEAE	345	<i>Hyalosperma glutinosum</i> ssp. <i>glutinosum</i>			A	herb				19a			
ASTERACEAE	345	<i>*Hypochoeris glabra</i>		Flatweed	A	herb weed	9		14	18	19		
ASTERACEAE	345	<i>Millotia tenuifolia</i>		Soft Millotia	A	herb	9	10	11	13	19	20	
ASTERACEAE	345	<i>Olearia dampieri</i> var. <i>eremicola</i> ms			P	shrub	10a		13	14a	17a	18a	19
ASTERACEAE	345	<i>Podolepis canescens</i>		Bright Podolepis	A	herb				17	19	21	
ASTERACEAE	345	<i>Podolepis capillaris</i>			A	herb	11a	13	14	17	18	19	20
ASTERACEAE	345	<i>Podolepis tepperi</i>			A	herb			16				
ASTERACEAE	345	<i>Podotheca angustifolia</i>			A	herb	11a					21	
ASTERACEAE	345	<i>Podotheca gnaphalioides</i>			A	herb	9a			19a		21	



FAMILY	NO.	GENUS (Botanical Name)	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM	WYCH	QUADRATS	OPPO
ASTERACEAE	345	<i>Pogonolepis stricta</i>		-	A	herb		17	
ASTERACEAE	345	<i>Rhodanthe laevis</i>		Smooth Sunray	A	herb	10	14 16	
ASTERACEAE	345	* <i>Sonchus oleraceus</i>		Common Sowthistle	A	herb weed		17	
ASTERACEAE	345	* <i>Ursinia anthemoides</i>			A	herb weed		14 19	
ASTERACEAE	345	<i>Waitzia acuminata</i> ssp. <i>acuminata</i>		Orange Immortelle	A	herb	11a 13 14	19	

**APPENDIX F1: FLORA RECORDED "ELASHGIN-FAULKNER ROAD BUSHLAND, WYALKATCHEM**  
 – by alphabetical order of species (Recordings and collections made 4/9/00, 16/9/00 and/or 27/11/01)
**LEGEND** (Refer also Appendix A for explanation of terminology)

- FAMILY, GENUS, SPECIES = PLANT TAXA
- NO. = Plant Family Reference Number, as used in classification by WA Herbarium
- LIFE FORM = 'A' for annual + 'P' for perennial
- GROWTH FORM = shape & ability of plant to lay down woody tissue
- ▲ = priority flora (Refer Section 5)
- ms = manuscript name (recently described species, awaiting acceptance)
- \* = introduced plant / weed
- aff. = affinity
- sp. = species
- ssp. = subspecies
- var. = variety
- x = hybrid

FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
Mimosaceae	163	<i>Acacia</i>	<i>nyssophylla</i>		P	shrub
Asteraceae	345	<i>Actinobole</i>	<i>uliginosum</i>	Flannel Cudweed	A	herb
Poaceae	31	* <i>Aira</i>	<i>caryophyllea/cupaniana</i>	Silvery Hairgrass	A	grass weed
Loranthaceae	97	<i>Amyema</i>	<i>preissii</i>	Mistletoe	P	Parasitic shrub
Primulaceae	293	* <i>Anagallis</i>	<i>arvensis</i>	Pimpernel	A	herb weed
Asteraceae	345	* <i>Arctotheca</i>	<i>calendula</i>	Capeweed	A	herb weed
Asteraceae	345	<i>Argyroglossis</i>	<i>turbinata</i>		A	shrub
Anthericaceae	54F	<i>Arthropodium</i>	<i>curvipes</i>		P	herb
Chenopodiaceae	105	<i>Atriplex</i>	<i>holocarpa</i>	Pop Saltbush	P	shrub
Chenopodiaceae	105	<i>Atriplex</i>	<i>stipitata</i>	Mallee Saltbush	P	shrub
Poaceae	31	<i>Austrodanthonia</i>	<i>setacea</i>	Small Flower Wallaby Grass	P	grass
Poaceae	31	<i>Austrodanthonia</i>	sp.		P	grass
Poaceae	31	<i>Austrodanthonia</i>	sp. Hairy Leaves WSWA WYCH14/26		P	grass
Poaceae	31	<i>Austrostipa</i>	<i>elegantissima</i>	Feather Speargrass	P	grass
Poaceae	31	<i>Austrostipa</i>	sp.	Speargrass	P	grass
Poaceae	31	* <i>Avena</i>	<i>barbata</i>	Wild Oat, Bearded Oat	A	grass weed
Asteraceae	345	<i>Blennospora</i>	<i>phlegmatocarpa</i>		A	herb
Asteraceae	345	<i>Brachyscome</i>	<i>iberidifolia</i>		A	herb
Brassicaceae	138	* <i>Brassica</i>	<i>tournefortii</i>	Wild Turnip	A	herb weed
Poaceae	31	* <i>Bromus</i>	<i>rubens</i>	Soft Brome	A	grass weed
Asphodelaceae	54G	<i>Bulbine</i>	<i>semibarbata</i>	Leek Lily	A	herb
Portulacaceae	111	<i>Calandrinia</i>	<i>eremaea</i>	Twining Purslane	A	herb
Portulacaceae	111	<i>Calandrinia</i>	<i>granulifera</i>	Pygmy Purslane	A	herb
Asteraceae	345	<i>Calotis</i>	<i>hispidula</i>	Bindy Eye	A	herb
Ranunculaceae	119	<i>Clematis</i>	<i>delicata</i>		P	climber
Polygalaceae	183	<i>Comesperma</i>	<i>integerrimum</i>		P	climber
Asteraceae	345	* <i>Cotula</i>	<i>bipinnata</i>	Ferny Cotula	A	herb weed
Crassulaceae	149	<i>Crassula</i>	<i>colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop	A	herb
Solanaceae	315	<i>Cyphanthera</i>	<i>microphyllum</i>		P	shrub
Goodeniaceae	341	<i>Dampiera</i>	<i>lavandulacea</i>		P	herb
Apiaceae	281	<i>Daucus</i>	<i>glochidiatus</i>	Small Pennywort	A	herb
Aizoaceae	110	<i>Disphyma</i>	<i>crassifolium</i> ssp. <i>clavellatum</i>	Round-leaved pigface	P	shrub
Chenopodiaceae	105	<i>Enchylaena</i>	<i>lanata</i>		P	shrub
Chenopodiaceae	105	<i>Enchylaena</i>	<i>tomentosa</i>	Barrier Saltbush	P	shrub
Myoporaceae	326	<i>Eremophila</i>	<i>decipiens</i> ssp. <i>decipiens</i>	Slender Fuschia	P	shrub

FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
Myoporaceae	326	<i>Eremophila</i>	<i>deserti</i>	Poverty Bush	P	shrub
Geraniaceae	167	<i>Erodium</i>	<i>cygnorum</i>	Blue Stoksbill	A	herb
Asteraceae	345	<i>Erymophyllum</i>	<i>ramosum</i>		A	herb
Myrtaceae	273	<i>Eucalyptus</i>	<i>loxophleba</i> <i>ssp. lissophloia</i>	York Gum	P	tree
Myrtaceae	273	<i>Eucalyptus</i>	<i>salubris</i>	Gimlet	P	tree
Santalaceae	92	<i>Exocarpos</i>	<i>aphyllus</i>	Leafless Ballart	P	shrub
Frankeniaceae	236	<i>Frankenia</i>	<i>pauciflora</i>	Seaheath	P	shrub
Frankeniaceae	236	<i>Frankenia</i>	sp. WYCR01/5		P	shrub
Goodeniaceae	341	<i>Goodenia</i>	<i>affinis</i>	Silver Goodenia	P	herb
Goodeniaceae	341	<i>Goodenia</i>	<i>pusilliflora</i>	Smallflower Goodenia	A	herb
Proteaceae	90	<i>Grevillea</i>	<i>hakeoides</i> <i>ssp. hakeoides</i>		P	shrub
Aizoaceae	110	<i>Gunniopsis</i>	<i>septifraga</i>		A	herb
Proteaceae	90	<i>Hakea</i>	<i>kippistiana</i>		P	shrub
Chenopodiaceae	105	<i>Halosarcia</i>	aff. <i>pergranulata</i>	Blackweed Samphire	P	shrub
Chenopodiaceae	105	<i>Halosarcia</i>	<i>doleiformis</i>	Samphire	P	shrub
Chenopodiaceae	105	<i>Halosarcia</i>	<i>indica</i> <i>ssp. bidens</i>	Samphire	P	shrub
Chenopodiaceae	105	<i>Halosarcia</i>	<i>pergranulata</i>	Blackweed Samphire	P	shrub
Chenopodiaceae	105	<i>Halosarcia</i>	<i>undulata</i>	Samphire	P	shrub
Poaceae	31	<i>*Hordeum</i>	<i>leporinum</i>	Barley Grass	A	grass weed
Asteraceae	345	<i>Hyalosperma</i>	<i>glutinosum</i> <i>ssp. glutinosum</i>		A	herb
Apiaceae	281	<i>Hydrocotyle</i>	<i>medicaginoideis</i>	Small Pennywort	A	herb
Asteraceae	345	<i>*Hypochaeris</i>	<i>glabra</i>	Flatweed	A	herb weed
Hypoxidaceae	56A	<i>Hypoxis</i>	sp.		A	herb
Poaceae	31	<i>*Lamarckia</i>	<i>aurea</i>	Golden Top	A	grass weed
Brassicaceae	138	<i>Lepidium</i>	<i>rotundum</i>	Veined Peppergrass	A	herb
Poaceae	31	<i>*Lolium</i>	<i>rigidum</i>	Wimmera Ryegrass	A	grass weed
Poaceae	31	<i>*Lolium</i>	sp.	Ryegrass	A	grass weed
Solanaceae	315	<i>Lycium</i>	<i>australe</i>	Australian Boxhorn	P	shrub
Loranthaceae	97	<i>Lysiana</i>	<i>casuarinae</i>	Mistletoe	P	Parasitic shrub
Chenopodiaceae	105	<i>Maireana</i>	<i>carnosa</i>	Cottony Bluebush	P	shrub
Chenopodiaceae	105	<i>Maireana</i>	<i>trichoptera</i>	Pink-seeded Bluebush	P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>adenostyla</i>		P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>halmaturorum</i>		P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>lateriflora</i> <i>ssp. lateriflora ms</i>	Gorada	P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>radula</i>	Graceful Honeymyrtle	P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>uncinata</i>	Broom Bush	P	shrub
Brassicaceae	138	<i>Menkea</i>	<i>australis</i>	Fairy Spectacles	A	herb
Aizoaceae	110	<i>*Mesembryanthemum</i>	<i>nodiflorum</i>	Iceplant	A/B	herb weed
Asteraceae	345	<i>Millotia</i>	<i>myosotidifolia</i>		A	herb
Asteraceae	345	<i>Olearia</i>	<i>muelleri</i>	Dusky Daisybush	P	shrub
Asteraceae	345	<i>*Osteospermum</i>	<i>clandestinum</i>	Stinking Roger	A	herb weed
Poaceae	31	<i>*Parapholis</i>	<i>incurva</i>	Curly Barb Grass	A	grass weed
Scrophulariaceae	316	<i>*Parentucellia</i>	<i>latifolia</i>	Sticky Bartsia	A	herb weed
Urticaceae	88	<i>Parietaria</i>	<i>debilis</i>	Pellitory	A	herb
Caryophyllaceae	113	<i>*Petrorhagia</i>	<i>velutina</i>	Velvet Pink	A	herb weed

FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
Poaceae	31	<i>*Phalaris</i>	<i>minor</i>	Rat's Tail Fescue	A	grass weed
Pittosporaceae	152	<i>Pittosporum</i>	<i>phylliraeoides</i> var. <i>microphylla</i>	Weeping Pittosporum	P	shrub
Asteraceae	345	<i>Podolepis</i>	<i>canescens</i>	Bright Podolepis	A	herb
Asteraceae	345	<i>Podolepis</i>	<i>capillaris</i>	Wiry Podolepis	A	herb
Asteraceae	345	<i>Podotheca</i>	<i>angustifolia</i>	Sticky Longheads	A	herb
Asteraceae	345	<i>Podotheca</i>	<i>gnaphalioides</i>	Golden Longheads	A	herb
Asteraceae	345	<i>Pogonolepis</i>	<i>stricta</i>		A	herb
Amaranthaceae	106	<i>Ptilotus</i>	<i>divaricatus</i>	Climbing Mulla Mulla	P	shrub
Chenopodiaceae	105	<i>Rhagodia</i>	<i>drummondii</i>		P	shrub
Chenopodiaceae	105	<i>Rhagodia</i>	<i>preissii</i> ssp. <i>preissii</i>		P	shrub
Asteraceae	345	<i>Rhodanthe</i>	<i>corymbosa</i>		A	herb
Asteraceae	345	<i>Rhodanthe</i>	<i>pygmaea</i>	Pink Sunray	A	herb
Santalaceae	92	<i>Santalum</i>	<i>acuminatum</i>	Quandong	P	shrub
Chenopodiaceae	105	<i>Sclerolaena</i>	<i>diacantha</i>	Grey Copper Burr	P	shrub
Asteraceae	345	<i>Senecio</i>	<i>glossanthus</i>	Slender Groundsel	A	herb
Asteraceae	345	<i>Siloxerus</i>	<i>pygmaeus</i>		A	herb
Asteraceae	345	<i>*Sonchus</i>	<i>oleraceus</i>	Common Sowthistle	A	herb weed
Asteraceae	345	<i>*Sonchus</i>	<i>tenerrimus</i>	Clammy Sowthistle	A	herb weed
Caryophyllaceae	113	<i>*Spergula</i>	<i>diandra</i>	Lesser Sand Spurry	A	herb weed
Papilionaceae	165	<i>Templetonia</i>	<i>smithiana</i>		P	shrub
Anthericaceae	54F	<i>Thysanotus</i>	<i>britannii</i>	Fringe Lily	P	herb
Anthericaceae	54F	<i>Thysanotus</i>	<i>patersonii</i>	Twining Fringe Lily	P	climber
Papilionaceae	165	<i>*Trifolium</i>	<i>subterraneum</i>	Clover	A	herb weed
Papilionaceae	165	<i>*Trifolium</i>	sp.	Clover	A	herb weed
Juncaginaceae	26	<i>Triglochin</i>	<i>minutissima</i> var. <i>elongatum</i>	Prickly Arrowgrass	A	herb
Juncaginaceae	26	<i>Triglochin</i>	<i>mucronata</i>	Arrowgrass	A	herb
Campanulaceae	339	<i>Wahlenbergia</i>	<i>preissii</i>		A	herb
Poaceae	31	<i>*Vulpia</i>	<i>myuros</i>	Rat's Tail Fescue	A	grass weed
Asteraceae	345	<i>Waitzia</i>	<i>acuminata</i> ssp. <i>acuminata</i>	Orange Immortelle	A	herb
Zygophyllaceae	173	<i>Zygophyllum</i>	<i>eremaeum</i>	Twinleaf	A	herb

**APPENDIX F2: FLORA RECORDED FOR "HUTCHY'S BLOCK" CARDIFF PASTORAL CO.,  
WYALKATCHEM** -- by alphabetical order of species  
(Recordings and collections made 4/9/00, 16/9/00, 17/9/00 and/or 28/11/01)

**LEGEND** (Refer also Appendix A for explanation of terminology)

- FAMILY, GENUS, SPECIES = PLANT TAXA
- NO. = Plant Family Reference Number, as used in classification by WA Herbarium
- LIFE FORM = 'A' for annual + 'P' for perennial
- GROWTH FORM = shape & ability of plant to lay down woody tissue
- ▲ = priority flora (Refer Section 5)
- ms = manuscript name (recently described species, awaiting acceptance)
- \* = introduced plant / weed
- aff. = affinity
- sp. = species
- ssp. = subspecies
- var. = variety
- x = hybrid

FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
Mimosaceae	163	<i>Acacia</i>	<i>acuaria</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	aff. <i>bidentata</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>densiflora</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>erinacea</i>	Spiny Wattle	P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>fragilis</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>hemiteles</i>	Tan Wattle	P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>heteroneura</i> var. <i>heteroneura</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>jacksonioides</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>lasiocalyx</i>	Wilyurwur	P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>merrallii</i>	Merrall's Wattle	P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>multispicata</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>nigripilosa</i> ssp. <i>nigripilosa</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>phaeocalyx</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>stereophylla</i> var. <i>stereophylla</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	? <i>verricula</i>		P	shrub
Mimosaceae	163	<i>Acacia</i>	<i>yorkrakinensis</i> ssp. <i>acrita</i>	Yorkrakine Wattle	P	shrub
Asteraceae	345	<i>Actinobole</i>	<i>uliginosum</i>	Flannel Cudweed	A	herb
Poaceae	31	* <i>Aira</i>	<i>caryophyllea/cupaniana</i>	Silvery Hairgrass	A	grass weed
Casuarinaceae	70	<i>Allocasuarina</i>	<i>acutivalvis</i>	Black Tamma	P	shrub
Casuarinaceae	70	<i>Allocasuarina</i>	<i>campestris</i> ssp. <i>campestris</i>	Tamma	P	shrub
Asteraceae	345	* <i>Arctotheca</i>	<i>calendula</i>	Capeweed	A	herb weed
Poaceae	31	<i>Aristida</i>	<i>contorta</i>	Wind Grass	P	grass
Myrtaceae	273	<i>Astartea</i>	<i>heteranthera</i>		P	shrub
Epacridaceae	288	<i>Astroloma</i>	<i>serratifolium</i> ssp. <i>horridulum</i>	Cankerberry, Kondrung	P	shrub
Poaceae	31	<i>Austrodanthonia</i>	<i>setacea</i>	Small Flower Wallaby Grass	P	grass
Poaceae	31	<i>Austrodanthonia</i>	Sp Hairy Leaves WSWA WYCH19/H		P	grass
Poaceae	31	<i>Austrodanthonia</i>	sp. Hairy Leaves WSWA WYCH14/26		P	grass
Poaceae	31	<i>Austrostipa</i>	<i>elegantissima</i>	Feather Speargrass	P	grass
Poaceae	31	<i>Austrostipa</i>	<i>mollis</i>	Soft Speargrass	P	grass
Poaceae	31	<i>Austrostipa</i>	<i>tenuifolia</i>		P	grass
Myrtaceae	273	<i>Baeckea</i>	<i>megaflora</i>		P	shrub

FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
Myrtaceae	273	<i>Beaufortia</i>	<i>interstans</i>		P	shrub
Pittosporaceae	152	<i>Billardiera</i>	<i>coriacea</i>		P	twiner
Asteraceae	345	<i>Blennospora</i>	<i>drummondii</i>		A	herb
Rutaceae	175	<i>Boronia</i>	<i>crenulata</i>	Aniseed Boronia	P	shrub
Boryaceae	54L	<i>Borya</i>	<i>laciniata</i>	Pincushions	P	herb
Boryaceae	54L	<i>Borya</i>	<i>sphaerocephala</i>	Pincushions	P	herb
Epacridaceae	288	<i>Brachyloma</i>	<i>preissii</i>	Globe Heath	P	shrub
Epacridaceae	288	<i>Brachyloma</i>	sp.		P	shrub
Asteraceae	345	<i>Brachyscome</i>	<i>exilis</i>		A	herb
Asteraceae	345	<i>Brachyscome</i>	<i>perpusilla</i>	Tiny Daisy	A	herb
Poaceae	31	<i>*Bromus</i>	<i>rubens</i>	Soft Brome	A	grass weed
Anthericaceae	54F	<i>Caesia</i>	<i>alfordii</i>	Chocolate Lily	P	herb
Orchidaceae	66	<i>Caladenia</i>	<i>flava</i>	Cowslip Orchid	P	herb
Orchidaceae	66	<i>Caladenia</i>	<i>roei</i>	Ant Orchid	P	herb
Portulacaceae	111	<i>Calandrinia</i>	<i>calyptata</i>	Pink Purslane	A	herb
Myrtaceae	273	<i>Calytrix</i>	<i>violacea</i>		P	shrub
Lauraceae	131	<i>Cassytha</i>	<i>flava</i>	Dodder Laurel	P	twiner
Lauraceae	131	<i>Cassytha</i>	<i>melantha</i>	Large Dodder Laurel	P	twiner
Lauraceae	131	<i>Cassytha</i>	<i>pomiformis</i>	Dodder Laurel	P	twiner
Centrolepidaceae	40	<i>Centrolepis</i>	<i>pilosa</i>		A	herb
Asteraceae	345	<i>Ceratogyne</i>	<i>obionoides</i>	Wingwort	A	herb
Dasypogonaceae	54C	<i>Chamaexeros</i>	<i>fimbriata</i>		P	herb
Dasypogonaceae	54C	<i>Chamaexeros</i>	<i>macranthera</i>		P	herb
Myrtaceae	273	<i>Chamelaucium</i>	aff. <i>pauciflorum</i>	Waxflower	P	shrub
Myrtaceae	273	<i>Chamelaucium</i>	<i>drummondii</i> ssp. <i>hallii</i>	Waxflower	P	shrub
Polygalaceae	183	<i>Comesperma</i>	<i>integerrimum</i>		P	twiner
Polygalaceae	183	<i>Comesperma</i>	<i>scoparium</i>	Broom Milkwort	P	shrub
Polygalaceae	183	<i>Comesperma</i>	<i>volubile</i>	Love Creeper	P	twiner
Haemodoraceae	55	<i>Conostylis</i>	<i>teretifolia</i> ssp. <i>teretifolia</i>		P	herb
Asteraceae	345	<i>*Cotula</i>	<i>bipinnata</i>	Ferny Cotula	A	herb weed
Crassulaceae	149	<i>Crassula</i>	<i>colorata</i> ssp. <i>acuminata</i>	Dense Stonecrop	A	herb
Goodeniaceae	341	<i>Dampiera</i>	<i>lavandulacea</i>		P	herb/shrub
Goodeniaceae	341	<i>Dampiera</i>	<i>sacculata</i>	Pouched Dampiera	P	herb/shrub
Goodeniaceae	341	<i>Dampiera</i>	<i>wellsiana</i>		A	herb
Papilionaceae	165	<i>Daviesia</i>	<i>benthamii</i> ssp. <i>benthamii</i>		P	shrub
Papilionaceae	165	<i>Daviesia</i>	<i>hakeoides</i> ssp. <i>subnuda</i>		P	shrub
Papilionaceae	165	<i>Daviesia</i>	<i>nematophylla</i>		P	shrub
Papilionaceae	165	<i>Daviesia</i>	<i>nudiflora</i> ssp. <i>drummondii</i>		P	shrub
Restionaceae	39	<i>Desmocladius</i>	<i>flexuosus</i>		P	rush
Phormiaceae	165	<i>Dianella</i>	<i>revoluta</i>	Blueberry Lily	P	herb
Anthericaceae	54F	<i>Dichopogon</i> ?	<i>fimbriatus</i>		P	herb
Sapindaceae	207	<i>Dodonaea</i>	<i>bursariifolia</i>		P	shrub
Sapindaceae	207	<i>Dodonaea</i>	<i>divaricata</i>	Hop Bush	P	shrub
Sapindaceae	207	<i>Dodonaea</i>	<i>viscosa</i>	Sticky Hop Bush	P	shrub



FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
			<i>ssp. angustissima</i>			
Droseraceae	143	<i>Drosera</i>	<i>androsacea</i>	Cone Sundew	A	herb
Droseraceae	143	<i>Drosera</i>	<i>glanduligera</i>	Pimpernel Sundew	A	herb
Droseraceae	143	<i>Drosera</i>	<i>macrantha</i>	Bridal Rainbow	P/A	herb climber
			<i>ssp. macrantha</i>			
Rutaceae	175	<i>Drummondita</i>	<i>hassellii</i>	Peak Charles Drummondita	P	shrub
Proteaceae	90	<i>Dryandra</i>	<i>conferta</i>		P	shrub
			<i>var. conferta</i>			
Proteaceae	90	<i>Dryandra</i>	<i>purdieana</i>		P	shrub
Ecdeiocoleaceae	39A	<i>Ecdeiocolea</i>	<i>monostachya</i>		P	rush
Poaceae	31	<i>*Ehrharta</i>	<i>longiflora</i>	Annual Veldt Grass	A	grass weed
Chenopodiaceae	105	<i>Enchylaena</i>	<i>lanata</i>		P	shrub
Chenopodiaceae	105	<i>Enchylaena</i>	<i>tomentosa</i>	Barrier Saltbush	P	shrub
			<i>ssp. tomentosa</i>			
Myoporaceae	326	<i>Eremophila</i>	<i>drummondii</i>		P	shrub
Geraniaceae	167	<i>Erodium</i>	<i>cygnorum</i>	Blue Storksbill	P	herb
Asteraceae	345	<i>Erymophyllum</i>	<i>ramosum</i>		A	herb
Myrtaceae	273	<i>Eucalyptus</i>	<i>brachycorys</i>	Cowcowing Mallee	P	mallee
Myrtaceae	273	<i>Eucalyptus</i>	<i>capillosa</i>	Wheatbelt Wandoo	P	tree
			<i>ssp. capillosa</i>			
Myrtaceae	273	<i>Eucalyptus</i>	<i>celastroides</i>	Mirret	P	mallee
			<i>ssp. virella</i>			
Myrtaceae	273	<i>Eucalyptus</i>	<i>erythronema</i>	Red-Flowered Mallee	P	mallee
			<i>var. marginata</i>			
Myrtaceae	273	<i>Eucalyptus</i>	<i>flocktoniae</i>	Merrit	P	mallee
			<i>ssp. flocktoniae</i>			
Myrtaceae	273	<i>Eucalyptus</i>	<i>hypochlamydea</i>		P	mallee
			<i>ssp. ecdysiastes</i>			
Myrtaceae	273	<i>Eucalyptus</i>	<i>incrassata</i>	Lerp Mallee	P	mallee
Myrtaceae	273	<i>Eucalyptus</i>	<i>oldfieldii</i>	Oldfield's Malee	P	mallee
Myrtaceae	273	<i>Eucalyptus</i>	<i>pluricaulis</i>		P	mallee
			<i>ssp. pluricaulis</i>			
Myrtaceae	273	<i>Eucalyptus</i>	<i>tenera</i>		P	mallee
Santalaceae	92	<i>Exocarpos</i>	<i>aphyllus</i>	Leafless Ballart	P	shrub
Papilionaceae	165	<i>Gastrolobium</i>	<i>parviflorum</i>	Berry Poison	P	shrub
Papilionaceae	165	<i>Gastrolobium</i>	<i>spinosum</i>	Prickly Poison	P	shrub
			<i>ssp. spinosum</i>			
Papilionaceae	165	<i>Gastrolobium</i>	<i>triangulare</i>	Triangular Poson	P	shrub
Haloragaceae	276	<i>Glischrocaryon</i>	<i>aureum</i>	Common Pop Flower	P	herb
			<i>var. aureum</i>			
Asteraceae	345	<i>Gnephosis</i>	<i>drummondii</i>		A	herb
Papilionaceae	165	<i>Gompholobium</i>	<i>obcordatum</i>		P	shrub
Goodeniaceae	341	<i>Goodenia</i>	<i>berardiana</i>		A	herb
Goodeniaceae	341	<i>Goodenia</i>	<i>pinifolia</i>	Pine leaved Goodenia	P	shrub
Goodeniaceae	341	<i>Goodenia</i>	<i>pusilliflora</i>	Small Flowered Goodenia	A	herb
Proteaceae	90	<i>Grevillea</i>	<i>didymobotrya</i>		P	shrub
			<i>ssp. didymobotrya</i>			
Proteaceae	90	<i>Grevillea</i>	<i>hakeoides</i>		P	shrub
			<i>ssp. stenophylla</i>			
Proteaceae	90	<i>Grevillea</i>	<i>hookeriana</i>	Red Tooth Brushes	P	shrub

FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
Proteaceae	90	<i>Grevillea</i>	<i>huegelii</i>		P	shrub
Proteaceae	90	<i>Grevillea</i>	<i>paniculata</i>		P	shrub
Proteaceae	90	<i>Grevillea</i>	<i>petrophiloides</i>	Poker Grevillea	P	shrub
Sterculiaceae	223	<i>Guichenotia</i>	<i>micrantha</i>		P	shrub
Proteaceae	90	<i>Hakea</i>	<i>erecta</i>		P	shrub
Proteaceae	90	<i>Hakea</i>	<i>incrassata</i>	Marble Hakea	P	shrub
Proteaceae	90	<i>Hakea</i>	<i>multilineata</i>	Bottle-Brush	P	shrub
Proteaceae	90	<i>Hakea</i>	<i>recurva</i>	Djarnokmurd	P	shrub
Proteaceae	90	<i>Hakea</i>	<i>scoparia</i>		P	shrub
Boraginaceae	310	<i>Halgania</i>	<i>lavandulacea</i>	Blue Bush	P	shrub
Dilleniaceae	226	<i>Hibbertia</i>	<i>exasperata</i>		P	shrub
Dilleniaceae	226	<i>Hibbertia</i>	<i>polystachya</i>		P	shrub
Asteraceae	345	<i>Hyalosperma</i>	<i>demissum</i>	Tiny Sunray	A	herb
Asteraceae	345	<i>Hyalosperma</i>	<i>glutinosum</i> <i>ssp. glutinosum</i>		A	herb
Violaceae	243	<i>Hybanthus</i>	<i>floribundus</i> <i>ssp. adpressa</i>		P	shrub
Apiaceae	281	<i>Hydrocotyle</i>	<i>medicaginoides</i>	Small Pennywort	A	herb
Apiaceae	281	<i>Hydrocotyle</i>	<i>rugulosa</i>		A	herb
Asteraceae	345	<i>*Hypochaeris</i>	<i>glabra</i>	Flatweed	A	herb weed
Proteaceae	90	<i>Isopogon</i>	<i>scabriusculus</i>		P	shrub
Brassicaceae	138	<i>Lepidium</i>	<i>sp.</i>	Peppercress	A	herb
Restionaceae	39	<i>Lepidobolus</i>	<i>preissianus</i> <i>ssp. preissianus</i>		P	rush
Restionaceae	39	<i>Lepidobolus</i>	<i>sp.</i>		P	rush
Cyperaceae	32	<i>Lepidosperma</i>	<i>brunonianum</i>		P	sedge
Cyperaceae	32	<i>Lepidosperma</i>	<i>sp A2 Island</i> Flat (Keighery 7000)		P	sedge
Cyperaceae	32	<i>Lepidosperma</i>	<i>tenu</i>		P	sedge
Cyperaceae	32	<i>Lepidosperma</i>	<i>viscidum</i>	Sticky Sword Sedge	P	sedge
Santalaceae	92	<i>Leptomeria</i>	<i>preissiana</i>	Currant Bush	P	shrub
Myrtaceae	273	<i>Leptospermum</i>	<i>erubescens</i>	Roadside Tea-tree	P	shrub
Epacridaceae	288	<i>Leucopogon</i>	<i>? insularis</i>		P	shrub
Epacridaceae	288	<i>Leucopogon</i>	<i>obtusatus</i>		P	shrub
Epacridaceae	288	▲ <i>Leucopogon</i>	<i>sulcatus</i> ms		P	shrub
Lobeliaceae	341	<i>Lobelia</i>	<i>? tenue</i>		A	herb
Dasyogonaceae	54C	<i>Lomandra</i>	<i>collina</i>	Pale Mat Rush	P	herb
Dasyogonaceae	54C	<i>Lomandra</i>	<i>effusa</i>	Scented Mat Rush	P	herb
Epacridaceae	288	<i>Lysinema</i>	<i>ciliatum</i>	Curry Plant	P	shrub
Sterculiaceae	223	<i>Lysiosepalum</i>	<i>hexandrum</i>		P	shrub
Chenopodiaceae	105	<i>Maireana</i>	<i>carnosa</i>	Cottony Bluebush	P	shrub
Chenopodiaceae	105	<i>Maireana</i>	<i>georgei</i>	Satiny Bluebush	P	shrub
Chenopodiaceae	105	<i>Maireana</i>	<i>marginata</i>	Grey Copperbur	P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>conothamnoides</i>		P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>coronicarpa</i>		P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>orbicularis</i>		P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>radula</i>	Graceful Honey myrtle	P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>scabra</i>	Wurru Bush	P	shrub
Myrtaceae	273	<i>Melaleuca</i>	<i>uncinata</i>	Broom Bush	P	shrub
Aizoaceae	110	<i>*Mesembryanthemum</i>	<i>nodiflorum</i>	Iceplant	A/B	herb weed

FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
Cyperaceae	32	<i>Mesomelaena</i>	<i>preissii</i>		P	sedge
Myrtaceae	273	<i>Micromyrtus</i>	<i>obovata</i>		P	shrub
Asteraceae	345	<i>Millotia</i>	<i>tenuifolia</i>	Soft Millotia	A	herb
Papilionaceae	165	<i>Mirbelia</i>	<i>trichocalyx</i>		P	shrub
Polygonaceae	103	<i>Muehlenbeckia</i>	<i>adpressa</i>	Native Sarsaparilla	P	twiner
Poaceae	31	<i>Neurachne</i>	<i>alopecuroidea</i>	Foxtail Mulga Grass	P	grass
Asteraceae	345	<i>Olearia</i>	<i>dampieri</i> var. <i>eremicola</i> ms		P	shrub
Rubiaceae	331	<i>Opercularia</i>	<i>vaginata</i>		A	herb
Scrophulariaceae	316	<i>*Parentucellia</i>	<i>latifolia</i>	Sticky Bartsia	A	herb weed
Iridaceae	60	<i>Patersonia</i>	<i>drummondii</i> ssp. <i>borealis</i>	Drummond's Native Iris	P	herb
Iridaceae	60	<i>Patersonia</i>	<i>drummondii</i> ssp. <i>drummondii</i>	Drummond's Native Iris	P	herb
Poaceae	31	<i>*Pentaschistis</i>	<i>airoides</i>	False Hairgrass	A	grass weed
Proteaceae	90	<i>Persoonia</i>	<i>coriacea</i>	Leathery Leaf Persoonia	P	shrub
Proteaceae	90	<i>Persoonia</i>	<i>quinquenervis</i>		P	shrub
Proteaceae	90	<i>Persoonia</i>	<i>saundersiana</i>		P	shrub
Proteaceae	90	<i>Persoonia</i>	<i>trinervis</i>		P	shrub
Proteaceae	90	<i>Petrophile</i>	<i>shuttleworthiana</i>		P	shrub
Rutaceae	175	<i>Phebalium</i>	<i>filifolium</i>	Slender Phebalium	P	shrub
Rutaceae	175	<i>Phebalium</i>	<i>tuberculosum</i>		P	shrub
Apiaceae	281	<i>Platysace</i>	<i>maxwellii</i>	Karno	P	shrub
Apiaceae	281	<i>Platysace</i>	<i>trachymenioides</i>		P	shrub
Asteraceae	345	<i>Podolepis</i>	<i>canescens</i>	Bright Podolepis	A	herb
Asteraceae	345	<i>Podolepis</i>	<i>capillaris</i>	Wiry Podolepis	A	herb
Asteraceae	345	<i>Podolepis</i>	<i>tepperi</i>		A	herb
Asteraceae	345	<i>Podotheca</i>	<i>angustifolia</i>	Sticky Longheads	A	herb
Asteraceae	345	<i>Podotheca</i>	<i>gnaphalioides</i>	Golden Longheads	A	herb
Asteraceae	345	<i>Pogonolepis</i>	<i>stricta</i>		A	herb
Celastraceae	199	<i>Psammomoya</i>	<i>choretroides</i>		P	shrub
Orchidaceae	66	<i>Pterostylis</i>	<i>sargentii</i>		P	herb
Amaranthaceae	106	<i>Ptilotus</i>	<i>polystachyus</i> var. <i>polystachyus</i>	Bottle Washers	A/P	herb
Amaranthaceae	106	<i>Ptilotus</i>	<i>spathulatus</i>		P	herb
Asteraceae	345	<i>Rhodanthe</i>	<i>laevis</i>	Smooth Sunray	A	herb
Santalaceae	92	<i>Santalum</i>	<i>acuminatum</i>	Quandong	P	shrub
Cyperaceae	32	<i>Schoenus</i>	<i>calcatus</i>		P	sedge
Cyperaceae	32	<i>Schoenus</i>	<i>clandestinus</i>		A	sedge
Cyperaceae	32	▲ <i>Schoenus</i>	<i>griffinianus</i>		P	sedge
Cyperaceae	32	<i>Schoenus</i>	<i>hexandrus</i>		P	sedge
Cyperaceae	32	<i>Schoenus</i>	aff. <i>hexandrus</i>		P	sedge
Cyperaceae	32	<i>Schoenus</i>	<i>nanus</i>	Tiny Bog Rush	A	sedge
Cyperaceae	32	<i>Schoenus</i>	sp.		A	sedge
Chenopodiaceae	105	<i>Sclerolaena</i>	<i>diantha</i>		P	shrub
Caesalpiniaceae	164	<i>Senna</i>	<i>artemisioides</i> ssp. <i>artemisioides</i>		P	shrub
Asteraceae	345	<i>*Sonchus</i>	<i>oleraceus</i>	Common Sowthistle	A	herb weed
Euphorbiaceae	185	<i>Stachystemon</i>	<i>brachyphyllus</i>		P	herb
Stackhousiaceae	202	<i>Stackhousia</i>	<i>monogyna</i>		P	herb
Rhamnaceae	215	<i>Stenanthemum</i>	<i>pomaderroides</i>		P	shrub

FAMILY	No.	GENUS	SPECIES	COMMON NAME	LIFE FORM	GROWTH FORM
Stylidiaceae	343	<i>Stylidium</i>	<i>dichotomum</i>	Pins-and-Needles	A	herb
Proteaceae	90	<i>Synaphea</i>	<i>interioris</i>		P	shrub
Papilionaceae	165	<i>Templetonia</i>	<i>aculeata</i>		P	shrub
Papilionaceae	165	<i>Templetonia</i>	<i>sulcata</i>	Centipede Bush	P	shrub
Anthericaceae	54F	<i>Thysanotus</i>	<i>patersonii</i>	Twining Fringe Lily	P	climber
Anthericaceae	54F	<i>Thysanotus</i>	sp.	Fringe Lily	P	herb
Apiaceae	281	<i>Trachymene</i>	<i>cyanopetala</i>	Spongefruit	A	herb
Apiaceae	281	<i>Trachymene</i>	sp.		A	herb
Juncaginaceae	26	<i>Triglochin</i>	sp. A Flora of Australia GJ Keighery 2477	Arrowgrass	A	herb
Asteraceae	345	<i>*Ursinia</i>	<i>anthemoides</i>	Ursinea	A	herb weed
Goodeniaceae	341	<i>Velleia</i>	<i>cynopotamica</i>		A	herb
Myrtaceae	273	<i>Verticordia</i>	<i>acerosa</i> var. <i>preissii</i>	Featherflower	P	shrub
Myrtaceae	273	<i>Verticordia</i>	<i>brachypoda</i>	Featherflower	P	shrub
Myrtaceae	273	<i>Verticordia</i>	<i>chrysantha</i>	Featherflower	P	shrub
Myrtaceae	273	<i>Verticordia</i>	<i>eriocephala</i>	Featherflower	P	shrub
Myrtaceae	273	<i>Verticordia</i>	<i>picta</i>	Painted Featherflower	P	shrub
Poaceae	31	<i>*Vulpia</i>	? <i>myuros</i>	Rat's Tail Fescue	A	grass weed
Poaceae	31	<i>*Vulpia</i>	<i>myuros</i>	Rat's Tail Fescue	A	grass weed
Poaceae	31	<i>*Vulpia</i>	sp.	Fescue	A	grass weed
Campanulaceae	339	<i>Wahlenbergia</i>	<i>preissii</i>		A	herb
Asteraceae	345	<i>Waitzia</i>	<i>acuminata</i> ssp. <i>acuminata</i>	Orange Immortelle	A	herb
Lamiaceae	313	<i>Westringia</i>	<i>cephalantha</i>		P	shrub
Xanthorrhoeaceae	54B	<i>Xanthorrhoea</i>	? <i>nana</i>	Blackboy / Grass Tree	P	herb (shrub-like)