# The Biodiversity of the Avon NRM Region: Towards Prioritisation for Conservation
# DRAFT

**By**
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**August 2007**

AVON CATCHMENT COUNCIL

Government of Western Australia

Australian Government

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**Note to Readers and Reviewers of the DRAFT Document:**

**This is a draft document. It contains most of the analyses and interpretations that will be shown in the final document, but not all**

**This draft has been released:**

- **to promote discussion on, and critical review, the data, analyses and interpretations included in this document; and,**
- **to inform groups requesting these analyses; and,**
- **as a plea for information about knowledge and/or programs that have not been included in this draft.**

**If you have found any omissions or would like to make suggestions, please contact the senior author at jeff.richardson@dec.wa.gov.au or (08) 9334 0548. The final draft for this document will be submitted by February 2008, comments will be accepted until November 9th 2007.**

**Cover photo: Gimlet (*Eucalyptus salubris*) a distinctive WA Wheatbelt species (Photo by Jeff Richardson).**

## Acknowledgments

We would like to thank those people that gave us and/or interpreted their data and knowledge. These include

| | |
|---|---|
| Alan Burbidge | DEC Science Division |
| Alex Chapman | DEC Western Australia Herbarium |
| Andrew Watson | Commissioner of Soil and Land Conservation, Dept. Ag. and Food |
| Angas Hopkins | DEC Science Division |
| Avril Baxter | DEC Land for Wildlife |
| Ben Bayliss | DEC Science Division |
| Ben Lullfitz | DEC Species and Communities Branch |
| Bernie Kelly | Department of Water |
| Blair Parsons | CSIRO |
| Brett Beecham | DEC Wheatbelt Region |
| Colin Yates | DEC Science Division |
| Cressida Wilson | DEC Roadside Conservation Committee |
| Damian Sheperd | Department of Agriculture and Food |
| Diane Jones | Western Australian Museum |
| Graeme Behn | DEC Information Management Branch |
| Greg Keighery | DEC Science Division |
| Greg Strelein | DEC Forest Management Branch |
| Ian Steward | DEC Northam |
| Jack Green | DEC Information Management Branch |
| John Riley | DEC Species and Communities Branch |
| Kate Gole | Department of Water |
| Kellie Mantle | DEC Species and Communities Branch |
| Ken Atkins | DEC Species and Communities Branch |
| Libby Mattiske | Mattiske Consulting |
| Malcolm Trudgeon | Consultant |
| Mia Morley | DEC Species and Communities Branch |
| Mike Lyons | DEC Science Division |
| Mike Stukely | DEC Science Division |
| Paul Gioia | DEC Science Divsion |
| Penny Hussy | DEC Land for Wildlife |
| Peter Orell | DEC Species and Communities Branch |
| Phil Goulding | Department of Agriculture and Food |
| Piers Higgs | Gaia Resources |
| Rebecca Hayes | DEC Roadside Conservation Committee |
| Steve Jones | DEC Information Management Branch |
| Sue Carrol | DEC Western Australian Herbarium |
| Susan Wooller | Murdoch University |
| Ted Griffin | Department of Agriculture and Food |

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## Acronyms

| | |
|---|---|
| ANDA | Avon Natural Diversity Alliance |
| ANRMR | Avon Natural Resource Management Region |
| BHVA | Beard's and Hopkins' Vegetation Associations |
| CALM | Dept. of Conservation and Land Management (now DEC) |
| CR | Critically Endangered as per IUCN definitions (see Appendix 1) |
| DAFWA | Department of Agriculture and Food Western Australia |
| DEC | Dept. of Environment and Conservation (formerly CALM) |
| DRF | Declared Rare Flora |
| DRPF | Declared Rare and Priority Flora |
| EN | Endangered as per IUCN definitions (see Appendix 1) |
| EPBC | *Environment Protection and Biodiversity Conservation Act 1999* |
| FCO | Flora Conservation Officer |
| IBRA | Interim Bio-Regionalisation of Australia |
| IRP | Interim Recovery Plan |
| LfW | Land for Wildlife |
| P1-4 | Priority Fauna or Flora (see Appendix 1) |
| PEC | Priority Ecological Community (see Appendix1.1) |
| RP | Recovery Plan |
| RVPS | Remnant Vegetation Protection Scheme |
| SAP | Salinity Action Plan |
| TEC | Threatened Ecological Community (see Appendix1.1) |
| VU | Vulnerable as per IUCN definitions (see Appendix 1) |
| WAM | Western Australian Museum |
| WONS | Weeds of National Significance |

# Summary and Recommendations

This study aims to collate, interpret and present biodiversity related data in order to inform and improve biodiversity conservation planning within the Avon Natural Resource Management Region (ANRMR). It does this by:
a) Collating an inventory of biodiversity assets within the ANRMR.
b) Determining the condition and trend of these assets, and
c) Examining current biodiversity conservation practices and programs in context of the assets, their condition and trend.

Recommendations highlight identified shortcomings in existing data and/or in current biodiversity conservation programs to aid in future planning across the ANRMR.

General comments emerging from the study are:

- While we a have a general knowledge of the species of the ANRMR, we usually have little knowledge of their status or trend and, particularly for fauna their present distribution.
- There is little knowledge of the type and extent and condition of vegetation communities within the region.
- There are opportunities for synergies between projects for biodiversity conservation in the ANRMR that, as yet, have not been utilised.
- Some projects may need to be reconfigured using the results from this study.
- The analyses/results outlined in this document can be applied at two levels of biodiversity conservation planning: 1) At the asset level the analyses are principally aimed at prioritisation of on-ground works within each asset class, for example rare flora. 2) At the landscape scale, the analyses aim to collating assets spatially to allow for landscape scale conservation planning.

Results of some of the analyses described in this document are already being integrated into biodiversity conservation programs within the ANRMR. For instance:

- The priority Beard and Hopkins Vegetation Associations identified by an expert panel using our analyses of current extent and level of reservation is now being used by the Healthy Ecosystem and Ecoscapes projects.
- A database synthesising the extent/range, threats and associated relevant current biodiversity programs for Declared Rare and Priority Flora has been developed and will soon be used to establish work-program priorities for these assets within the Species and Communities project.

### Findings & Recommendations for each Asset Class

*Remnant Vegetation*

There is 16% vegetation cover left in the agricultural zone of the ANRMR represented by 110,000 patches; most of these (nearly 70 000) patches are ≤ 1 ha, only 1,189 are more than 100 ha.

*Recommendation: Programs aimed at biodiversity revegetation should engage with existing similar programs such as the Roadside Vegetation Conservation Committee and Land for Wildlife and be cognisant of older programs such as the Remnant Vegetation Protection Scheme. The output from the analyses described in this document are typically spatial simplifying these links.*

*Beard's and Hopkins' Vegetation Associations (BHVA)*

The ANRMR contain 137 BHVA of which:

- 42 have 100% of their current extent remnant within the ANRMR; another four BHVA have more than 95% of their current remnant extent within the ANRMR.
- 17 of these have ≤10% of their original WA extent remaining.
- 53 are limited in extent (<2000 hectares in the ANRMR or WA); however, 14 of these always had a limited extent. Twenty-nine have <2000 hectares in WA.
- 31 are not represented and another 76 have <15% of their pre-European extent represented within the IUCN reserve categories I-IV within the State.
- 56 are limited in extent *and* poorly reserved. These are limited in present extent (<2000 ha and/or ≤10% of pre-European extent remaining in NAR or the State) and are poorly reserved (unreserved or <15% of pre-European extent reserved in NAR or the State).

A workshop aimed at prioritising BHVA of concern identified 33 high priority BHVA. From this workshop came a suite of recommendations aimed at improving our knowledge of the extent and types of BHVA.

*Recommendation: That the recommendations from the BHVA workshop be implemented.*

*Threatened Ecological Communities and Communities at Risk*

- There are 11 known Threatened Ecological Communities (TEC) and 34 known Priority Ecological Communities (PEC) within the ANRMR.
- Two of the TEC (Perth to Gingin Ironstone Association and Lake Bryde) are endemic to the ANRMR.
- All five of the Critically Endangered TEC in the ANRMR have recovery plans, one (Lake Bryde) is not recognised under Commonwealth EPBC legislation.
- Two of the three Endangered TEC have recovery plans, only one is recognised under Commonwealth EPBC legislation.
- None of the three Vulnerable TEC have recovery plans or are recognised under Commonwealth EPBC legislation.

There is no consistent monitoring of the condition and trend of TEC or PEC of the ANRMR, thus we cannot report specifically on condition and trend of these communities.

*Recommendations*:

- *That a prioritisation process be developed to investigate the need for recovery actions (starting with a recovery plan and subsequent listing under the EPBC Act) for these communities.*
- *That the conservation status of TEC and PEC communities be reviewed.*

- *That condition indices are developed and trend monitoring of these communities be established.*
- *That the descriptions of TEC and PEC are given to field based staff to aid them in identifying new occurrences of these communities.*

*Plants and allied taxa*

- The region has 4983 current taxa, including 4267 formally recognised species and 307 undescribed species.
- A full 37% of Western Australia's dicotyledon plants are found within the ANRMR.
- 8% of the ANRMR vascular taxa are Declared Rare or Priority Flora (DRPF)

*Endemic flora*

- 416 taxa are endemic to the ANRMR;
- Over ½ of these are threatened or priority taxa, and two are considered extinct.
- 64 of the endemic taxa are known from a single voucher; this includes 2 species of DRF and 41 other taxa that are not considered Rare or Priority.

*Declared Rare or Priority*

- There are 2556 populations of 394 taxa of DRPF within the ANRMR; all of these are vascular plants.
- The ANRMR has a relatively high number of Western Australia's Declared Rare and Priority Flora (DRPF) taxa and populations: 34% and 24% respectively.
- 26 of these are only known from a single population; 20 of these are Priority taxa.
- Of the remaining taxa (those with greater than one population), 16 are know from an extent of <1 kilometre.
- 19 DRPF taxa have not been fully described (having manuscript names only). One of these is Critically Endangered.
- 11% of ANRMR DRF and 16% of Priority flora populations are on road verges.

While there is regular monitoring of DRPF, this information does not readily convert into measures of status, trend or condition.

*General DRPF flora recommendations:*

- *That DRFP prioritisation database developed as part of this document be employed in prioritising recovery actions and for reviewing the conservation status of taxa.*
- *That monitoring protocols be established that identify thresholds for action for DRPF taxa.*
- *Reviewing the conservation status of, in particular, those priority taxa considering with few known populations. We also recommend that the number of populations be used in a prioritisation across all DRPF.*
- *It is recommended that the taxonomy of those species be resolved that are not fully described (i.e. have manuscript names only) is resolved.*

*Fauna*

NB: The fauna results presented here should be considered as preliminary only.

There are 1197 fauna species considered to be extant in the ANRMR; this consists of: 22 species amphibian, 165 species of birds, 19 species of fish, 56 species of mammal, 121 species of reptile and 814 invertebrates.

For some species we have an indication on their trend:

- 68% of the amphibians have decreased, the condition for 27% is unknown and 1 species is considered stable.
- 26% of the birds are increasing, 48% are, or have, decreased, and 10% are considered stable.
- 67% of mammals are, or have, decreased, 13% are stable and 14% are increasing (most of these increasers are introduced herbivores).
- 60% of the reptiles are, or have, decreased, 29% are considered stable, and 2% are considered increasing.

There are 66 species of Threatened, Priority and Specially Protected fauna in the Avon NRM Region.

Four of these species are considered extinct (all mammals), 25 species are Threatened with extinction, 34 are Priority species and three are Specially Protected.

The mammals constitute the greatest number of Threatened and Priority species in the ANRMR, 11 and 9 species respectively.

Specific recommendations for fauna are:

- *Improve collation of Threatened and Priority fauna records through the development and enforcement of protocols of reporting for consultants and researchers.*
- *It is recommended that the current locations of Tammars and Quendas across the ANRMR be resolved.*
- *The remaining Water-rat records for the ANRMR (near the town of York) be re-confirmed.*
- *Need further investigation into a number of species to improve currency of information such as the bees. For instance, the Endangered bee,* Leioproctus douglasiellus *is only known from a single 1954 record. We should assume that this species may still be extant within the region but recommend some work to confirm this.*
- *Some bird species (such as the Australian Painted Snipe) have been only recorded recently and/or occasionally within the ANRMR. These records highlight the informal nature of bird survey and limited understanding of some birds across the wheatbelt. Because of this we recommend the engaging with the community to do regular bird surveys across this large area.*
- *There is only one post-1980 record of the Bilby (*Macrotis lagotis*) in the ANRMR: a 2003 record 5.5 kilometres from Chiddarcooping Nature Reserve. This record may warrant further investigation, as previous records are all quite old.*
- *Need to review Numbat recovery actions to determine the status of the species in the ANRMR.*

# 1. Introduction

The South West Botanical Province of Western Australia is one of the world's biodiversity hotspots. The region earned this appellation through its high species diversity, its high level of endemism and the high level of threat to these values (Myers *et al*., 2000). The area is known to have over 5000 plant species, of which over 4000 are endemic and it has a diverse range of vertebrate and invertebrate fauna that are found nowhere else(Myers *et al*., 2000). These biodiversity values, though, are under substantial threat. The region has endured considerable clearing of vegetation, a subsequent rising of the water table, and the introduction of vertebrate pests has led to declines and, in some cases, regional and national extinctions of fauna. The south-west of Western Australia is also one of the six most vulnerable of the world's biodiversity hotspots to climate change (Malcolm *et al*. 2006). Thus, we have a globally significant area under numerous pressures and threats. The Avon Natural Resource Management Region (ANRMR) is centred on the central/southern Wheatbelt and straddles this globally significant area (Map 1).

Acknowledging the global significance of the region the Avon Catchment Council (ACC) has provided substantial investment through the State and Australian Governments Natural Heritage Trust and the National Action Plan for Salinity and Water Quality for biodiversity conservation. These funds are devolved through a consortium of government and non-government organisations that have joined forces to improve conservation across the ANRMR. This consortium is called the Avon Natural Diversity Alliance (ANDA) and includes the Department of Environment and Conservation, the Department of Water, WWF Australia and Greening Australia WA. ANDA is charged with improving nature conservation outcomes across the region. It aims to achieve this by developing and managing a range of projects that operate at the species, biological community, ecosystem and landscape levels of biodiversity organisation. To inform these projects a Baselining Project was developed.

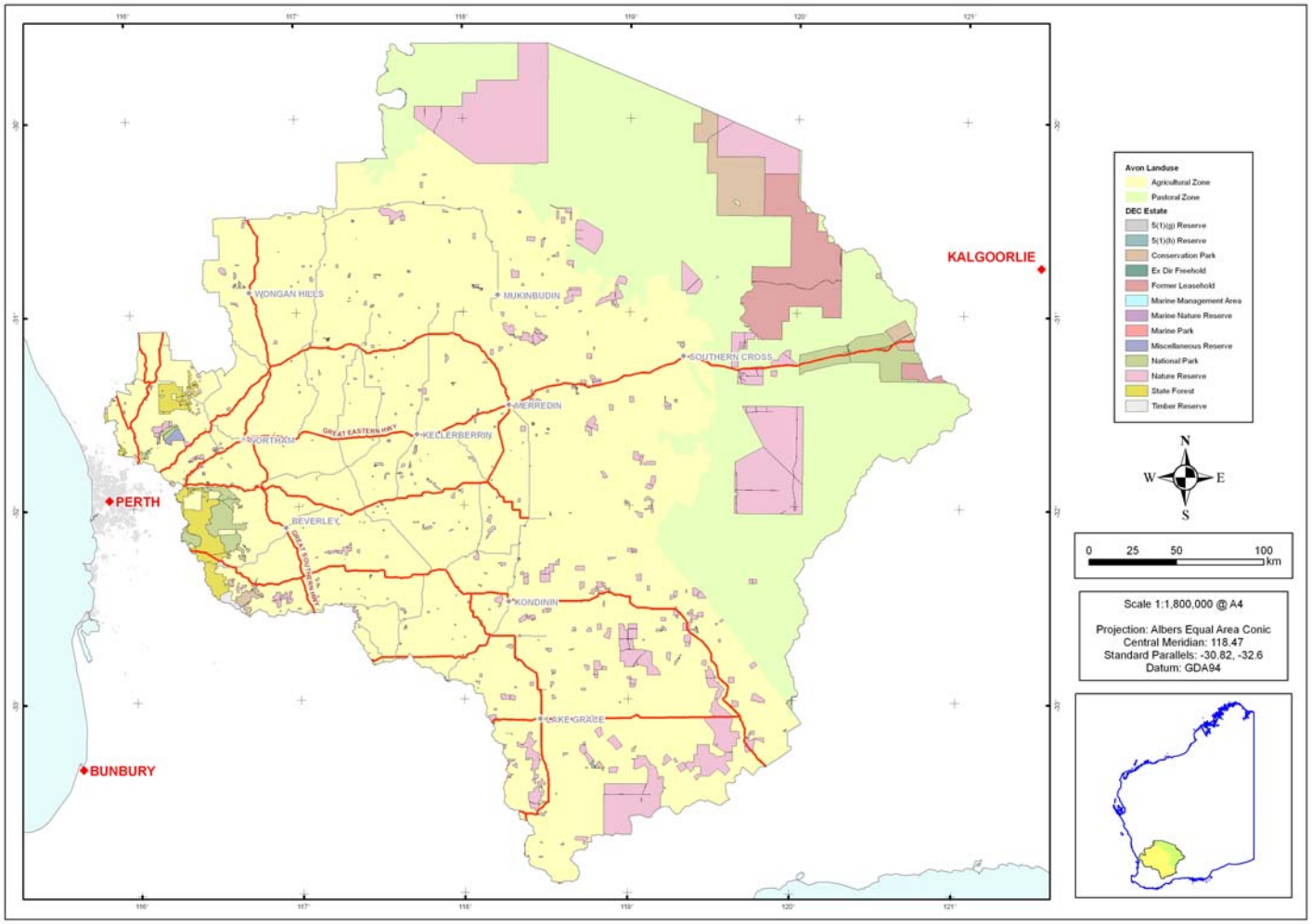
One of the major tasks for Baselining is to inform other projects within ANDA of biodiversity assets, threats and existing biodiversity related programs within the ANRMR; and this represents the primary intent of this document. Specifically, this document focuses on collating and interpreting existing biodiversity-relevant-information in such a way that these other groups can prioritise their works programs.

This document does not intend to review all the known threats across the region. Rather it collates those knowledge and data that are useful for a landscape scale biodiversity prioritisation planning program. Within that framework, this document has several intents. It aims to present summary statistics of the regional biodiversity assets, the threats operative on these assets and the in-place and historic programs aimed to preserve these assets. Specifically, this document will:

- Collate and summarise existing knowledge of the location and status and trend of biodiversity assets across the ANRMR.
- Identify those assets known to be of-concern identified by their current conservation status, the literature and from analyses done as part of this project.
- Map extent of assets and the intensity of threats to these assets.
- Identify historic and existing programs aimed at conserving these assets.

- Where appropriate make recommendations on further actions to conserve these assets.

As the data used here are updated regularly the results and interpretation presented here should be seen as a snapshot in time. However, we acknowledge that to retain biodiversity assets of the ANRMR is a long-term challenge. Thus, we attempted to explain our data sources and analyses as clearly as possible so that they can be repeated at a later time.




**Map 1:** The Avon Natural Resource Management Region.

# 2. Methods and Data Sets

This section identifies the custodian and provenance of data and the analyses used in this report. The date attributed to the dataset follows the dataset name in parentheses.

## 2.1 Relevant Existing and Historic works

This section identifies programs (whether extant or historic) that do or aimed to contribute to biodiversity conservation within the ANRMR. Not mentioned specifically in this section but incorporated within the Assets Section (Section 2.3) is some of DEC's core business: flora and fauna conservation programs.

### 2.1.1 Land for Wildlife

Land for Wildlife (LfW) locations data was sourced from Avril Baxter on 14/05/07. This not the full data set for the ANRMR but should be seen as an interim list of locations. It is thought that the full data set will be available for the final version of this document. Custodian of this data is Penny Hussey at DEC's Species and Communities Branch.

### 2.1.2 Remnant Vegetation Protection Scheme

The Remnant Vegetation Protection Scheme was started *c.* 1988 and aimed at getting covenants under the *Soil and Land Conservation Act 1945.* The custodian for these data is DAFWA.

### 2.1.3 Roadside Vegetation

Of the 43 Shires wholly or partially within the ANRMR, 21 have had the roadside vegetation wholly or partially surveyed. Of these 11 are provided to identify the summary statistics available from the data. These 11 Shires are those that are both 100% within the ANRMR boundary and have a published report with summary tables from the RCC.

Those Shires excluded are: Brookton, Bruce Rock, Corrigin, Cunderdin, Kellerberrin, Kondinin, Koorda , Lake Grace , Merredin , Narembeen, Northam, Quairading, Tammin, Westonia, Yilgarn, Chittering, Kulin, Pingelly, Kent, Swan, Wickepin, Mundaring, Coolgardie, Dumbleyung, Wandering, Gnowangerup, Cuballing, Ravensthorpe, Gingin, Wanneroo, Dundas, Jerramungup.

The methods used for assessing conservation value of roadside vegetation are outlined in Jackson (2002). This methods defines 12 value categories based on weediness, width of vegetation, number of strata and species richness. These categories are typically grouped into four categorical classes of conservation value: conservation value rating 1 to 4, is considered low conservation value; rating 5-6 medium-low; rating 7-8 medium-high; rating 9-12 is high conservation value.

### 2.1.4 Salinity Action Plan Sites

The Salinity Action Plan (SAP) sites are study sites from the Wheatbelt biological survey (Keighery *et al.*, 2004). Two types of sites are defined: aquatic and terrestrial. These data are retained by DEC.

### 2.1.5 ANDA Programs

The Avon Natural Diversity Alliance (ANDA) programs location are shown here for completeness; this does not constitute a review of the ANDA program.

The Terrestrial component of Healthy Ecosystems data was collated in July 2007, these are the location as measured by actual signed landholder agreements (VMAs or covenants) spanning the life of the Woodland Watch project and merging into the current project of Healthy Ecosystems: 2000-2007.

The Aquatic component of Healthy Ecosystems data was collated in June 2007. These are the locations of planning, baselining and on-ground actions since 1995.

The Ecoscapes project locations were collated in June 2007.

### 2.1.6 Vegetation Mapping

There are numerous vegetation maps across the ANRMR. These are presently being collated, digitised and attributed as part of the Baselining project.

### 2.1.7 Other Programs

Some programs such as the Save the Bush program data are not available. This program was a percussor to Bushcare and may identify locations where federal government money has been allocated for on ground works.

There are two nature conservation focused covenanting programs operative in the south-west of Western Australia: covenants through the Department of Environment and Conservation and those available through the National Trust. The number and location of these covenants were acquired through the Nature Conservation Branch of DEC in June 2007.

## 2.2 Landscape Scale Threats

The intent of this section is not to review all the known threats across the region. The intent of this document is not a review of all biodiversity related assets and processes but rather a pragmatic collation of data and information that is useful for a landscape scale biodiversity prioritisation planning program.

### 2.2.1 Salinity

Salinity mapping came from two datasets derived from the Landmonitor project (http://www.landmonitor.wa.gov.au/index.html). One is a derived at risk of salinity model using digital elevation modelling height above streamline as the index of salinity risk. It allocates pixels to fixed height intervals above streamlines namely <.5, <1m, <1.5m and <2m. The other dataset is the 'salinity monitoring product' which indicates the extent of salinity in the years 1987-1998.

### 2.2.2 Phytophthora Dieback

Dieback records are being collated as part of the dieback atlas that may be finished by the end of 2007.

## 2.3 Assets

### 2.3.1 Pre-European and Remnant Vegetation

Pre-European vegetation (September 2006) and Remnant Vegetation datasets (September 2006) were used to derive change in vegetation extent since European settlement (defined as pre-1750). These analyses are based on the vegetation association concept which has been spatially captured on Beard's and Hopkins' database (BVHA; Hopkins *et al.*, in prep.). Beard's Vegetation Associations were mapped by John Beard in the 1970s. This mapping is generally at the scale of 1:250000.

To separate the cleared from the uncleared areas the above analyses were performed on the intensive and extensive land use zones (i.e. on the cleared and uncleared parts of the ANRMR respectively). The boundary between these two zones is defined by the Department of Agriculture and Food's "Clearing Line – South Western Australia" dataset (October 2002).

To remove the potential impact of small areas the above areas were rounded down to the nearest whole number. Each vegetation association with a remaining extent of <10 ha was examined to see if the record was erroneous, otherwise all records were taken as correct.

Percentage of original remaining vegetation was calculated as current extent expressed as a percentage of pre-European extent in each area (agricultural, pastoral and total in WA).

To determine the reserve status for each vegetation association two types of data where used. Firstly, DEC Tenure with IUCN Categories I-IV (June 2006). These are terrestrial protected areas managed specifically for nature conservation as outlined in IUCN (1994); specifically they include National Parks, Nature Reserves, Conservation Parks and Forest Conservation Zones to be classified under section 62 of the CALM Act. The other tenure grouping used is DEC managed lands as per section 33(2) of the CALM Act; these are Unallocated Crown Lands managed by DEC.

In forests, it is considered that 15% of pre-1750 extent should be protected in a reserve system (JANIS, 1997). We defined vegetation associations with less than 15% of pre-European extent within the reserve system as poorly reserved. Thresholds of ≤ l0% and ≤ 30% of pre-1750 extent define endangered and of-concern vegetation associations respectively (EPA, 2000).

The amount of each vegetation association within IUCN I-IV reserves and DEC-managed estate were calculated as a percent of its pre-European extent. These results were rounded down to the nearest full number, thus associations with <1% in IUCN and DEC managed lands are recorded has having 0% reserved. These analyses were done separately for ANRMR and the State, the former using present vegetation association extent in reserves in ANRMR divided by ANRMR pre-European extent; the latter using State values.

In order to present a summary of vegetation associations status, a summary table was calculated using criteria of vegetation associations with limited extent (≤2000

hectares remaining), endangered (≤ 10% of original extent remaining) and poorly reserved (<15% in reserves IUCN I-IV) at either the State or ANRMR level.

To develop an understanding of the perimeter/area relationship of patches of remnant vegetation a measure of compactness was derived for each patch of remnant vegetation. For our purposes using compactness was found to be the only consistent measure of shape of patches of remnant vegetation.

The formula for compactness is:

$CF=(4*\Pi)*A/P^2$
Where:
CF is compactness
A is area of patch ($m^2$)
P is perimeter of patch (m).

The values for Patch Compactness will be between 0.0 and 1.0. The most compact geometric shape being a perfect circle. A value close to 1.0 will have a large perimeter to area ratio, large core area and will be roughly square to circular in shape. Conversely a value closer to 0 will have a very small perimeter to area ratio and are either long thin patches or blockier polygons but with convoluted and/or highly corroded boundaries (see Appendix 2.1).

### 2.3.2 Threatened Ecological Communities and Communities at Risk

Data was sourced from DEC's Species and Communities Branch's Threatened Ecological Database on the 28th March 2007. These records are all the identified Threatened and Priority Ecological Communities across Western Australia.

To flag other TEC or PEC that may occur but are, as yet, unrecorded within the ANRMR a 20km buffer was used.

### 2.3.3 Plants and Allied Taxa

Flora data was acquired from two sources. Those taxa considered Threatened or Priority where accessed from DEC's Species and Communities Branch on 13th of December 2006. These data represent the known locations of Threatened and Priority plant species across the State. These data were clipped to the ANRMR boundary. The other source of plant data was from the WA Herbarium, these data where acquired from the Western Australian Herbarium on the 18th of September 2006.

The list of taxa from the ANRMR was derived from the WA Herbarium data.

The estimation of the range of taxa was derived to identify a further aspect of threat: a reduced range of a taxon implies higher extinction probability. For this analysis taxa with only a single record or population (as in DRFP) where excluded from the analysis. Using database query the maximum and minimum easting and northing for each taxon was identified. These co-ordinates created a bounding box for each taxon's distribution. The diagonal distance was then calculated using Pythagoras' Theorem namely: Extent = Square Root(((MaxX- MinX)*(MaxX-MinX))+((MaxY-MinY)*(MaxY-MinY))). The units for this calculation were in metres.

Endemics were derived using techniques outlined in Hopper and Gioia (in prep.). This analysis was run by Jack Green November 2006.

Density maps of WA Herbarium vouchers used only those vouchers with a precision of 1,2 or3. They were created in Arc-GIS by defining a neighbourhood of 10km around the centre point of a 100m square cell. The number of points that fall within the neighbourhood is totalled and divided by the area of the neighbourhood.

Weed data was derived from the Western Australian Herbarium data. That data contains a field identifying naturalised taxa. To identify weeds of concern the subset of these species that are considered environmental weeds as defined in Keighery and Longman (2004) have been identified.

### 2.3.4 Fauna

Fauna data was derived from three principle sources. Firstly, those species that are considered threatened or priority (as identified in Schedule 1 of the Western Australian *Wildlife Conservation Act 1950*) is held within DEC's Threatened and Priority Fauna Database. These data are a collation of museum records, opportunistic sightings, published and unpublished records and reports returned by researchers and environmental consultants under scientific licence. This database attempts to retain contemporary location records of these species. These data were acquired on the 20th November 2006 for the ANRMR including a 20km buffer.

Within this data were 38 records of the White-tailed Black Cockatoo (*Calyptorhynchus* sp.). As these data were not attributed to species and could have been either Baudin's Black-Cockatoo or Carnaby's Black-Cockatoo (both resident within the region), these records were excluded from further analysis.

Secondly, bird data (for the ANRMR and a 50km buffer) was acquired from CSIRO at Floreat which is their Birdbank database. This database consists of bird data from:

- the literature since 1865
- CSIRO catchment surveys
- Birds Australia Atlas I (selected records with low locational accuracy)
- Birds Australia Atlas II (records for the SW corner of WA, most with GPS locations)
- unpublished lists of Arnold, Bougher, Brooker, Cale, Chapman, Davis, Garstone, McKenzie, Rowley, Russell, Secomb, Smith and others
- Museum records (for selected bird species)

Thirdly, the Western Australian Museum (WAM) fauna data was acquired for the ANRMR and a 50km buffer. These data are from the museum collections databases, and is across all taxonomic groups. These data were collated on 27/04/07.

Previous work in the ANRMR identified status of vertebrates within the ANRMR boundary; this was developed by a panel with specialist knowledge (see Safstrom *et al*. 2000). The results from this analysis are used here also (with the kind permission of Rod Safstrom) to identify other species of concern that have not been identified as threatened or priority.

Each of these datasets was used independently: Threatened and Priority fauna is derived from DEC's Fauna File data, the list of resident species for the ANRMR is taken from the WA Museum data and the CSIRO bird data.

# 3. Results and Discussion

## 3.1 Relevant Existing and Historic works

### 3.1.1 Land for Wildlife

The preliminary Land for Wildlife (LfW) shows that there are 448 members active within the LfW scheme across the ANRMR (Map 2).

### 3.1.2 Remnant Vegetation Protection Scheme

The objective of the Remnant Vegetation Protection Scheme (RVPS) was to encourage land owners across the southwest of Western Australia to fence and protect areas of remnant vegetation (Hamilton *et al.*, 1991). The scheme ran from 1988-2000. Map 3 shows the generalised locations of the RVPS sites. Which patches of vegetation were given priority to preserve was partly defined by the classes of vegetation (synonymous with vegetation communities). For example, in the central Wheatbelt the very high priority vegetation classes include woodlands of Banksia or Salmon Gum, shrublands on sandy soils and Greenstone or Quartzite outcrops; thus the program has potentially preserved a substantial amount of important vegetation types.

There are a few caveats in using these data. Firstly, many of these sites may be moribund and fences may be down. The sites may be confidential.
One of the appendices in an evaluation of RVPS (Hamilton *et al.*, 1991) presents a brief vegetation description of many of the patches protected under this scheme; Mollemans (1992) identifies the 962 bush remnants he surveyed in the southern Wheatbelt for the RVPS. These data would be an important contribution to the vegetation mapping collation presently being undertaken within the Baselining project (see Section 3.1.6).

Because of the fencing component of this program it may be instructive to re-evaluate these sites to test the effectiveness of fencing and other management actions.

*We recommend that the issues of access to locations and confidentiality be resolved and, if possible, locations of these important sites identified for other projects such as LfW, as well as ANDA projects such as Ecoscapes and Healthy Ecosystems.*

### 3.1.3 Roadside Vegetation

Because of the extensive clearing across the ANRMR roadside vegetation is often the last indication of what used to be in the region. This has been found useful as benchmark sites. Furthermore, roadside vegetation has been found to be critical for the retention of some birds including breeding sites for the Endangered Carnaby's Cockatoo (Lamont, 1998) and substantial numbers of Rare and Priority flora populations are found in these remnants (see Figure 4, Section 3.3.3.3).

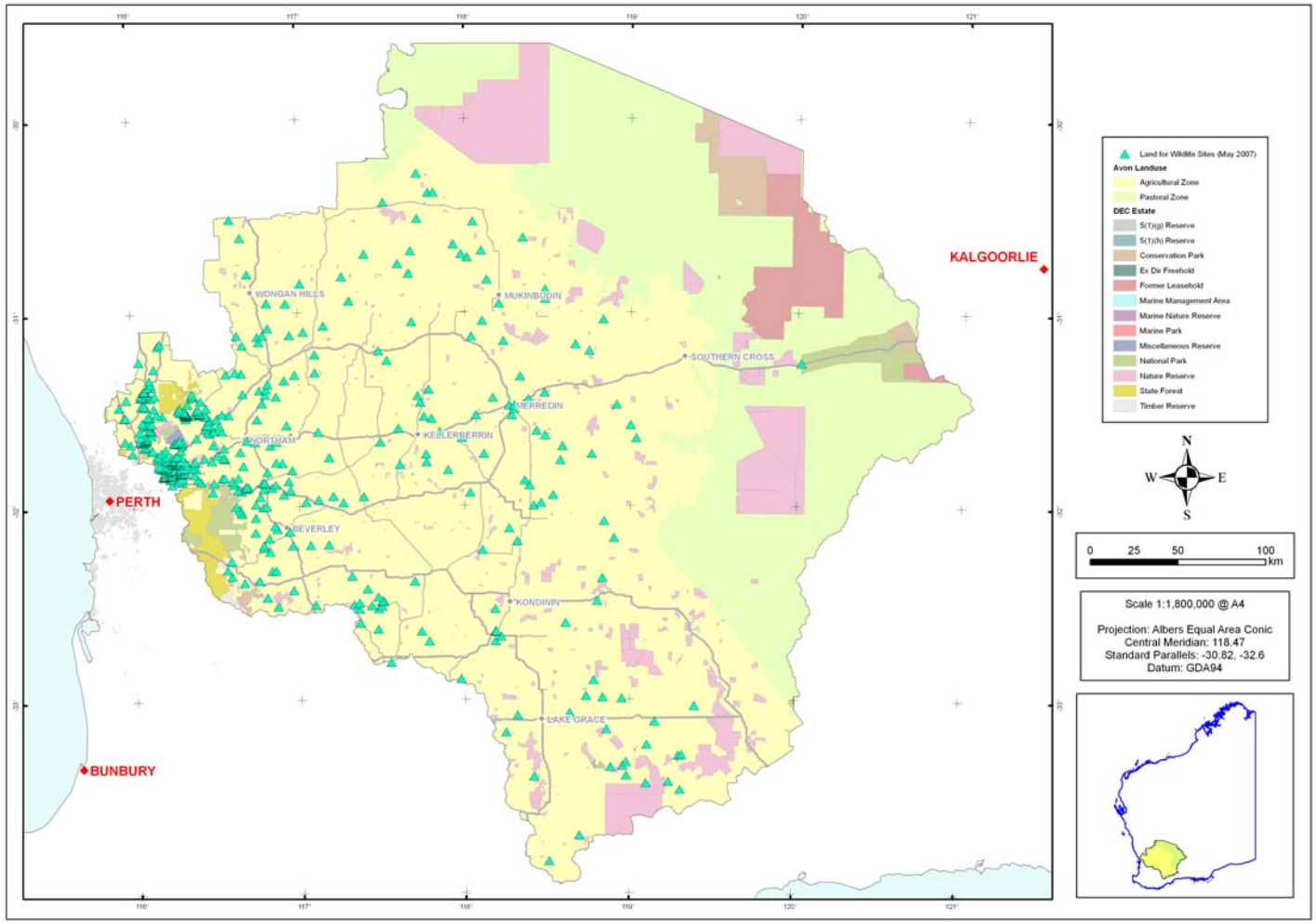
Eleven of the 43 Shires within the ANRMR fitted the criteria for summarising here (see Section 2.1.3). Most surveys are quite recent, 9 of the 11 started on or after the year 2000. Over 8500 km roads surveyed within these 11 Shires.
Forty-two percent of sampled roadsides in the selected Shires are considered of high conservation value (Table 1, Map 4). Nineteen Shires within the ANRMR boundary have not been surveyed.

*It is recommended that:*

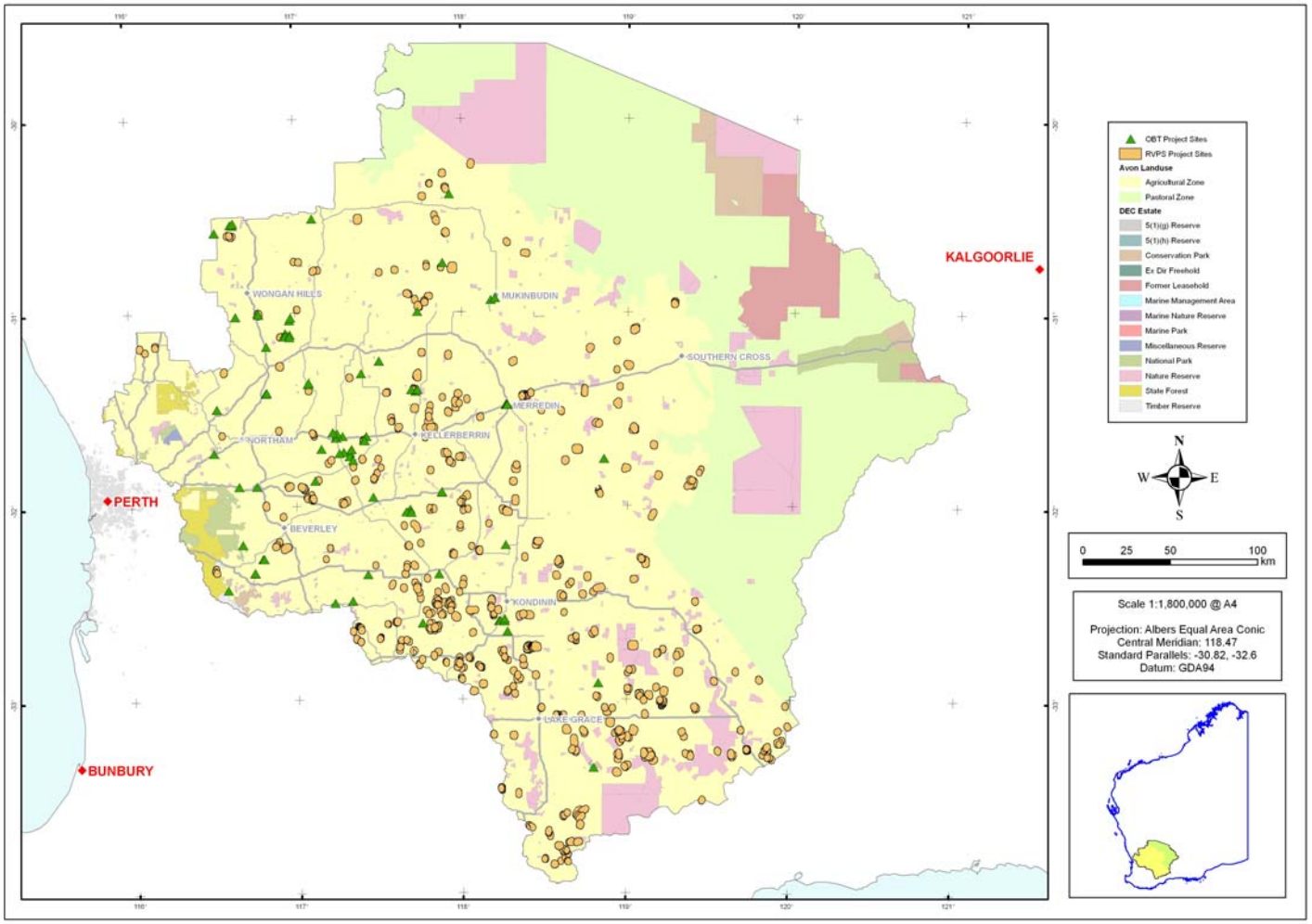
- *Road corridors are considered in landscape scale conservation planning particularly where they have the potential to link large patches of remnant vegetation.*
- *That the Shires that have not been surveyed are.*

**Table 1:** Summary of conservation value categories of roadside vegetation in selected Shires within the ANRMR.
[1] CV stands for conservation value a relative measure of the conservation value of a particular section of road (see Section 2.1.2).

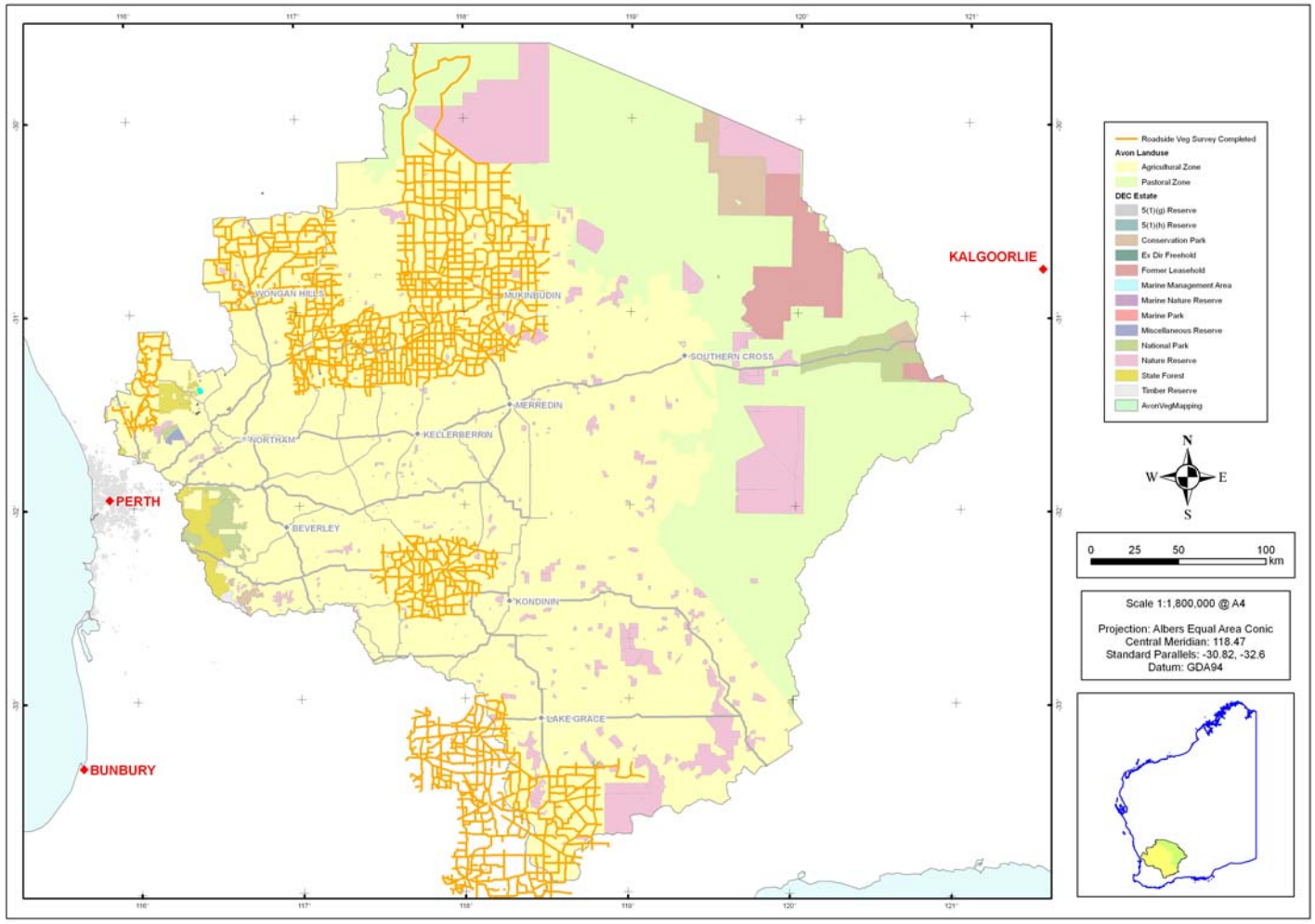
| Shire | Low CV[1] | Med.-Low CV | Med.-High CV | High CV | Year Surveyed |
|---|---|---|---|---|---|
| Dowerin | 28% | 15% | 15% | 28% | 2004 |
| Goomalling | 10% | 27% | 23% | 33% | 2005 |
| Mount Marshall | 2% | 4% | 26% | 64% | 2003 - 2004 |
| Mukinbudin | 2% | 6% | 32% | 52% | 2003 |
| Nungarin | 4% | 4% | 17% | 49% | 2003 |
| Toodyay | 24% | 9% | 9% | 25% | 1988 -1990 |
| Trayning | 21% | 16% | 23% | 32% | 2004-2005 |
| Wongan-Ballidu | 20% | 16% | 20% | 21% | 2004 |
| Wyalkatchem | 9% | 31% | 25% | 22% | 2003-2004 |
| York | 15% | 33% | 33% | 12% | 1988-1989 |
| Beverley | 10% | 19% | 24% | 29% | 2000-2003 |
| **Total** | 14% | 17% | 27% | 42% | |




**Map 2:** Properties that are involved in the Land for Wildlife scheme.




**Map 3:** The location of Remnant Vegetation Protection Scheme and One Billion Tree Sites.




**Map 4:** The extent of roadside vegetation assessment within the ANRMR.

### 3.1.4 Salinity Action Plan Sites

There are 101 aquatic and 725 terrestrial SAP sites within the ANRMR (Map 5).

### 3.1.5 ANDA Programs

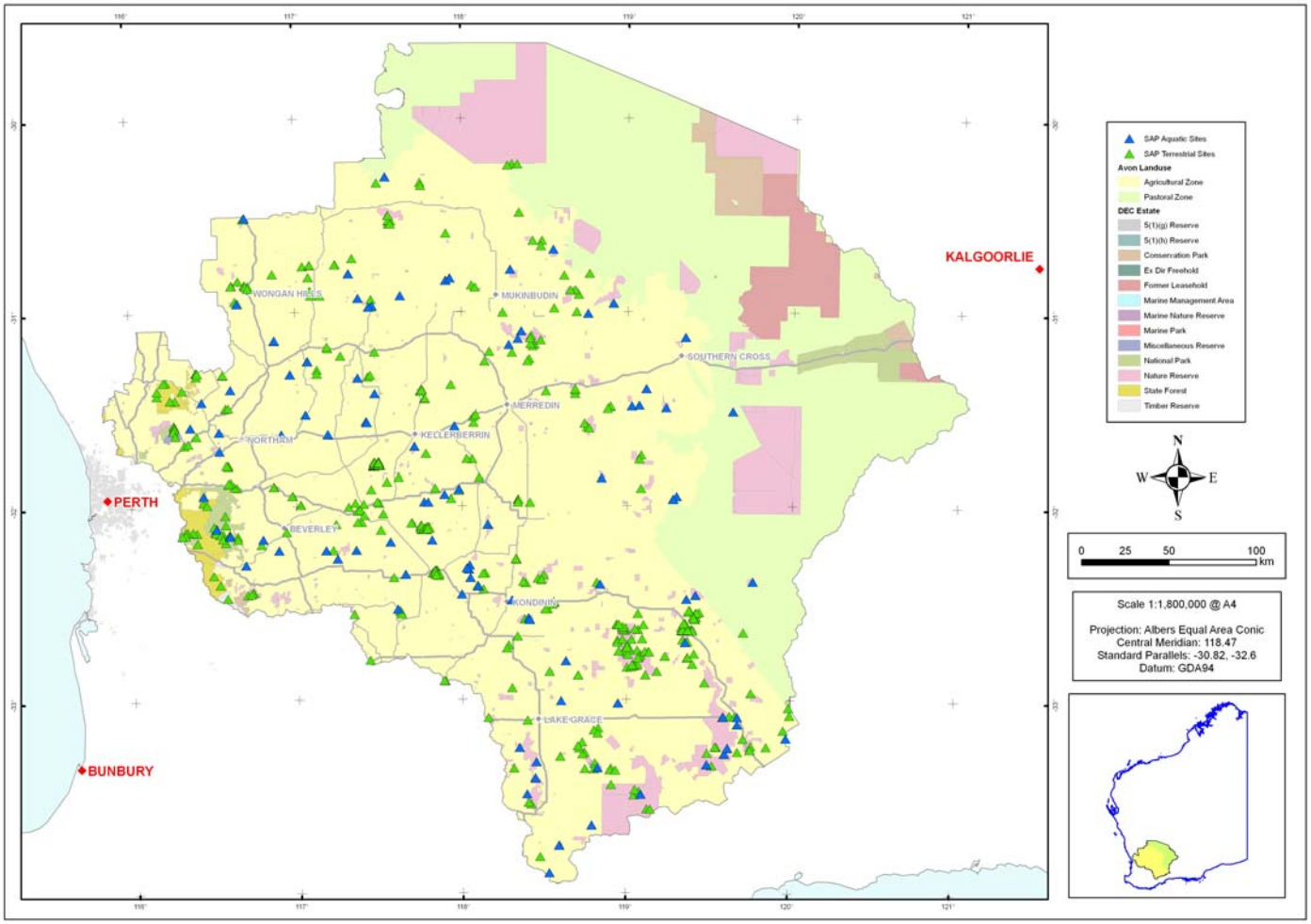
A summary of the outcomes for the terrestrial component of Healthy Ecosystems is given in Table 2, they are shown visually in Map 6 . Two hundred and four participants have been involved with the program.

**Table 2:** A summary of outcomes from the terrestrial part of Healthy Ecosystems.
VMA means Voluntary Management Agreement.

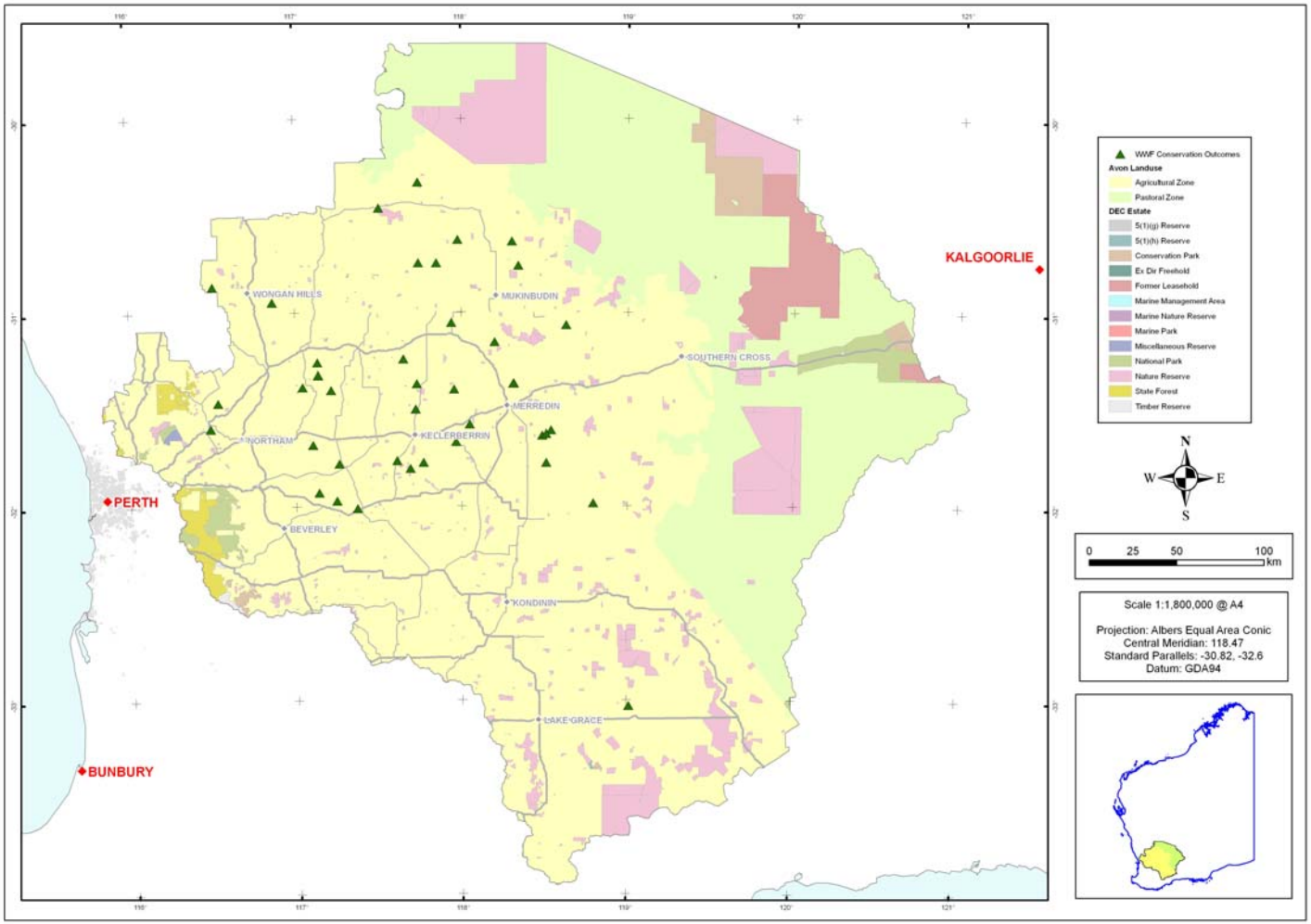
| Description | Extent | Reporting Measure |
|---|---|---|
| Number of participant sites | ACC Total | 204 |
| Number of flora surveys conducted | ACC Total | 158 |
| Number of covenants facilitated | ACC Total | 11 |
| Area of covenants facilitated (ha) | ACC Total | 1074.2 |
| Area of covenants under negotiation (ha) | ACC Total | 2010 |
| Number of VMAs facilitated | ACC Total | 47 |
| Area of VMAs facilitated (ha) | ACC Total | 4757 |
| Area of VMAs under negotiation (ha) | ACC Total | 2131 |
| # species vouchered during flora surveys | ACC Total | 6143 |
| Area of woodland surveyed (ha) | ACC Total | 5681 |
| Area of bush fenced by facilitated fencing | ACC Total | 5287.2 |
| Area of target veg fenced by facilitated fencing | ACC Total | 1283.1 |

The outcomes of the aquatic part of Healthy Ecosystems are shown visually in Map 7. These are the river recovery actions including foreshore survey, river recovery plans and water assessment. Through this work the project has substantially contributed to riparian vegetation conservation and restoration with, for instance, over 35000 native plants being planted in riparian zones during 2006 and 2007.

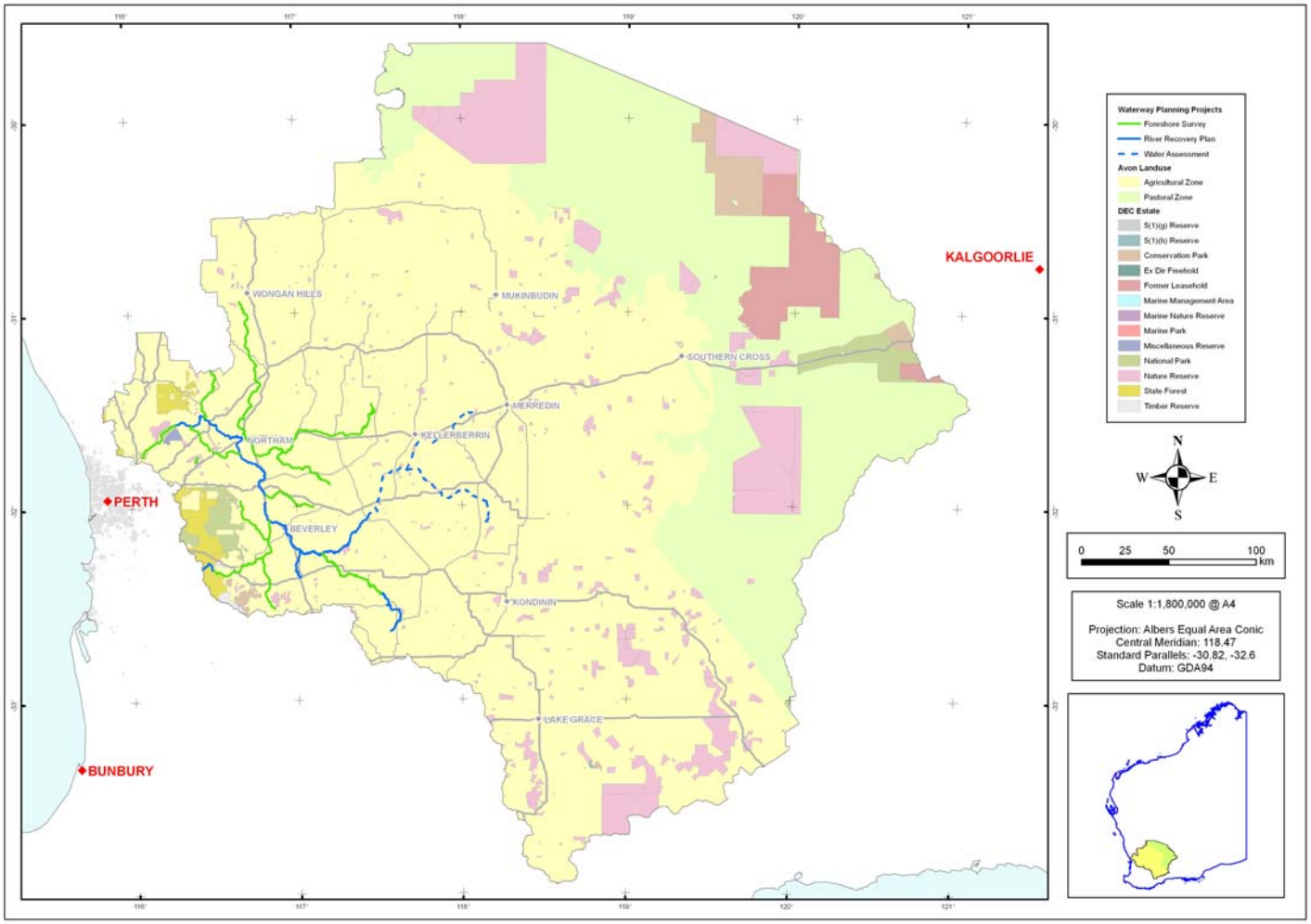
The Ecoscapes project was developed to preserve the extant and integrity of selected landscapes; these landscapes were termed Ecoscapes (Walsh, 2006) as part of the ANDA program. The locations of the 13 selected Ecoscapes are shown in Map 8. Detail on the nature of the program is given in Avon Catchment Council (2005).



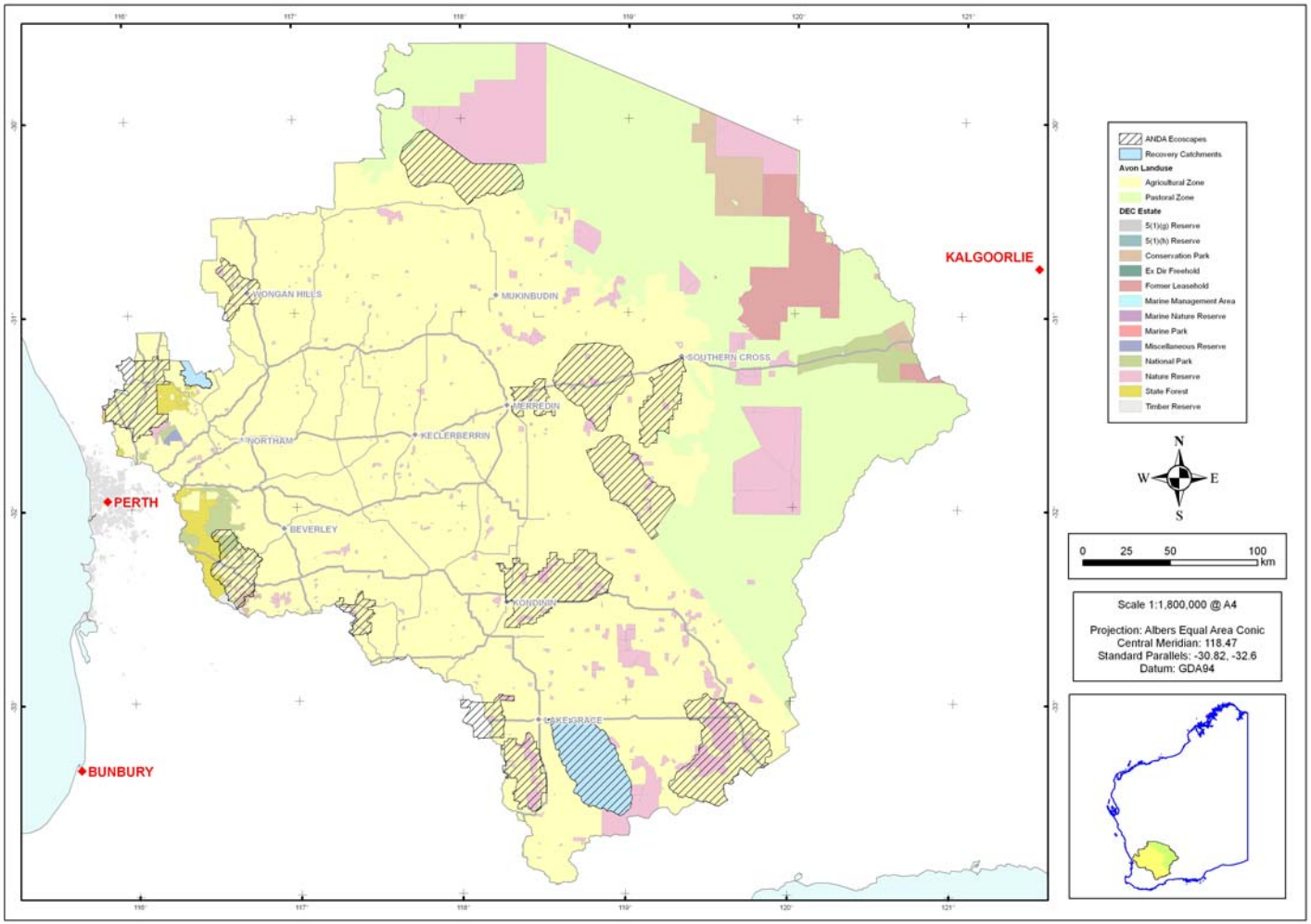

**Map 5:** The Salinity Action Plan study sites within the ANRMR.



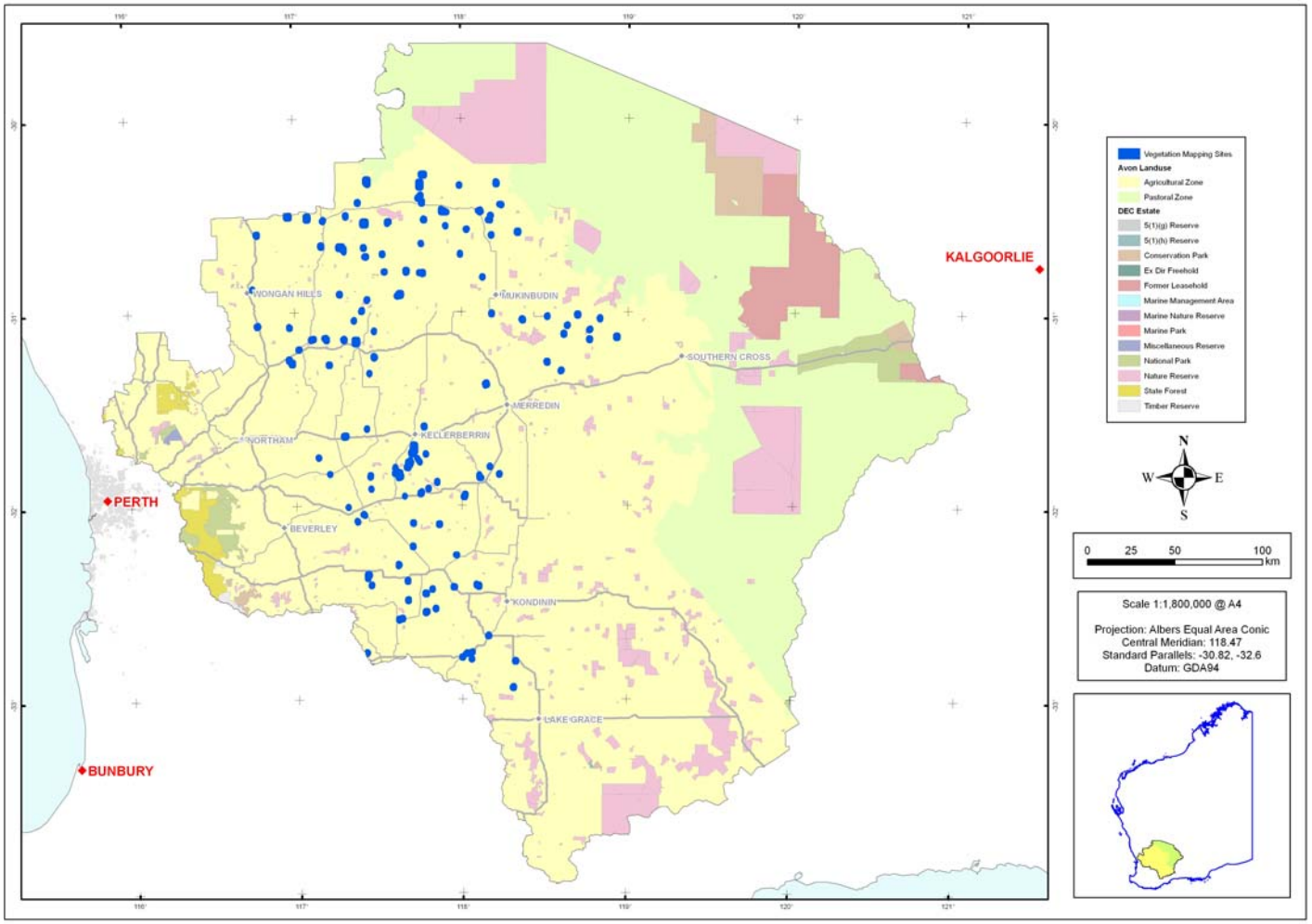

**Map 6:** The location of on-ground works by the terrestrial component of Healthy Ecosystems.



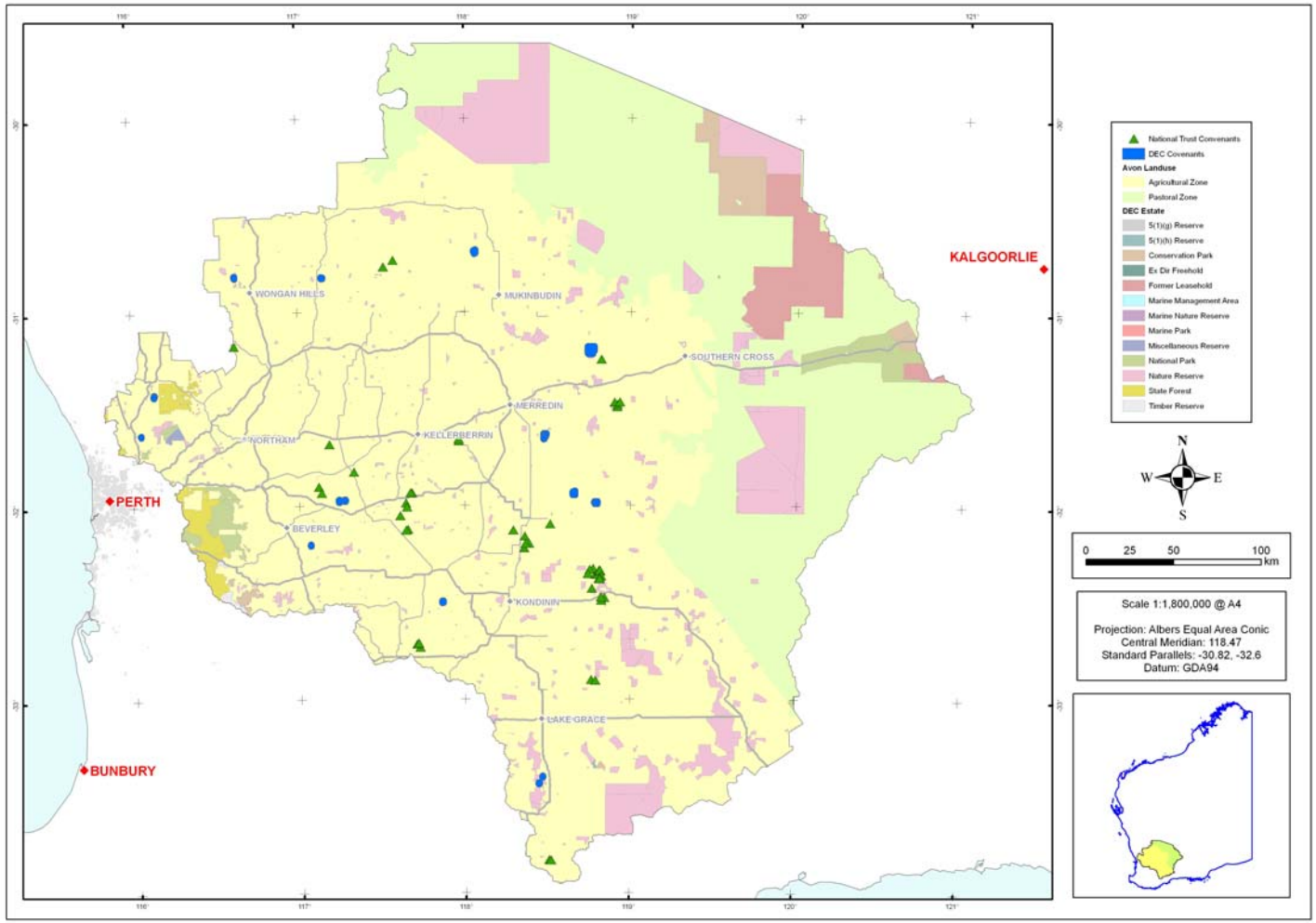

**Map 7**: The location of outputs from the aquatic component of Healthy Ecosystems.



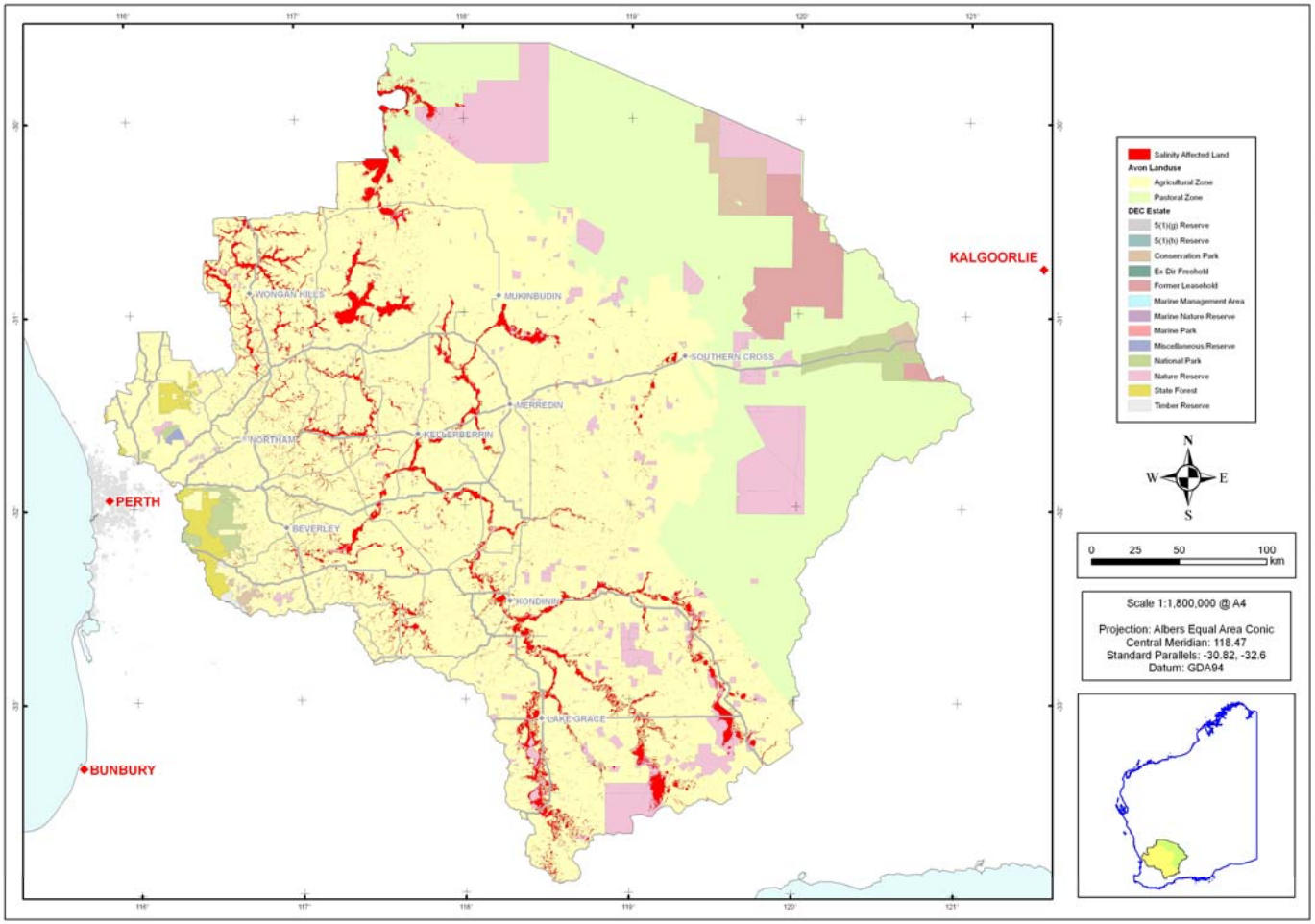

**Map 8:** The Ecoscapes and Recovery Catchments of the ANRMR.



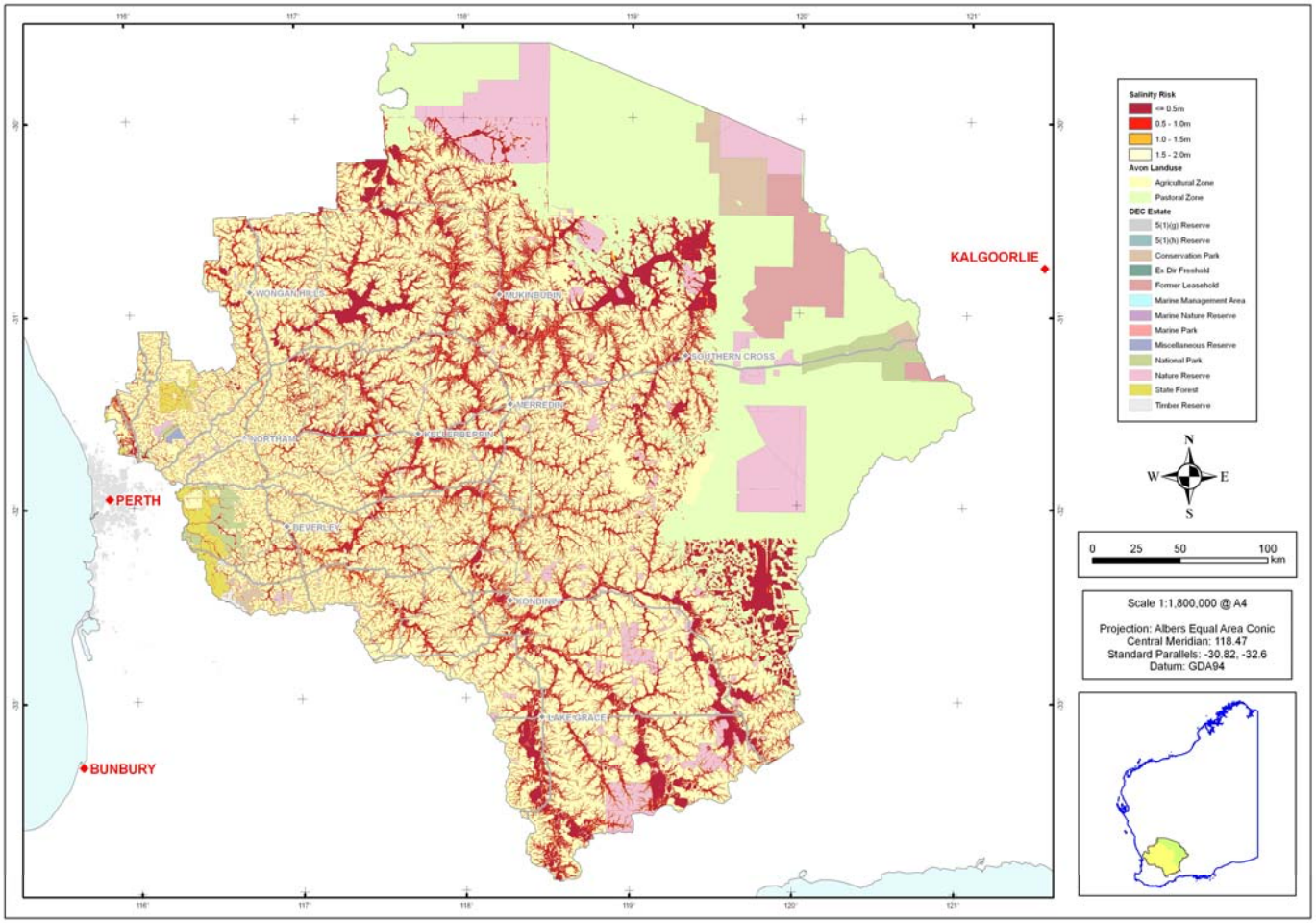

**Map 9:** The interim vegetation mapping within the ANRMR.




**Map 10:** The location of DEC and NT covenants.




**Map 11:** The mapped present extent of salinity within the ANRMR.
See Section 2.2.1 for how these data were derived.




**Map 12:** The mapped area of salinity risk.
See Section 2.2.1 for how these data were derived.

### 3.1.6 Vegetation Mapping

There are approximately 300 existing vegetation community maps across the ANRMR; approximately ½ of these are on the conservation and the majority of the other ½ are ex-water reserves. Many of these maps are old (eg Muir's vegetation mapping of the Wheatbelt reserves in the 1970s). Map 9 shows the location of the 97 maps that have been digitised at the time of writing this report.

### 3.1.7 Other Programs

The Australian Wildlife Conservancy (AWC) has two properties, Karakamia and Paruna sanctuaries, within the ANRMR. These properties are part of AWC's 14 national properties portfolio. The intent of Paruna was to develop a wildlife corridor linking the Avon Valley and Walyunga National Parks. Both properties have at least some of their boundaries protected by predator proof fencing. Between them these properties retain a number of Threatened fauna including Woylies, Tammar wallabies, Black-flanked Rock-wallabies, Western Ringtail Possums, Quokkas, Quenda and Numbats. For some of these species (eg Quokka, Western Ringtail Possums) these represent the only populations of these species within the ANRMR.

The Recovery Catchment Program was established to provide landscape-scale biodiversity conservation. Lake Bryde Recovery Catchment and part of Drummond Recovery Catchment fall within the ANRMR boundary (Map 8).

There are two nature conservation focused covenanting programs operative in the south-west of Western Australia: covenants through the Department of Environment and Conservation and those available through the National Trust. The number and location of these covenants were acquired through the Nature Conservation Branch of DEC in June 2007.

The location of DEC and National Trust covenants is shown in Map 10. There are 51 NT and 20 DEC covenants in the ANRMR.

## 3.2 Landscape Scale Threats

### 3.2.1 Salinity

NB: salinity mapping (either present or risk) are derived products that need to be used carefully. Throughout this report they are used as indicative measures only.

Current salinity is shown in Map 11; salinity risk is shown in Map 12.

Salinity risk as derived from DEM mapping has 5 categories: between 0 to .5 metres above valley floor, between .5 and 1 metre above valley floor, between 1 and 1.5 metres above valley floor and between 1.5 and 2 metres above valley floor, and, above 2 metres above valley floor.

### 3.2.2 Phytophthora Dieback

DEC is currently developing a Dieback Atlas that will ultimately include the ANRMR (http://www.naturebase.net/content/view/213/548/1/3/). This atlas aims to give an accurate assessment of the extent of Dieback in the south-west Botanical

Province. Assessment has generally been in the highly susceptible coastal areas leading to only the western and southern edge of the ANRMR being assessed. This atlas may be ready by the end of 2007 (pers. comm. Greg Strelein[1]).

There are few positive records of Phytophthora Dieback within the ANRMR.

Areas that are prone to Phytophthora dieback are those that are wet from October to April and have susceptible species (pers. comm. Mike Stukely[2]). There are broad patterns of susceptibility to Phytophthora die-back and rainfall: in areas of >600 mm rainfall infestation is generally along roads; between 400-600mm infestation is along creek lines, below granite rocks and along drainage lines off roads (pers. comm. G. Strelein).

## 3.3 Assets

### 3.3.1 Pre-European and Remnant Vegetation

*Remnant Vegetation*

The ANRMR has an area of nearly 13,000,000 ha. If divided into land-use categories 34% is extensively used (beyond the clearing line). In the agricultural zone which constituents most-66%-of the ANRMR only 16% is still vegetated (Table 3).

**Table 3**: Remnant vegetation statistics for the ANRMR.

| | Area (ha) | % of ANRM | Remaining Vegetation (ha) | % Remaining Veg |
|---|---|---|---|---|
| Pastoral | 4459753 | 34 | 4459656 | 100 |
| Agricultural | 8810869 | 66 | 1385166 | 16 |
| ANRMR Total | 13270621 | 100 | 5844822 | 44 |

There are over 110 000 patches of remnant vegetation in the ANRMR; most of these (nearly 70 000) patches are ≤ 1 ha, only 1,189 are more than 100 ha (Figure 1). The interpretation of the remnant vegetation patch data for small and/or elongated patches is influenced by the digitising process of these data. Many road reserves, for instance, while ostensibly a single remnant were partitioned incorrectly by this process into a series of smaller patches. The extent that this biases the precision of our count/size data (and consequently shape, see below)is unknown however, because of the absolute number of patches and that it is the smaller, less ecologically viable patches influenced we don't believe that this influences our results in a substantial way.

[1] Greg Strelein, DEC, Bunbury
[2] Mike Stukely, DEC

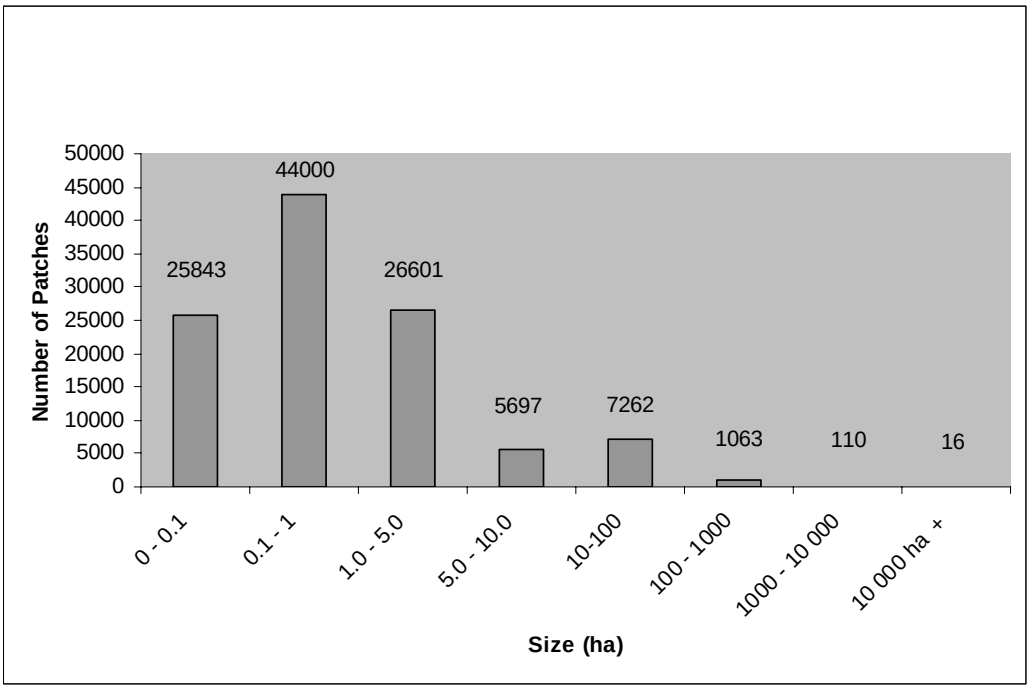



**Figure 1**: The number of remnant vegetation patches within each size class for the ANRMR.

Compactness is the measure being used for the perimeter/area relationship (see Section 2.3.1). Appendix 2 (Table A2.1) gives a visual representation of patch shape and compactness indices. Table 4 gives the compactness values for each of size classes of remnant vegetation within the ANRMR. The majority of small (0-1 ha) patches are generally in the .4-.8 compactness category. This may be an artefact of digitising (ie the digitising process has divided some small elongated shapes, those with a low compactness, into a series of smaller squarer polygons, those with a high compactness). There is a general trend that the larger patch area categories have a lower compactness i.e. they are more convoluted or more elongated.

**Table 4:** Compactness values for each of the size classes of patches of remnant vegetation in the ANRMR.
C Category is the compactness category (see text).

| C Category | Patch Area Category (ha) | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | 0.-0.1 | 0.1-1 | 1-5 | 5-10 | 10-100 | 100-1000 | 1000-10 000 | >10 000 | |
| 0.0 - 0.2 | 265 | 224 | 2012 | 1266 | 2674 | 669 | 92 | 13 | 7215 |
| 0.2 - 0.4 | 359 | 4528 | 9892 | 2312 | 2663 | 272 | 15 | 0 | 20041 |
| 0.4 - 0.6 | 299 | 18805 | 8795 | 1305 | 1266 | 90 | 2 | 0 | 30562 |
| 0.6 - 0.8 | 20610 | 19321 | 5003 | 724 | 610 | 30 | 1 | 0 | 46299 |
| 0.8 - 1.0 | 4310 | 1122 | 899 | 90 | 49 | 2 | 0 | 0 | 6472 |
| Total | 25843 | 44000 | 26601 | 5697 | 7262 | 1063 | 110 | 13 | 110563 |

Little is known of the status and condition of these patches of vegetation though previous work may be of some guide. Beeston *et al.* (2002) believe that 40% of all remaining patches of vegetation across Western Australia show some level of

disturbance. In vegetation mapping/condition assessment of the Northern Agricultural Region Richardson *et al.* (2005) found 60% of the patches they examined were in good or better condition; 15%, however, were degraded. That study focused on large patches of remnant vegetation regardless of tenure and included many conservation reserves.

*Beard's and Hopkins' Vegetation Associations*

There are 145 attributed BHVA types within the ANRMR. Reviewing these identified a number of BHVA that should be excluded from further consideration due to a number of reasons. Firstly, initial examination of the data revealed a number of BHVA that have been attributed incorrectly. These were removed from further analysis. Secondly, as part of the process in identifying BHVA that are of high-importance, a workshop was convened (see Appendix 2.2). One of the outputs from this workshop was informing the significance of some of the small BHVA (the workshop only considered those BHVA that occured in the agricultural zone of the ANRMR). This workshop also identified that the mapped distribution and description of some of the BHVA needs to be reviewed.

The BHVA removed due to this are described below:

- BHVA 40 has only seven hectares within the ANRMR, this particular Vegetation Association has a large remaining extent (347641 ha) outside the ANRMR, because of this it has been removed from further analysis.
- BHVA 59 is a northern Australian vegetation type; this was removed from later analysis. The polygon was only 3 hectares current extent (25 hectares in the ANRMR pre-European).
- BHVA 129 (described as bare areas drift sand) had a pre-European extent of 37 ha and a present extent of 2 ha, as the areas were small and seem to have little conservation significance this association was also removed from further analysis. This BHVA was also considered by the expert panel to be of very low importance.
- BHVA 169 (Shrublands; mulga & minnieritchie scrub) is included in the ANRMR pre-European dataset by a single sliver of .36 hectares; this BHVA has 100% of its 430533 hectares remaining elsewhere. This BHVA was excluded from further analysis.
- BHVA 516 (Shrublands; mallee scrub, black marlock) has a current extent of 5 hectares in the ANRMR but over 337 000 ha within Western Australia. The expert panel (see Appendix 2.2) thought that this was possibly a mapping artefact as this BVHA is generally found on the south coast. This BHVA has been excluded as an ANRMR BHVA. Though it is recommended that this BHVA be re-examined and the polygon reattributed.
- BHVA 942 (Mosaic: Medium woodland; yate / Shrublands; mallee scrub, black marlock) has only a 1 hectare left of a 36 hectare ANRMR pre-European extent (but 8343 hectares remaining in the South Coast NRM Region). This BHVA was excluded from further analysis.
- BHVA 1076 (described as Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub *Eucalyptus eremophila* & bloodwood; *E. dichromophloia*). *E. dichromophloia* is a Kimberley species, when reviewed it was found that this was a small (11 hectare polygon) that was attributed incorrectly.

- BHVA 1094 (Mosaic: Medium woodland; York gum & salmon gum / Shrublands; mallee scrub *Eucalyptus eremophila* & black marlock) has one hectare remaining within the ANRMR (of a 172 hectare pre-European extent), though 4059 ha left elsewhere. It was excluded from further analysis.

Some small BHVA have been retained. During the prioritisation workshop it was suggested that these are amalgamated into other BHVA (such as 962 and 1005). Other small present extent BHVA (such as 411 and 486) have been retained, these are in the extensive zone.

*It is recommended that the BHVA review identified in the BHVA prioritisation workshop be performed.*

With the above changes to the BHVA found within the ANRMR, 137 BHVA are considered to be extant. Appendix 2.3 contains three summary tables of statistics for BHVA in the ANRMR. The first considers pre-European and remnant extent for each BHVA. The second table is the result of analyses relating to the reservation status within the conservation estate. Finally, the third table identifies those BHVA which should be of concern due to limited or remaining extent and/or poorly represented in the conservation estate.

Summary statistics of the ANRMR BHVA extent include:

- Forty-two BHVA are endemic to the ANRMR; another four BHVA have more than 95% of their current remnant extent within the ANRMR.
- Seventy-seven are found exclusively within the agricultural (intensive) land use zone; 27 exclusively in the extensive land use zone and 33 occur in both.
- Twenty have ≤10% of their original extent remaining in either the ANRMR or WA. Seventeen of these have ≤10% of their original WA extent remaining.
- Thirty-nine are reduced in extent (i.e. have between 10 and 30% of their original extent remaining) in the ANRMR or WA.
- Fifty-three BHVA are limited in extent (<2000 hectares in the ANRMR or WA). However, 14 of these always had a limited extent. Twenty-nine are <2000 hectares of current extent in WA, 10 of these have 100% of their pre-European extent remaining in WA.
- Eighty-four have less than 10000 hectares of their original ANRMR extent remaining (including BHVA with < 2,000ha). Sixty of these always had <10000 hectares. Only 16 of these have 100% of their pre-European extent remaining.

Summary statistics of the ANRMR BHVA reservation include:

- There is a total of 1, 397, 491 hectares of ANRMR reserved within the IUCN reserve categories I-IV. Map 1 shows the extent of the DEC estate within the ANRMR.
- There is an average of 10% of the pre-European extent of each BHVA reserved in IUCN reserves I-IV within Western Australia; but 31 BHVA are not represented anywhere in the State and another 76 are poorly (some but <15% of their pre-European extent)represented within the IUCN reserve categories I-IV within the State. Of the 31 not represented, 13 have none of their pre-European extent under Section 16 agreements or within UCL.

Appendix 2, Table A2.4 summarises the present extent and reservation status for all vegetation associations within the ANRMR. Of the 137 BHVA, there are 56 that

are limited in extent *and* poorly reserved. These are limited in present extent (<2000 ha and/or ≤10% of pre-European extent remaining in ANRMR or the State) and are poorly reserved (unreserved and/or <15% of pre-European extent reserved in ANRMR or the State.

### 3.3.2 Threatened Ecological Communities and Communities at Risk

Descriptions of the terms and how they are applied can be found in Appendix1.1. Summary data for TEC and PEC can be found in Appendix 3.

#### 3.3.2.1 Threatened Ecological Communities

There are 11 TEC types with 32 occurrences within the ANRMR (Table A3.1, Map 13); two of these are endemic types: Perth to Gingin Ironstone Association and Unwooded freshwater wetlands of the southern Wheatbelt dominated by *Muehlenbeckia horrida* subsp. *abdita* and *Tecticornia verrucosa* (see Appendix 3, Table A3.1). The majority of the TEC are found on the western side of the ANRMR, particularly on the Swan Coastal Plain (Map 13).

**Table 5:** The conservation status of the Threatened Ecological Communities of the ANRMR and the 20km buffer.

| Conservation Status | Number of Communities | Number listed under EPBC Act | Number of Recovery Plans |
|---|---|---|---|
| CR | 9 | 8 | 9 |
| EN | 4 | 1 | 4 |
| VU | 4 | 0 | 0 |
| Total | 17 | 9 | 12 |

There are six TEC community types within the 20km buffer that do not have occurrences within the ANRMR, three of these (Aquatic Root Mat Community Number 1 of Caves of the Swan Coastal Plain; Shrublands and woodlands of the eastern side of the Swan Coastal Plain and Herblands and Bunch Grasslands on gypsum lunette dunes alongside saline playa lakes) are endemic to the buffer. It is not expected that these communities will be found within the ANRMR (pers. comm. Val English[3]). The other three TEC communities have occurrences in the buffer and elsewhere but not in the ANRMR. These are:

(i) Woodlands over sedgelands in Holocene dune swales of the southern Swan Coastal Plain (original description; Gibson *et al.* (1994).

(ii) *Eucalyptus calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain.

(iii) *Melaleuca huegelii - Melaleuca acerosa* (currently *M. systena*) shrublands on limestone ridges (Gibson *et al.* 1994 type 26a).

Only one of these (the *Eucalyptus calophylla - Kingia australis* woodland) is considered to be possibly in the ANRMR (pers. comm. Val English).

All of the nine State listed Critically Endangered TEC of the ANRMR and the 20km buffer have recovery plans, but one of them (Lake Bryde) is not listed under the EPBC Act (Table 5; Appendix 3). All of the four State listed EN communities have recovery plans but only one is recognised under the EPBC Act. None of the four

[3] Val English, Species and Communities Branch, DEC.

State listed VU communities are recognised within the EPBC Act or have recovery plans.

*It is recommended that a prioritisation process be developed to investigate the need for recovery actions (starting with a recovery plan and subsequent listing under the EPBC Act) for these communities.*

#### 3.3.2.2 Priority Ecological Communities

There are 34 PEC types with 66 occurrences within the ANRMR (Table A3.2, Map 13); all but one of these (Claypans with mid dense shrublands of *Melaleuca lateritia* over herbs) are endemic to the ANRMR. The buffer contains another four occurrences of this PEC.

There are two PEC that are found outside the ANRMR but are in the 20km buffer (these are Plant assemblages of the Bremer Range System and Thickets on the lower slopes of the Die Hardy Range) none of which are likely to be found within the ANRMR (pers. comm. Val English).

Thirty-two of the 36 PEC types in the ANRMR and the buffer are Priority 1 (see Appendix1.1 for elaboration), two are Priority 2 and there is one each of Priority 3 and 4. None of the PEC have recovery plans or are recognised under the EPBC Act. There are four draft recovery plans in process, one each for: Claypans with shrub over herbs, Wandoo Woodland over dense low sedges, Mortlock flats and Low level sandplains.

*It is recommended that the descriptions of TEC and PEC are given to field based staff to aid them in identifying new occurrences of these communities.*

### 3.3.3 Plants and allied taxa

There are 81,124 vouchers from the ANRMR lodged in the WA Herbarium. The majority (85%) of these are dicotyledons (Table 6).

**Table 6**: A summary of the vouchers held in the WA Herbarium from the ANRMR.

| Group | Total | % of total |
|---|---|---|
| Dicotyledons | 68976 | 85 |
| Monocot | 10853 | 13 |
| Lichen | 722 | 1 |
| Gymnosperms | 345 | <1 |
| Fern | 226 | <1 |
| Alga | 2 | <1 |
| **Total** | 81124 | |

The region has 4983 current taxa, including 4267 formally recognised species and 307 undescribed species. One-hundred and nine taxa are non-current names (Table 7).

*It is recommended that the 108 taxa with non-current names are reattributed with current taxonomy.*

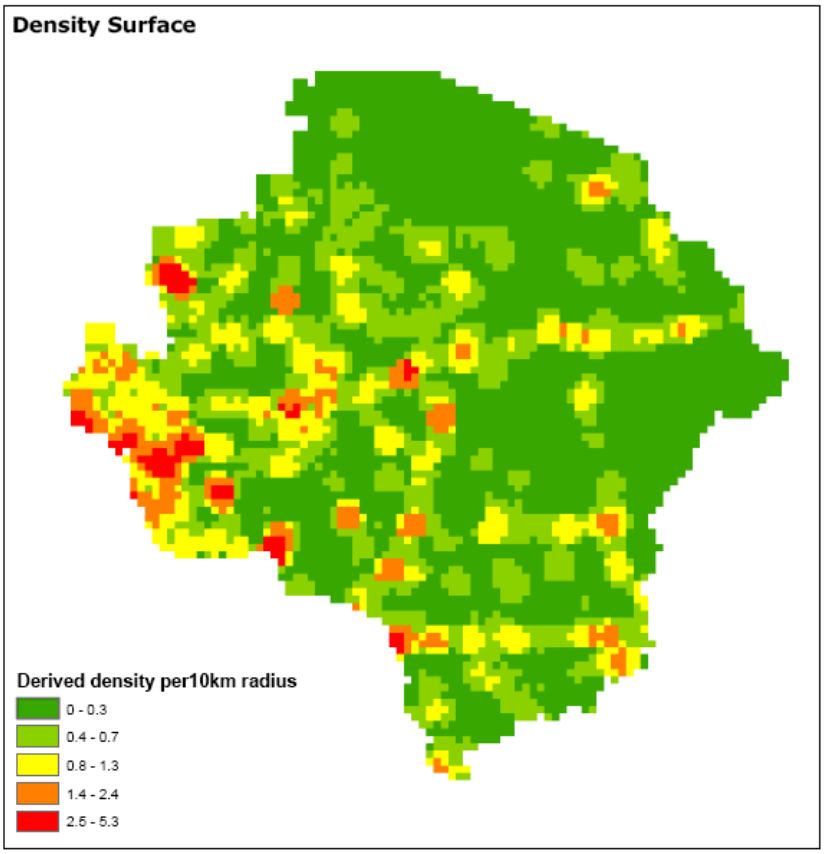



**Figure 2:** The hotpot areas for WA Herbarium vouchers.

**Table 7:** Summary statistics of the native plant taxa of the ANRMR.

| | Dicots | Monocots | Lichen | Ferns | Gymnos | Alga | Total |
|---|---|---|---|---|---|---|---|
| Total taxa | 3962 | 915 | 171 | 27 | 14 | 2 | 5091 |
| Non-current taxa | 80 | 25 | 1 | 0 | 2 | 1 | 108 |
| All current taxa | 3882 | 891 | 170 | 27 | 12 | 1 | 4983 |
| Manuscript names | 179 | 27 | | | | | 206 |
| Phrase names | 248 | 58 | 1 | | | | 307 |
| Formally recognised species | 3262 | 793 | 169 | 27 | 14 | 2 | 4267 |
| Subspecific taxa (subspecies, variety or forma) | 790 | 115 | 8 | 1 | 0 | 0 | 914 |
| Families represented | 92 | 36 | 29 | 12 | 4 | 1 | 174 |
| Genera represented | 527 | 212 | 59 | 14 | 5 | 1 | 818 |
| Species represented | 3568 | 847 | 169 | 27 | 12 | 1 | 4624 |

The ANRMR contains a significant fraction of the West Australian flora. For instance, of the 10476[4] currently recognised dicot taxa of Western Australia 3882 (37%) are found in the ANRMR.

Herbarium vouchers have not been collected equally across the ANRMR with a tendency for higher collections in western part of the ANRMR and along the major roads traversing the region (Figure 2). Most of the region (particularly the eastern part) has less than 0.3 vouchers/10 km radius.

### 3.3.3.1 Flora of interest

This section uses the WA Herbarium data to develop an understanding of which plant taxa are considered of-interest. This includes endemics and those of restricted ranges.

*Endemics*
Four-hundred and sixteen plants and allied currently named taxa are considered endemic to the ANRMR (Table 8). The majority are dicotyledons, though all groups are represented. Over ½ of the taxa are considered threatened or priority taxa, and two are considered extinct.

A list of the endemic flora as well as the number of vouchers for each taxon is presented in Table A4.1.

**Table 8:** The endemic plant and allied taxa of the ANRMR within conservation categories.

| | X | CR | EN | VU | P1 | P2 | P3 | P4 | None | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **DICOT** | 2 | 25 | 15 | 21 | 71 | 56 | 23 | 25 | 120 | 358 |
| **FERN** | | | | | | | 1 | | | 1 |
| **LICHEN** | | | | | 3 | | 1 | | 16 | 20 |
| **MONOCOT** | | 4 | | 1 | 4 | 3 | 2 | 1 | 22 | 37 |
| **Total** | 2 | 29 | 15 | 20 | 78 | 59 | 27 | 26 | 150 | 416 |

**Table 9:** The number of geo-referenced vouchers in the WA Herbarium of the endemic plants and allied taxa of the ANRMR.

| | Conservation Status | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **# Vouchers** | **X** | **CR** | **EN** | **VU** | **P1** | **P2** | **P3** | **P4** | **None** | **Total** |
| 1 | | | 1 | 1 | 15 | 6 | | | 41 | 64 |
| 2 to 9 | 2 | 17 | 3 | 6 | 50 | 31 | 7 | 6 | 77 | 199 |
| 10 to 20 | | 11 | 10 | 9 | 9 | 17 | 12 | 13 | 23 | 104 |
| >20 | | 1 | 1 | 6 | 4 | 5 | 8 | 7 | 17 | 49 |
| Total | 2 | 29 | 15 | 22 | 78 | 59 | 27 | 26 | 158 | 416 |

The number of WA Herbarium vouchers for the endemic taxa is shown in Table 9. Sixty-four endemic taxa are known from a single voucher, including two species of DRF and 41 other taxa that, even though they are only known from a single voucher, are not considered Rare or Priority.

[4] The WA Herbarium summary statistics come from http://florabase.calm.wa.gov.au/statistics/ and were calculated in June 2006.

*Poorly Collected and Restricted Range Taxa*

The final document will identify other species of interest. This analysis will be done using WA Herbarium vouchers reporting which species are poorly collected at both the State and ANRMR scale. In a similar way these data will be analysed for distance between vouchers to determine which species may have reduced extent.

### 3.3.3.2 Threatened and Priority Flora

In this discussion sub-populations are treated as populations in their own right. The list of all species of Threatened and Priority Flora is found in Appendix 4. The location of the DRF and Priority Flora of the ANRMR is presented in Map 14.

There are 2556 populations of 394 taxa of Threatened and Priority flora within the ANRMR (Table 10); this presents 8% of the regional vascular plant taxa. Two-hundred and two of these taxa (with a total of 1494 populations) are endemic to the ANRMR (see Appendix 4.2).

The ANRMR has a relatively high number of Western Australia's Threatened and Priority taxa and populations. For instance, 34% of Western Australia's CR plant taxa are found within the ANRMR (Table 11).

The addition of a 20km buffer has added 62 other taxa (with 310 populations) that may be found within the ANRMR; 19 of these taxa and 40 populations are exclusively found within the buffer.

**Table 10:** The Threatened and Priority taxa of the ANRMR.

| | CR | EN | VU | P 1 | P 2 | P 3 | P 4 | Total |
|---|---|---|---|---|---|---|---|---|
| **Number of Avon taxa** | 45 | 33 | 51 | 52 | 77 | 79 | 57 | 394 |
| **Number of Avon populations** | 232 | 378 | 561 | 193 | 332 | 346 | 514 | 2556 |

**Table 11:** The ANRMR Threatened and Priority flora in a Western Australian context.

| | EX | CR | EN | VU | 1 | 2 | 3 | 4 | Total |
|---|---|---|---|---|---|---|---|---|---|
| **Number of WA taxa** | 1 | 131 | 114 | 132 | 176 | 231 | 215 | 171 | 1171 |
| **Number of WA populations** | 1 | 1059 | 1468 | 1972 | 704 | 1169 | 1703 | 2704 | 10780 |
| **% Avon pops cf WA pops** | 0 | 22 | 26 | 28 | 27 | 28 | 20 | 19 | 24 |
| **% Avon taxa cf WA taxa** | 0 | 34 | 29 | 39 | 30 | 33 | 37 | 33 | 34 |

*DRF and Priority populations*

Of the 394 DRF and Priority plant taxa within the ANRMR, 26 are only known from a single population across the State, this includes 20 taxa of Priority species (Table 12). Table A4.2 shows the number of populations for each taxon.

*We recommend reviewing the conservation status of, in particular, these priority taxa considering the few known populations. We also recommend that the number of populations be used in a prioritisation across all DRF and P.*

**Table 12:** Number of WA populations for taxa within each conservation class of DRF and Priority species found within the ANRMR.
For instance there are 5 CR taxa known from only a single population across WA.

| | Number of populations | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **>10** | **Total** |
| **CR** | 5 | 7 | 4 | 5 | 6 | 3 | 1 | 1 | 1 | 3 | 9 | 45 |
| **EN** | | 1 | 1 | 4 | 1 | 2 | 1 | | 2 | 2 | 19 | 33 |
| **VU** | 1 | 1 | 4 | 3 | 1 | 4 | 2 | 3 | 2 | 4 | 26 | 51 |
| **P1** | 7 | 10 | 11 | 4 | 6 | 3 | 1 | 1 | 4 | | 5 | 52 |
| **P2** | 6 | 9 | 8 | 9 | 7 | 8 | 5 | 4 | 5 | 4 | 12 | 77 |
| **P3** | 6 | 7 | 8 | 9 | 7 | 7 | 4 | 2 | 3 | 6 | 20 | 79 |
| **P4** | 1 | 2 | 4 | 4 | 1 | 2 | | 4 | 1 | 3 | 35 | 57 |
| **Total** | 26 | 37 | 40 | 38 | 29 | 29 | 14 | 15 | 18 | 22 | 126 | 394 |

*DRF and Priority Population Extent*

The estimation of the extent of the range of species was derived to identify a further aspect of threat under the assumption that restricted range increases extinction probability. For this analysis taxa with only a single population from within the ANRMR where excluded from the analysis.

The number of taxa within each extent category for each conservation status for the 305 DRF and P taxa (with 1486 populations) that have more than one population in the ANRMR is shown in Table 13. Nine taxa have a range of 500 metres or less.

*We recommend that spatial extent of known populations of taxa be employed in any prioritisation process.*

**Table 13**: The number of taxa (within each conservation category) within each range category.

| Range category | CR | EN | VU | 1 | 2 | 3 | 4 | Total |
|---|---|---|---|---|---|---|---|---|
| **0m** | 1 | | 1 | 2 | | | | 4 |
| **0m-500m** | 2 | | | 1 | 2 | | | 5 |
| **500m-1000m** | 2 | | 2 | 1 | 1 | | 1 | 7 |
| **1km-2km** | 3 | 1 | | 1 | 1 | | | 6 |
| **2km-5km** | 7 | 2 | 2 | 4 | 1 | 1 | | 17 |
| **5km-10km** | 3 | 2 | 4 | | 4 | 1 | 1 | 15 |
| **10km-20km** | 5 | 2 | 1 | 1 | 4 | 1 | 2 | 16 |
| **20km-100km** | 6 | 13 | 19 | 14 | 17 | 16 | 9 | 94 |
| **>100km** | 7 | 10 | 18 | 11 | 27 | 34 | 34 | 141 |
| **Total** | 36 | 30 | 47 | 35 | 57 | 53 | 47 | 305 |

*Recovery Plans*

Of the 394 Threatened and Priority flora within the ANRMR 46 have recovery or interim recovery plans written or in preparation (Table 14). Another 3 exisiting but outdated Interim Recovery Plans are being rewritten. There is a substainial gap between number of DRF taxa in the ANRMR (129) and number of recovery or interim recovery plans (47). *It is recommended that the DRF taxa are reviewed and prioritised for developing RPs/IRPs or other recovery planning documentation.*

Appendix 4, Table A4.3 shows the current status of recovery plans for DRF and P taxa within the ANRMR.

*Undescribed taxa*

Nineteen taxa of DRF and Priority flora have not been fully described (having manuscript names only). One of these (Leucopogon sp. Helena & Aurora Range (B.J. Lepschi 2077)) is Critically Endangered (Table 15).

*It is recommended that the taxonomy of these species be resolved.*

**Table 14:** Recovery and Interim Recovery Plans for Threatened and Priority plants within the ANRNR.
The numbers in parentheses are those plans that expired but are being rewritten.
RP means Recovery Plans; IRP means Interim Recovery Plans.

| Conservation Status | Number of taxa | # existing RP or IRP | # in prep. | Total # existing or in preparation |
|---|---|---|---|---|
| **CR** | 45 | 21(3) | 5 | 26(3) |
| **EN** | 33 | 6 | 5 | 11 |
| **VU** | 51 | 3 | 4 | 7 |
| **1** | 52 | | | |
| **2** | 77 | | | |
| **3** | 79 | | | |
| **4** | 57 | 1 | 1 | 2 |
| **Total** | 394 | 31(3) | 15 | 46(3) |

**Table 15:** The undescribed threatened and priority flora of the ANRMR.

| Manuscript Name | Conservation Status |
|---|---|
| Leucopogon sp. Helena & Aurora Range (B.J. Lepschi 2077) | CR |
| Baeckea crispiflora subsp. Ongerup(A.Scougall & C.Garawanta E35) | Priority 1 |
| Beyeria sp. Jackson Range (R. Cranfield & P. Spencer 7751) | Priority 1 |
| Calandrinia sp. Piawaning (A.C. Beauglehole 12257) | Priority 1 |
| Commersonia sp. Bindoon (C. Wilkins & F. & J. Hort CW 2155) | Priority 1 |
| Darwinia sp. Westdale(F.Hort 864) | Priority 2 |
| Dryandra nivea subsp. Morangup (M. Pieroni 94/2) | Priority 2 |
| Goodenia sp.Lake King (M.Gustafsson et K.Bremer 132) | Priority 2 |
| Lasiopetalum sp. Northam(F.Hort 1196) | Priority 2 |
| Leucopogon sp. Bindoon (F. Hort 2766) | Priority 2 |
| Leucopogon sp. Flynn (F. Hort, J. Hort & A. Lowrie 859) | Priority 2 |
| Leucopogon sp. Bungulla(R.D.Royce 3435) | Priority 2 |
| Verticordia serrata var. Udumung(D.Hunter & B.Yarran 941006) | Priority 2 |
| Baeckea sp. Hyden (J.M. Brown 141) | Priority 3 |
| Leucopogon sp.Ironcaps (N.Gibson & K.Brown 3070) | Priority 3 |
| Pityrodia sp. Yilgarn (A.P. Brown 2679) | Priority 3 |
| Astroloma sp.Cataby(E.A.Griffin 1022) | Priority 4 |
| Baeckea sp.Chittering (R.J.Cranfield 1983) | Priority 4 |
| Microcorys sp.Forrestania (V.English 2004) | Priority 4 |

### 3.3.3.3 DRF and Priority Flora Threat Analyses

One of the data products to be developed by Baselining is a database to aid in prioritisation of DRF and Priority Flora on-ground activities. This section identifies the datasets used in this spreadsheet and, for those not previously mentioned, drills down into them to give summary statistics on each. The fields for the spreadsheet of these combined datasets are outlined and described in Appendix 4.3.

*Land Vesting and Purpose*

Land is vested to a range of government bodies (both State and local) and also for private use. There can be several possible purposes of land within each tenure group, for instance land vested within a shire may be for the purpose of gravel pits or road reserves; at the State government level land could have the purpose of conservation or railway reserves. So the two need to be considered seperately.

Appendix 4.2 and Table A4.4 and Table A4.5 give the complete analysis of number of populations within each of the vesting and purpose classes (respectively), what follows here is a summary of the most common vesting and purposes for threatened and priority flora across the ANRMR.

Of the 25 vesting classes, seven contain 46% and 54% of the threatened and priority populations respectively (Figure 3). In particular land vested to the Conservation Commission, Shires and Private has the most populations of DRF and Priority species. The vesting of 4% (106 populations) is unknown.

*It is recommended that the vesting of all populations of DRF and priority flora be resolved.*

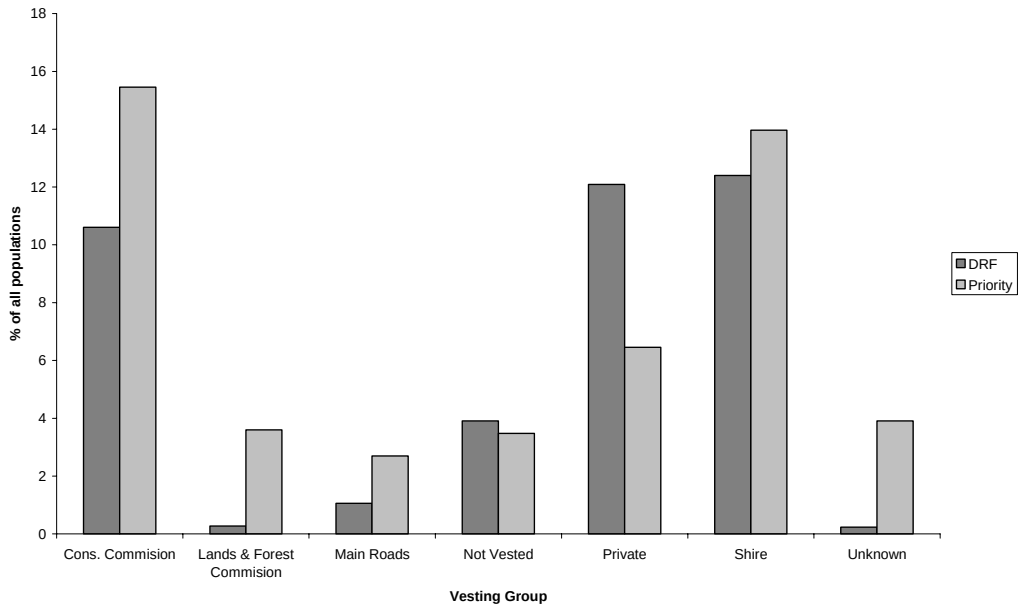



**Figure 3:** The land vesting classes with the most populations of threatened and priority flora.

Figure 4 shows the land purposes with the most populations of DRF and priority flora of the ANRMR. The unknowns within the figure not necessarily reflect a shortcoming of the data-all land vested as private property is annotated with a purpose of unknown.

Of the 51 listed land purposes the seven most common contain 46% of the threatened and 54% of the priority populations of flora. Eleven percent of the threatened and 16% of the priority flora are on road verges.

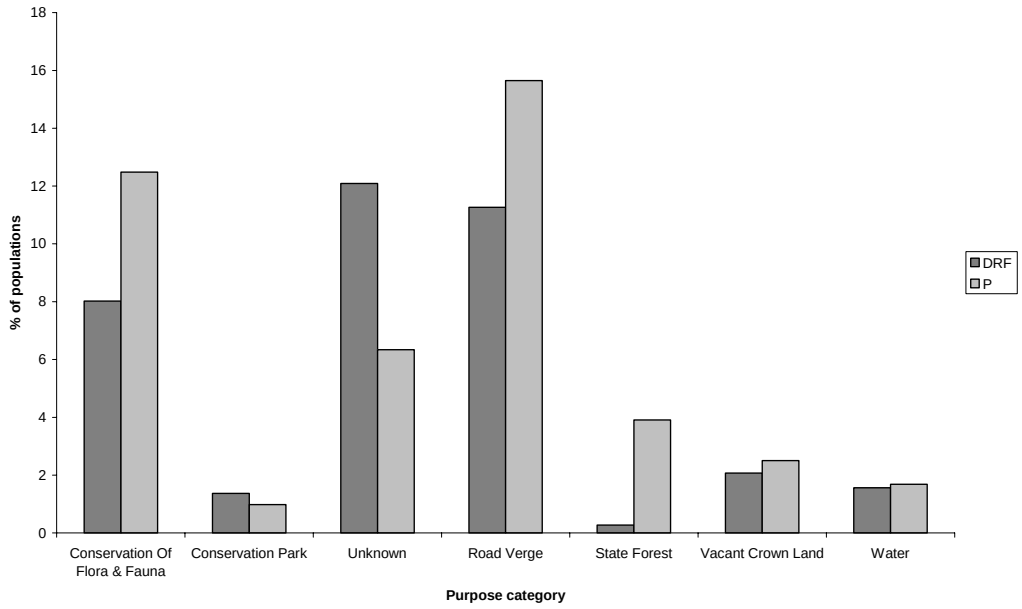



**Figure 4:** The land purposes with the most populations of threatened and priority flora.

*It is recommended that land vesting and purpose be considerations in any process aimed at prioritising DRF and P species recovery planning.*

*Salinity Threat*

Figure 5 shows the number of DRF and P flora populations within each of four height classes above the valley floor. Most populations of DRF and P flora are 2 metres or more than 2 metres above the valley floor (1875 of the 2556 populations). The no data field relates to areas typically to the east of the clearing line (Map 1) where the 'salinity risk' and 'salinity mapping product' were not derived.

Twenty-nine taxa (including five of DRF) have all their populations within one half of one metre of the valley floor. Fifteen of these species are ANRMR endemics (see Appendix 4.2, Table A4.6).

Most (2030 of the 2556 populations) are not in an area considered salt positive (Figure 6), though there are some populations from each class that are considered to be in areas where salt has already expressed itself. Eleven species (including

two DRF) have all of their populations in areas that are considered to be already affected by salt, six of these are endemic to the ANRMR (see Appendix 4.2, Table A4.7)

*It is recommended that the height above valley floor analysis be used as indicative only as they may overestimate salinity risk high in the landscape and underestimate areas low in the valley floor.*

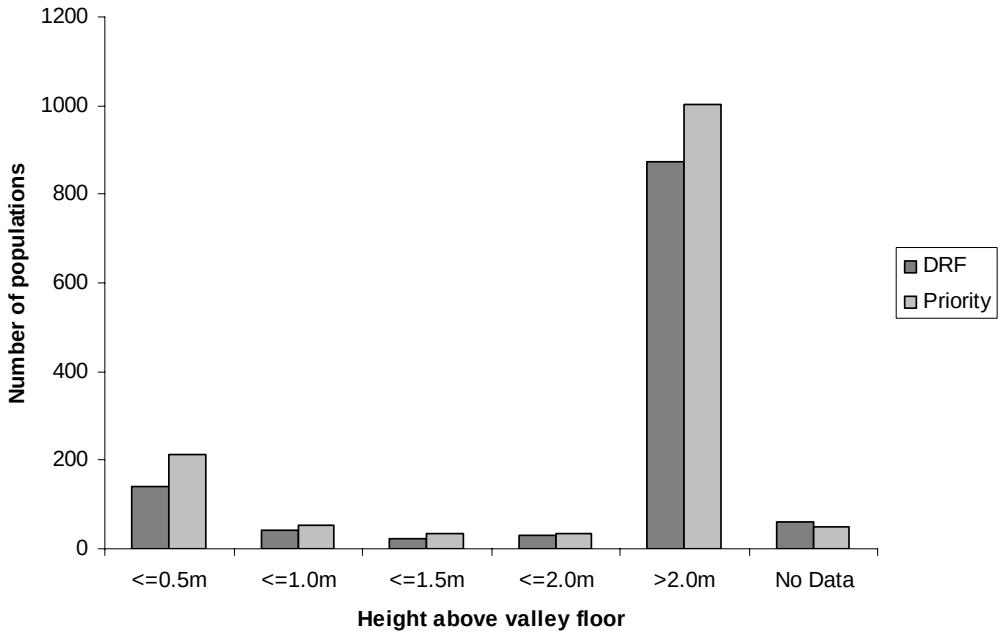



**Figure 5:** The number of populations of DRF and Priority flora within each height above valley floor category.

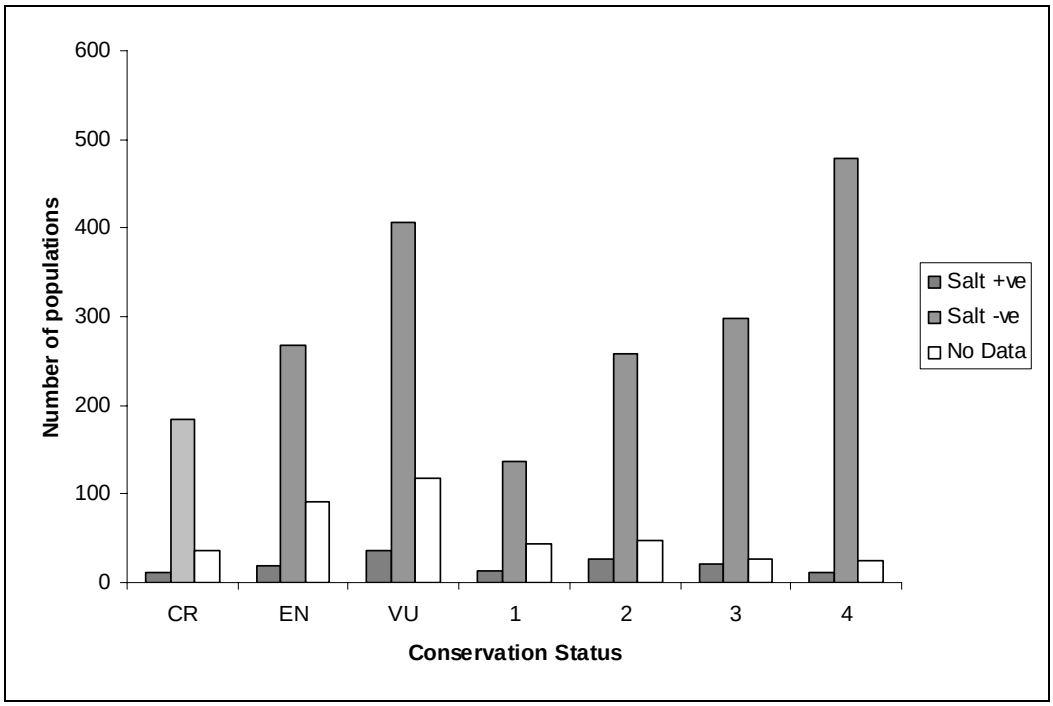



**Figure 6:** The number of pops of DRF and Priority flora within the present salinity extent classes.

*Phytophthora Die-Back*

DEC's Forest Management Branch is currently mapping Phytophthora die-back in the south-west and this project will extend to the ANRMR. DEC's DRPF database has a field to record if a population is considered to be threatened by dieback. Five populations of four species have been indicated in this way. This does not, however, imply that only four species of DRF or Priority species are susceptible to dieback, it is that only this many populations have been attributed in this way. The Dieback Atlas (DEC, 2006) states that 40% of all the taxa and 49% of the south-west's DRF and priority species are Phytophthora dieback susceptible.

### 3.3.3.4 Weeds

There are 458 weed taxa in the ANRMR from the WA Herbarium records (Table 16). Two-hundred and sixty-eight of these are considered environmental weeds by Keighery and Longman (2004); three of these are Weeds of National Significance (WONS). The WONS in the ANRMR are *Tamarix aphylla* (Athel Pine), *Asparagus asparagoides* (Bridal Creeper) and *Chrysanthemoides monilifera* subsp *monilifera* (Bitou bush). A WONS that exists in the Avon NRM Region but is not present in the WA Herbarium Data is the Blackberry (*Rubus fruticosus*).

There are few records of the range of these weeds across the ANRMR and the few WA Herbarium records would not give a meaningful distribution of these weeds.

### 3.3.3.5 Prioritising Flora on-ground works

There are two main groupings for flora for this discussion: Rare and Priority flora and those taxa that are considered 'of-concern' from the result of the analyses

above. These two groups are imposed by the type of data available. The former are described as typically discrete populations and because of a historical focus by DEC these populations can be described in terms of their land tenure and number of visits etc. In contrast, the 'of-concern' taxa are derived from WA Herbaium vouchers thus we have little but location. Thus, these of-concern taxa are prioritised in two ways only: either by the number of vouchers and/or the range of the taxa as derived from these taxa.

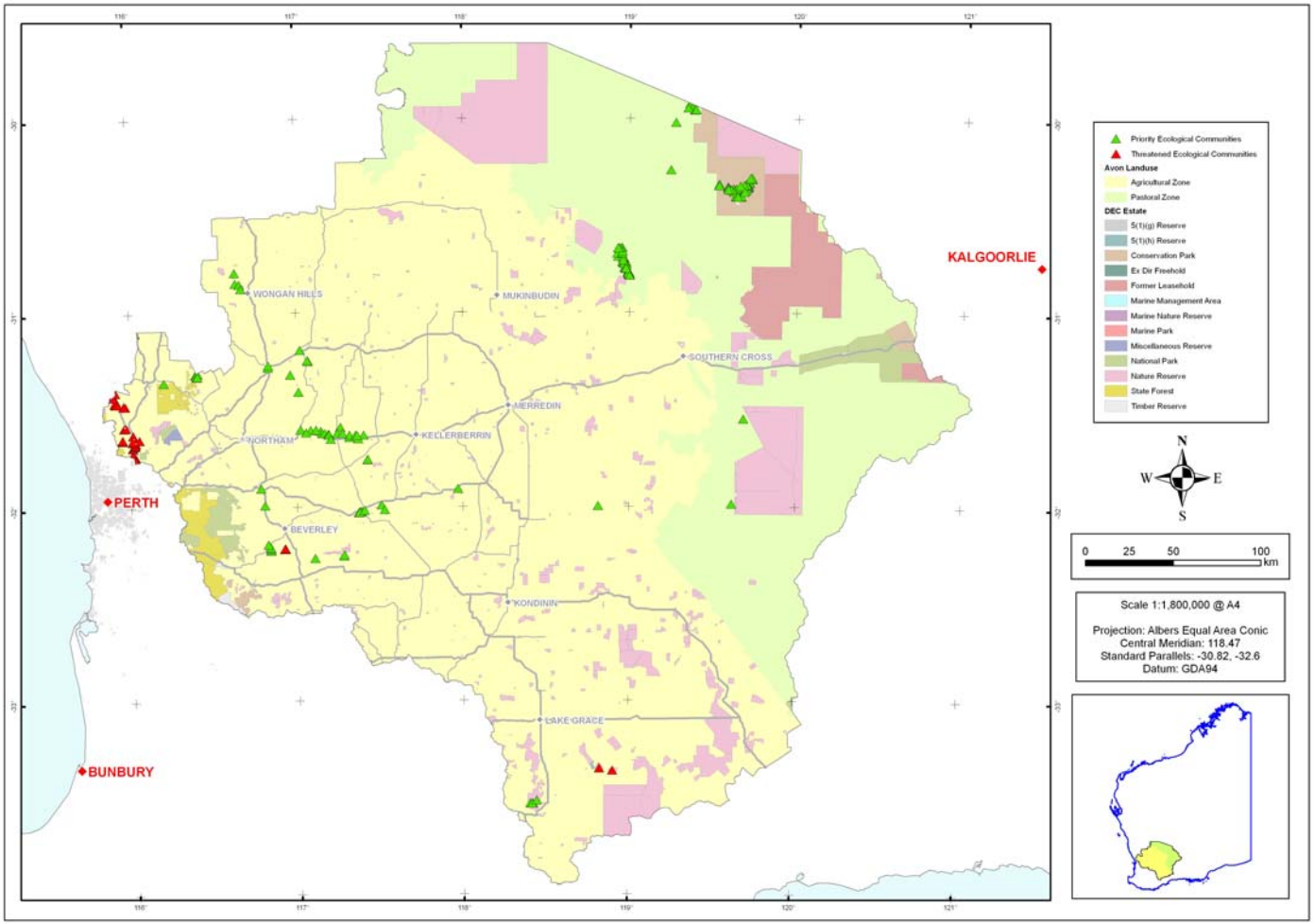
Table A4.8 (in Appendix A 4.3) shows the fields used in the DRF and P prioritisation database. These fields are a synthesis of the analyses from Section 3.3.3.2. Prioritisation can be done at two scales: the taxa or the population. At the taxa level the number of populations, the range of the taxa and present recovery actions can be used for prioritisation. At the population level, tenure, derived threat and the date of last visit can be used for this process.

The 'flora of interest' taxa (Section 3.3.3.1) prioritisation relies on WA Herbarium data alone. These analyses were restricted to number of vouchers and, from these results the extent of the taxa. Included in this are those taxa considered endemic to the ANRMR.

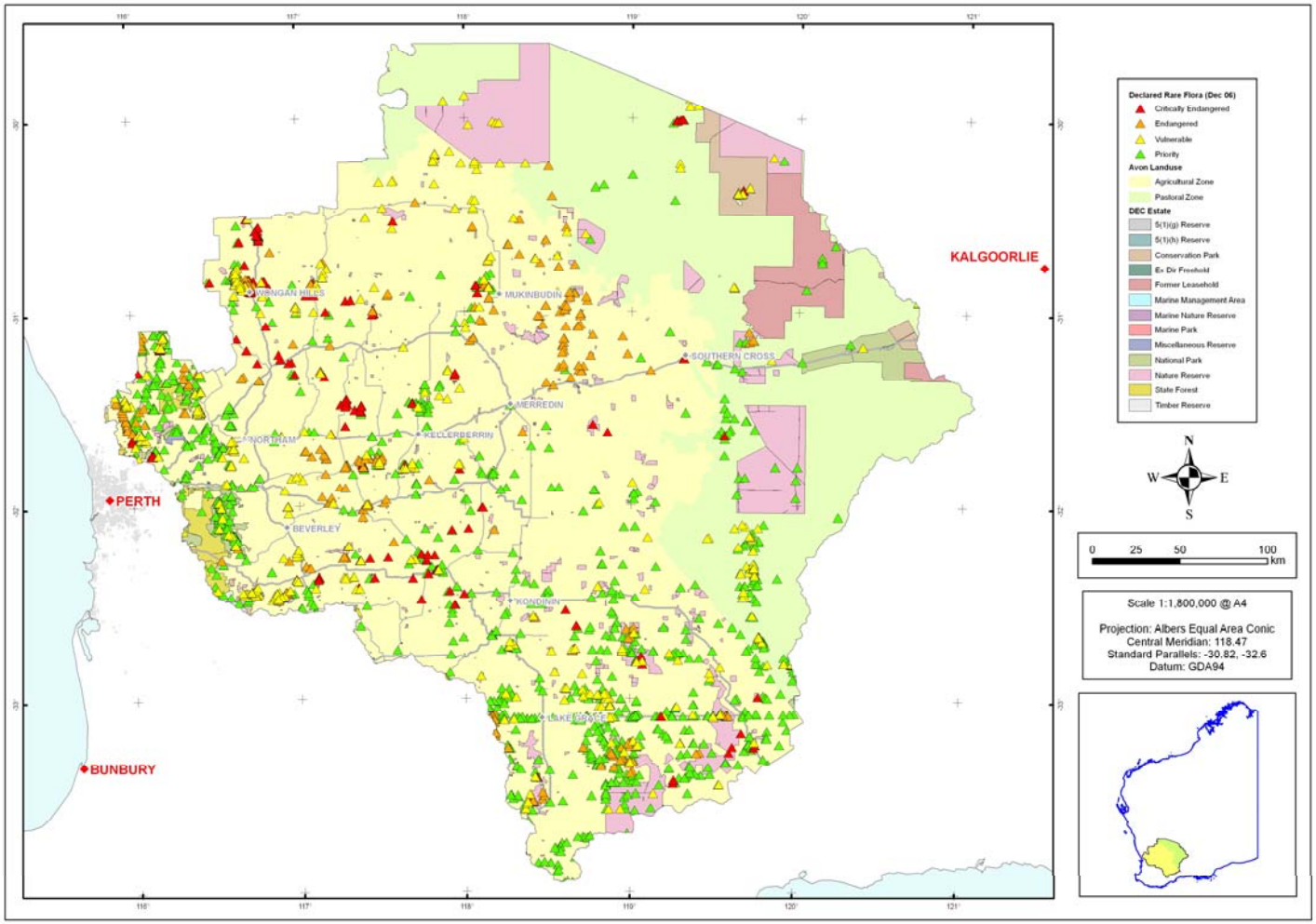
**Table 16:** Weeds of the ANRMR.

| Group | # Species | # Environmental Weeds | # WONS* |
|---|---|---|---|
| Dicots | 286 | 162 | 2 |
| Ferns | 2 | 2 | |
| Gymnosperms | 1 | | |
| Monocots | 169 | 104 | 1 |
| Total | 458 | 268 | 3 |

*WONS are Weeds of National Significance.




**Map 13:** The TEC and PEC of the ANRMR.




**Map 14:** The location of DRF and Priority plant populations across the ANRMR.

### 3.3.4 Fauna

NB The fauna data here is derived from two sources. The first is from *The Current State of Biodiversity in the Avon River Basin* (Safstrom *et al.*, 2000) which collated a list of the fauna for their Avon River Catchment and workshopped the status and trend for each of these species. Their study area was somewhat different to ours. Secondly, the WA Museum data for the ANRMR was acquired to give a comprehensive species list. There were some discrepancies between these two data sources; at the time of writing these discrepancies are being resolved.

#### 3.3.4.1 General Fauna

There are 1197 species from 81 orders and 210 families of fauna from the ANRMR (Table 17). Safstrom *et al*. (2000) divided their Avon Catchment boundary into three biogeographic regions: the Bassian, the Eremaean and the Bassian/Eremaean. The number of species within each of these areas is shown in Table 18. Sastrom *et al.* (2000) also derived the trend of all the taxa of their study area, this is summarised (with permission) in Table 19. Appendix 5.1 (and the tables therein) list the species, their extent (within Safstrom's three biogeographic regions) and their status.

**Table 17:** The fauna of the ANRMR.
Derived from the WA Museum data.

| Taxonomic Group | Number |
|---|---|
| Order | 81 |
| Family | 210 |
| Genus | 520 |
| Species | **1197** |
| Subspecies | 111 |

**Table 18:** Summary statistics of the fauna of the ANRMR by taxonomic grouping and by region*.

| Category | Families | Genera | Species | Bassian | Bassian/Eremaean | Eremaean |
|---|---|---|---|---|---|---|
| Amphibians | 2 | 8 | 22 | 12 | 10 | 2 |
| Birds | 48 | 106 | 165 | 89 | 98 | 65 |
| Fish | 15 | 19 | 19 | 4 | 1 | |
| Invertebrates | 121 | 302 | 814 | | | |
| Mammals | 15 | 34 | 56 | 28 | 1 | 55 |
| Reptiles | 9 | 51 | 121 | 26 | 41 | 51 |
| **Grand Total** | 210 | 520 | 1197 | 159 | 151 | 173 |

***These results were derived from the WA Museum data and from Safstrom *et al.* (2000), but only those species found in the latter are allocated into one of the three regions. The three regional groupings come from the latter which did not include invertebrates consequently the total number of species (bottom of column 4) does not align with the totals from the last 3 columns.

#### 3.3.4.2 Threatened and Priority Fauna

The Threatened and Priority Fauna Database records for those species within the ANRMR and the 20 km buffer and not considered nationally extinct were examined to identify:

- The level of confidence of each species distribution and status, i.e. to determine whether the species is still extant in the ANRMR.
- Whether the species has an Interim Recovery Plan, Recovery Plan or is part of an existing management program.
- To identify any gaps in understanding of each species present distribution.

This discussion is in Appendix 5.3. The results of that discussion are a list of the threatened and priority fauna of the ANRMR and other conservation activities. What follows here is a summary of these results; Appendix 5.2 lists the Threatened and Priority species discussed here.

**Table 19:** The trend of the fauna of the ANRMR.

| Category | Increasing* | Stable | Decreased | Decreasing | Insufficient information |
|---|---|---|---|---|---|
| Amphibians | | 1 | 15 | | |
| Birds | 31 | 12 | 21 | 36 | 18 |
| Fish | | | 3 | | 2 |
| Invertebrates | | | | | |
| Mammals | 8 | 7 | 21 | 8 | |
| Reptiles | 2 | 25 | 50 | 1 | 7 |
| Grand Total | 41 | 45 | 110 | 45 | 27 |

*These trends were derived by a working group in 2000 (see Safstrom *et al*. 2000).

From DEC database records there are 1,885 records of 80 species of Threatened, Priority and Specially Protected fauna in the Avon NRM Region and the 20km buffer (Table 20). Five of these species are considered extinct, 30 species are Threatened with extinction and three species are Specially Protected (Schedule 4) under the *Western Australian Wildlife Conservation Act 1950*, 42 are considered Priority species within DEC's Priority Fauna listing (see Appendix 1.2).

**Table 20**: Number of species within each of the DEC Conservation Code categories for the buffered Avon NRM Region.
Those species in parentheses were only recorded from within the 20 km buffer.

| Fauna Group | DEC Conservation Codes* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Ex | T | P1 | P2 | P3 | P4 | P5 | S | Total |
| Mammals | 4(1) | 11(1) | | | 1 | 5 | 3 | | 24(2) |
| Birds | | 7(2) | | 2 | 3 | 9(1) | | 2 | 23(3) |
| Reptiles | | 2 | 1 | | | (1) | | 1 | 4(1) |
| Fish | | | | | (1) | (1) | | | (2) |
| Invertebrates | | 5(2) | 7(1) | | 2(2) | 1(1) | | | 15(6) |
| Totals | 4(1) | 25(5) | 8(1) | 2 | 6(3) | 15(4) | 3 | 3 | **66(14)** |

* See Appendix 1.2 for elaboration on the Western Australian conservation codes.

Most of the species that are considered Threatened under Western Australian legislation have IUCN rankings. The only exception is a native bee, *Leioproctus contraries* which is Endangered within IUCN categories but is Priority 3 in Western Australia. There are many differences between the Commonwealth's rankings and those of Western Australia (see Appendix 1.2), consequently, the WA list has 30 threatened species but there are 31 species listed within the IUCN equivalents of Critically Endangered, Endangered and Vulnerable and a further six are Conservation Dependent.

Map 15 shows the locations of Threatened and Priority fauna discussed in the text.

*It is recommended that the differences between Commonwealth conservation status and Western Australia conservation status are resolved.*

The breakdown of species within each IUCN conservation code is shown in Table 21.

**Table 21:** Number of species with IUCN conservation status within the buffered Avon NRM Region. Those species in parentheses were only recorded from within the 20 km buffer.

.

| Fauna Group | IUCN CODES* | | | | | |
|---|---|---|---|---|---|---|
| | EX | CR | EN | VU | CD | Total |
| Mammals | 4(1) | | 2(1) | 9 | 3 | 18(2) |
| Birds | | (1) | 2 | 5(1) | | 7(2) |
| Reptiles | | 1 | 1 | | | 2 |
| Fish | | | | | | |
| Invertebrates | | 2(1) | 3(1) | 1 | | 6(2) |
| Totals | 4(1) | 3(2) | 8(2) | 15(1) | 3 | **33(6)** |

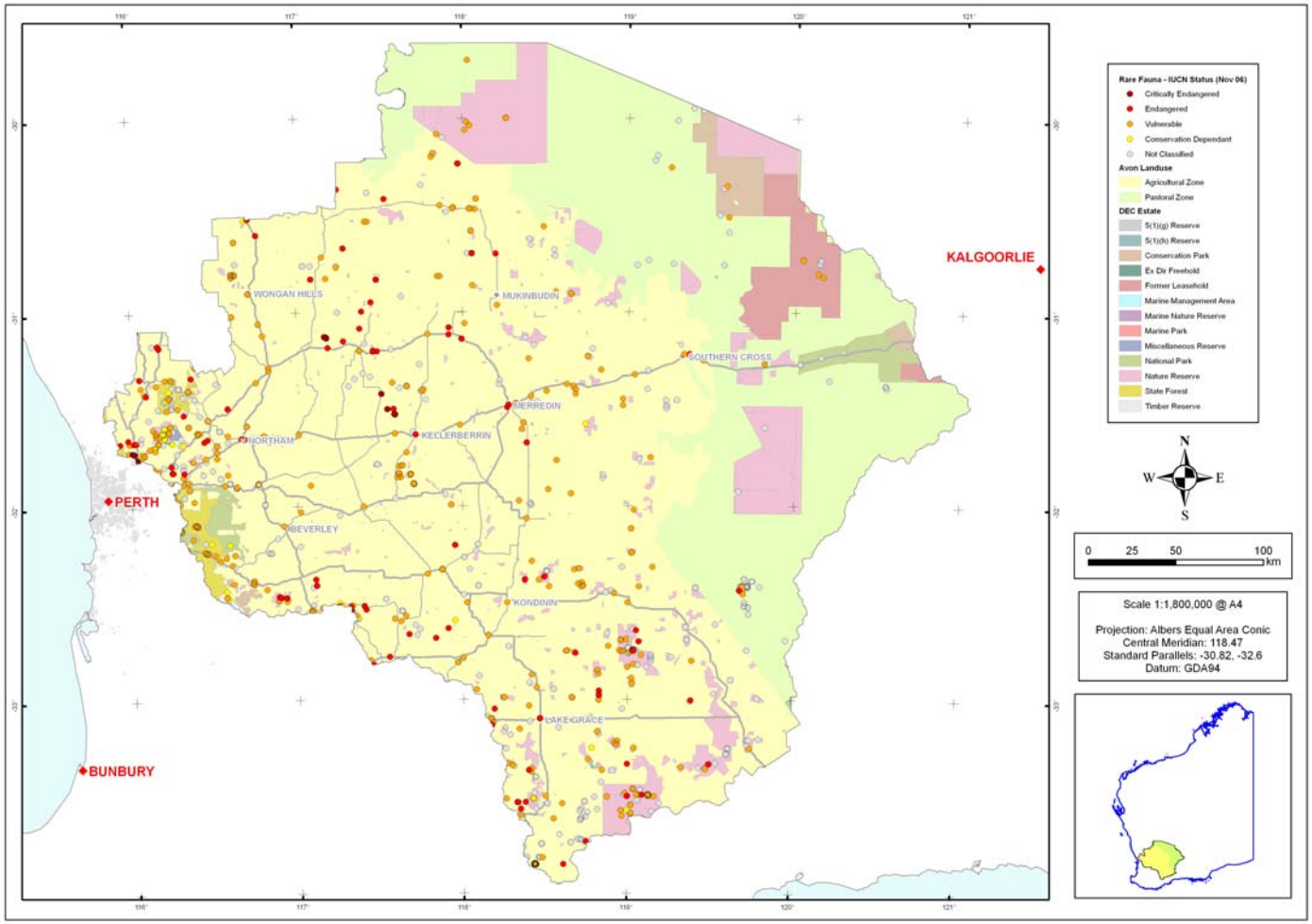
*See Appendix 1.2 for elaboration on the IUCN conservation codes

*General Recommendation*

- *That the literature is examined for further occurrences of Threatened and Priority fauna*

*Species level recommendations*

- *That the current locations of Tammars and Quendas across the ANRMR be resolved.*
- *For example, the Endangered bee,* Leioproctus douglasiellus *is only known from a single 1954 record.*
- *The remaining Water-rat records for the ANRMR (near the town of York) be re-confirmed.*
- *The bee* Leioproctus contraries *has is considered a P3 under WA legislation but EN under IUCN categories this disparity should be resolved.*
- *There is only one post-1980 record of the Bilby (Macrotis lagotis) in the ANRMR: a 2003 record 5.5 kilometres from Chiddarcooping Nature Reserve. This record may warrant further investigation, as previous records are all quite old.*
- *Some bird species (such as the Australian Painted Snipe) have been only recorded recently and/or occasionally within the ANRMR. These records highlight the informal nature of bird survey and limited understanding of some birds across the wheatbelt. Because of this we recommend the engaging with the community to do regular bird surveys across this large area.*




**Map 15:** The Threatened and Priority Fauna of the ANRMR.

# 4. General Discussion

It has long been known that the Avon NRM Region is an area of high biodiversity conservation significance under high threat; the results of this study concur: the region has a very high percentage of Western Australia's plant species diversity. This study aimed at collating this information and analysing it in such a way as to allow prioritisation of each asset class. A brief review of existing or historic programs (Section 3.1), the data on known threats (Section 3.2) and the known assets (Section 3.3) is presented. In some instances linking the assets, threat and conservation programs was simple and meaningful, in these instances developing an understanding of which assets have existing conservation programs and the types and level of threat was easy to derive; and consequently analyses aimed at identifying those of concern species and/or populations were easy and meaningful. In many instances this was not the case and it will be instructive to examine why this is so.

Rare flora was one of the easiest asset classes. Rare flora management is performed by Flora Conservation Officers (FCO) which are based in each DEC District in the south-west of Western Australia. Rare flora information is held within a centralised database from which FCO identify population location and to which FCO submit standardised reports. Because of this centralising and standardisation it is comparatively easy to develop an understanding of what has been done and where for Rare and Priority flora. Section 3.3.3.2 describes these data; most of these analyses were only possible because of the existing database. Thus, we have an understanding of which ANRMR Rare and Priority species do not have any recovery actions, when they were last monitored and which threats are active. These results will support a prioritisation program in that they are a collation of the existing knowledge for each population of Rare and Priority species.

Threatened and Priority fauna was not so simplistic. Firstly, of course, fauna is mobile, but, while there is a centralised database for Threatened and Priority fauna it is not as comprehensive as the equivalent flora database. Part of the reason for this is that many people work on these fauna, not all of them for DEC, thus their data may not be recorded within this database; as such there are problems with present locations of these fauna. Indeed the review of the Threatened and Priority Fauna (Appendix 5.2) identifies many records of these species not on this database, consequently there needs to be considerable work to identify the extent of some species. Also, outside Western Shield monitoring, there are few long-term monitoring programs thus, in many cases, we don't know the locations of extant populations. Moreover, any discussion about status and trend of extant populations is also limited.

The location of historical work was also difficult to collate in a meaningful way. While we easily identified the large-scale on-ground revegetation programs it was considerably more difficult to identify where, for instance, biological survey had been performed. A bibliography that can be searched on both key terms and also by geographic location (for instance reserve or shire) would help. To resolve this issue with the flora we used vouchers lodged with the WA Herbarium as a surrogate for flora sampling intensity. While this is not the complete set of flora records from the ANRMR it is the most easily accessible and retains current taxonomy. Taking a similar approach with the fauna would not be as meaningful as many extant fauna are often not vouchered in the museum (for instance there are no

Carnaby's White-tailed Black-Cockatoo vouchers in the museum). In saying this though, the bird information was made simpler by the work from CSIRO (see Section 3.3.4). Unfortunately, for most fauna, we have limited information, and, where we do have records we are unsure whether or not the species is still extant in that location. For example, see the review on Quendas and Tammar Wallabies in Appendix 5.3.

The herbarium voucher density figure (Figure 2) is quite revealing: it identifies large areas that have few or no herbarium vouchers. In a region with such high plant species diversity, high endemicity, high level of rare taxa and numerous restricted range taxa (Section 3.3), this is quite a concern. A prioritised sampling program should be established, though it is difficult to determine criteria on which to stratify this sampling. In their study of the Wheatbelt Gibson *et al.* (2004) defined 23 vegetation assemblages defined by a species classification from their sampling quadrats. These may be a useful way to start this stratification, however, this same study also found that >60% of their taxa were found in fewer than 5 quadrats.

Within the Baselining project we are collating the existing regional vegetation mapping and digitising these into GIS shape-files. Furthermore, we are attributing these mapped polygons with vegetation structural and floristic data using the National Vegetation Information System protocols (ESCAVI, 2003). While this in no way supposes that this information is all that is required for conservation planning and prioritisation it contributes to our knowledge in several ways:

- Many Threatened and Priority Ecological Communities (TECs and PECs) are described by vegetation characteristics (typically single or co-occurring species or vegetation structure).
- Vegetation community level is important for management of remnant vegetation, such as fire management
- Having knowledge of local vegetation communities for revegetation programs (such as the ANDA Ecoscapes project).

Part of the planning for this database was that it had a 'front-end' that was user friendly to the extent that other groups can add to this database with time. Early discussions with Land for Wildlife and others seem positive in this regard.

Beard's Vegetation Associations (BVA) are used as a landscape-scale vegetation community surrogate across Western Australia. This is 1:250000 scale vegetation mapping. There is considerable debate about the fidelity of these data and the use for conservation planning. Gibson *et al.* (2004) concluded that their quadrat based data from across the Wheatbelt was poorly correlated with BVA. Since then system-associations have been developed. These are BVA reattributed from Beard's memoirs, thus each BVA is subdivided into a number of smaller polygons which are each described in NVIS terms. It is untested if Gibson's conclusion applies at the system-association level.

It was acknowledged from the outset that we did not intend to review each of the threat classes operative across the region. We assumed that these are well understood. We did, however, intend to collate the meaningful threat based data that can be used for later prioritisation. Many threats are ubiquitous and/or not in a sphere of influence hence have not been mentioned. One of these is climate change; while we acknowledge its importance-and urge more research into its

affect of the values identified here-we felt that we can contribute little (besides making our data and analyses available if requested) to this discussion. Other threats like foxes are a known and wide-spread threat which, for our purposes we assume ubiquity. The two threats we have focused on (salinity and phytophthora) are both landscape scale and, to some extent, have or are being mapped. Thus, we can use these data to inform threat to discrete assets (such as rare flora).

It should be acknowledged that there is already substantial biodiversity conservation related work occurring within the ANRMR (Section 3.1.1). The generation of this document gave the opportunity to collate and reflect on these projects and how they interact. One disconnect that came apparent was that between species level and management scale. DRF is typically dealt with *in situ* with FCO working to reduce threats through fencing or other activities. Other species of concern-such as limited range flora-may appear in discrete but scattered remnants on private land; there is no existing program focusing on these taxa. We suggest that the results of these analyses are given to those groups working with landholders, principally Land for Wildlife and the ANDA Healthy Ecosystem project. Roadside vegetation assessment also fits in this category. Roadside vegetation is considered important for corridors and DRF (See Section 3.3.3.3) but, there is not integration of these data within other programs such as corridor development. We recommend that these important areas for conservation are considered in conservation planning.

Historical programs are also useful for examining the effectiveness of programs. For instance, part of the Remnant Vegetation Protection Scheme (see Section 3.1.2) aimed at fencing selected patches of remnant vegetation. It would instructive to review the success of this scheme in the context of both land-holder involvement and the results of long-term grazer exclusion.

In overview we have collated the biodiversity knowledge from the ANRMR. We have analysed this information in ways that will be useful for biodiversity conservation planning and particularly in regards to prioritisation within ANDA programs. These analyses operated at three levels of biodiversity organisation (species, communities and ecosystems). At each of these levels we analysed available data to identify the status of each asset. At the ecosystem level, we used Beard's Vegetation Associations. From these data we can develop a measure of status as in amount remnant and amount within the conservation estate. At the community level of organisation existing Threatened and Priority Ecological Communities were used. In previous work with the Avon Catchment Council (Richardson, 2007) it was argued that English and Blyth's (1999) definition would be used but the application of this definition would be largely based on those as vegetation communities. This was applied as it is conceptually easy and that many of the Threatened and Priority Ecological Communities are vegetation communities. But, outside the known Threatened and Priority Ecological Communities, little is known of these communities. This is why the existing vegetation mapping is being collated. Because we don't know the location or extent of these communities we also have little information on their status or trend. Our vegetation mapping collation will start the process of informing about this level of asset. The species level also presented numerous challenges in developing an understanding of condition and trend. Even for those plant taxa that are acknowledged as rare, it is not easy to develop an understanding of these population parameters (Richardson and Yates, in prep.). It was even more difficult for fauna. Consequently, much of the analyses focused on two approaches: what

we have and what is being done to protect it. This information will form the baseline for prioritisation and conservation planning.

It is intended for the results and analyses to be used in two ways: in on-ground work prioritisation and landscape-scale biodiversity conservation planning. At present the outputs from this program are being used by Healthy Ecosystems and Ecoscape Projects (both part of ANDA). Biodiversity planning is essentially spatially (Pressey *et al.*, in prep.). As an acknowledgement of this our data is also available in GIS formats suitable for this next level of work within the ANRMR: identifying the areas of highest significance.

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# Appendix 1: Key Definitions

## Appendix1.1 Threatened and Priority Ecological Communities

This information was taken (with kind permission) from DEC's Species and Communities Branches' *Definitions, Categories and Criteria for Threatened and Priority Ecological Communities 2006.*

### Ecological Community

A naturally occurring biological assemblage that occurs in a particular type of habitat.

A **threatened ecological community** (TEC) is one which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable".

Possible threatened ecological communities that do not meet survey criteria are added to CALM's Priority Ecological Community Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

**Presumed Totally Destroyed (PD)**
An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant **and either** of the following applies ( A or B):

A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats **or**

B) All occurrences recorded within the last 50 years have since been destroyed

**Critically Endangered (CR)**
An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

An ecological community will be listed as **Critically Endangered** when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the

best available information, by it meeting **any one or more of** the following criteria (A, B or C):

A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% **and either or both** of the following apply (i or ii):

i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);

ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.

B) Current distribution is limited, **and one or more** of the following apply (i, ii or iii):

i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);

ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;

iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.

C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

**Endangered (EN)**

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

An ecological community will be listed as **Endangered** when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting **any one or more of** the following criteria (A, B, or C):

A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement **and either or both** of the following apply (i or ii):

i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years);

ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.

B) Current distribution is limited, **and one or more** of the following apply (i, ii or iii):

i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years);

ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes;

iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.

C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

**Vulnerable (VU)**

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

An ecological community will be listed as **Vulnerable** when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting **any one or more of** the following criteria (A, B or C):

A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.

B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.

C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

## 3. Definitions And Criteria For Priority Ecological Communities

### Priority Ecological Community List

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community Lists under Priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as threatened ecological communities. Ecological Communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

**Priority One**: Poorly-known ecological communities

Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

**Priority Two**: Poorly-known ecological communities

Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

**Priority Three**: Poorly known ecological communities

(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:
(ii) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;
(iii) communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

**Priority Four**: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

(a) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.

(b) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

(c) Ecological communities that have been removed from the list of threatened communities during the past five years.

**Priority Five**: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

## Appendix1.2 Fauna

This information was extracted (with kind permission) from DEC's Species and Communities Branches' *Fauna Management Manual.*

### IUCN RED LIST CATEGORIES

These categories and criteria have become widely recognised internationally and were last revised in 2001. They were adopted by the Commonwealth Government under the *Endangered Species Protection Act 1992* and are used to rank species under the *Environment Protection and Biodiversity Conservation Act 1999*. They have also been adopted by the Threatened Species Scientific Committee for the purposes of reviewing the status of WA species for listing under the *Wildlife Conservation Act 1950*.

The IUCN categories are defined as follows:

**Extinct (EX)**
A taxon is extinct when there is no reasonable doubt that the last individual has died.

**Extinct in the Wild (EW)**
A taxon is extinct in the wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

**Critically endangered (CR)**
A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.

**Endangered (EN)**
A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.

**Vulnerable (VU)**
A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.

**Lower Risk (LR)**
A taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three groups;

- *Near Threatened* **-** taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.
- *Least Concern* **-** taxa which do not qualify for Conservation Dependent or Near Threatened.

### LISTINGS PURSUANT TO THE *WILDLIFE CONSERVATION ACT, 1950*

The Wildlife Conservation Act provides for species to be declared as 'likely to become extinct or rare, or otherwise in need of special protection', by Ministerial Notice in Government Gazette.

The Gazette Notice groups species into Schedules according to their status as follows.

**Schedule 1 - Fauna that is rare or is likely to become extinct**

These species are usually termed 'threatened' and can be defined as;
native fauna which are

- well defined in taxonomic literature, or if undescribed, represented by a voucher specimen in a record collection,
- in imminent danger or threatened with extinction,
- dependent on/restricted to vulnerable habitats, and
- very uncommon, even if widespread.

Species in this schedule have been ranked as Extinct in the Wild, Critically Endangered, Endangered, or Vulnerable under the criteria for the IUCN Red List Categories described above.
Schedule 2 - Fauna presumed to be extinct

Species in this schedule have been ranked as Extinct under the criteria for IUCN Red List Categories.
Schedule 3 - Birds protected under an international agreement
Schedule 4 - Other specially protected fauna

Fauna under this category are also known as Specially Protected Fauna. Specially Protected Fauna are likely to be taken because of high commercial value or are uncommon, but not currently threatened, but are either of commercial or intrinsic value or are perceived to be damaging to a commercial or hobby enterprise and taking may lead to the species becoming threatened.

**DEC PRIORITY FAUNA LIST**

DEC manages fauna according to the Wildlife Conservation Act schedules. In addition DEC maintains a 'Priority Fauna List' that contains taxa that do not currently meet the criteria for the threatened categories but are of concern for various reasons. Taxa in this list would fall into the IUCN Red List Categories of Near Threatened, Conservation Dependent or Data Deficient. The list is not supported by legislation. Taxa are allocated to one of four priority categories as follows:

**Priority One** *Taxa with few, poorly known populations on threatened lands.*

Taxa which are known from few specimens or sight records from one or two localities on lands not managed for conservation, eg. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of status before consideration can be given to declaration as threatened fauna.

**Priority Two** *Taxa with few, poorly known populations on conservation lands.*

Taxa which are known from few specimens or sight records from one or two localities on lands not under immediate threat of habitat destruction or degradation, eg. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of status before consideration can be given to declaration as threatened fauna.

**Priority Three** *Taxa with several, poorly known populations, some on conservation lands*

Taxa which are known from few specimen or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

**Priority Four** *Taxa in need of monitoring*

Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if current circumstances change. These taxa are usually represented on conservation lands.

**Priority Five** *Taxa in need of monitoring*

Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

**LISTINGS PURSUANT TO THE (COMMONWEALTH)** *ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT, 1999*

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) provides for the listing of species as threatened. The following categories are used and are based on the IUCN Red List Categories:

- Extinct
- *Extinct in the Wild
- *Critically Endangered
- *Endangered
- *Vulnerable
- Conservation Dependant

Only those species in the categories marked * are of national environmental significance under the EPBC Act.

## Appendix 1.3 Flora

This information was provided from DEC's Species and Communities Branch and has been presented verbatim.

**THE DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

**DECLARED RARE AND PRIORITY FLORA LIST**

for Western Australia

CONSERVATION CODES

R: Declared Rare Flora - Extant Taxa

**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 gazetted as such.

X: Declared Rare Flora - Presumed Extinct Taxa

**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 gazetted as such.

1: Priority One - Poorly known Taxa

**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.

2: Priority Two - Poorly Known Taxa

**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.

3: Priority Three - Poorly Known Taxa

**Taxa which are known from several populations, and the taxa are not believed to be under immediate threat** (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.

4: Priority Four - Rare Taxa

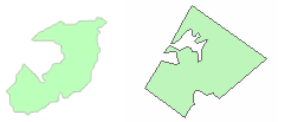
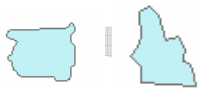
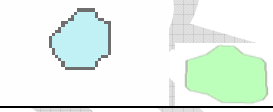
**Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors**. These taxa require monitoring every 5-10 years.

Note, the need for further survey of poorly known taxa is prioritised into the three categories depending on the perceived urgency for determining the conservation status of those taxa, as indicated by the apparent degree of threat to the taxa based on the current information.

# Appendix 2: BHVA and Remnant Vegetation

## Appendix 2.1 Remnant Vegetation Compactness

**Table A2.1:** A visual representation of the relationship between compactness values and the shape of patches of vegetation that they represent.
The final column indicates the number of ANRMR remnant vegetation patches within each compactness class, see Section 3.3.1.

| Compactness Class | Examples of patch shapes from the Avon NRM Region | Number of Patches in the Avon NRM Region |
|---|---|---|
| 0.0-0.2 |  | 7181 |
| 0.2-0.4 |  | 20 044 |
| 0.4-0.6 |  | 30 568 |
| 0.6-0.8 |  | 46301 |
| 0.8-1.0 |  | 6469 |
| **Total** | | **110563** |

**Appendix 2.2 Prioritisation Workshop**

The attached document is the outcome of a workshop aimed to prioritise the Beard's and Hopkins' Vegetation Association (BHVA). To identify the highest priority BHVA an expert panel used extent remaining compared to pre-European extent, percentage within the conservation estate as well as their own expert knowledge of each BHVA and the vegetation communities they contained.

# Ecosystem Prioritisation Workshop Report

By Jeff Richardson DEC June 2007

AVON CATCHMENT COUNCIL

Government of Western Australia

Australian Government

## Table of Contents



## Acronyms

| | |
|---|---|
| ACC | Avon Catchment Council |
| ANRMR | Avon Natural Resource Management Region |
| BHVA | Beard's and Hopkins' Vegetation Associations |
| DEC | Department of Environment and Conservation |
| ND | Natural Diversity Program within the ACC investment |
| WWF | WWF-Australia (formerly World Wide Fund for Nature) |

**Cover photograph:** Photo of the expert panel (front row) hard at work. Panel (left to right) Brett Beecham, Greg Keighery, Mike Lyons, Angas Hopkins, Ken Atkins. Sitting behind (left to right) Ben Bayliss, Tim Gamblin, Jeff Richardson, Paul Gioia, Richard McLellan. Photo courtesy Mick Davis (WWF).

# 1. Introduction

As part of the Avon Natural Resources Management Strategy the Avon Catchment Council (ACC), through the support of the State and Australian Governments Natural Heritage Trust and the National Action Plan for Salinity and Water Quality programs, has made a substantial investment into biodiversity conservation through the establishment of a Natural Diversity (ND) program. This program has the stated goal to "retain, restore and enhance the Avon Region's natural biodiversity in ways that are consistent with the core values and sustainability goals of the region". One of the ways in which the ND program is to achieve this goal is by delivering funding projects within the program. One of these projects is Baselining which, amongst other things, is responsible for biodiversity relevant data collation, processing, interpretation and dissemination. One of the specific aims of the project is to support other projects within the ND program.

One of the projects that Baselining is supporting is the 'Healthy Ecosystems' project which is being delivered by the Avon Catchment Council through a partnership between WWF and the Department of Water. The terrestrial part of this project is based on WWF's 'Woodland Watch' program that operated in the Avon NRM Region (ANRMR) from 2000-2005 and still operates in the Northern Agricultural NRM Region. The Baselining project has been asked to identify priority ecosystems within the ANRMR for Healthy Ecosystems.

On the 15th May 2007 at the ISA Seminar Room, Technology Park in Kensington a panel of botanists and ecologists with Wheatbelt experience was convened to identify priority ecosystems within the ANRMR. This document outlines the process and its results.

## 1.1 Attendees and Agenda

**Workshop to identify priority Beard's Vegetation Associations within the Avon NRM Region.**

**Attendees and roles**

*Facilitator*
Jeff Richardson (DEC)

*Panel*
Greg Keighery (DEC), Angas Hopkins (DEC), Ken Atkins (DEC), Brett Beecham (DEC), Mike Lyons (DEC).

*Observers*
Wayne Elliot (DEC), Chris Curnow (WWF), Richard McLellan (WWF), Helena Mills (WWF), Mike Griffiths(WWF), Mick Davis (WWF), Rebecca Palumbo (ACC), Paul Gioia (DEC)

*Support*
Jane Hogden (DEC), Brett Glossop (DEC), Tim Gamblin (DEC), Ben Bayliss (DEC)

**Agenda**

Date: 15th May 2007
Location: ISA Seminar Room, Technology Park
Start Time: 8:30 am.

| Time | Item | Who |
|---|---|---|
| **8:30** | Introduction to using the lecture theatre | TBA |
| **8:50** | Personal Introductions (30 seconds each) | All |
| **9:00** | Outline of Healthy Ecosystems | Chris Curnow |
| **9:10** | Background of Beards Vegetation Associations | Angas Hopkins |
| **9:20** | Outline of the process to define priority ecosystems | Jeff Richardson |
| **9:30** | Start Prioritisation | Panel |
| **10:00** | Morning Tea | |
| **10:30** | Prioritisation continues | Panel |
| **12:30** | Lunch | |
| **1:30** | Prioritisation continues | Panel |
| **3:00** | Afternoon Tea | |
| **3:30** | Where to next? Followed by questions | Jeff Richardson and others |
| **4:30** | Close | |

## 2. Data and Data analysis

Beard's and Hopkins' Vegetation Associations (BHVA) are used as the surrogate for ecosystems for this process. BHVA are biologically based and are currently mapped. These data are the work of John Beard who mapped the vegetation of Western Australia at, approximately, the scale of 1:250,000. His line-work was subsequently digitised and attributed into a GIS . Having these data spatially represented (as polygons) allows for analysis for not only extent of clearing but also extent of reservation within the conservation estate.

BHVA data for the ANRMR was clipped from the Western Australia dataset. For the purposes of this prioritisation, those BHVA that were exclusively found beyond the agricultural zone were excluded from this analysis[5]: of the 145 BHVAs, 114 have some or all of their extent within the agricultural area. These data were analysed to determine current (remnant) extent and extent of reservation within the conservation estate. The raw data for this process will be available in the forthcoming Biodiversity Assessment, also being delivered under ACC funding.

## 3. Workshop Process and Results

To set the stage and frame the panel's thinking two presentations were given prior to the prioritisation process. The first of these was from Chris Curnow (WWF) who gave a brief introduction to the work done by the Healthy Ecosystems team. Angas Hopkins (DEC) gave an overview of BHVA history and application, highlighting issues of scale.

The results of the analyses described above (i.e. current extent and percentage reservation for each BHVA) were collated and projected on screens during the prioritisation workshop. BHVA were grouped by structural characteristics (i.e. Shrublands, Woodlands etc). Structural-floristic descriptions for each BHVA as described in accordance with the National Vegetation Information System standard (essentially vegetation structure and dominant species), were also projected to aid the panel in their deliberations. To give spatial context, the location of each BHVA within the ANRMR was displayed from another projector.

The panel was asked to prioritise the BHVA using the criteria of extent remaining compared to pre-European extent, percentage within the conservation estate as well as their own expert knowledge of each BHVA and the vegetation communities they contained.

With the above data on the screen in front of the panel, they collectively discussed the raw data and their experiences. Some of the observers (who have very good localised knowledge of Wheatbelt vegetation communities) contributed to this discussion.

[5] The nature and focus of the work of the Healthy Ecosystems project is within the agricultural zone.

The panel went through the data twice. On the first pass they removed those BHVA that they believed were of low priority and identified some that required further clarification (through on-ground survey or desk top review). There was general consensus in this process as the statistics of extent remaining were primarily used. At the end of this process 53 BHVA were considered to be of low priority and were not considered further. These were all attributed with a priority ranking of five (a score of '1' being highest priority and '5' being the lowest). Four BHVA (516, 934, 962 and 1058) were considered to require further work in describing them, or, due to their small size, were considered to be either an artefact of mapping and/or may require some further desktop examination of extent and condition (see Appendix).

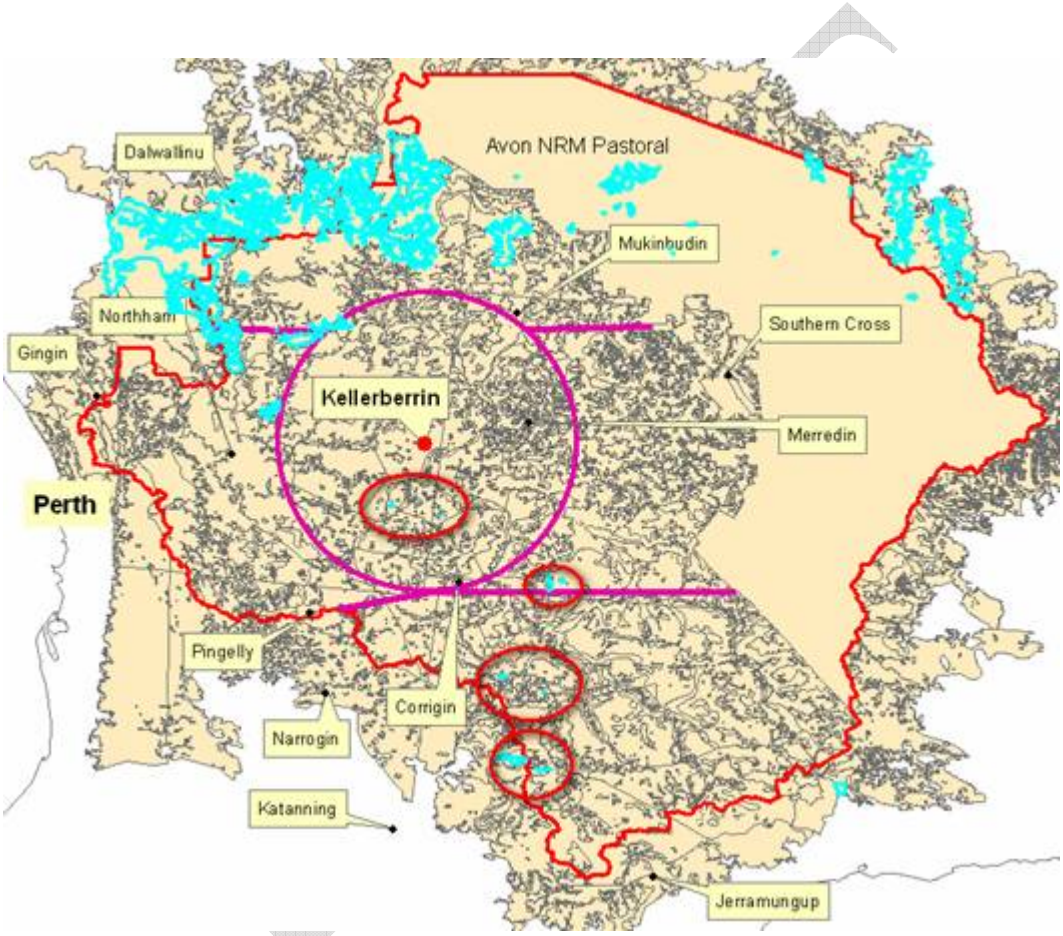



**Figure 1:** BHVA 142 (blue polygons) within the ANRMR (reddish boundary). Purple was used to segregate the ANRMR into central, north, south etc. Red ovals are used to indicate small patches of BHVA 142. See text for details.

On the second pass, the remaining 57 BHVA were reviewed again, this time being grouped by soil type and/or position within the landscape. It was thought that these groups would inform the decision making process as they are also indicative of the level of threat from altered hydrology. For instance, BHVAs that occur on laterite would be under less risk from salinity from rising groundwater than those low in the

landscape. Seven such groups were defined: clay, freshwater, granite, laterite, saline, sand, and valley floor. For some BHVA it was difficult to allocate to a single group, so two other 'combined' groups (valley floor/sand and laterite/sand) were also defined.

Using these categories and through discussion the panel scored each of these BHVA from 1 (high priority) to 5 (low priority). The panel also considered the variation in biological assemblage within BHVA across their range and, in five instances, divided up a BHVA into different areas and prioritised these differently. For instance, BHVA # 142 (Medium woodland of York gum & salmon gum) consists of numerous polygons from north of the ANRMR boundary, within the ANRMR but in the pastoral zone and some small discrete patches in the central and southern parts of the ANRMR (see Figure 1). The panel considered the southern patches (due to their isolation and size) as high priority (score of 1), whereas the northern patches were a low priority (score of 5).

During the prioritisation and review the panel also made the following suggestions:

- BHVA 128 (bare rocks) -requires determination as to whether this BHVA contains all granites. The panel acknowledged the importance of granite rocks but expressed concern that this BHVA may not contain all rocks and, even if it did, this would be a project unto itself. It was thought that Healthy Ecosystems should involve property owners in granite rock conservation where granites are thought to be in good condition.
- *Allocasuarina huegeliana* communities around granite should be considered as a single entity when prioritising (though BHVA 1005 excluded from this as it is largely on the southern margins of the ANRMR).
- Consideration is required as to whether the York gum/various York/morrel/salmon gum BHVA are substantially different or should be combined. These include: 8, 131,141, 145, 511, 537, 936, 941, and 945. Note that only three of these (145, 537, 945) are considered highest priority.
- That for some small discrete BHVAs there may need to be some desktop and/or field work to confirm status (this is elaborated on in Section 4)

The prioritisation process identified 41 high priority BHVAs within the ANRMR (see Appendix for full list and details).

## 4. Where now?

At the end of the prioritisation process a conversation involving all participants on how to use the outputs followed.

This conversation focused on how to do this via desktop using mapped remnant vegetation within each of the identified BHVA polygons. It was suggested that within each of the priority BHVAs the focus should be on large patches of remnant vegetation, with near neighbours in good condition. The process also needs to be cognisant of where other work has been done (for instance Land for Wildlife and existing WWF flora and structure surveys of priority woodlands) and if it is in the conservation estate or not.

There was some discussion regarding those identified priority BHVAs annotated as being in saline areas (see Appendix). The Healthy Ecosystem project has little capacity to influence salinity risk to these but, it was thought, there may be parts of these BHVA that are sufficiently above salinity risk (for instance on dunes) that may still be in good condition and viable in the long term. The group thought that aerial photograph interpretation may aid in this.

It was suggested that Jeff Richardson and Brett Beecham along with some of the Healthy Ecosystem team engage with Ian Steward (GIS Analyst, Northam) to establish protocols to perform this work.

It was also thought the results from this process may be useful for other projects within the ND program such as the work being undertaken by DoW and the Ecoscapes project.

## Appendix

Output from the BHVA prioritisation process. The highlighted BHVAs are endemic to the ANRMR (defined as containing >95% of their pre-European extent within the region). Rank represents the order of priority from 1 to 5 with 1 considered by the panel to be the highest priority; within each ranking the BHVA have been grouped by soil/landscape position and this ranking does not constitute within-ranking prioritisation. The four BHVA at the end of the table need some further work before their priority will be determined.

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 1271 | Bare areas; claypans | 1 | Clay | |
| 931 | Medium woodland; yate | 1 | Fresh | |
| 948 | Medium woodland; York gum & river gum | 1 | Fresh | |
| 954 | Shrublands; thicket, Jam & Allocasuarina huegeliana | 1 | Granite | Combine 954, 1041 and 3041 and visit to check status. High priority. |
| 1041 | Low woodland; Allocasuarina huegeliana & Jam | 1 | Granite | Combine 954, 1041 and 3041 and visit to check status. High priority. |
| 3041 | Mosaic: Low woodland; Allocasuarina huegeliana & jam around granite rocks | 1 | Granite | Combine 954, 1041 and 3041 and visit to check status. High priority. |
| 25 | Low woodland; Allocasuarina huegeliana & York gum | 1 | Granite | Small discrete area verify still intact as well as condition |
| 413 | Shrublands; Acacia neurophylla & A. species thicket | 1 | Lat/Sand | Small discrete area verify still intact as well as condition. BHVA 413 and 435 may be the same. |
| 37 | Shrublands; teatree thicket | 1 | Saline | |
| 41 | Shrublands; teatree scrub | 1 | Saline | |
| 356 | Succulent steppe with open woodland; eucalypts over saltbush | 1 | Saline | Small discrete area verify still intact as well as condition |
| 392 | Shrublands; Melaleuca thyoides thicket | 1 | Saline | |
| 631 | Succulent steppe with woodland and thicket; York gum over Melaleuca thyoides & samphire | 1 | Saline | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 953 | Succulent steppe with thicket; teatree over samphire (m5) | 1 | Saline | |
| 1062 | Succulent steppe with open woodland & thicket; york gum over Melaleuca thyoides & samphire | 1 | Saline | |
| 950 | Medium woodland; Casuarina obesa | 1 | Saline | |
| 951 | Succulent steppe with sparse woodland & thicket; york gum & Kondinin blackbutt over teatree thicket & samphire | 1 | Saline | |
| 959 | Succulent steppe with sparse woodland & thicket; yorrell & Kondinin blackbutt over teatree & samphire | 1 | Saline | |
| 966 | Succulent steppe with sparse woodland & thicket; salmon gum & morrel over teatree & samphire | 1 | Saline | |
| 1048 | Mosaic: Shrublands; melaleuca patchy scrub / Succulent steppe; samphire | 1 | Saline | |
| 1080 | Succulent steppe with mallee & thickets; Mallee and Melaleuca uncinata thickets on salt flats | 1 | Saline | Small discrete area verify still intact as well as condition |
| 49 | Shrublands; mixed heath | 1 | Sand | An unusual combination, verify what is here |
| 694 | Shrublands; scrub-heath on yellow sandplain banksia-xylomelum alliance in the Geraldton Sandplain & Avon-Wheatbelt Regions | 1 | Sand | |
| 1056 | Shrublands; thicket, acacia & Allocasuarina campestris | 1 | Sand | Isolated |
| 1147 | Shrublands; scrub-heath in the south-east Avon-Wheatbelt Region | 1 | Sand | |
| 949 | Low woodland; banksia | 1* | Sand | 1* non-coastal; 5 coastal |
| 352 | Medium woodland; York gum | 1 | Valley Floor | |
| 1023 | Medium woodland; York gum, wandoo & salmon gum (Eucalyptus salmonophloia) | 1 | Valley Floor | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 1053 | Shrublands; Melaleuca uncinata thicket with scattered York gum | 1 | Valley Floor | |
| 1200 | Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub Eucalyptus eremophila & black marlock (E. redunca) | 1 | Valley Floor | |
| 145 | Mosaic: Medium woodland; York gum & salmon gum / Shrublands; thicket, acacia-casuarina-melaleuca alliance | 1 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations |
| 537 | Medium woodland; morrel (Eucalyptus longicornis) | 1 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations |
| 945 | Mosaic: Medium woodland; salmon gum / Shrublands; mallee scrub, redwood & black marlock | 1 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations |
| 1025 | Mosaic: Medium woodland; York gum, salmon gum & morrel / Succulent steppe; saltbush & samphire | 1 | Valley Floor | Small discrete area verify still intact as well as condition |
| 1049 | Medium woodland; wandoo, York gum, salmon gum, morrel & gimlet | 1 | Valley Floor | |
| 1059 | Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee Eucalyptus longicornis & E. sheathiana scrub | 1 | Valley Floor | Small discrete area verify still intact as well as condition |
| 946 | Medium woodland; wandoo | 1* | Valley Floor | 1 eastern (E. capillosa areas); 5 western |
| 7 | Medium woodland; York gum (Eucalyptus loxophleba) & wandoo | 1* | Valley Floor | 1 outlier mid-Avon; 5 western (ignore Western) |
| 142 | Medium woodland; York gum & salmon gum | 1* | Valley Floor | 1 southern occurrence; 5 elsewhere. Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations. |
| 1061 | Mosaic: Medium sparse woodland; salmon gum & yorrell / Succulent steppe; saltbush & samphire | 1 | VF/Saline | |
| 1079 | Mosaic: Medium open woodland; salmon gum & morrel / Succulent steppe; saltbush | 1 | VF/Saline | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 2047 | Shrublands; tamma & dryandra thicket | 2 | Laterite | |
| 960 | Shrublands; mallee scrub, redwood & black marlock | 2 | Sand | |
| 131 | Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee scrub, redwood & black marlock | 2 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations |
| 1065 | Mosaic: Shrublands;Medium woodland; wandoo & gimlet / York gum & Eucalyptus sheathiana mallee scrub | 2 | Valley Floor | |
| 955 | Mosaic: Shrublands; scrub-heath (South East Avon) / Shrublands; Allocasuarina campestris thicket | 3 | Lat/Sand | Potential high species diversity but, comparatively, low threat. |
| 941 | Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub, redwood | 3 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations. BHVA description for this does not agree with the NVIS mapping. |
| 1055 | Shrublands; York gum & Eucalyptus sheathiana mallee scrub | 3 | Valley Floor | Quite a bit of this type left |
| 1057 | Mosaic: Shrublands; Medium woodland; salmon gum & gimlet / York gum & Eucalyptus sheathiana mallee scrub | 3 | Valley Floor | |
| 1081 | Shrublands; mallee scrub, Eucalyptus longicornis & E. sheathiana | 3 | Valley Floor | |
| 552 | Shrublands; Casuarina acutivalvis & calothamnus (also Melaleuca) thicket on greenstone hills | 4 | Laterite | Be interesting to look at outliers in SW of the ANRMR |
| 8 | Medium woodland; salmon gum & gimlet | 4 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations |
| 141 | Medium woodland; York gum, salmon gum & gimlet | 4 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations |
| 936 | Medium woodland; salmon gum | 4 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| | | | | combinations |
| 1075 | Shrublands; mallee scrub, Eucalyptus eremophila & black marlock (Eucalyptus redunca) | 4 | Valley Floor | Low rating due to a lot left outside the ANRMR |
| 511 | Medium woodland; salmon gum & morrel | 4 | Valley Floor | Need to identify what (if any differences are found between these york gum/salmon gum/morrel combinations |
| 128 | Bare areas; rock outcrops | 5 | Granite | |
| 4 | Medium woodland; marri & wandoo | 5 | | |
| 51 | Sedgeland; reed swamps, occasionally with heath | 5 | | |
| 125 | Bare areas; salt lakes | 5 | | |
| 129 | Bare areas; drift sand | 5 | | |
| 325 | Succulent steppe; saltbush & samphire | 5 | | |
| 435 | Shrublands; Acacia neurophylla, A. beauverdiana & A. resinomarginea thicket | 5 | | BHVA 413 and 435 may be the same. |
| 519 | Shrublands; mallee scrub, Eucalyptus eremophila | 5 | | |
| 538 | Shrublands; Acacia brachystachya scrub | 5 | | |
| 551 | Shrublands; Allocasuarina campestris thicket | 5 | | |
| 676 | Succulent steppe; samphire | 5 | | |
| 929 | Low forest; moort (Eucalyptus platypus) | 5 | | |
| 942 | Mosaic: Medium woodland; yate / Shrublands; mallee scrub, black marlock | 5 | | Only a very small occurrence inside the ANRMR |
| 947 | Medium woodland; powderbark & mallet | 5 | | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 952 | Shrublands; dryandra heath | 5 | | |
| 965 | Medium woodland; jarrah & marri | 5 | | |
| 968 | Medium woodland; jarrah, marri & wandoo | 5 | | |
| 973 | Low forest; paperbark (Melaleuca rhaphiophylla) | 5 | | |
| 987 | Medium woodland; jarrah & wandoo | 5 | | |
| 988 | Succulent steppe with thicket; Melaleuca thyoides over samphire | 5 | | |
| 999 | Medium woodland; marri | 5 | | |
| 1002 | Medium open woodland; jarrah | 5 | | |
| 1003 | Medium forest; jarrah, marri & wandoo | 5 | | |
| 1004 | Mosaic: Medium open woodland; wandoo / Shrublands; mixed heath | 5 | | |
| 1005 | Low woodland; Allocasuarina huegeliana | 5 | | |
| 1006 | Medium woodland; jarrah, wandoo & powderbark | 5 | | |
| 1014 | Mosaic: Low woodland; banksia / Shrublands; teatree thicket | 5 | | |
| 1017 | Medium open woodland; jarrah & marri, with low woodland; banksia | 5 | | |
| 1018 | Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree / Low woodland; Casuarina obesa | 5 | | |
| 1019 | Medium sparse woodland; jarrah & marri | 5 | | |
| 1024 | Shrublands; mallee & casuarina thicket | 5 | | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 1027 | Mosaic: Medium open woodland; jarrah & marri, with low woodland; banksia / Medium sparse woodland; jarrah & marri | 5 | | |
| 1094 | Mosaic: Medium woodland; York gum & salmon gum / Shrublands; mallee scrub Eucalyptus eremophila & black marlock | 5 | | |
| 1413 | Shrublands; acacia, casuarina & melaleuca thicket | 5 | | |
| 2048 | Shrublands; scrub-heath in the Mallee Region | 5 | | |
| 3003 | Medium forest; jarrah & marri on laterite with wandoo in valleys, sandy swamps with teatree and Banksia | 5 | | |
| 13 | Medium open woodland; wandoo | 5 | | |
| 147 | Succulent steppe with scrub; acacia species over saltbush | 5 | | |
| 535 | Medium woodland; rough fruited mallee on greenstone hills | 5 | | |
| 536 | Medium woodland; morrel & rough fruited mallee (Eucalyptus corrugata) | 5 | | |
| 956 | Shrublands; Allocasuarina campestris thicket with scattered wandoo | 5 | | |
| 961 | Mosaic: Shrublands; scrub-heath (South East Avon)/ Shrublands; Allocasuarina campestris thicket | 5 | | |
| 1020 | Mosaic: Medium forest; jarrah-marri / Medium woodland; marri-wandoo | 5 | | |
| 1063 | Medium-Low woodland; York gum & cypress pine (Callitris columellaris) | 5 | | |
| 1067 | Medium woodland; salmon gum, morrel, gimlet & rough fruited mallee | 5 | | |
| 1068 | Medium woodland; salmon gum, morrel, gimlet & Eucalyptus sheathiana | 5 | | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 1098 | Mosaic: Medium sparse woodland; salmon gum & morrel / Succulent steppe; samphire | 5 | | |
| 3 | Medium forest; jarrah-marri | 5 | | |
| 5 | Medium woodland; wandoo & powderbark (Eucalyptus accedens) | 5 | | |
| 36 | Shrublands; thicket, acacia-casuarina alliance | 5 | | |
| 47 | Shrublands; tallerack mallee-heath | 5 | | |
| 380 | Shrublands; scrub-heath on sandplain | 5 | | |
| 520 | Shrublands; Acacia quadrimarginea thicket | 5 | | |
| 1148 | Shrublands; scrub-heath in the Coolgardie Region | 5 | | |
| 962 | Medium woodland; mallet (Eucalytpus astringens) | v | | Need to check mapping and see if these are substantially different from other similar types. Also need to check whether *E. astringens* is is this location. |
| 1058 | Shrublands; York gum & Eucalyptus gongylocarpa mallee scrub | v | | An odd combination of York gum & Eucalyptus gongylocarpa, need to see if it exists. |
| 934 | Shrublands; mallee scrub (Eucalyptus nutans) | v | | Compare Sth coast with ANRMR population and see if they are the same, also need to check species as no longer *E. nutans*. |
| 516 | Shrublands; mallee scrub, black marlock | v | | Possibly a mapping artefact, as this largely found on the south coast. |

## Appendix 2.3 BHVA Tables

**Table A2.2:** The current and pre-European extent of the BVHA of the ANRMR.
This table shows the pre-European and current extent (ha) of each vegetation association in the agricultural (intensive) and pastoral (extensive) regions of the ANRMR, and the percent remaining (current extent as a percentage of pre-European extent). The final column shows the current extent of each regional BHVA expressed as a percentage of the current extent in the State. Rows shaded in grey are BHVA with >95% of their current extent in the ANRMR.

| | | Current Area (ha) | | | | Pre-European Area (ha) | | | Percent | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BHVA | Beards Description | Avon Intensive | Avon Extensive | Avon Total | WA | Avon Intensive | Avon Extensive | Area WA | Remnant Avon | Remnant WA | Current Avon Of Current WA |
| 3 | Medium forest; jarrah-marri | 99273 | 0 | 99273 | 1846549 | 122026 | 0 | 2661405 | 81 | 69 | 5 |
| 4 | Medium woodland; marri & wandoo | 112393 | 0 | 112393 | 245945 | 270569 | 0 | 1054280 | 42 | 23 | 46 |
| 5 | Medium woodland; wandoo & powderbark (Eucalyptus accedens) | 9827 | 0 | 9827 | 23123 | 15888 | 0 | 51731 | 62 | 45 | 42 |
| 7 | Medium woodland; York gum (Eucalyptus loxophleba) & wandoo | 311 | 0 | 311 | 22900 | 2809 | 0 | 179725 | 11 | 13 | 1 |
| 8 | Medium woodland; salmon gum & gimlet | 35594 | 49768 | 85362 | 329595 | 400201 | 49768 | 694638 | 19 | 47 | 26 |
| 13 | Medium open woodland; wandoo | 210 | 0 | 210 | 210 | 392 | 0 | 392 | 54 | 54 | 100 |
| 18 | Low woodland; mulga (Acacia aneura) | 0 | 15708 | 15708 | 19886871 | 0 | 15708 | 19888959 | 100 | 100 | 0 |
| 19 | Low woodland; mulga between sandridges | 0 | 3173 | 3173 | 4384254 | 0 | 3173 | 4385295 | 100 | 100 | 0 |
| 25 | Low woodland; Allocasuarina huegeliana & York gum | 958 | 0 | 958 | 5871 | 8374 | 0 | 13765 | 11 | 43 | 16 |
| 36 | Shrublands; thicket, acacia-casuarina alliance | 64746 | 870 | 65616 | 216340 | 299375 | 870 | 495431 | 22 | 44 | 30 |
| 37 | Shrublands; teatree thicket | 2470 | 0 | 2470 | 22849 | 7232 | 0 | 39385 | 34 | 58 | 11 |
| 39 | Shrublands; mulga scrub | 0 | 139 | 139 | 6613463 | 0 | 139 | 6613569 | 100 | 100 | 0 |
| 41 | Shrublands; teatree scrub | 4992 | 0 | 4992 | 179370 | 13772 | 0 | 194251 | 36 | 92 | 3 |
| 47 | Shrublands; tallerack mallee-heath | 15041 | 0 | 15041 | 290206 | 40501 | 0 | 820389 | 37 | 35 | 5 |
| 49 | Shrublands; mixed heath | 1135 | 0 | 1135 | 24366 | 1374 | 0 | 52492 | 83 | 46 | 5 |
| 51 | Sedgeland; reed swamps, occasionally with heath | 60 | 0 | 60 | 34008 | 63 | 0 | 59086 | 95 | 58 | 0 |
| 125 | Bare areas; salt lakes | 8526 | 132955 | 141481 | 3288247 | 135714 | 132955 | 3491804 | 53 | 94 | 4 |
| 128 | Bare areas; rock outcrops | 24249 | 72940 | 97189 | 281154 | 64770 | 72940 | 329870 | 71 | 85 | 35 |
| 131 | Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee scrub, redwood & black marlock | 8941 | 0 | 8941 | 9820 | 171465 | 0 | 181155 | 5 | 5 | 91 |
| 141 | Medium woodland; York gum, salmon gum & gimlet | 12098 | 798440 | 810538 | 952986 | 199638 | 798440 | 1158760 | 81 | 82 | 85 |
| 142 | Medium woodland; York gum & salmon gum | 8643 | 47696 | 56339 | 188633 | 157967 | 47696 | 711262 | 27 | 27 | 30 |
| 144 | Medium woodland; wandoo, salmon gum, morrel, gimlet & rough fruited mallee | 0 | 3988 | 3988 | 3988 | 0 | 3988 | 3988 | 100 | 100 | 100 |

| | | Current Area (ha) | | | | Pre-European Area (ha) | | | Percent | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beards Description** | **Avon Intensive** | **Avon Extensive** | **Avon Total** | **WA** | **Avon Intensive** | **Avon Extensive** | **Area WA** | **Remnant Avon** | **Remnant WA** | **Current Avon Of Current WA** |
| 145 | Mosaic: Medium woodland; York gum & salmon gum / Shrublands; thicket, acacia-casuarina-melaleuca alliance | 322 | 0 | 322 | 322 | 7949 | 0 | 8054 | 4 | 4 | 100 |
| 147 | Succulent steppe with scrub; acacia species over saltbush | 60 | 34406 | 34466 | 34466 | 1072 | 34406 | 35478 | 97 | 97 | 100 |
| 148 | Medium woodland; gimlet | 0 | 320 | 320 | 320 | 0 | 320 | 320 | 100 | 100 | 100 |
| 202 | Shrublands; mulga & Acacia quadrimarginea scrub | 0 | 1844 | 1844 | 448529 | 0 | 1844 | 448529 | 100 | 100 | 0 |
| 214 | Mosaic: Medium woodland; goldfield eucalypts / Succulent steppe with open low woodland; myoporum over saltbush | 0 | 15693 | 15693 | 505487 | 0 | 15693 | 505487 | 100 | 100 | 3 |
| 221 | Succulent steppe; saltbush | 0 | 12036 | 12036 | 63625 | 0 | 12036 | 63720 | 100 | 100 | 19 |
| 256 | Low woodland; York gum, and cypress pine (adjacent to e6pMLi) | 0 | 64955 | 64955 | 67666 | 0 | 64955 | 67666 | 100 | 100 | 96 |
| 314 | Succulent steppe with open woodland; york gum over saltbush | 0 | 6394 | 6394 | 7442 | 0 | 6394 | 7442 | 100 | 100 | 86 |
| 325 | Succulent steppe; saltbush & samphire | 249 | 7219 | 7468 | 60138 | 703 | 7219 | 64628 | 94 | 93 | 12 |
| 337 | Mosaic: Shrublands; bowgada scrub / Hummock grasslands, mixed sandplain - open red mallee & mixed sparse dwarf shrubs over Triodia basedowii | 0 | 2785 | 2785 | 2785 | 0 | 2785 | 2785 | 100 | 100 | 100 |
| 352 | Medium woodland; York gum | 21700 | 229 | 21929 | 120611 | 348719 | 229 | 724273 | 6 | 17 | 18 |
| 356 | Succulent steppe with open woodland; eucalypts over saltbush | 958 | 0 | 958 | 1967 | 3320 | 0 | 4330 | 29 | 45 | 49 |
| 357 | Medium woodland over scrub; York gum over bowgada & jam (Acacia acuminata) | 0 | 25556 | 25556 | 37003 | 0 | 25556 | 37003 | 100 | 100 | 69 |
| 380 | Shrublands; scrub-heath on sandplain | 13648 | 0 | 13648 | 338133 | 32541 | 0 | 580375 | 42 | 58 | 4 |
| 392 | Shrublands; Melaleuca thyoides thicket | 24 | 0 | 24 | 1383 | 191 | 0 | 3069 | 13 | 45 | 2 |
| 411 | Succulent steppe with open scrub; scattered bowgada & jam over saltbush | 0 | 22 | 22 | 44035 | 0 | 22 | 44035 | 100 | 100 | 0 |
| 413 | Shrublands; Acacia neurophylla & A. species thicket | 78 | 0 | 78 | 1620 | 375 | 0 | 3474 | 21 | 47 | 5 |
| 414 | Succulent steppe with open scrub; scattered bowgada & jam over saltbush & bluebush | 0 | 15714 | 15714 | 30389 | 0 | 15714 | 30389 | 100 | 100 | 52 |
| 416 | Low woodland; mulga mixed with cypress pine & york gum | 0 | 74263 | 74263 | 240331 | 0 | 74263 | 240331 | 100 | 100 | 31 |
| 420 | Shrublands; bowgada & jam scrub | 0 | 16251 | 16251 | 829286 | 0 | 16251 | 859632 | 100 | 96 | 2 |
| 435 | Shrublands; Acacia neurophylla, A. beauverdiana & A. resinomarginea thicket | 9940 | 505382 | 515322 | 757195 | 23626 | 505382 | 994575 | 97 | 76 | 68 |
| 436 | Shrublands; mixed Acacia thickets in thickets of acacia-casuarina-melaleuca alliance | 0 | 1059 | 1059 | 1059 | 0 | 1059 | 1059 | 100 | 100 | 100 |
| 437 | Shrubalnds; Mixed acacia thicket on sandplain | 0 | 114154 | 114154 | 474367 | 0 | 114154 | 505365 | 100 | 94 | 24 |
| 468 | Medium woodland; salmon gum & goldfields blackbutt | 0 | 352 | 352 | 592022 | 0 | 352 | 592022 | 100 | 100 | 0 |
| 483 | Hummock grasslands, mixed sandplain - open mallee over sparse dwarf shrubs with spinifex ; red mallee mallee & | 0 | 49064 | 49064 | 439579 | 0 | 49064 | 439579 | 100 | 100 | 11 |

| | | Current Area (ha) | | | | Pre-European Area (ha) | | | Percent | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beards Description** | **Avon Intensive** | **Avon Extensive** | **Avon Total** | **WA** | **Avon Intensive** | **Avon Extensive** | **Area WA** | **Remnant Avon** | **Remnant WA** | **Current Avon Of Current WA** |
| | mixed sparse dwarf shrubs over Triodia basedowii | | | | | | | | | | |
| 486 | Mosaic: Medium woodland; salmon gum & red mallee / Shrublands; mallee scrub Eucalyptus eremophila | 0 | 18 | 18 | 256582 | 0 | 18 | 436130 | 100 | 59 | 0 |
| 491 | Medium woodland; morrel & Dundas blackbutt (E. dundasii) | 0 | 64 | 64 | 67168 | 0 | 64 | 67168 | 100 | 100 | 0 |
| 501 | Medium woodland; goldfields blackbutt | 0 | 68 | 68 | 48022 | 0 | 68 | 48022 | 100 | 100 | 0 |
| 511 | Medium woodland; salmon gum & morrel | 39158 | 444954 | 484112 | 493862 | 243608 | 444954 | 700409 | 70 | 71 | 98 |
| 519 | Shrublands; mallee scrub, Eucalyptus eremophila | 232090 | 234726 | 466816 | 1398666 | 986398 | 234726 | 2333440 | 38 | 60 | 33 |
| 520 | Shrublands; Acacia quadrimarginea thicket | 7 | 24996 | 25003 | 37906 | 23 | 24996 | 37923 | 100 | 100 | 66 |
| 522 | Medium woodland; redwood (Eucalyptus transcontinentalis) & merrit (E. flocktoniae) | 0 | 123327 | 123327 | 709715 | 0 | 123327 | 709715 | 100 | 100 | 17 |
| 535 | Medium woodland; rough fruited mallee on greenstone hills | 451 | 23136 | 23587 | 23587 | 1210 | 23136 | 24346 | 97 | 97 | 100 |
| 536 | Medium woodland; morrell & rough fruited mallee (Eucalyptus corrugata) | 3987 | 1727 | 5714 | 5714 | 11450 | 1727 | 13178 | 43 | 43 | 100 |
| 537 | Medium woodland; morrel (Eucalyptus longicornis) | 332 | 207 | 539 | 540 | 494 | 207 | 701 | 77 | 77 | 100 |
| 538 | Shrublands; Acacia brachystachya scrub | 1098 | 123869 | 124967 | 144196 | 4724 | 123869 | 147822 | 97 | 98 | 87 |
| 551 | Shrublands; Allocasuarina campestris thicket | 28444 | 17341 | 45785 | 69690 | 146524 | 17341 | 302423 | 28 | 23 | 66 |
| 552 | Shrublands; Casuarina acutivalvis & calothamnus (also melaleuca) thicket on greenstone hills | 98 | 12341 | 12439 | 31733 | 745 | 12341 | 33909 | 95 | 94 | 39 |
| 555 | Hummock grasslands, mallee steppe; red mallee over spinifex, Triodia scariosa | 0 | 11656 | 11656 | 57420 | 0 | 11656 | 57420 | 100 | 100 | 20 |
| 631 | Succulent steppe with woodland and thicket; York gum over Melaleuca thyoides & samphire | 3914 | 0 | 3914 | 53885 | 11812 | 0 | 106853 | 33 | 50 | 7 |
| 676 | Succulent steppe; samphire | 300 | 626 | 926 | 1958159 | 6810 | 626 | 2063389 | 12 | 95 | 0 |
| 694 | Shrublands; scrub-heath on yellow sandplain banksia-xylomelum alliance in the Geraldton Sandplain & Avon-Wheatbelt Regions | 4864 | 0 | 4864 | 60378 | 149967 | 0 | 346494 | 3 | 17 | 8 |
| 929 | Low forest; moort (Eucalyptus platypus) | 181 | 0 | 181 | 7895 | 227 | 0 | 10735 | 80 | 74 | 2 |
| 931 | Medium woodland; yate | 648 | 0 | 648 | 13421 | 2216 | 0 | 31390 | 29 | 43 | 5 |
| 934 | Shrublands; mallee scrub (Eucalyptus nutans) | 88 | 0 | 88 | 4264 | 259 | 0 | 9282 | 34 | 46 | 2 |
| 936 | Medium woodland; salmon gum | 9816 | 16132 | 25948 | 675636 | 29028 | 16132 | 698752 | 57 | 97 | 4 |
| 941 | Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub, redwood | 3694 | 10822 | 14516 | 14516 | 23425 | 10822 | 34248 | 42 | 42 | 100 |
| 945 | Mosaic: Medium woodland; salmon gum / Shrublands; mallee scrub, redwood & black marlock | 13926 | 8443 | 22369 | 22369 | 168169 | 8443 | 176612 | 13 | 13 | 100 |
| 946 | Medium woodland; wandoo | 8151 | 786 | 8937 | 11316 | 44727 | 786 | 53225 | 20 | 21 | 79 |
| 947 | Medium woodland; powderbark & mallet | 2828 | 0 | 2828 | 10196 | 12717 | 0 | 34033 | 22 | 30 | 28 |

| | | Current Area (ha) | | | | Pre-European Area (ha) | | | Percent | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beards Description** | **Avon Intensive** | **Avon Extensive** | **Avon Total** | **WA** | **Avon Intensive** | **Avon Extensive** | **Area WA** | **Remnant Avon** | **Remnant WA** | **Current Avon Of Current WA** |
| 948 | Medium woodland; York gum & river gum | 115 | 0 | 115 | 115 | 1441 | 0 | 1441 | 8 | 8 | 100 |
| 949 | Low woodland; banksia | 15199 | 0 | 15199 | 124758 | 22466 | 0 | 218194 | 68 | 57 | 12 |
| 950 | Medium woodland; Casuarina obesa | 190 | 0 | 190 | 190 | 497 | 0 | 497 | 38 | 38 | 100 |
| 951 | Succulent steppe with sparse woodland & thicket; york gum & Kondinin blackbutt over teatree thicket & samphire | 8444 | 0 | 8444 | 8444 | 27508 | 0 | 27508 | 31 | 31 | 100 |
| 952 | Shrublands; dryandra heath | 303 | 0 | 303 | 9266 | 495 | 0 | 58931 | 61 | 16 | 3 |
| 953 | Succulent steppe with thicket; teatree over samphire (m5) | 1431 | 0 | 1431 | 1613 | 9457 | 0 | 9928 | 15 | 16 | 89 |
| 954 | Shrublands; thicket, Jam & Allocasuarina huegeliana | 1044 | 0 | 1044 | 1044 | 6502 | 0 | 6502 | 16 | 16 | 100 |
| 955 | Mosaic: Shrublands; scrub-heath (South East Avon) / Shrublands; Allocasuarina campestris thicket | 9417 | 0 | 9417 | 10684 | 130560 | 0 | 139324 | 7 | 8 | 88 |
| 956 | Shrublands; Allocasuarina campestris thicket with scattered wandoo | 2744 | 0 | 2744 | 2744 | 25556 | 0 | 25556 | 11 | 11 | 100 |
| 959 | Succulent steppe with sparse woodland & thicket; yorrell & Kondinin blackbutt over teatree & samphire | 4005 | 0 | 4005 | 4005 | 13092 | 0 | 13092 | 31 | 31 | 100 |
| 960 | Shrublands; mallee scrub, redwood & black marlock | 23045 | 0 | 23045 | 23045 | 220441 | 0 | 220441 | 10 | 10 | 100 |
| 961 | Mosaic: Shrublands; scrub-heath (South East Avon)/ Shrublands; Allocasuarina campestris thicket | 4277 | 0 | 4277 | 4299 | 27390 | 0 | 27800 | 16 | 15 | 99 |
| 962 | Medium woodland; mallet (Eucalytpus astringens) | 4 | 0 | 4 | 4 | 62 | 0 | 62 | 6 | 6 | 100 |
| 965 | Medium woodland; jarrah & marri | 271 | 0 | 271 | 5145 | 723 | 0 | 9356 | 37 | 55 | 5 |
| 966 | Succulent steppe with sparse woodland & thicket; salmon gum & morrell over teatree & samphire | 379 | 0 | 379 | 379 | 7087 | 0 | 7087 | 5 | 5 | 100 |
| 968 | Medium woodland; jarrah, marri & wandoo | 53629 | 0 | 53629 | 97596 | 69062 | 0 | 296878 | 78 | 33 | 55 |
| 973 | Low forest; paperbark (Melaleuca rhaphiophylla) | 109 | 0 | 109 | 1786 | 242 | 0 | 5003 | 45 | 36 | 6 |
| 987 | Medium woodland; jarrah & wandoo | 37 | 0 | 37 | 1319 | 146 | 0 | 3595 | 25 | 37 | 3 |
| 988 | Succulent steppe with thicket; Melaleuca thyoides over samphire | 3377 | 0 | 3377 | 23166 | 49488 | 0 | 96635 | 7 | 24 | 15 |
| 999 | Medium woodland; marri | 256 | 0 | 256 | 14707 | 1069 | 0 | 115707 | 24 | 13 | 2 |
| 1002 | Medium open woodland; jarrah | 361 | 0 | 361 | 15527 | 361 | 0 | 15948 | 100 | 97 | 2 |
| 1003 | Medium forest; jarrah, marri & wandoo | 4369 | 0 | 4369 | 8337 | 5760 | 0 | 20109 | 76 | 41 | 52 |
| 1004 | Mosaic: Medium open woodland; wandoo / Shrublands; mixed heath | 1595 | 0 | 1595 | 3583 | 1658 | 0 | 9768 | 96 | 37 | 45 |
| 1005 | Low woodland; Allocasuarina huegeliana | 3 | 0 | 3 | 205 | 155 | 0 | 787 | 2 | 26 | 1 |
| 1006 | Medium woodland; jarrah, wandoo & powderbark | 20177 | 0 | 20177 | 22614 | 35903 | 0 | 44908 | 56 | 50 | 89 |
| 1014 | Mosaic: Low woodland; banksia / Shrublands; teatree thicket | 959 | 0 | 959 | 21856 | 1976 | 0 | 41064 | 49 | 53 | 4 |
| 1017 | Medium open woodland; jarrah & marri, with low woodland; banksia | 248 | 0 | 248 | 11481 | 1272 | 0 | 17528 | 19 | 66 | 2 |

| | | Current Area (ha) | | | | Pre-European Area (ha) | | | Percent | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beards Description** | **Avon Intensive** | **Avon Extensive** | **Avon Total** | **WA** | **Avon Intensive** | **Avon Extensive** | **Area WA** | **Remnant Avon** | **Remnant WA** | **Current Avon Of Current WA** |
| 1018 | Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree / Low woodland; Casuarina obesa | 1835 | 0 | 1835 | 3193 | 7005 | 0 | 14059 | 26 | 23 | 57 |
| 1019 | Medium sparse woodland; jarrah & marri | 191 | 0 | 191 | 361 | 514 | 0 | 804 | 37 | 45 | 53 |
| 1020 | Mosaic: Medium forest; jarrah-marri / Medium woodland; marri-wandoo | 1850 | 0 | 1850 | 1850 | 5610 | 0 | 5610 | 33 | 33 | 100 |
| 1023 | Medium woodland; York gum, wandoo & salmon gum (Eucalyptus salmonophloia) | 38342 | 0 | 38342 | 103053 | 844117 | 0 | 1601602 | 5 | 6 | 37 |
| 1024 | Shrublands; mallee & casuarina thicket | 38740 | 19582 | 58322 | 69895 | 573505 | 19582 | 742950 | 10 | 9 | 83 |
| 1025 | Mosaic: Medium woodland; York gum, salmon gum & morrel / Succulent steppe; saltbush & samphire | 32 | 0 | 32 | 32 | 1920 | 0 | 1920 | 2 | 2 | 100 |
| 1027 | Mosaic: Medium open woodland; jarrah & marri, with low woodland; banksia / Medium sparse woodland; jarrah & marri | 8034 | 0 | 8034 | 22313 | 16567 | 0 | 39809 | 48 | 56 | 36 |
| 1041 | Low woodland; Allocasuarina huegeliana & Jam | 624 | 0 | 624 | 1185 | 2506 | 0 | 4781 | 25 | 25 | 53 |
| 1048 | Mosaic: Shrublands; melaleuca patchy scrub / Succulent steppe; samphire | 2373 | 0 | 2373 | 2373 | 13815 | 0 | 13815 | 17 | 17 | 100 |
| 1049 | Medium woodland; wandoo, York gum, salmon gum, morrel & gimlet | 30084 | 0 | 30084 | 30084 | 833385 | 0 | 833385 | 4 | 4 | 100 |
| 1053 | Shrublands; Melaleuca uncinata thicket with scattered York gum | 1722 | 0 | 1722 | 2212 | 12706 | 0 | 13823 | 14 | 16 | 78 |
| 1055 | Shrublands; York gum & Eucalyptus sheathiana mallee scrub | 13793 | 0 | 13793 | 13793 | 126806 | 0 | 126806 | 11 | 11 | 100 |
| 1056 | Shrublands; thicket, acacia & Allocasuarina campestris | 3098 | 0 | 3098 | 3098 | 21073 | 0 | 21073 | 15 | 15 | 100 |
| 1057 | Mosaic: Shrublands; Medium woodland; salmon gum & gimlet / York gum & Eucalyptus sheathiana mallee scrub | 13586 | 0 | 13586 | 13586 | 145311 | 0 | 145311 | 9 | 9 | 100 |
| 1058 | Shrublands; York gum & Eucalyptus gongylocarpa mallee scrub | 244 | 0 | 244 | 244 | 9363 | 0 | 9363 | 3 | 3 | 100 |
| 1059 | Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee Eucalyptus longicornis & E. sheathiana scrub | 13 | 0 | 13 | 13 | 2260 | 0 | 2260 | 1 | 1 | 100 |
| 1061 | Mosaic: Medium sparse woodland; salmon gum & yorrell / Succulent steppe; saltbush & samphire | 12495 | 0 | 12495 | 12495 | 42747 | 0 | 42747 | 29 | 29 | 100 |
| 1062 | Succulent steppe with open woodland & thicket; york gum over Melaleuca thyoides & samphire | 4270 | 335 | 4605 | 7442 | 18776 | 335 | 22527 | 24 | 33 | 62 |
| 1063 | Medium-Low woodland; York gum & cypress pine (Callitris columellaris) | 1824 | 160926 | 162750 | 162752 | 11553 | 160926 | 172482 | 94 | 94 | 100 |
| 1065 | Mosaic: Shrublands; Medium woodland; wandoo & gimlet / | 448 | 0 | 448 | 448 | 863 | 0 | 863 | 52 | 52 | 100 |

| | | Current Area (ha) | | | | Pre-European Area (ha) | | | Percent | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beards Description** | **Avon Intensive** | **Avon Extensive** | **Avon Total** | **WA** | **Avon Intensive** | **Avon Extensive** | **Area WA** | **Remnant Avon** | **Remnant WA** | **Current Avon Of Current WA** |
| | York gum & Eucalyptus sheathiana mallee scrub | | | | | | | | | | |
| 1067 | Medium woodland; salmon gum, morrel, gimlet & rough fruited mallee | 4046 | 9339 | 13385 | 13385 | 5932 | 9339 | 15272 | 88 | 88 | 100 |
| 1068 | Medium woodland; salmon gum, morrel, gimlet & Eucalyptus sheathiana | 24402 | 111467 | 135869 | 135869 | 157433 | 111467 | 268900 | 51 | 51 | 100 |
| 1071 | Succulent steppe with scrub; acacia species over saltbush & bluebush | 0 | 762 | 762 | 762 | 0 | 762 | 762 | 100 | 100 | 100 |
| 1075 | Shrublands; mallee scrub, Eucalyptus eremophila & black marlock (Eucalyptus redunca) | 29587 | 0 | 29587 | 62595 | 174477 | 0 | 527021 | 17 | 12 | 47 |
| 1078 | Medium woodland; salmon gum, redwood, merrit, gimlet & Eucalyptus sheathiana | 0 | 757 | 757 | 757 | 0 | 757 | 757 | 100 | 100 | 100 |
| 1079 | Mosaic: Medium open woodland; salmon gum & morrel / Succulent steppe; saltbush | 3877 | 0 | 3877 | 3877 | 10119 | 0 | 10119 | 38 | 38 | 100 |
| 1080 | Succulent steppe with mallee & thickets; Mallee and Melaleuca uncinata thickets on salt flats | 81 | 0 | 81 | 81 | 3951 | 0 | 3951 | 2 | 2 | 100 |
| 1081 | Shrublands; mallee scrub, Eucalyptus longicornis & E. sheathiana | 2266 | 0 | 2266 | 2266 | 15148 | 0 | 15148 | 15 | 15 | 100 |
| 1098 | Mosaic: Medium sparse woodland; salmon gum & morrel / Succulent steppe; samphire | 2967 | 0 | 2967 | 2967 | 13669 | 0 | 13669 | 22 | 22 | 100 |
| 1147 | Shrublands; scrub-heath in the south-east Avon-Wheatbelt Region | 2375 | 0 | 2375 | 2436 | 41057 | 0 | 42855 | 6 | 6 | 97 |
| 1148 | Shrublands; scrub-heath in the Coolgardie Region | 452 | 192029 | 192481 | 257534 | 3302 | 192029 | 260384 | 99 | 99 | 75 |
| 1200 | Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub Eucalyptus eremophila & black marlock (E. redunca) | 8105 | 0 | 8105 | 12837 | 102557 | 0 | 162786 | 8 | 8 | 63 |
| 1271 | Bare areas; claypans | 31 | 495 | 526 | 86111 | 601 | 495 | 86684 | 48 | 99 | 1 |
| 1413 | Shrublands; acacia, casuarina & melaleuca thicket | 91839 | 728280 | 820119 | 1247105 | 490974 | 728280 | 1679917 | 67 | 74 | 66 |
| 2047 | Shrublands; tamma & dryandra thicket | 940 | 0 | 940 | 940 | 1463 | 0 | 1463 | 64 | 64 | 100 |
| 2048 | Shrublands; scrub-heath in the Mallee Region | 37108 | 107158 | 144266 | 155847 | 198538 | 107158 | 322220 | 47 | 48 | 93 |
| 3003 | Medium forest; jarrah & marri on laterite with wandoo in valleys, sandy swamps with teatree and Banksia | 36119 | 0 | 36119 | 40723 | 61566 | 0 | 66452 | 59 | 61 | 89 |
| 3041 | Mosaic: Low woodland; Allocasuarina huegeliana & jam around granite rocks | 843 | 0 | 843 | 1266 | 3947 | 0 | 6374 | 21 | 20 | 67 |

**Table A2.3:** Reservation status of vegetation associations in IUCN I-IV Reserves and other CALM-managed lands of ANRMR and the State (see text).
Reservation status is expressed as a percent of the pre-European extent of ANRMR and the State. Shaded vegetation associations are not represented or poorly reserved (<15%) in IUCN reserve categories I-IV within the State.

| | | Area within IUCN I-IV (ha) | | % Area in IUCN I-IV | | Area S16 and UCL (ha) | | % Area S16 and UCL | | pre-European extent (ha) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BHVA | Beard's Description | Avon | WA | Avon | WA | Avon | WA | Avon | WA | Avon | WA |
| 3 | Medium forest; jarrah-marri | 20645 | 490823 | 17 | 18 | 850 | 17248 | 1 | 1 | 122026 | 2661405 |
| 4 | Medium woodland; marri & wandoo | 34287 | 46226 | 13 | 4 | 715 | 6893 | 0 | 1 | 270569 | 1054280 |
| 5 | Medium woodland; wandoo & powderbark (Eucalytpus accedens) | 7669 | 8178 | 48 | 16 | 173 | 198 | 1 | 0 | 15888 | 51731 |
| 7 | Medium woodland; York gum (Eucalyptus loxophleba) & wandoo | 1 | 529 | 0 | 0 | 0 | 238 | 0 | 0 | 2809 | 179725 |
| 8 | Medium woodland; salmon gum & gimlet | 14926 | 44683 | 3 | 6 | 38166 | 113039 | 8 | 16 | 449969 | 694638 |
| 13 | Medium open woodland; wandoo | 154 | 154 | 39 | 39 | 0 | 0 | 0 | 0 | 392 | 392 |
| 18 | Low woodland; mulga (Acacia aneura) | 3296 | 424372 | 21 | 2 | 0 | 2851016 | 0 | 14 | 15708 | 19888959 |
| 19 | Low woodland; mulga between sandridges | 176 | 4783 | 6 | 0 | 2757 | 2771696 | 87 | 63 | 3173 | 4385295 |
| 25 | Low woodland; Allocasuarina huegeliana & York gum | 2 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 8374 | 13765 |
| 36 | Shrublands; thicket, acacia-casuarina alliance | 9314 | 25547 | 3 | 5 | 23902 | 98426 | 8 | 20 | 300244 | 495431 |
| 37 | Shrublands; teatree thicket | 1316 | 4803 | 18 | 12 | 151 | 2119 | 2 | 5 | 7232 | 39385 |
| 39 | Shrublands; mulga scrub | 0 | 479438 | 0 | 7 | 0 | 2443680 | 0 | 37 | 139 | 6613569 |
| 41 | Shrublands; teatree scrub | 6299 | 21751 | 46 | 11 | 205 | 112681 | 1 | 58 | 13772 | 194251 |
| 47 | Shrublands; tallerack mallee-heath | 6738 | 136946 | 17 | 17 | 6241 | 53011 | 15 | 6 | 40501 | 820389 |
| 49 | Shrublands; mixed heath | 1066 | 10562 | 78 | 20 | 0 | 1875 | 0 | 4 | 1374 | 52492 |
| 51 | Sedgeland; reed swamps, occasionally with heath | 63 | 22245 | 100 | 38 | 0 | 724 | 0 | 1 | 63 | 59086 |
| 125 | Bare areas; salt lakes | 62515 | 250416 | 23 | 7 | 106449 | 1333102 | 40 | 38 | 268669 | 3491804 |
| 128 | Bare areas; rock outcrops | 23386 | 47796 | 17 | 14 | 42279 | 158702 | 31 | 48 | 137711 | 329870 |
| 131 | Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee scrub, redwood & black marlock | 1396 | 1408 | 1 | 1 | 94 | 94 | 0 | 0 | 171465 | 181155 |
| 141 | Medium woodland; York gum, salmon gum & gimlet | 120493 | 139499 | 12 | 12 | 228619 | 249211 | 23 | 22 | 998077 | 1158760 |
| 142 | Medium woodland; York gum & salmon gum | 5308 | 8646 | 3 | 1 | 21433 | 120731 | 10 | 17 | 205663 | 711262 |
| 144 | Medium woodland; wandoo, salmon gum, morrel, gimlet & rough fruited mallee | 303 | 303 | 8 | 8 | 3682 | 3682 | 92 | 92 | 3988 | 3988 |
| 145 | Mosaic: Medium woodland; York gum & salmon gum / Shrublands; thicket, acacia-casuarina-melaleuca alliance | 0 | 0 | 0 | 0 | 48 | 48 | 1 | 1 | 7949 | 8054 |
| 147 | Succulent steppe with scrub; acacia species over saltbush | 4297 | 4297 | 12 | 12 | 14425 | 14425 | 41 | 41 | 35478 | 35478 |

| | | Area within IUCN I-IV (ha) | | % Area in IUCN I-IV | | Area S16 and UCL (ha) | | % Area S16 and UCL | | pre-European extent (ha) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** |
| 148 | Medium woodland; gimlet | 0 | 0 | 0 | 0 | 320 | 320 | 100 | 100 | 320 | 320 |
| 202 | Shrublands; mulga & Acacia quadrimarginea scrub | 335 | 1729 | 18 | 0 | 0 | 23615 | 0 | 5 | 1844 | 448529 |
| 214 | Mosaic: Medium woodland; goldfield eucalypts / Succulent steppe with open low woodland; myoporum over saltbush | 5032 | 5032 | 32 | 1 | 10439 | 124578 | 67 | 25 | 15693 | 505487 |
| 221 | Succulent steppe; saltbush | 0 | 3517 | 0 | 6 | 33 | 12115 | 0 | 19 | 12036 | 63720 |
| 256 | Low woodland; York gum, and cypress pine (adjacent to e6pMLi) | 30331 | 30331 | 47 | 45 | 533 | 3244 | 1 | 5 | 64955 | 67666 |
| 314 | Succulent steppe with open woodland; york gum over saltbush | 1084 | 1084 | 17 | 15 | 112 | 112 | 2 | 2 | 6394 | 7442 |
| 325 | Succulent steppe; saltbush & samphire | 0 | 0 | 0 | 0 | 1060 | 2935 | 13 | 5 | 7922 | 64628 |
| 337 | Mosaic: Shrublands; bowgada scrub / Hummock grasslands, mixed sandplain - open red mallee & mixed sparse dwarf shrubs over Triodia basedowii | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2785 | 2785 |
| 352 | Medium woodland; York gum | 1790 | 3071 | 1 | 0 | 929 | 7603 | 0 | 1 | 348947 | 724273 |
| 356 | Succulent steppe with open woodland; eucalypts over saltbush | 159 | 159 | 5 | 4 | 19 | 19 | 1 | 0 | 3320 | 4330 |
| 357 | Medium woodland over scrub; York gum over bowgada & jam (Acacia acuminata) | 0 | 0 | 0 | 0 | 1 | 805 | 0 | 2 | 25556 | 37003 |
| 380 | Shrublands; scrub-heath on sandplain | 10897 | 102376 | 33 | 18 | 0 | 93275 | 0 | 16 | 32541 | 580375 |
| 392 | Shrublands; Melaeuca thyioides thicket | 0 | 274 | 0 | 9 | 0 | 273 | 0 | 9 | 191 | 3069 |
| 411 | Succulent steppe with open scrub; scattered bowgada & jam over saltbush | 0 | 0 | 0 | 0 | 0 | 1113 | 0 | 3 | 22 | 44035 |
| 413 | Shrublands; Acacia neurophylla & A. species thicket | 0 | 24 | 0 | 1 | 31 | 1387 | 8 | 40 | 375 | 3474 |
| 414 | Succulent steppe with open scrub; scattered bowgada & jam over saltbush & bluebush | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 15714 | 30389 |
| 416 | Low woodland; mulga mixed with cypress pine & york gum | 12122 | 16907 | 16 | 7 | 3607 | 47246 | 5 | 20 | 74263 | 240331 |
| 420 | Shrublands; bowgada & jam scrub | 0 | 490 | 0 | 0 | 0 | 11855 | 0 | 1 | 16251 | 859632 |
| 435 | Shrublands; Acacia neurophylla, A. beauverdiana & A. resinomarginea thicket | 111954 | 133640 | 21 | 13 | 311074 | 463950 | 59 | 47 | 529008 | 994575 |
| 436 | Shrublands; mixed Acacia thickets in thickets of acacia-casuarina-melaleuca alliance | 0 | 0 | 0 | 0 | 47 | 47 | 4 | 4 | 1059 | 1059 |
| 437 | Shrubalnds; Mixed acacia thicket on sandplain | 27508 | 63246 | 24 | 13 | 72667 | 267109 | 64 | 53 | 114154 | 505365 |
| 468 | Medium woodland; salmon gum & goldfields blackbutt | 56 | 25313 | 16 | 4 | 297 | 142961 | 84 | 24 | 352 | 592022 |
| 483 | Hummock grasslands, mixed sandplain - open mallee over sparse dwarf shrubs with spinifex ; red mallee mallee & mixed sparse dwarf shrubs over Triodia basedowii | 22423 | 22696 | 46 | 5 | 21116 | 234305 | 43 | 53 | 49064 | 439579 |
| 486 | Mosaic: Medium woodland; salmon gum & red mallee / Shrublands; mallee scrub Eucalyptus eremophila | 0 | 21207 | 0 | 5 | 18 | 183746 | 100 | 42 | 18 | 436130 |
| 491 | Medium woodland; morrel & Dundas blackbutt (E. dundasii) | 0 | 0 | 0 | 0 | 64 | 67106 | 100 | 100 | 64 | 67168 |
| 501 | Medium woodland; goldfields blackbutt | 0 | 0 | 0 | 0 | 68 | 10144 | 100 | 21 | 68 | 48022 |

| | | Area within IUCN I-IV (ha) | | % Area in IUCN I-IV | | Area S16 and UCL (ha) | | % Area S16 and UCL | | pre-European extent (ha) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** |
| 511 | Medium woodland; salmon gum & morrel | 98911 | 98974 | 14 | 14 | 332679 | 341683 | 48 | 49 | 688562 | 700409 |
| 519 | Shrublands; mallee scrub, Eucalyptus eremophila | 149033 | 243624 | 12 | 10 | 250527 | 1040233 | 21 | 45 | 1221124 | 2333440 |
| 520 | Shrublands; Acacia quadrimarginea thicket | 10074 | 10074 | 40 | 27 | 1693 | 8690 | 7 | 23 | 25019 | 37923 |
| 522 | Medium woodland; redwood (Eucalyptus transcontinentalis) & merrit (E. floctoniae) | 25118 | 30071 | 20 | 4 | 94612 | 647686 | 77 | 91 | 123327 | 709715 |
| 535 | Medium woodland; rough fruited mallee on greenstone hills | 0 | 0 | 0 | 0 | 390 | 390 | 2 | 2 | 24346 | 24346 |
| 536 | Medium woodland; morrell & rough fruited mallee (Eucalyptus corrugata) | 1294 | 1294 | 10 | 10 | 1288 | 1288 | 10 | 10 | 13178 | 13178 |
| 537 | Medium woodland; morrel (Eucalyptus longicornis) | 0 | 0 | 0 | 0 | 43 | 43 | 6 | 6 | 701 | 701 |
| 538 | Shrublands; Acacia brachystachya scrub | 16995 | 16995 | 13 | 11 | 72105 | 73606 | 56 | 50 | 128593 | 147822 |
| 551 | Shrublands; Allocasuarina campestris thicket | 18584 | 19387 | 11 | 6 | 110 | 2779 | 0 | 1 | 163865 | 302423 |
| 552 | Shrublands; Casuarina acutivalvus & calothamnus (also melalueca) thicket on greenstone hills | 24 | 303 | 0 | 1 | 12114 | 29186 | 93 | 86 | 13086 | 33909 |
| 555 | Hummock grasslands, mallee steppe; red mallee over spinifex, Triodia scariosa | 6300 | 14678 | 54 | 26 | 5308 | 7134 | 46 | 12 | 11656 | 57420 |
| 631 | Succulent steppe with woodland and thicket; York gum over Melaleuca thyoides & samphire | 293 | 2604 | 2 | 2 | 152 | 3698 | 1 | 3 | 11812 | 106853 |
| 676 | Succulent steppe; samphire | 414 | 73745 | 6 | 4 | 2282 | 678982 | 31 | 33 | 7435 | 2063389 |
| 694 | Shrublands; scrub-heath on yellow sandplain banksia-xylomelum alliance in the Geraldton Sandplain & Avon-Wheatbelt Regions | 1875 | 32222 | 1 | 9 | 31 | 10065 | 0 | 3 | 149967 | 346494 |
| 929 | Low forest; moort (Eucalytpus platypus) | 0 | 217 | 0 | 2 | 0 | 4814 | 0 | 45 | 227 | 10735 |
| 931 | Medium woodland; yate | 282 | 2392 | 13 | 8 | 0 | 1704 | 0 | 5 | 2216 | 31390 |
| 934 | Shrublands; mallee scrub (Eucalyptus nutans) | 0 | 1089 | 0 | 12 | 0 | 1962 | 0 | 21 | 259 | 9282 |
| 936 | Medium woodland; salmon gum | 6389 | 14899 | 14 | 2 | 12027 | 456839 | 27 | 65 | 45160 | 698752 |
| 941 | Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub, redwood | 2829 | 2829 | 8 | 8 | 10834 | 10834 | 32 | 32 | 34248 | 34248 |
| 945 | Mosaic: Medium woodland; salmon gum / Shrublands; mallee scrub, redwood & black marlock | 4070 | 4070 | 2 | 2 | 8645 | 8645 | 5 | 5 | 176612 | 176612 |
| 946 | Medium woodland; wandoo | 1514 | 1514 | 3 | 3 | 1231 | 1286 | 3 | 2 | 45513 | 53225 |
| 947 | Medium woodland; powderbark & mallet | 891 | 2357 | 7 | 7 | 5 | 37 | 0 | 0 | 12717 | 34033 |
| 948 | Medium woodland; York gum & river gum | 7 | 7 | 0 | 0 | 36 | 36 | 2 | 2 | 1441 | 1441 |
| 949 | Low woodland; banksia | 551 | 29070 | 2 | 13 | 9792 | 17971 | 44 | 8 | 22466 | 218194 |
| 950 | Medium woodland; Casuarina obesa | 121 | 121 | 24 | 24 | 25 | 25 | 5 | 5 | 497 | 497 |
| 951 | Succulent steppe with sparse woodland & thicket; york gum & Kondinin blackbutt over teatree thicket & samphire | 4450 | 4450 | 16 | 16 | 938 | 938 | 3 | 3 | 27508 | 27508 |

| | | Area within IUCN I-IV (ha) | | % Area in IUCN I-IV | | Area S16 and UCL (ha) | | % Area S16 and UCL | | pre-European extent (ha) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** |
| 952 | Shrublands; dryandra heath | 259 | 3828 | 52 | 6 | 0 | 0 | 0 | 0 | 495 | 58931 |
| 953 | Succulent steppe with thicket; teatree over samphire (m5) | 530 | 714 | 6 | 7 | 202 | 202 | 2 | 2 | 9457 | 9928 |
| 954 | Shrublands; thicket, Jam & Allocasuarina huegeliana | 346 | 346 | 5 | 5 | 0 | 0 | 0 | 0 | 6502 | 6502 |
| 955 | Mosaic: Shrublands; scrub-heath (South East Avon) / Shrublands; Allocasuarina campestris thicket | 1616 | 1783 | 1 | 1 | 49 | 228 | 0 | 0 | 130560 | 139324 |
| 956 | Shrublands; Allocasuarina campestris thicket with scattered wandoo | 1144 | 1144 | 4 | 4 | 15 | 15 | 0 | 0 | 25556 | 25556 |
| 959 | Succulent steppe with sparse woodland & thicket; yorrell & Kondinin blackbutt over teatree & samphire | 2982 | 2982 | 23 | 23 | 0 | 0 | 0 | 0 | 13092 | 13092 |
| 960 | Shrublands; mallee scrub, redwood & black marlock | 10462 | 10462 | 5 | 5 | 123 | 123 | 0 | 0 | 220441 | 220441 |
| 961 | Mosaic: Shrublands; scrub-heath (South East Avon)/ Shrublands; Allocasuarina campestris thicket | 2879 | 2879 | 11 | 10 | 15 | 15 | 0 | 0 | 27390 | 27800 |
| 962 | Medium woodland; mallet (Eucalytpus astringens) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 62 | 62 |
| 965 | Medium woodland; jarrah & marri | 14 | 2302 | 2 | 25 | 5 | 15 | 1 | 0 | 723 | 9356 |
| 966 | Succulent steppe with sparse woodland & thicket; salmon gum & morrell over teatree & samphire | 0 | 0 | 0 | 0 | 192 | 192 | 3 | 3 | 7087 | 7087 |
| 968 | Medium woodland; jarrah, marri & wandoo | 10738 | 32850 | 16 | 11 | 57 | 537 | 0 | 0 | 69062 | 296878 |
| 973 | Low forest; paperbark (Melaleuca rhaphiophylla) | 112 | 303 | 46 | 6 | 0 | 59 | 0 | 1 | 242 | 5003 |
| 987 | Medium woodland; jarrah & wandoo | 0 | 746 | 0 | 21 | 0 | 121 | 0 | 3 | 146 | 3595 |
| 988 | Succulent steppe with thicket; Melaleuca thyoides over samphire | 1027 | 2363 | 2 | 2 | 269 | 564 | 1 | 1 | 49488 | 96635 |
| 999 | Medium woodland; marri | 0 | 890 | 0 | 1 | 0 | 46 | 0 | 0 | 1069 | 115707 |
| 1002 | Medium open woodland; jarrah | 0 | 12580 | 0 | 79 | 0 | 20 | 0 | 0 | 361 | 15948 |
| 1003 | Medium forest; jarrah, marri & wandoo | 3881 | 4485 | 67 | 22 | 0 | 2 | 0 | 0 | 5760 | 20109 |
| 1004 | Mosaic: Medium open woodland; wandoo / Shrublands; mixed heath | 1620 | 1627 | 98 | 17 | 0 | 176 | 0 | 2 | 1658 | 9768 |
| 1005 | Low woodland; Allocasuarina huegeliana | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 155 | 787 |
| 1006 | Medium woodland; jarrah, wandoo & powderbark | 1986 | 1996 | 6 | 4 | 604 | 604 | 2 | 1 | 35903 | 44908 |
| 1014 | Mosaic: Low woodland; banksia / Shrublands; teatree thicket | 2 | 8730 | 0 | 21 | 268 | 968 | 14 | 2 | 1976 | 41064 |
| 1017 | Medium open woodland; jarrah & marri, with low woodland; banksia | 0 | 12 | 0 | 0 | 0 | 201 | 0 | 1 | 1272 | 17528 |
| 1018 | Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree / Low woodland; Casuarina obesa | 175 | 221 | 2 | 2 | 19 | 23 | 0 | 0 | 7005 | 14059 |
| 1019 | Medium sparse woodland; jarrah & marri | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 514 | 804 |
| 1020 | Mosaic: Medium forest; jarrah-marri / Medium woodland; marri-wandoo | 101 | 101 | 2 | 2 | 0 | 0 | 0 | 0 | 5610 | 5610 |
| 1023 | Medium woodland; York gum, wandoo & salmon gum (Eucalyptus salmonophloia) | 4453 | 12108 | 1 | 1 | 1793 | 3392 | 0 | 0 | 844117 | 1601602 |
| 1024 | Shrublands; mallee & casuarina thicket | 6045 | 6820 | 1 | 1 | 11386 | 11561 | 2 | 2 | 593087 | 742950 |

| | | Area within IUCN I-IV (ha) | | % Area in IUCN I-IV | | Area S16 and UCL (ha) | | % Area S16 and UCL | | pre-European extent (ha) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** |
| 1025 | Mosaic: Medium woodland; York gum, salmon gum & morrel / Succulent steppe; saltbush & samphire | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1920 | 1920 |
| 1027 | Mosaic: Medium open woodland; jarrah & marri, with low woodland; banksia / Medium sparse woodland; jarrah & marri | 263 | 6944 | 2 | 17 | 0 | 1 | 0 | 0 | 16567 | 39809 |
| 1041 | Low woodland; Allocasuarina huegeliana & Jam | 273 | 321 | 11 | 7 | 0 | 57 | 0 | 1 | 2506 | 4781 |
| 1048 | Mosaic: Shrublands; melaleuca patchy scrub / Succulent steppe; samphire | 36 | 36 | 0 | 0 | 58 | 58 | 0 | 0 | 13815 | 13815 |
| 1049 | Medium woodland; wandoo, York gum, salmon gum, morrel & gimlet | 3307 | 3307 | 0 | 0 | 1119 | 1119 | 0 | 0 | 833385 | 833385 |
| 1053 | Shrublands; Melaleuca uncinata thicket with scattered York gum | 416 | 972 | 3 | 7 | 54 | 61 | 0 | 0 | 12706 | 13823 |
| 1055 | Shrublands; York gum & Eucalyptus sheathiana mallee scrub | 1133 | 1133 | 1 | 1 | 3609 | 3609 | 3 | 3 | 126806 | 126806 |
| 1056 | Shrublands; thicket, acacia & Allocasuarina campestris | 996 | 996 | 5 | 5 | 11 | 11 | 0 | 0 | 21073 | 21073 |
| 1057 | Mosaic: Shrublands; Medium woodland; salmon gum & gimlet / York gum & Eucalyptus sheathiana mallee scrub | 2881 | 2881 | 2 | 2 | 511 | 511 | 0 | 0 | 145311 | 145311 |
| 1058 | Shrublands; York gum & Eucalyptus gonglocarpa mallee scrub | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9363 | 9363 |
| 1059 | Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee Eucalyptus longicornis & E. sheathiana scrub | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2260 | 2260 |
| 1061 | Mosaic: Medium sparse woodland; salmon gum & yorrell / Succulent steppe; saltbush & samphire | 7627 | 7627 | 18 | 18 | 5410 | 5410 | 13 | 13 | 42747 | 42747 |
| 1062 | Succulent steppe with open woodland & thicket; york gum over Melaleuca thyiodes & samphire | 1384 | 2429 | 7 | 11 | 1149 | 1927 | 6 | 9 | 19111 | 22527 |
| 1063 | Medium-Low woodland; York gum & cypress pine (Callitris columellaris) | 127354 | 127354 | 74 | 74 | 9069 | 9072 | 5 | 5 | 172479 | 172482 |
| 1065 | Mosaic: Shrublands;Medium woodland; wandoo & gimlet / York gum & Eucalyptus sheathiana mallee scrub | 392 | 392 | 45 | 45 | 0 | 0 | 0 | 0 | 863 | 863 |
| 1067 | Medium woodland; salmon gum, morrel, gimlet & rough fruited mallee | 1556 | 1556 | 10 | 10 | 4357 | 4357 | 29 | 29 | 15272 | 15272 |
| 1068 | Medium woodland; salmon gum, morrel, gimlet & Eucalyptus sheathiana | 16790 | 16790 | 6 | 6 | 80468 | 80468 | 30 | 30 | 268900 | 268900 |
| 1071 | Succulent steppe with scrub; acacia species over saltbush & bluebush | 263 | 263 | 35 | 35 | 31 | 31 | 4 | 4 | 762 | 762 |
| 1075 | Shrublands; mallee scrub, Eucalyptus eremophila & black marlock (Eucalyptus redunca) | 18329 | 28493 | 11 | 5 | 428 | 878 | 0 | 0 | 174477 | 527021 |
| 1078 | Medium woodland; salmon gum, redwood, merrit, gimlet & Eucalyptus sheathiana | 757 | 757 | 100 | 100 | 0 | 0 | 0 | 0 | 757 | 757 |
| 1079 | Mosaic: Medium open woodland; salmon gum & morrel / Succulent steppe; saltbush | 4641 | 4641 | 46 | 46 | 200 | 200 | 2 | 2 | 10119 | 10119 |
| 1080 | Succulent steppe with malle & thickets; Mallee and Melaleuca uncinata thickets on salt flats | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3951 | 3951 |
| 1081 | Shrublands; mallee scrub, Eucalyptus longicornis & E. sheathiana | 427 | 427 | 3 | 3 | 41 | 41 | 0 | 0 | 15148 | 15148 |
| 1098 | Mosaic: Medium sparse woodland; salmon gum & morrel / Succulent steppe; samphire | 2762 | 2762 | 20 | 20 | 896 | 896 | 7 | 7 | 13669 | 13669 |

| | | Area within IUCN I-IV (ha) | | % Area in IUCN I-IV | | Area S16 and UCL (ha) | | % Area S16 and UCL | | pre-European extent (ha) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** | **Avon** | **WA** |
| 1147 | Shrublands; scrub-heath in the south-east Avon-Wheatbelt Region | 228 | 228 | 1 | 1 | 114 | 116 | 0 | 0 | 41057 | 42855 |
| 1148 | Shrublands; scrub-heath in the Coolgardie Region | 43053 | 45028 | 22 | 17 | 145747 | 207886 | 75 | 80 | 195330 | 260384 |
| 1200 | Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub Eucalyptus eremophila & black marlock (E. redunca) | 2265 | 2376 | 2 | 1 | 643 | 680 | 1 | 0 | 102557 | 162786 |
| 1271 | Bare areas; claypans | 207 | 207 | 19 | 0 | 169 | 27704 | 15 | 32 | 1095 | 86684 |
| 1413 | Shrublands; acacia, casuarina & melaleuca thicket | 188782 | 192589 | 15 | 11 | 532246 | 900027 | 44 | 54 | 1219254 | 1679917 |
| 2047 | Shrublands; tamma & dryandra thicket | 467 | 467 | 32 | 32 | 0 | 0 | 0 | 0 | 1463 | 1463 |
| 2048 | Shrublands; scrub-heath in the Mallee Region | 18651 | 22502 | 6 | 7 | 108188 | 114338 | 35 | 35 | 305697 | 322220 |
| 3003 | Medium forest; jarrah & marri on laterite with wandoo in valleys, sandy swamps with teatree and Banksia | 4426 | 5248 | 7 | 8 | 168 | 170 | 0 | 0 | 61566 | 66452 |
| 3041 | Mosaic: Low woodland; Allocasuarina huegeliana & jam around granite rocks | 93 | 112 | 2 | 2 | 0 | 2 | 0 | 0 | 3947 | 6374 |

**Table A2.4:** Summary of ANRMR BHVA extent and reservation status.
Those shaded are extremely limited in their present extent (< 2,000 ha and/or ≤10% of original extent remaining in ANRMR or the State) and poorly represented (0% and/or <15% of original extent in ANRMR or the State) in the present conservation reserve system (IUCN I-IV reserves).

| | | Remnant Extent | | | | Representation in IUCN I-IV Reserves | | | |
|---|---|---|---|---|---|---|---|---|---|
| BHVA | Beard's Description | <2000 ha Avon | <2000 ha WA | <10% Avon | <10% WA | 0% Avon | <15% Avon | 0% WA | <15% WA |
| 3 | Medium forest; jarrah-marri | | | | | | | | |
| 4 | Medium woodland; marri & wandoo | | | | | | X | | X |
| 5 | Medium woodland; wandoo & powderbark (Eucalytpus accedens) | | | | | | | | |
| 7 | Medium woodland; York gum (Eucalyptus loxophleba) & wandoo | X | | | | X | X | X | X |
| 8 | Medium woodland; salmon gum & gimlet | | | | | | X | | X |
| 13 | Medium open woodland; wandoo | X | X | | | | | | |
| 18 | Low woodland; mulga (Acacia aneura) | | | | | | | | X |
| 19 | Low woodland; mulga between sandridges | | | | | | X | X | X |
| 25 | Low woodland; Allocasuarina huegeliana & York gum | X | | | | X | X | X | X |
| 36 | Shrublands; thicket, acacia-casuarina alliance | | | | | | X | | X |
| 37 | Shrublands; teatree thicket | | | | | | | | X |
| 39 | Shrublands; mulga scrub | X | | | | X | X | | X |
| 41 | Shrublands; teatree scrub | | | | | | | | X |
| 47 | Shrublands; tallerack mallee-heath | | | | | | | | |
| 49 | Shrublands; mixed heath | X | | | | | | | |
| 51 | Sedgeland; reed swamps, occasionally with heath | X | | | | | | | |
| 125 | Bare areas; salt lakes | | | | | | | | X |
| 128 | Bare areas; rock outcrops | | | | | | | | X |
| 131 | Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee scrub, redwood & black marlock | | | X | X | | X | | X |
| 141 | Medium woodland; York gum, salmon gum & gimlet | | | | | | X | | X |
| 142 | Medium woodland; York gum & salmon gum | | | | | | X | | X |

| | | Remnant Extent | | | | Representation in IUCN I-IV Reserves | | | |
|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **<2000 ha Avon** | **<2000 ha WA** | **<10% Avon** | **<10% WA** | **0% Avon** | **<15% Avon** | **0% WA** | **<15% WA** |
| 144 | Medium woodland; wandoo, salmon gum, morrel, gimlet & rough fruited mallee | | | | | | X | | X |
| 145 | Mosaic: Medium woodland; York gum & salmon gum / Shrublands; thicket, acacia-casuarina-melaleuca alliance | X | X | X | X | X | X | X | X |
| 147 | Succulent steppe with scrub; acacia species over saltbush | | | | | | X | | X |
| 148 | Medium woodland; gimlet | X | X | | | X | X | X | X |
| 202 | Shrublands; mulga & Acacia quadrimarginea scrub | X | | | | | | X | X |
| 214 | Mosaic: Medium woodland; goldfield eucalypts / Succulent steppe with open low woodland; myoporum over saltbush | | | | | | | | X |
| 221 | Succulent steppe; saltbush | | | | | X | X | | X |
| 256 | Low woodland; York gum, and cypress pine (adjacent to e6pMLi) | | | | | | | | |
| 314 | Succulent steppe with open woodland; york gum over saltbush | | | | | | | | |
| 325 | Succulent steppe; saltbush & samphire | | | | | X | X | X | X |
| 337 | Mosaic: Shrublands; bowgada scrub / Hummock grasslands, mixed sandplain - open red mallee & mixed sparse dwarf shrubs over Triodia basedowii | | | | | X | X | X | X |
| 352 | Medium woodland; York gum | | | X | | | X | X | X |
| 356 | Succulent steppe with open woodland; eucalypts over saltbush | X | X | | | | X | | X |
| 357 | Medium woodland over scrub; York gum over bowgada & jam (Acacia acuminata) | | | | | X | X | X | X |
| 380 | Shrublands; scrub-heath on sandplain | | | | | | | | |
| 392 | Shrublands; Melaeuca thyioides thicket | X | X | | | X | X | | X |
| 411 | Succulent steppe with open scrub; scattered bowgada & jam over saltbush | X | | | | X | X | X | X |
| 413 | Shrublands; Acacia neurophylla & A. species thicket | X | X | | | X | X | | X |
| 414 | Succulent steppe with open scrub; scattered bowgada & jam over saltbush & bluebush | | | | | X | X | X | X |

| | | Remnant Extent | | | | Representation in IUCN I-IV Reserves | | | |
|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **<2000 ha Avon** | **<2000 ha WA** | **<10% Avon** | **<10% WA** | **0% Avon** | **<15% Avon** | **0% WA** | **<15% WA** |
| 416 | Low woodland; mulga mixed with cypress pine & york gum | | | | | | | | X |
| 420 | Shrublands; bowgada & jam scrub | | | | | X | X | X | X |
| 435 | Shrublands; Acacia neurophylla, A. beauverdiana & A. resinomarginea thicket | | | | | | | | X |
| 436 | Shrublands; mixed Acacia thickets in thickets of acacia-casuarina-melaleuca alliance | X | X | | | X | X | X | X |
| 437 | Shrubalnds; Mixed acacia thicket on sandplain | | | | | | | | X |
| 468 | Medium woodland; salmon gum & goldfields blackbutt | X | | | | | | | X |
| 483 | Hummock grasslands, mixed sandplain - open mallee over sparse dwarf shrubs with spinifex ; red mallee mallee & mixed sparse dwarf shrubs over Triodia basedowii | | | | | | | | X |
| 486 | Mosaic: Medium woodland; salmon gum & red mallee / Shrublands; mallee scrub Eucalyptus eremophila | X | | | | X | X | | X |
| 491 | Medium woodland; morrel & Dundas blackbutt (E. dundasii) | X | | | | X | X | X | X |
| 501 | Medium woodland; goldfields blackbutt | X | | | | X | X | X | X |
| 511 | Medium woodland; salmon gum & morrel | | | | | | X | | X |
| 519 | Shrublands; mallee scrub, Eucalyptus eremophila | | | | | | X | | X |
| 520 | Shrublands; Acacia quadrimarginea thicket | | | | | | | | |
| 522 | Medium woodland; redwood (Eucalyptus transcontinentalis) & merrit (E. floctoniae) | | | | | | | | X |
| 535 | Medium woodland; rough fruited mallee on greenstone hills | | | | | X | X | X | X |
| 536 | Medium woodland; morrell & rough fruited mallee (Eucalyptus corrugata) | | | | | | X | | X |
| 537 | Medium woodland; morrel (Eucalyptus longicornis) | X | X | | | X | X | X | X |
| 538 | Shrublands; Acacia brachystachya scrub | | | | | | X | | X |
| 551 | Shrublands; Allocasuarina campestris thicket | | | | | | X | | X |
| 552 | Shrublands; Casuarina acutivalvus & calothamnus (also melalueca) thicket on greenstone hills | | | | | X | X | | X |

| | | Remnant Extent | | | | Representation in IUCN I-IV Reserves | | | |
|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **<2000 ha Avon** | **<2000 ha WA** | **<10% Avon** | **<10% WA** | **0% Avon** | **<15% Avon** | **0% WA** | **<15% WA** |
| 555 | Hummock grasslands, mallee steppe; red mallee over spinifex, Triodia scariosa | | | | | | | | |
| 631 | Succulent steppe with woodland and thicket; York gum over Melaleuca thyoides & samphire | | | | | | X | | X |
| 676 | Succulent steppe; samphire | X | | | | | X | | X |
| 694 | Shrublands; scrub-heath on yellow sandplain banksia-xylomelum alliance in the Geraldton Sandplain & Avon-Wheatbelt Regions | | | X | | | X | | X |
| 929 | Low forest; moort (Eucalytpus platypus) | X | | | | X | X | | X |
| 931 | Medium woodland; yate | X | | | | | X | | X |
| 934 | Shrublands; mallee scrub (Eucalyptus nutans) | X | | | | X | X | | X |
| 936 | Medium woodland; salmon gum | | | | | | X | | X |
| 941 | Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub, redwood | | | | | | X | | X |
| 945 | Mosaic: Medium woodland; salmon gum / Shrublands; mallee scrub, redwood & black marlock | | | | | | X | | X |
| 946 | Medium woodland; wandoo | | | | | | X | | X |
| 947 | Medium woodland; powderbark & mallet | | | | | | X | | X |
| 948 | Medium woodland; York gum & river gum | X | X | X | X | X | X | X | X |
| 949 | Low woodland; banksia | | | | | | X | | X |
| 950 | Medium woodland; Casuarina obesa | X | X | | | | | | |
| 951 | Succulent steppe with sparse woodland & thicket; york gum & Kondinin blackbutt over teatree thicket & samphire | | | | | | | | |
| 952 | Shrublands; dryandra heath | X | | | | | | | X |
| 953 | Succulent steppe with thicket; teatree over samphire (m5) | X | X | | | | X | | X |
| 954 | Shrublands; thicket, Jam & Allocasuarina huegeliana | X | X | | | | X | | X |

| | | Remnant Extent | | | | Representation in IUCN I-IV Reserves | | | |
|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **<2000 ha Avon** | **<2000 ha WA** | **<10% Avon** | **<10% WA** | **0% Avon** | **<15% Avon** | **0% WA** | **<15% WA** |
| 955 | Mosaic: Shrublands; scrub-heath (South East Avon) / Shrublands; Allocasuarina campestris thicket | | | X | X | | X | | X |
| 956 | Shrublands; Allocasuarina campestris thicket with scattered wandoo | | | | | | X | | X |
| 959 | Succulent steppe with sparse woodland & thicket; yorrell & Kondinin blackbutt over teatree & samphire | | | | | | | | |
| 960 | Shrublands; mallee scrub, redwood & black marlock | | | | | | X | | X |
| 961 | Mosaic: Shrublands; scrub-heath (South East Avon)/ Shrublands; Allocasuarina campestris thicket | | | | | | X | | X |
| 962 | Medium woodland; mallet (Eucalytpus astringens) | X | X | X | X | X | X | X | X |
| 965 | Medium woodland; jarrah & marri | X | | | | | X | | |
| 966 | Succulent steppe with sparse woodland & thicket; salmon gum & morrell over teatree & samphire | X | X | X | X | X | X | X | X |
| 968 | Medium woodland; jarrah, marri & wandoo | | | | | | | | X |
| 973 | Low forest; paperbark (Melaleuca rhaphiophylla) | X | X | | | | | | X |
| 987 | Medium woodland; jarrah & wandoo | X | X | | | X | X | | |
| 988 | Succulent steppe with thicket; Melaleuca thyoides over samphire | | | X | | | X | | X |
| 999 | Medium woodland; marri | X | | | | X | X | | X |
| 1002 | Medium open woodland; jarrah | X | | | | X | X | | |
| 1003 | Medium forest; jarrah, marri & wandoo | | | | | | | | |
| 1004 | Mosaic: Medium open woodland; wandoo / Shrublands; mixed heath | X | | | | | | | |
| 1005 | Low woodland; Allocasuarina huegeliana | X | X | X | | X | X | X | X |
| 1006 | Medium woodland; jarrah, wandoo & powderbark | | | | | | X | | X |
| 1014 | Mosaic: Low woodland; banksia / Shrublands; teatree thicket | X | | | | X | X | | |
| 1017 | Medium open woodland; jarrah & marri, with low woodland; banksia | X | | | | X | X | X | X |

| | | Remnant Extent | | | | Representation in IUCN I-IV Reserves | | | |
|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **<2000 ha Avon** | **<2000 ha WA** | **<10% Avon** | **<10% WA** | **0% Avon** | **<15% Avon** | **0% WA** | **<15% WA** |
| 1018 | Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree / Low woodland; Casuarina obesa | X | | | | | X | | X |
| 1019 | Medium sparse woodland; jarrah & marri | X | X | | | X | X | X | X |
| 1020 | Mosaic: Medium forest; jarrah-marri / Medium woodland; marri-wandoo | X | X | | | | X | | X |
| 1023 | Medium woodland; York gum, wandoo & salmon gum (Eucalyptus salmonophloia) | | | X | X | | X | | X |
| 1024 | Shrublands; mallee & casuarina thicket | | | | X | | X | | X |
| 1025 | Mosaic: Medium woodland; York gum, salmon gum & morrel / Succulent steppe; saltbush & samphire | X | X | X | X | X | X | X | X |
| 1027 | Mosaic: Medium open woodland; jarrah & marri, with low woodland; banksia / Medium sparse woodland; jarrah & marri | | | | | | X | | |
| 1041 | Low woodland; Allocasuarina huegeliana & Jam | X | X | | | | X | | X |
| 1048 | Mosaic: Shrublands; melaleuca patchy scrub / Succulent steppe; samphire | | | | | X | X | X | X |
| 1049 | Medium woodland; wandoo, York gum, salmon gum, morrel & gimlet | | | X | X | X | X | X | X |
| 1053 | Shrublands; Melaleuca uncinata thicket with scattered York gum | X | | | | | X | | X |
| 1055 | Shrublands; York gum & Eucalyptus sheathiana mallee scrub | | | | | | X | | X |
| 1056 | Shrublands; thicket, acacia & Allocasuarina campestris | | | | | | X | | X |
| 1057 | Mosaic: Shrublands; Medium woodland; salmon gum & gimlet / York gum & Eucalyptus sheathiana mallee scrub | | | X | X | | X | | X |
| 1058 | Shrublands; York gum & Eucalyptus gonglocarpa mallee scrub | X | X | X | X | X | X | X | X |
| 1059 | Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee Eucalyptus longicornis & E. sheathiana scrub | X | X | X | X | X | X | X | X |

| | | Remnant Extent | | | | Representation in IUCN I-IV Reserves | | | |
|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **<2000 ha Avon** | **<2000 ha WA** | **<10% Avon** | **<10% WA** | **0% Avon** | **<15% Avon** | **0% WA** | **<15% WA** |
| 1061 | Mosaic: Medium sparse woodland; salmon gum & yorrell / Succulent steppe; saltbush & samphire | | | | | | | | |
| 1062 | Succulent steppe with open woodland & thicket; york gum over Melaleuca thyiodes & samphire | | | | | | X | | X |
| 1063 | Medium-Low woodland; York gum & cypress pine (Callitris columellaris) | | | | | | | | |
| 1065 | Mosaic: Shrublands;Medium woodland; wandoo & gimlet / York gum & Eucalyptus sheathiana mallee scrub | X | X | | | | | | |
| 1067 | Medium woodland; salmon gum, morrel, gimlet & rough fruited mallee | | | | | | X | | X |
| 1068 | Medium woodland; salmon gum, morrel, gimlet & Eucalyptus sheathiana | | | | | | X | | X |
| 1071 | Succulent steppe with scrub; acacia species over saltbush & bluebush | X | X | | | | | | |
| 1075 | Shrublands; mallee scrub, Eucalyptus eremophila & black marlock (Eucalyptus redunca) | | | | | | X | | X |
| 1078 | Medium woodland; salmon gum, redwood, merrit, gimlet & Eucalyptus sheathiana | X | X | | | | | | |
| 1079 | Mosaic: Medium open woodland; salmon gum & morrel / Succulent steppe; saltbush | | | | | | | | |
| 1080 | Succulent steppe with malle & thickets; Mallee and Melaleuca uncinata thickets on salt flats | X | X | X | X | X | X | X | X |
| 1081 | Shrublands; mallee scrub, Eucalyptus longicornis & E. sheathiana | | | | | | X | | X |
| 1098 | Mosaic: Medium sparse woodland; salmon gum & morrel / Succulent steppe; samphire | | | | | | | | |
| 1147 | Shrublands; scrub-heath in the south-east Avon-Wheatbelt Region | | | X | X | | X | | X |
| 1148 | Shrublands; scrub-heath in the Coolgardie Region | | | | | | | | |

| | | Remnant Extent | | | | Representation in IUCN I-IV Reserves | | | |
|---|---|---|---|---|---|---|---|---|---|
| **BHVA** | **Beard's Description** | **<2000 ha Avon** | **<2000 ha WA** | **<10% Avon** | **<10% WA** | **0% Avon** | **<15% Avon** | **0% WA** | **<15% WA** |
| 1200 | Mosaic: Medium woodland; salmon gum & morrel / Shrublands; mallee scrub Eucalyptus eremophila & black marlock (E. redunca) | | | X | X | | X | | X |
| 1271 | Bare areas; claypans | X | | | | | | X | X |
| 1413 | Shrublands; acacia, casuarina & melaleuca thicket | | | | | | | | X |
| 2047 | Shrublands; tamma & dryandra thicket | X | X | | | | | | |
| 2048 | Shrublands; scrub-heath in the Mallee Region | | | | | | X | | X |
| 3003 | Medium forest; jarrah & marri on laterite with wandoo in valleys, sandy swamps with teatree and Banksia | | | | | | X | | X |
| 3041 | Mosaic: Low woodland; Allocasuarina huegeliana & jam around granite rocks | X | X | | | | X | | X |

## Appendix 3: Ecological Communities

**Table A3.1:** The Threatened Ecological Communities of the ANRMR and the 20km buffer
These communities have been arranged by conservation status in Western Australia; those shaded are endemic to the ANRMR.
The definitions of the criteria (eg A, B or C) and sub-criteria (eg (i)) can be found in Appendix1.1.

| | | Conservation Status | | | Number of Occurrences | | | |
|---|---|---|---|---|---|---|---|---|
| **Community Identifier** | **Community Name** | **WA Conservation Status** | **EPBC Act** | **Recovery Plan** | **Buffer** | **AVON** | **WA** | **Total** |
| Mound Springs SCP | Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain) | CR A) i), CR A) ii), CR B) i), CR B) ii) | EN | Y | 1 | 3 | | 4 |
| Toolibin | Perched wetlands of the Wheatbelt region with extensive stands of Casuarina obesa and Melaleuca strobophylla | CR A) i); CR A) 11); CR C) | EN | Y | 3 | 1 | | 4 |
| NTHIRON | Perth to Gingin Ironstone Association | CR A) ii), CR B) ii), CR C) | EN | Y | | 3 | | 3 |
| Bryde | Unwooded freshwater wetlands of the southern Wheatbelt dominated by Muehlenbeckia horrida subsp. abdita and Tecticornia verrucosa | CR B) i), CR B) ii) | | Y | | 2 | | 2 |
| CAVES SCP01 | Aquatic Root Mat Community Number 1 of Caves of the Swan Coastal Plain | CR B) i), CR B) ii) | EN | Y | 7 | | | 7 |
| SCP20c | Shrublands and woodlands of the eastern side of the Swan Coastal Plain | CR B) ii) | EN | Y | 2 | | | 2 |
| SCP19b | Woodlands over sedgelands in Holocene dune swales of the southern Swan Coastal Plain (original description; Gibson et al. (1994). | CR B) ii) | EN | Y | 1 | | 37 | 38 |
| SCP3a | Eucalyptus calophylla - Kingia australis woodlands on heavy soils, Swan Coastal Plain | CR B) ii) | EN | Y | 1 | | 26 | 27 |
| SCP3c | Eucalyptus calophylla - Xanthorrhoea preissii woodlands and shrublands, Swan Coastal Plain | CR B) ii) | EN | Y | 5 | 11 | 10 | 26 |
| SCP20b | Banksia attenuata and/or Eucalyptus marginata woodlands of the eastern side of the Swan Coastal Plain | EN B) i), EN B) ii) | | N | 1 | 1 | 33 | 35 |
| MUCHEA LIMESTONE | Shrublands and woodlands on Muchea Limestone | EN B) ii) | EN | Y | 1 | 2 | 6 | 9 |

| | | Conservation Status | | | Number of Occurrences | | | |
|---|---|---|---|---|---|---|---|---|
| **Community Identifier** | **Community Name** | **WA Conservation Status** | **EPBC Act** | **Recovery Plan** | **Buffer** | **AVON** | **WA** | **Total** |
| SCP20a | Banksia attenuata woodland over species rich dense shrublands | EN B) ii) | | Y | 32 | 1 | 16 | 49 |
| Limestone ridges (SCP 26a) | Melaleuca huegelii - Melaleuca acerosa (currently M. systena) shrublands on limestone ridges (Gibson et al. 1994 type 26a) | EN B) iii) | | Y | 46 | | 33 | 79 |
| Herblands and Bunch Grasslands | Herblands and Bunch Grasslands on gypsum lunette dunes alongside saline playa lakes | VU B) | | N | 1 | | | 1 |
| SCP07 | Herb rich saline shrublands in clay pans | VU B) | | N | 5 | 2 | 19 | 26 |
| SCP08 | Herb rich shrublands in clay pans | VU B) | | N | | 2 | 19 | 21 |
| SCP15 | Forests and woodlands of deep seasonal wetlands of the Swan Coastal Plain | VU C) | | N | | 4 | 2 | 6 |
| **Total** | | | | | **106** | **32** | **201** | **339** |

**Table A3.2:** The Priority Ecological Communities of the ANRMR and the 20km buffer.
The definitions of the Conservation Status (eg P1, P2 etc) and sub-criteria (eg (i)) can be found in Appendix1.1.

| Community Identifier | Conservation Status | Community Name | Number of occurrences | | | |
|---|---|---|---|---|---|---|
| | | | 20 km Buffer | Avon | WA | Total |
| Die Hardy Range1 | P1 | Low Woodland on sandy, clayey silt | | 1 | | 1 |
| Die Hardy Range2 | P1 | Low Woodland along a drainage line of the Die Hardy Range | | 1 | | 1 |
| Die Hardy Range3 | P1 | Allocasuarina corniculata thickets on the lower slopes of the Die Hardy Range | | 1 | | 1 |
| Die Hardy Range5 | P1 | Mid-slope thickets of the Die Hardy Range | | 1 | | 1 |
| Die Hardy Range6 | P1 | Mid-slope open scrub of the Die Hardy Range | | 1 | | 1 |
| Die Hardy Range7 | P1 | Low Woodland on clayey silt soils of the Die Hardy Range | | 1 | | 1 |
| Helena and Aurora Range1 | P1 | Shrublands and woodlands on banded ironstone uplands of the Helena and Aurora Range | | 1 | | 1 |
| Helena and Aurora Range2 | P1 | Eucalypt woodlands on banded ironstone uplands of the Helena and Aurora Range | | 1 | | 1 |
| Helena and Aurora Range3 | P1 | Midslope community dominated by Eucalyptus ebbanoensis and/or E. corrugata of the Helena and Aurora Range | | 1 | | 1 |
| Helena and Aurora Range4 | P1 | Lower slopes and flats community of the Helena and Aurora Range | | 1 | | 1 |
| Helena and Aurora Range5a | P1 | Eucalypt woodlands on the flats below the Helena and Aurora Range with a diverse chenopod understorey | | 1 | | 1 |
| Helena and Aurora Range5b | P1 | Eucalypt woodlands on the extensive flats between the Helena and Aurora Range with a diverse chenopod understorey | | 1 | | 1 |
| Highclere Hills1 | P1 | Eucalypt woodlands of the Highclere Hills. | | 1 | | 1 |
| Highclere Hills2 | P1 | Acacia acuminata shrublands on greenstones of the Highclere Hills. | | 1 | | 1 |
| Highclere Hills3 | P1 | Acacia tetragonophylla and Scaevola spinescens shrublands on the ridges of massive banded ironstone of the Highclere Hills. | | 1 | | 1 |
| Highclere Hills4 | P1 | Acacia tetragonophylla and Scaevola spinescens shrublands on either banded ironstone or greenstone lower in the landscape | | 1 | | 1 |
| Highclere Hills5 | P1 | Shrublands on a lateritic breakaway of the Highclere Hills. | | 1 | | 1 |
| Melaleuca thicket | P1 | Dense Melaleuca thickets with emergent Eucalyptus erythronema var. marginata and Eucalyptus transcontinentalis | | 1 | | 1 |

| Community Identifier | Conservation Status | Community Name | Number of occurrences | | | |
|---|---|---|---|---|---|---|
| | | | 20 km Buffer | Avon | WA | Total |
| Mottlecah | P1 | Wheatbelt Mottlecah dominated heathland on deep white sands. | | 1 | | 1 |
| Mount Jackson1 | P1 | Open Heath to Tall Shrubland on the Mount Jackson Range | | 1 | | 1 |
| Parker Range System | P3 (iii) | Plant assemblage of the Parker Range System | | 1 | | 1 |
| Pteridium fernland | P2 | Wheatbelt Allocasuarina huegeliana over Pteridium esculentum communities | | 1 | | 1 |
| Saline Seeps | P1 | Natural organic saline seeps of the Avon Botanical District | | 1 | | 1 |
| Windarling1 | P1 | Mixed shrublands on shallow soils of the Windarling Ranges slopes | | 1 | | 1 |
| Canegrass | P1 | Perched clay wetlands of the Wheatbelt dominated by Eragrostis australasica and Melaleuca strobophylla | | 2 | | 2 |
| Chinocup | P2 | Gypsum dunes (Lake Chinocup) | | 2 | | 2 |
| Red Morrel Woodland | P1 | Red Morrel Woodlands of the Wheatbelt | | 2 | | 2 |
| Tamma-Dryandra-Eremaea shrubland | P1 | Tamma-Dryandra-Eremaea shrubland on cream sands of the Ulva Landform Unit | | 2 | | 2 |
| Claypans with shrubs over herbs | P1 | Claypans with mid dense shrublands of Melaleuca lateritia over herbs | 4 | 3 | 5 | 12 |
| Wandoo woodland over dense low sedges | P1 | Wandoo woodland over dense low sedges of Mesomelaena preisii | | 3 | | 3 |
| Wongan Hills System | P4a | Plant assemblages of the Wongan Hills System | | 4 | | 4 |
| Avon Pools | P1 | Deep pools of the Avon Botanical District | | 6 | | 6 |
| Mortlock Flats | P1 | Salt Flats Plant Assemblages of the Mortlock River (East Branch) | | 7 | | 7 |
| Low level sandplains | P1 | Banksia prionotes and Xylomelum angustifolium low woodlands on transported yellow sands | | 11 | | 11 |
| Bremer Range | P1 | Plant assemblages of the Bremer Range System | 1 | | | 1 |
| Die Hardy Range4 | P1 | Thickets on the lower slopes of the Die Hardy Range | 1 | | | 1 |
| **Total** | | | **6** | **66** | **5** | **77** |

# Appendix 4: Flora

## Appendix 4.1 Endemic Flora

**Table A4.1:** The endemic flora of the ANRMR.

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 27839 | Fungi | LICHEN | Collemataceae | Leptogium corniculatum | | | | 2 |
| 27819 | Fungi | LICHEN | Lecideaceae | Lecidea contigua | | | | 1 |
| 27861 | Fungi | LICHEN | Mycoporaceae | Mycoporum quercus | | | | 2 |
| 18007 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia fumigata | | P1 | | 1 |
| 27750 | Fungi | LICHEN | Parmeliaceae | Flavoparmelia secalonica | | | | 2 |
| 27915 | Fungi | LICHEN | Parmeliaceae | Parmelina endoleuca | | | | 1 |
| 28112 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia cheelii | | | | 1 |
| 28133 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia filsonii | | | | 1 |
| 28136 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia furcata | | | | 1 |
| 28141 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia hypoleiella | | P3 | | 2 |
| 28149 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia luminosa | | | | 2 |
| 28152 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia microcephala | | | | 1 |
| 28161 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia nortegeta | | | | 1 |
| 28324 | Fungi | LICHEN | Parmeliaceae | Protoparmelia pulchra | | | | 1 |
| 28358 | Fungi | LICHEN | Parmeliaceae | Imshaugia sp. Corinthia (R.J. Cranfield 11814) | PN | | | 1 |
| 29017 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia scabrosina | | P1 | | 2 |
| 29020 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia subbarbatica | | P1 | | 2 |
| 29041 | Fungi | LICHEN | Parmeliaceae | Xanthoparmelia subloxodella | | | | 1 |
| 28026 | Fungi | LICHEN | Ramalinaceae | Ramalina canariensis | | | | 1 |
| 29388 | Fungi | LICHEN | Thelotremataceae | Diploschistes conceptionis | | | | 1 |
| 23476 | Plantae | DICOT | Amaranthaceae | Ptilotus halophilus | | P4 | | 4 |
| 1337 | Plantae | MONOCOT | Anthericaceae | Thysanotus lavanduliflorus | | P1 | | 6 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 20657 | Plantae | MONOCOT | Anthericaceae | Arthropodium sp. Yenyenning (G.J. Keighery & N. Gibson 2957) | PN | | | 1 |
| 29183 | Plantae | MONOCOT | Anthericaceae | Caesia sp. Ennuin (N. Gibson & M.N. Lyons 2737) | PN | | | 1 |
| 6215 | Plantae | DICOT | Apiaceae | Chlaenosciadium gardneri | | | | 20 |
| 14373 | Plantae | DICOT | Apiaceae | Hydrocotyle hexaptera | MS | P1 | | 2 |
| 12632 | Plantae | DICOT | Asteraceae | Millotia steetziana | | P2 | | 6 |
| 13240 | Plantae | DICOT | Asteraceae | Rhodanthe chlorocephala subsp. chlorocephala | | | | 1 |
| 14338 | Plantae | DICOT | Asteraceae | Millotia newbeyi | | P1 | | 3 |
| 14343 | Plantae | DICOT | Asteraceae | Millotia pilosa | | P2 | | 2 |
| 20793 | Plantae | DICOT | Asteraceae | Angianthus sp. Altham (M.N. Lyons 2623) | PN | | | 1 |
| 23469 | Plantae | DICOT | Asteraceae | Angianthus halophilus | | P3 | | 6 |
| 23985 | Plantae | DICOT | Asteraceae | Senecio glabrescens | | | | 1 |
| 28287 | Plantae | DICOT | Asteraceae | Dimorphotheca sinuata | | | | 2 |
| 19831 | Plantae | MONOCOT | Boryaceae | Borya sp. Wheatbelt (A.S. George 16470) | PN | | | 2 |
| 3028 | Plantae | DICOT | Brassicaceae | Lepidium genistoides | | P2 | | 17 |
| 1727 | Plantae | DICOT | Casuarinaceae | Allocasuarina fibrosa | | R | VU | 28 |
| 12654 | Plantae | DICOT | Casuarinaceae | Allocasuarina tortiramula | | R | VU | 8 |
| 2577 | Plantae | DICOT | Chenopodiaceae | Rhagodia acicularis | | R | VU | 5 |
| 2588 | Plantae | DICOT | Chenopodiaceae | Roycea pycnophylloides | | R | VU | 53 |
| 15755 | Plantae | DICOT | Chenopodiaceae | Chenopodium melanocarpum forma melanocarpum | | | | 1 |
| 16597 | Plantae | DICOT | Chenopodiaceae | Halosarcia halocnemoides subsp. Lake Grace (N. Casson G231. 10) | PN | | | 2 |
| 14642 | Plantae | MONOCOT | Cyperaceae | Lepidosperma obtusum | | | | 9 |
| 16279 | Plantae | MONOCOT | Cyperaceae | Schoenus sp. Bullsbrook (J.J. Alford 915) | PN | P2 | | 1 |
| 19667 | Plantae | MONOCOT | Cyperaceae | Schoenus sp. Toodyay (G.J. Keighery & N. Gibson 2918) | PN | | | 1 |
| 29138 | Plantae | MONOCOT | Cyperaceae | Lepidosperma sp. Pigeon Rocks (H. Pringle 30237) | PN | | | 3 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 29187 | Plantae | MONOCOT | Cyperaceae | Lepidosperma sp. Ironcap (K.R. Newbey 5233) | PN | | | 4 |
| 14457 | Plantae | DICOT | Dilleniaceae | Hibbertia glabriuscula | | P2 | | 15 |
| 14458 | Plantae | DICOT | Dilleniaceae | Hibbertia graniticola | | P3 | | 12 |
| 19430 | Plantae | DICOT | Dilleniaceae | Hibbertia axillibarba | | P1 | | 4 |
| 19690 | Plantae | DICOT | Dilleniaceae | Hibbertia lepidocalyx subsp. tuberculata | | P1 | | 4 |
| 19932 | Plantae | DICOT | Dilleniaceae | Hibbertia glomerata subsp. wandoo | | P3 | | 14 |
| 20035 | Plantae | DICOT | Dilleniaceae | Hibbertia chartacea | | P2 | | 4 |
| 3099 | Plantae | DICOT | Droseraceae | Drosera graniticola | | P4 | | 10 |
| 13184 | Plantae | DICOT | Droseraceae | Drosera walyunga | | | | 4 |
| 13195 | Plantae | DICOT | Droseraceae | Drosera helodes | | | | 3 |
| 13226 | Plantae | DICOT | Droseraceae | Drosera grievei | | P1 | | 7 |
| 13388 | Plantae | DICOT | Droseraceae | Drosera macrophylla subsp. monantha | | | | 22 |
| 19254 | Plantae | DICOT | Droseraceae | Drosera zigzagia | | | | 9 |
| 16526 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Helena & Aurora Range (B.J. Lepschi 2077) | PN | R | CR | 8 |
| 6356 | Plantae | DICOT | Epacridaceae | Leucopogon amplectens | | P2 | | 14 |
| 14506 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Yanneymooning (F. Mollemans 3797) | PN | | | 11 |
| 17697 | Plantae | DICOT | Epacridaceae | Brachyloma delbi | | P1 | | 6 |
| 17872 | Plantae | DICOT | Epacridaceae | Astroloma sp. sessile leaf (J.L. Robson 657) | PN | | | 9 |
| 19367 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Gunapin (F. Hort 808) | PN | | | 15 |
| 19413 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Bungulla (R.D. Royce 3435) | PN | P2 | | 14 |
| 19424 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Flynn (F. Hort, J. Hort & A. Lowrie 859) | PN | P2 | | 5 |
| 19515 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Corrigin (K. Kershaw KK 2091) | PN | | | 30 |
| 19581 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Lake King (A.J.G. Wilson 65) | PN | | | 11 |
| 19591 | Plantae | DICOT | Epacridaceae | Pseudactinia sp. Bruce Rock (J. Buegge D36) | PN | P1 | | 1 |

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|---|---|---|---|---|---|---|---|---|
| 19656 | Plantae | DICOT | Epacridaceae | Leucopogon compressicarpus | MS | P1 | | 3 |
| 20084 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Brookton (K. Kershaw & L. Kerrigan KK 2192) | PN | P1 | | 3 |
| 20306 | Plantae | DICOT | Epacridaceae | Conostephium pungens | | | | 3 |
| 20327 | Plantae | DICOT | Epacridaceae | Brachyloma sp. Forrestania White (M. Hislop & F. Hort MH 2591) | PN | | | 2 |
| 20413 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Parker Range (F.H. & M.P. Mollemans 2860) | PN | P1 | | 6 |
| 20645 | Plantae | DICOT | Epacridaceae | Lissanthe scabra | | P2 | | 6 |
| 20867 | Plantae | DICOT | Epacridaceae | Leucopogon sp. Dragon Rocks (A.M. Coates 2609) | PN | | | 10 |
| 14225 | Plantae | DICOT | Euphorbiaceae | Ricinocarpos brevis | MS | R | CR | 12 |
| 11744 | Plantae | DICOT | Euphorbiaceae | Beyeria calycina var. minor | | | | 4 |
| 20753 | Plantae | DICOT | Euphorbiaceae | Beyeria sp. Jackson Range (R. Cranfield & P. Spencer 7751) | PN | P1 | | 7 |
| 5208 | Plantae | DICOT | Frankeniaceae | Frankenia parvula | | R | EN | 7 |
| 20795 | Plantae | DICOT | Frankeniaceae | Frankenia sp. southern gypsum (M.N. Lyons 2864) | PN | | | 1 |
| 12526 | Plantae | DICOT | Goodeniaceae | Goodenia integerrima | | R | EN | 1 |
| 7667 | Plantae | DICOT | Goodeniaceae | Verreauxia verreauxii | | P4 | | 40 |
| 19119 | Plantae | DICOT | Goodeniaceae | Goodenia sp. Lake King (M. Gustafsson et K. Bremer 132) | PN | P2 | | 3 |
| 19224 | Plantae | DICOT | Goodeniaceae | Dampiera sp. Central Wheatbelt (L.W. Sage, F. Hort, C.A. Hollister LWS 2321) | PN | | | 2 |
| 19348 | Plantae | DICOT | Goodeniaceae | Scaevola sp. Lake Cairlocup (K. Newbey 9834) | PN | | | 1 |
| 19349 | Plantae | DICOT | Goodeniaceae | Goodenia heatheriana | | P1 | | 92 |
| 19753 | Plantae | DICOT | Goodeniaceae | Goodenia sp. Chiddarcooping (S.D. Hopper 7055) | PN | | | 2 |
| 19782 | Plantae | DICOT | Goodeniaceae | Goodenia pulchella subsp. Dragon Rocks (A.M. Coates 3374) | PN | | | 1 |
| 19784 | Plantae | DICOT | Goodeniaceae | Goodenia sp. Jaurdi (L.W. Sage 1628) | PN | | | 3 |
| 20524 | Plantae | DICOT | Goodeniaceae | Lechenaultia hortii | MS | P2 | | 3 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 1449 | Plantae | MONOCOT | Haemodoraceae | Conostylis rogeri | | R | VU | 16 |
| 1419 | Plantae | MONOCOT | Haemodoraceae | Conostylis albescens | | P2 | | 7 |
| 29613 | Plantae | MONOCOT | Haemodoraceae | Tribonanthes minor | MS | P3 | | 3 |
| 13082 | Plantae | DICOT | Haloragaceae | Myriophyllum lapidicola | | R | VU | 3 |
| 6153 | Plantae | DICOT | Haloragaceae | Gonocarpus ericifolius | | P2 | | 2 |
| 6157 | Plantae | DICOT | Haloragaceae | Gonocarpus intricatus | | P4 | | 9 |
| 20655 | Plantae | MONOCOT | Hypoxidaceae | Hypoxis sp. Chinocup (R. Cugley 89) | PN | P1 | | 3 |
| 14434 | Plantae | MONOCOT | Iridaceae | Patersonia rudis subsp. velutina | | | | 4 |
| 8 | Plantae | FERN | Isoetaceae | Isoetes brevicula | | P3 | | 7 |
| 6819 | Plantae | DICOT | Lamiaceae | Pityrodia scabra | | R | CR | 9 |
| 6890 | Plantae | DICOT | Lamiaceae | Microcorys eremophiloides | | R | VU | 17 |
| 6834 | Plantae | DICOT | Lamiaceae | Hemiandra coccinea | | P3 | | 18 |
| 6846 | Plantae | DICOT | Lamiaceae | Hemigenia conferta | | P4 | | 6 |
| 6940 | Plantae | DICOT | Lamiaceae | Westringia discipulorum | | | | 12 |
| 12120 | Plantae | DICOT | Lamiaceae | Prostanthera semiteres subsp. semiteres | | | | 22 |
| 12704 | Plantae | DICOT | Lamiaceae | Prostanthera nanophylla | | P3 | | 6 |
| 18283 | Plantae | DICOT | Lamiaceae | Hemigenia sp. Merredin (M. Koch 2959) | PN | | | 9 |
| 18316 | Plantae | DICOT | Lamiaceae | Microcorys sp. Forrestania (V. English 2004) | PN | P4 | | 28 |
| 19436 | Plantae | DICOT | Lamiaceae | Brachysola halganiacea | | P2 | | 2 |
| 29634 | Plantae | DICOT | Lamiaceae | Hemigenia sp. Sweet Webb (R.J. Chinnock 8266) | PN | | | 2 |
| 29635 | Plantae | DICOT | Lamiaceae | Hemigenia sp. Jaurdi Station (L.W. Sage & F. Hort 2241) | PN | | | 1 |
| 12970 | Plantae | DICOT | Loganiaceae | Logania exilis | | P2 | | 5 |
| 3487 | Plantae | DICOT | Mimosaceae | Acacia pharangites | | R | CR | 11 |
| 3531 | Plantae | DICOT | Mimosaceae | Acacia sciophanes | | R | CR | 19 |
| 3597 | Plantae | DICOT | Mimosaceae | Acacia volubilis | | R | CR | 10 |
| 14063 | Plantae | DICOT | Mimosaceae | Acacia cochlocarpa subsp. velutinosa | | R | CR | 12 |
| 14146 | Plantae | DICOT | Mimosaceae | Acacia subflexuosa subsp. capillata | | R | CR | 12 |
| 12263 | Plantae | DICOT | Mimosaceae | Acacia lobulata | | R | EN | 24 |

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|---|---|---|---|---|---|---|---|---|
| 13611 | Plantae | DICOT | Mimosaceae | Acacia pygmaea | | R | EN | 10 |
| 14687 | Plantae | DICOT | Mimosaceae | Acacia ataxiphylla subsp. magna | | R | EN | 19 |
| 3293 | Plantae | DICOT | Mimosaceae | Acacia denticulosa | | R | VU | 25 |
| 13610 | Plantae | DICOT | Mimosaceae | Acacia leptalea | | R | VU | 12 |
| 14053 | Plantae | DICOT | Mimosaceae | Acacia auratiflora | | R | VU | 28 |
| 3218 | Plantae | DICOT | Mimosaceae | Acacia anfractuosa | | | | 70 |
| 3243 | Plantae | DICOT | Mimosaceae | Acacia botrydion | | P4 | | 17 |
| 3252 | Plantae | DICOT | Mimosaceae | Acacia campylophylla | | P3 | | 20 |
| 3334 | Plantae | DICOT | Mimosaceae | Acacia fauntleroyi | | | | 37 |
| 3385 | Plantae | DICOT | Mimosaceae | Acacia inophloia | | P3 | | 22 |
| 3441 | Plantae | DICOT | Mimosaceae | Acacia merrickiae | | P4 | | 11 |
| 3486 | Plantae | DICOT | Mimosaceae | Acacia phaeocalyx | | P3 | | 31 |
| 3536 | Plantae | DICOT | Mimosaceae | Acacia semicircinalis | | P4 | | 17 |
| 11838 | Plantae | DICOT | Mimosaceae | Acacia sclerophylla var. sclerophylla | | | | 9 |
| 12248 | Plantae | DICOT | Mimosaceae | Acacia ascendens | | P2 | | 24 |
| 12251 | Plantae | DICOT | Mimosaceae | Acacia caesariata | | P1 | | 17 |
| 12254 | Plantae | DICOT | Mimosaceae | Acacia cowaniana | | P2 | | 23 |
| 12270 | Plantae | DICOT | Mimosaceae | Acacia torticarpa | | | | 7 |
| 14031 | Plantae | DICOT | Mimosaceae | Acacia sp. P69 (W.E. Blackall 3754) | PN | | | 5 |
| 14037 | Plantae | DICOT | Mimosaceae | Acacia sp. P170 (B.R. Maslin 4474) | PN | | | 2 |
| 14044 | Plantae | DICOT | Mimosaceae | Acacia adinophylla | | P1 | | 22 |
| 14065 | Plantae | DICOT | Mimosaceae | Acacia congesta subsp. wonganensis | | P2 | | 13 |
| 14069 | Plantae | DICOT | Mimosaceae | Acacia desertorum var. nudipes | | P1 | | 19 |
| 14127 | Plantae | DICOT | Mimosaceae | Acacia mutabilis subsp. stipulifera | | P1 | | 26 |
| 14139 | Plantae | DICOT | Mimosaceae | Acacia repanda | | P3 | | 18 |
| 14148 | Plantae | DICOT | Mimosaceae | Acacia tetraneura | | P1 | | 24 |
| 14151 | Plantae | DICOT | Mimosaceae | Acacia tuberculata | | P2 | | 17 |
| 14160 | Plantae | DICOT | Mimosaceae | Acacia sclerophylla var. pilosa | | P2 | | 5 |
| 14618 | Plantae | DICOT | Mimosaceae | Acacia concolorans | | P2 | | 15 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 14679 | Plantae | DICOT | Mimosaceae | Acacia sedifolia subsp. pulvinata | | P3 | | 13 |
| 15293 | Plantae | DICOT | Mimosaceae | Acacia yorkrakinensis subsp. yorkrakinensis | | | | 15 |
| 16118 | Plantae | DICOT | Mimosaceae | Acacia cracentis | | | | 17 |
| 16124 | Plantae | DICOT | Mimosaceae | Acacia flavipila var. ovalis | | | | 20 |
| 16149 | Plantae | DICOT | Mimosaceae | Acacia sedifolia subsp. sedifolia | | | | 23 |
| 20338 | Plantae | DICOT | Mimosaceae | Acacia sp. Merredin (B.R. Maslin 586) | PN | | | 16 |
| 20339 | Plantae | DICOT | Mimosaceae | Acacia sp. Kokeby (L. Preiss 937) | PN | | | 3 |
| 20791 | Plantae | DICOT | Mimosaceae | Acacia sp. Kulin (S. Murray 504) | PN | P1 | | 5 |
| 7279 | Plantae | DICOT | Myoporaceae | Eremophila verticillata | | R | CR | 6 |
| 7262 | Plantae | DICOT | Myoporaceae | Eremophila resinosa | | R | EN | 17 |
| 7280 | Plantae | DICOT | Myoporaceae | Eremophila virens | | R | EN | 15 |
| 7275 | Plantae | DICOT | Myoporaceae | Eremophila ternifolia | | R | VU | 1 |
| 7179 | Plantae | DICOT | Myoporaceae | Eremophila adenotricha | | P2 | | 8 |
| 14852 | Plantae | DICOT | Myoporaceae | Eremophila complanata | MS | P2 | | 1 |
| 15050 | Plantae | DICOT | Myoporaceae | Calamphoreus inflatus | MS | P4 | | 20 |
| 16523 | Plantae | DICOT | Myoporaceae | Eremophila papillata | MS | | | 23 |
| 20265 | Plantae | DICOT | Myoporaceae | Eremophila glabra subsp. Kokeby (R. Davis 5080) | PN | | | 1 |
| 23994 | Plantae | DICOT | Myoporaceae | Eremophila glabra subsp. Forrestania (G.F. Craig 5897) | PN | | | 1 |
| 29061 | Plantae | DICOT | Myoporaceae | Eremophila sp. Beverley (K. Kershaw KK 2438) | PN | | | 1 |
| 29377 | Plantae | DICOT | Myoporaceae | Eremophila glabra subsp. York (P.G. Wilson 12172 B) | PN | | | 2 |
| 12464 | Plantae | DICOT | Myrtaceae | Verticordia staminosa var. erecta | | R | CR | 8 |
| 15614 | Plantae | DICOT | Myrtaceae | Verticordia staminosa subsp. staminosa | | R | CR | 12 |
| 5567 | Plantae | DICOT | Myrtaceae | Eucalyptus brevipes | | R | EN | 20 |
| 5962 | Plantae | DICOT | Myrtaceae | Melaleuca sciotostyla | | R | EN | 6 |
| 6089 | Plantae | DICOT | Myrtaceae | Verticordia hughanii | | R | EN | 5 |
| 20335 | Plantae | DICOT | Myrtaceae | Darwinia foetida | MS | R | EN | 11 |

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|---|---|---|---|---|---|---|---|---|
| 12463 | Plantae | DICOT | Myrtaceae | Verticordia staminosa var. cylindracea | | R | VU | 26 |
| 13016 | Plantae | DICOT | Myrtaceae | Eucalyptus recta | | R | VU | 12 |
| 20457 | Plantae | DICOT | Myrtaceae | Chamelaucium lullfitzii | MS | R | VU | 6 |
| 5345 | Plantae | DICOT | Myrtaceae | Baeckea exserta | | | | 3 |
| 5370 | Plantae | DICOT | Myrtaceae | Baeckea tenuiramea | | | | 53 |
| 5466 | Plantae | DICOT | Myrtaceae | Calytrix merrelliana | | | | 7 |
| 5469 | Plantae | DICOT | Myrtaceae | Calytrix parvivallis | | P2 | | 6 |
| 5732 | Plantae | DICOT | Myrtaceae | Eucalyptus ornata | | | | 30 |
| 6032 | Plantae | DICOT | Myrtaceae | Scholtzia eatoniana | | P1 | | 3 |
| 11656 | Plantae | DICOT | Myrtaceae | Eucalyptus erythronema var. erythronema | | | | 84 |
| 11758 | Plantae | DICOT | Myrtaceae | Eucalyptus caesia subsp. caesia | | P4 | | 34 |
| 11823 | Plantae | DICOT | Myrtaceae | Eucalyptus caesia subsp. magna | | P4 | | 27 |
| 12372 | Plantae | DICOT | Myrtaceae | Calytrix oncophylla | | P2 | | 5 |
| 12427 | Plantae | DICOT | Myrtaceae | Verticordia gracilis | | P3 | | 19 |
| 12442 | Plantae | DICOT | Myrtaceae | Verticordia mitodes | | P3 | | 21 |
| 12445 | Plantae | DICOT | Myrtaceae | Verticordia multiflora subsp. solox | | P2 | | 25 |
| 12454 | Plantae | DICOT | Myrtaceae | Verticordia pulchella | | P2 | | 20 |
| 12687 | Plantae | DICOT | Myrtaceae | Leptospermum macgillivrayi | | P1 | | 5 |
| 13132 | Plantae | DICOT | Myrtaceae | Hypocalymma uncinatum | | | | 12 |
| 13232 | Plantae | DICOT | Myrtaceae | Calothamnus superbus | | P1 | | 1 |
| 13514 | Plantae | DICOT | Myrtaceae | Eucalyptus myriadena subsp. parviflora | | P1 | | 11 |
| 14024 | Plantae | DICOT | Myrtaceae | Baeckea sp. Chittering (R.J. Cranfield 1983) | PN | P4 | | 19 |
| 14258 | Plantae | DICOT | Myrtaceae | Chamelaucium paynterae | MS | P1 | | 6 |
| 14710 | Plantae | DICOT | Myrtaceae | Verticordia citrella | | P2 | | 7 |
| 14711 | Plantae | DICOT | Myrtaceae | Verticordia dasystylis subsp. dasystylis | | P2 | | 18 |
| 15493 | Plantae | DICOT | Myrtaceae | Darwinia mollissima | MS | | | 7 |
| 16017 | Plantae | DICOT | Myrtaceae | Verticordia serrata var. Udumung (D. Hunter & B. Yarran 941006) | PN | P2 | | 4 |
| 16027 | Plantae | DICOT | Myrtaceae | Darwinia sp. Chiddarcooping (S.D. Hopper 6944) | PN | P4 | | 12 |

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|---|---|---|---|---|---|---|---|---|
| 16737 | Plantae | DICOT | Myrtaceae | Baeckea sp. Bencubbin-Koorda (M.E. Trudgen 5421) | PN | | | 25 |
| 16844 | Plantae | DICOT | Myrtaceae | Euryomyrtus ciliata | MS | P1 | | 3 |
| 17039 | Plantae | DICOT | Myrtaceae | Astartea sp. Mt Dimer (C. McChesney TRL4/72) | PN | P1 | | 1 |
| 17984 | Plantae | DICOT | Myrtaceae | Eremaea violacea subsp. Dobaderry Swamp (M.E. Trudgen 3909) | PN | | | 1 |
| 18128 | Plantae | DICOT | Myrtaceae | Melaleuca tuberculata var. arenaria | | | | 20 |
| 18637 | Plantae | DICOT | Myrtaceae | Calytrix sp. Jingaring (F. Obbens, R. Davis & L.W. Sage LWS1332) | PN | P2 | | 4 |
| 19287 | Plantae | DICOT | Myrtaceae | Darwinia sp. Westdale (F. Hort 864) | PN | P2 | | 2 |
| 19318 | Plantae | DICOT | Myrtaceae | Darwinia sp. Wyalgima Hill (L.W. Sage, J.P. Pigott & E.B. Pigott LWS1549) | PN | P1 | | 4 |
| 19450 | Plantae | DICOT | Myrtaceae | Melaleuca grieveana | | P1 | | 7 |
| 19464 | Plantae | DICOT | Myrtaceae | Aluta aspera subsp. localis | | P2 | | 6 |
| 19521 | Plantae | DICOT | Myrtaceae | Melaleuca manglesii | | P1 | | 5 |
| 19575 | Plantae | DICOT | Myrtaceae | Eucalyptus obtusiflora subsp. cowcowensis | | | | 8 |
| 19601 | Plantae | DICOT | Myrtaceae | Hypocalymma sylvestre | | P1 | | 2 |
| 19605 | Plantae | DICOT | Myrtaceae | Melaleuca wonganensis | | | | 8 |
| 19637 | Plantae | DICOT | Myrtaceae | Eucalyptus mimica subsp. mimica | | P3 | | 23 |
| 19638 | Plantae | DICOT | Myrtaceae | Eucalyptus mimica subsp. continens | | P1 | | 10 |
| 19694 | Plantae | DICOT | Myrtaceae | Thryptomene salina | | P1 | | 1 |
| 19993 | Plantae | DICOT | Myrtaceae | Baeckea sp. Walyahmoning (M.E. Trudgen 5412) | PN | | | 9 |
| 20142 | Plantae | DICOT | Myrtaceae | Micromyrtus triptycha subsp. elata | MS | | | 4 |
| 20273 | Plantae | DICOT | Myrtaceae | Eucalyptus spathulata subsp. salina | | P3 | | 12 |
| 20309 | Plantae | DICOT | Myrtaceae | Eucalyptus leptophylla var. floribunda | | | | 6 |
| 20334 | Plantae | DICOT | Myrtaceae | Darwinia divisa | | P1 | | 7 |
| 20404 | Plantae | DICOT | Myrtaceae | Eucalyptus kochii subsp. yellowdinensis | | | | 5 |
| 20418 | Plantae | DICOT | Myrtaceae | Calytrix sp. Dragon Rocks (K. Kershaw & L. Kerrigan KK 2180) | PN | P2 | | 4 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 20443 | Plantae | DICOT | Myrtaceae | Enekbatus clavifolius | MS | | | 17 |
| 20613 | Plantae | DICOT | Myrtaceae | Baeckea sp. Elsewhere Road (M.E. Trudgen 5420) | PN | P3 | | 7 |
| 20614 | Plantae | DICOT | Myrtaceae | Baeckea sp. Tammin (R. Coveny 8319 & B. Habberley) | PN | P3 | | 11 |
| 20617 | Plantae | DICOT | Myrtaceae | Baeckea sp. Bungalbin Hill (B.J. Lepschi, L.A. Craven 4586) | PN | P1 | | 6 |
| 20621 | Plantae | DICOT | Myrtaceae | Baeckea sp. Yacke Yackine Dam (K.R. Newbey 9195) | PN | P1 | | 1 |
| 20623 | Plantae | DICOT | Myrtaceae | Baeckea sp. Muntadgin (E.T. Bailey 231) | PN | P1 | | 6 |
| 20625 | Plantae | DICOT | Myrtaceae | Baeckea sp. Baladjie (P.J. Spencer 24) | PN | P1 | | 4 |
| 20626 | Plantae | DICOT | Myrtaceae | Baeckea sp. Beringbooding (A.R. Main 11/9/1957) | PN | P1 | | 3 |
| 20627 | Plantae | DICOT | Myrtaceae | Baeckea sp. Stockton Road (M.E. Trudgen MET22077 & B. Rye) | PN | P1 | | 1 |
| 20628 | Plantae | DICOT | Myrtaceae | Baeckea sp. Lake Cronin (K.R. Newbey 9191) | PN | P1 | | 1 |
| 20630 | Plantae | DICOT | Myrtaceae | Baeckea sp. North Ironcap (R.J. Cranfield 10580) | PN | P2 | | 2 |
| 20631 | Plantae | DICOT | Myrtaceae | Baeckea sp. Sheoaks Rocks (M.E. Trudgen MET5452) | PN | P1 | | 4 |
| 20632 | Plantae | DICOT | Myrtaceae | Baeckea sp. Forrestania (K.R. Newbey 1105) | PN | P1 | | 9 |
| 20634 | Plantae | DICOT | Myrtaceae | Baeckea sp. Jaurdi Station (L.W. Sage & F. Hort 2229) | PN | P2 | | 1 |
| 20675 | Plantae | DICOT | Myrtaceae | Baeckea sp. Wildflower Show (?A.M. Coates S 4407) | PN | | | 1 |
| 20677 | Plantae | DICOT | Myrtaceae | Baeckea sp. Chapman Road (M.E. Trudgen MET 5446) | PN | | | 5 |
| 20679 | Plantae | DICOT | Myrtaceae | Baeckea sp. Helena and Aurora Range (G.J. Keighery 4424) | PN | P1 | | 2 |
| 20681 | Plantae | DICOT | Myrtaceae | Baeckea sp. Pigeon Rocks (D. Grace DJP 281) | PN | P1 | | 1 |
| 20682 | Plantae | DICOT | Myrtaceae | Baeckea sp. Boorabbin (J.H. Willis s.n. | PN | | | 1 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| | | | | 4/10/1961) | | | | |
| 20685 | Plantae | DICOT | Myrtaceae | Baeckea sp. Lake Brown (E. Merrall s.n. 1889) | PN | | | 2 |
| 20689 | Plantae | DICOT | Myrtaceae | Baeckea sp. Queen Victoria Rock (K.R. Newbey 6103) | PN | | | 2 |
| 20690 | Plantae | DICOT | Myrtaceae | Baeckea sp. Mt Jackson (G.J. Keighery 4362) | PN | | | 1 |
| 20748 | Plantae | DICOT | Myrtaceae | Baeckea sp. Kalgarin Hill Road (A.M. Lyne, L. Craven & F. Zich AML1018) | PN | | | 4 |
| 20751 | Plantae | DICOT | Myrtaceae | Baeckea sp. Flying Fox Mine (A. O'Connor & V. Longman FF532) | PN | | | 2 |
| 20804 | Plantae | DICOT | Myrtaceae | Baeckea sp. Parker Range (M. Hislop & F. Hort MH2968) | PN | P1 | | 1 |
| 20805 | Plantae | DICOT | Myrtaceae | Baeckea sp. Yorkrakine (C.A. Gardner s.n. September 1933) | PN | | | 1 |
| 20806 | Plantae | DICOT | Myrtaceae | Baeckea sp. Bullfinch (K.R. Newbey 5838) | PN | | | 2 |
| 20809 | Plantae | DICOT | Myrtaceae | Eucalyptus phenax subsp. compressa | | | | 1 |
| 20812 | Plantae | DICOT | Myrtaceae | Baeckea sp. Billyacatting Hill (A.S. George 14349) | PN | | | 7 |
| 20814 | Plantae | DICOT | Myrtaceae | Baeckea sp. Tampia Hill (J.C. Amway 327) | PN | | | 3 |
| 20857 | Plantae | DICOT | Myrtaceae | Baeckea sp. Narembeen (G.J. Keighery & N. Gibson 3010) | PN | P2 | | 2 |
| 28315 | Plantae | DICOT | Myrtaceae | Baeckea sp. Eujinyn (J. Buegge D 99) | PN | P1 | | 1 |
| 28320 | Plantae | DICOT | Myrtaceae | Baeckea sp. Kellerberrin (C.A. Gardner s.n. PERTH 03351009) | PN | P1 | | 1 |
| 29557 | Plantae | DICOT | Myrtaceae | Micromyrtus redita | MS | P1 | | 2 |
| 29735 | Plantae | DICOT | Myrtaceae | Eucalyptus sp. Great Victoria Desert (D. Nicolle & M. French DN 3877) | PN | | | 1 |
| 29776 | Plantae | DICOT | Myrtaceae | Eucalyptus drummondii subsp. York (D. Nicolle & M. French DN 3684) | PN | | | 2 |
| 13828 | Plantae | MONOCOT | Orchidaceae | Drakaea isolata | MS | R | CR | 3 |
| 13861 | Plantae | MONOCOT | Orchidaceae | Caladenia melanema | | R | CR | 5 |
| 19873 | Plantae | MONOCOT | Orchidaceae | Caladenia williamsiae | | R | CR | 4 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 20716 | Plantae | MONOCOT | Orchidaceae | Caladenia graniticola | | R | CR | 7 |
| 10858 | Plantae | MONOCOT | Orchidaceae | Diuris picta | | | | 16 |
| 15401 | Plantae | MONOCOT | Orchidaceae | Cyanicula ashbyae | | | | 5 |
| 17429 | Plantae | MONOCOT | Orchidaceae | Prasophyllum giganteum subsp. fuligineum | MS | | | 7 |
| 18027 | Plantae | MONOCOT | Orchidaceae | Caladenia postea | | | | 4 |
| 18031 | Plantae | MONOCOT | Orchidaceae | Caladenia pendens subsp. talbotii | | | | 9 |
| 18594 | Plantae | MONOCOT | Orchidaceae | Caladenia sp. Muddarning Hill (S.D. Hopper 4013) | PN | | | 1 |
| 19709 | Plantae | MONOCOT | Orchidaceae | Pterostylis sp. Helena River (G. Brockman GBB 340) | PN | | | 6 |
| 19710 | Plantae | MONOCOT | Orchidaceae | Caladenia sp. Wyalkatchem (G.B. Brockman GBB 661) | PN | | | 5 |
| 20186 | Plantae | MONOCOT | Orchidaceae | Prasophyllum sp. Brookton Highway (G. Brockman 734) | PN | | | 4 |
| 20393 | Plantae | MONOCOT | Orchidaceae | Caladenia sp. Brookton Hwy (G. Brockman GBB 547) | PN | | | 7 |
| 20394 | Plantae | MONOCOT | Orchidaceae | Caladenia sp. Julimar (S.D. Hopper 3992) | PN | | | 1 |
| 20459 | Plantae | MONOCOT | Orchidaceae | Pterostylis sp. laterite (D.L. Jones 3081 & M.A. Clements) | PN | | | 1 |
| 25839 | Plantae | MONOCOT | Orchidaceae | Caladenia sp. Central Wheatbelt (G. Brockman GBB 1161) | PN | | | 2 |
| 29731 | Plantae | MONOCOT | Orchidaceae | Thelymitra yorkensis | MS | | | 19 |
| 3810 | Plantae | DICOT | Papilionaceae | Daviesia euphorbioides | | R | CR | 13 |
| 3902 | Plantae | DICOT | Papilionaceae | Gastrolobium glaucum | | R | CR | 14 |
| 16988 | Plantae | DICOT | Papilionaceae | Daviesia cunderdin | | R | CR | 4 |
| 19113 | Plantae | DICOT | Papilionaceae | Gastrolobium diabolophyllum | | R | CR | 8 |
| 14750 | Plantae | DICOT | Papilionaceae | Jacksonia quairading | MS | R | EN | 12 |
| 4109 | Plantae | DICOT | Papilionaceae | Muelleranthus crenulatus | | R | VU | 5 |
| 3841 | Plantae | DICOT | Papilionaceae | Daviesia spiralis | | P4 | | 12 |
| 4103 | Plantae | DICOT | Papilionaceae | Mirbelia taxifolia | | P1 | | 9 |
| 10969 | Plantae | DICOT | Papilionaceae | Gompholobium hendersonii | | | | 39 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 11142 | Plantae | DICOT | Papilionaceae | Gastrolobium spectabile | | P3 | | 17 |
| 14200 | Plantae | DICOT | Papilionaceae | Daviesia lineata | | P2 | | 13 |
| 14746 | Plantae | DICOT | Papilionaceae | Jacksonia jackson | MS | P1 | | 11 |
| 14755 | Plantae | DICOT | Papilionaceae | Daviesia oxylobium | | P4 | | 17 |
| 15439 | Plantae | DICOT | Papilionaceae | Daviesia elongata subsp. implexa | | P3 | | 30 |
| 16413 | Plantae | DICOT | Papilionaceae | Gastrolobium tenue | | P1 | | 16 |
| 16581 | Plantae | DICOT | Papilionaceae | Daviesia intricata subsp. xiphophylla | | | | 5 |
| 16584 | Plantae | DICOT | Papilionaceae | Daviesia nudiflora subsp. drummondii | | | | 18 |
| 16590 | Plantae | DICOT | Papilionaceae | Daviesia sarissa subsp. redacta | | | | 4 |
| 16592 | Plantae | DICOT | Papilionaceae | Daviesia smithiorum | | | | 4 |
| 17346 | Plantae | DICOT | Papilionaceae | Mirbelia magentea | MS | | | 10 |
| 19292 | Plantae | DICOT | Papilionaceae | Eutaxia lasiophylla | MS | | | 20 |
| 19563 | Plantae | DICOT | Papilionaceae | Urodon sp. Narkal (B.H. Smith 1440) | PN | P1 | | 1 |
| 19729 | Plantae | DICOT | Papilionaceae | Gastrolobium wonganense | | P2 | | 4 |
| 20041 | Plantae | DICOT | Papilionaceae | Aotus sp. Cunderdin (B.J. Lepschi et al. 3587) | PN | | | 2 |
| 20401 | Plantae | DICOT | Papilionaceae | Gastrolobium euryphyllum | | P1 | | 2 |
| 20480 | Plantae | DICOT | Papilionaceae | Gastrolobium effusum | | P2 | | 6 |
| 20481 | Plantae | DICOT | Papilionaceae | Gastrolobium crispatum | | P1 | | 6 |
| 20516 | Plantae | DICOT | Papilionaceae | Gastrolobium cyanophyllum | | | | 34 |
| 20702 | Plantae | DICOT | Papilionaceae | Eutaxia neurocalyx subsp. hirsuta | MS | | | 5 |
| 20741 | Plantae | DICOT | Papilionaceae | Eutaxia lasiocalyx | MS | | | 4 |
| 20742 | Plantae | DICOT | Papilionaceae | Eutaxia rubricarina | MS | | | 7 |
| 23488 | Plantae | DICOT | Papilionaceae | Gompholobium wonganense | MS | | | 5 |
| 19191 | Plantae | MONOCOT | Phormiaceae | Stypandra jamesii | | P2 | | 4 |
| 3150 | Plantae | DICOT | Pittosporaceae | Bentleya spinescens | | P4 | | 17 |
| 20794 | Plantae | DICOT | Plantaginaceae | Plantago sp. Kondinin hairy (M.N. Lyons 2917) | PN | | | 1 |
| 11446 | Plantae | MONOCOT | Poaceae | Echinopogon ovatus var. pubiglumis | | P1 | | 1 |
| 17337 | Plantae | MONOCOT | Poaceae | Austrostipa geoffreyi | | P1 | | 5 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 19171 | Plantae | MONOCOT | Poaceae | Neurachne sp. Helena & Aurora (K.R. Newbey 8972) | PN | P3 | | 6 |
| 17050 | Plantae | DICOT | Polygonaceae | Muehlenbeckia horrida subsp. abdita | | R | EN | 12 |
| 2091 | Plantae | DICOT | Proteaceae | Grevillea scapigera | | R | CR | 25 |
| 20354 | Plantae | DICOT | Proteaceae | Dryandra ionthocarpa subsp. chrysophoenix | | R | CR | 17 |
| 25898 | Plantae | DICOT | Proteaceae | Isopogon robustus | | R | CR | 3 |
| 2024 | Plantae | DICOT | Proteaceae | Grevillea involucrata | | R | EN | 14 |
| 2125 | Plantae | DICOT | Proteaceae | Hakea aculeata | | R | EN | 16 |
| 14412 | Plantae | DICOT | Proteaceae | Grevillea dryandroides subsp. hirsuta | | R | VU | 17 |
| 1896 | Plantae | DICOT | Proteaceae | Dryandra comosa | | P4 | | 14 |
| 1910 | Plantae | DICOT | Proteaceae | Dryandra horrida | | P3 | | 27 |
| 1926 | Plantae | DICOT | Proteaceae | Dryandra pulchella | | P4 | | 17 |
| 1933 | Plantae | DICOT | Proteaceae | Dryandra shanklandiorum | | P4 | | 33 |
| 1959 | Plantae | DICOT | Proteaceae | Grevillea asteriscosa | | P4 | | 44 |
| 1975 | Plantae | DICOT | Proteaceae | Grevillea candolleana | | P2 | | 17 |
| 2027 | Plantae | DICOT | Proteaceae | Grevillea kenneallyi | | P2 | | 20 |
| 2033 | Plantae | DICOT | Proteaceae | Grevillea lissopleura | | P1 | | 5 |
| 2034 | Plantae | DICOT | Proteaceae | Grevillea lullfitzii | | P1 | | 20 |
| 2041 | Plantae | DICOT | Proteaceae | Grevillea minutiflora | | P1 | | 6 |
| 2085 | Plantae | DICOT | Proteaceae | Grevillea roycei | | P3 | | 17 |
| 2106 | Plantae | DICOT | Proteaceae | Grevillea tetrapleura | | P4 | | 22 |
| 8830 | Plantae | DICOT | Proteaceae | Grevillea ceratocarpa | | | | 26 |
| 11353 | Plantae | DICOT | Proteaceae | Hakea cygna subsp. needlei | | P1 | | 11 |
| 12223 | Plantae | DICOT | Proteaceae | Grevillea marriottii | | P1 | | 6 |
| 13415 | Plantae | DICOT | Proteaceae | Grevillea petrophiloides subsp. magnifica | | | | 9 |
| 13901 | Plantae | DICOT | Proteaceae | Hakea sp. Walyunga (L. Penn s.n.) | PN | | | 3 |
| 13981 | Plantae | DICOT | Proteaceae | Dryandra wonganensis | | P4 | | 12 |
| 13998 | Plantae | DICOT | Proteaceae | Dryandra epimicta | | P2 | | 11 |
| 14002 | Plantae | DICOT | Proteaceae | Conospermum galeatum | | P1 | | 5 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 14319 | Plantae | DICOT | Proteaceae | Grevillea corrugata | | P1 | | 7 |
| 14410 | Plantae | DICOT | Proteaceae | Grevillea dissecta | | P4 | | 3 |
| 14416 | Plantae | DICOT | Proteaceae | Grevillea pilosa subsp. redacta | | P3 | | 14 |
| 14437 | Plantae | DICOT | Proteaceae | Isopogon scabriusculus subsp. scabriusculus | | | | 28 |
| 14450 | Plantae | DICOT | Proteaceae | Petrophile misturata | | | | 8 |
| 15973 | Plantae | DICOT | Proteaceae | Grevillea xiphoidea | | | | 6 |
| 16036 | Plantae | DICOT | Proteaceae | Dryandra idiogenes | | P2 | | 12 |
| 16673 | Plantae | DICOT | Proteaceae | Dryandra lindleyana subsp. agricola | | P2 | | 24 |
| 16684 | Plantae | DICOT | Proteaceae | Dryandra speciosa subsp. speciosa | | P2 | | 32 |
| 16766 | Plantae | DICOT | Proteaceae | Synaphea canaliculata | | P2 | | 12 |
| 16767 | Plantae | DICOT | Proteaceae | Synaphea parviflora | | P2 | | 6 |
| 16771 | Plantae | DICOT | Proteaceae | Synaphea tamminensis | | P2 | | 1 |
| 16868 | Plantae | DICOT | Proteaceae | Synaphea constricta | | P3 | | 24 |
| 16898 | Plantae | DICOT | Proteaceae | Hakea petiolaris subsp. trichophylla | | | | 16 |
| 16899 | Plantae | DICOT | Proteaceae | Hakea petiolaris subsp. angusta | | | | 3 |
| 17272 | Plantae | DICOT | Proteaceae | Synaphea cervifolia | | P2 | | 14 |
| 17441 | Plantae | DICOT | Proteaceae | Grevillea cheilocarpa | | | | 4 |
| 17772 | Plantae | DICOT | Proteaceae | Dryandra nivea subsp. Morangup (M. Pieroni 94/2) | PN | P2 | | 1 |
| 18635 | Plantae | DICOT | Proteaceae | Grevillea sp. Gunapin (F. Hort 308) | PN | | | 18 |
| 19056 | Plantae | DICOT | Proteaceae | Synaphea sp. Jilakin Flat Rocks Rd (R. Butcher et. al RB200) | PN | | | 3 |
| 19568 | Plantae | DICOT | Proteaceae | Grevillea synapheae subsp. latiloba | | | | 1 |
| 20260 | Plantae | DICOT | Proteaceae | Grevillea squiresiae | | P1 | | 4 |
| 20358 | Plantae | DICOT | Proteaceae | Dryandra pteridifolia subsp. inretita | | P1 | | 7 |
| 28307 | Plantae | DICOT | Proteaceae | Grevillea endlicheriana subsp. Wongan Hills (G.J. Keighery 15351) | PN | | | 2 |
| 29185 | Plantae | DICOT | Proteaceae | Synaphea sp. Darkin (F. Hort et al. 586) | PN | | | 12 |
| 29415 | Plantae | DICOT | Proteaceae | Synaphea sp. York (F. Hort 666) | PN | | | 6 |
| 17625 | Plantae | MONOCOT | Restionaceae | Loxocarya albipes | | P4 | | 2 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 14794 | Plantae | DICOT | Rhamnaceae | Trymalium densiflorum | | P1 | | 1 |
| 15545 | Plantae | DICOT | Rhamnaceae | Cryptandra apetala var. anomala | | | | 21 |
| 16026 | Plantae | DICOT | Rhamnaceae | Cryptandra dielsii | MS | P3 | | 21 |
| 16192 | Plantae | DICOT | Rhamnaceae | Cryptandra polyclada subsp. aequabilis | | | | 2 |
| 19706 | Plantae | DICOT | Rhamnaceae | Stenanthemum liberum | | P1 | | 4 |
| 13497 | Plantae | DICOT | Rutaceae | Philotheca basistyla | | R | CR | 5 |
| 4499 | Plantae | DICOT | Rutaceae | Phebalium drummondii | | P1 | | 10 |
| 13496 | Plantae | DICOT | Rutaceae | Philotheca langei | | P1 | | 5 |
| 13498 | Plantae | DICOT | Rutaceae | Drummondita wilsonii | | P1 | | 9 |
| 16328 | Plantae | DICOT | Rutaceae | Boronia westringioides | | P2 | | 15 |
| 18517 | Plantae | DICOT | Rutaceae | Philotheca falcata | | X | | 5 |
| 18519 | Plantae | DICOT | Rutaceae | Philotheca coccinea | | | | 29 |
| 19493 | Plantae | DICOT | Rutaceae | Boronia sp. Brookton (F. Hort 1098) | PN | | | 1 |
| 7062 | Plantae | DICOT | Scrophulariaceae | Glossostigma trichodes | | | | 1 |
| 7044 | Plantae | DICOT | Solanaceae | Symonanthus bancroftii | | R | CR | 9 |
| 17289 | Plantae | DICOT | Sterculiaceae | Guichenotia seorsiflora | | R | CR | 8 |
| 17740 | Plantae | DICOT | Sterculiaceae | Lysiosepalum abollatum | | R | CR | 9 |
| 13495 | Plantae | DICOT | Sterculiaceae | Thomasia glabripetala | | R | VU | 29 |
| 5082 | Plantae | DICOT | Sterculiaceae | Thomasia gardneri | | X | | 6 |
| 16337 | Plantae | DICOT | Sterculiaceae | Lasiopetalum sp. Ironcaps (P.G. Wilson 7024) | PN | | | 14 |
| 19503 | Plantae | DICOT | Sterculiaceae | Guichenotia glandulosa | | P1 | | 6 |
| 19915 | Plantae | DICOT | Sterculiaceae | Lasiopetalum sp. Northam (F. Hort 1196) | PN | P2 | | 4 |
| 19975 | Plantae | DICOT | Sterculiaceae | Lasiopetalum leucogriseum | MS | | | 3 |
| 25874 | Plantae | DICOT | Sterculiaceae | Lasiopetalum sp. Weam Reserve (M. Hislop 2755) | PN | | | 2 |
| 29495 | Plantae | DICOT | Sterculiaceae | Commersonia sp. Bindoon (C. Wilkins & F. & J. Hort CW 2155) | PN | P1 | | 2 |
| 17410 | Plantae | DICOT | Stylidiaceae | Stylidium semaphorum | | R | CR | 6 |
| 7761 | Plantae | DICOT | Stylidiaceae | Stylidium merrallii | | R | VU | 12 |

| TAXON ID | KINGDM | GROUP | FAMILY | SPECIES | INFRML | CONS CODE | IUCN | # WA Vouchers |
|---|---|---|---|---|---|---|---|---|
| 7748 | Plantae | DICOT | Stylidiaceae | Stylidium leptocalyx | | P4 | | 9 |
| 17582 | Plantae | DICOT | Stylidiaceae | Stylidium glabrifolium | | P2 | | 4 |
| 17993 | Plantae | DICOT | Stylidiaceae | Stylidium sp. Dewars Pool (K.F. Kenneally 11400) | PN | | | 1 |
| 18418 | Plantae | DICOT | Stylidiaceae | Stylidium pseudosacculatum | | P2 | | 6 |
| 18564 | Plantae | DICOT | Stylidiaceae | Stylidium aceratum | | P2 | | 1 |
| 19207 | Plantae | DICOT | Stylidiaceae | Stylidium chiddarcoopingense | | P2 | | 6 |
| 23472 | Plantae | DICOT | Stylidiaceae | Stylidium coroniforme subsp. amblyphyllum | MS | P1 | | 4 |
| 25803 | Plantae | DICOT | Stylidiaceae | Stylidium applanatum | MS | P1 | | 3 |
| 25834 | Plantae | DICOT | Stylidiaceae | Stylidium egralliforme | MS | | | 11 |
| 25835 | Plantae | DICOT | Stylidiaceae | Stylidium sp. Chittering (J.A. Wege 709) | PN | | | 2 |
| 4529 | Plantae | DICOT | Tremandraceae | Tetratheca deltoidea | | R | CR | 6 |
| 23988 | Plantae | DICOT | Tremandraceae | Tetratheca paynterae subsp. paynterae | MS | R | CR | 14 |
| 4534 | Plantae | DICOT | Tremandraceae | Tetratheca harperi | | R | VU | 17 |
| 20761 | Plantae | DICOT | Tremandraceae | Tetratheca erubescens | MS | R | VU | 17 |
| 29489 | Plantae | DICOT | Tremandraceae | Tetratheca aphylla subsp. aphylla | MS | R | | 14 |
| 29490 | Plantae | DICOT | Tremandraceae | Tetratheca aphylla subsp. megacarpa | MS | R | | 8 |

## Appendix 4.2 Declared Rare and Priority Flora

**Table A4.2:** The Declared Rare and Priority Flora taxa of the ANRMR. Shaded species are those endemic to the ANRMR.

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| CR | *Acacia cochlocarpa subsp. velutinosa* | 3 | 3 |
| CR | *Acacia pharangites* | 3 | 3 |
| CR | *Acacia sciophanes* | 7 | 7 |
| CR | *Acacia subflexuosa subsp. capillata* | 4 | 4 |
| CR | *Acacia vassalii* | 11 | 29 |
| CR | *Acacia volubilis* | 19 | 19 |
| CR | *Caladenia drakeoides* | 11 | 27 |
| CR | *Caladenia graniticola* | 10 | 10 |
| CR | *Caladenia melanema* | 2 | 2 |
| CR | *Caladenia williamsiae* | 4 | 4 |
| CR | *Cyphanthera odgersii subsp. occidentalis* | 3 | 3 |
| CR | *Daviesia cunderdin* | 2 | 2 |
| CR | *Daviesia euphorbioides* | 18 | 18 |
| CR | *Daviesia microcarpa* | 2 | 6 |
| CR | *Drakaea elastica* | 1 | 44 |
| CR | *Drakaea isolata* | 3 | 3 |
| CR | *Dryandra ionthocarpa subsp. chrysophoenix* | 5 | 5 |
| CR | *Eremophila nivea* | 1 | 14 |
| CR | *Eremophila subteretifolia* | 6 | 8 |
| CR | *Eremophila verticillata* | 5 | 5 |
| CR | *Gastrolobium diablophyllum* | 2 | 2 |
| CR | *Gastrolobium glaucum* | 5 | 5 |
| CR | *Gastrolobium hamulosum* | 5 | 10 |
| CR | *Grevillea althoferorum* | 1 | 2 |
| CR | *Grevillea curviloba subsp. curviloba* | 6 | 10 |
| CR | *Grevillea dryandroides subsp. dryandroides* | 13 | 13 |
| CR | *Grevillea scapigera* | 16 | 16 |
| CR | *Guichenotia seorsiflora* | 5 | 5 |
| CR | *Gyrostemon reticulatus* | 1 | 5 |
| CR | *Hemiandra rutilans* | 1 | 1 |
| CR | *Hydatella leptogyne* | 1 | 1 |
| CR | *Isopogon robustus* | 1 | 1 |
| CR | *Leucopogon sp. Helena & Aurora Range (B.J. Lepschi 2077)* | 12 | 12 |
| CR | *Lysiosepalum abollatum* | 2 | 2 |
| CR | *Philotheca basistyla* | 4 | 4 |
| CR | *Pityrodia scabra* | 6 | 6 |
| CR | *Rhizanthella gardneri* | 3 | 6 |
| CR | *Ricinocarpos brevis* | 5 | 5 |
| CR | *Stylidium semaphorum* | 1 | 1 |
| CR | *Symonanthus bancroftii* | 2 | 2 |
| CR | *Tetratheca deltoidea* | 1 | 1 |
| CR | *Tetratheca paynterae subsp. paynterae* | 2 | 2 |
| CR | *Thelymitra dedmaniarum* | 9 | 9 |
| CR | *Verticordia staminosa subsp. staminosa* | 4 | 4 |

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| CR | *Verticordia staminosa var. erecta* | 4 | 4 |
| EN | *Acacia ataxiphylla subsp. magna* | 20 | 20 |
| EN | *Acacia chapmanii subsp. australis* | 2 | 9 |
| EN | *Acacia depressa* | 14 | 24 |
| EN | *Acacia lobulata* | 6 | 6 |
| EN | *Acacia pygmaea* | 18 | 18 |
| EN | *Adenanthos pungens subsp. pungens* | 9 | 10 |
| EN | *Banksia cuneata* | 10 | 17 |
| EN | *Caladenia dorrienii* | 1 | 15 |
| EN | *Conostylis seorsiflora subsp. trichophylla* | 1 | 4 |
| EN | *Conostylis wonganensis* | 14 | 14 |
| EN | *Darwinia acerosa* | 7 | 12 |
| EN | *Darwinia foetida* | 4 | 4 |
| EN | *Eremophila resinosa* | 29 | 29 |
| EN | *Eremophila virens* | 25 | 25 |
| EN | *Eremophila viscida* | 19 | 32 |
| EN | *Eucalyptus brevipes* | 10 | 10 |
| EN | *Eucalyptus crucis subsp. crucis* | 9 | 9 |
| EN | *Frankenia parvula* | 7 | 7 |
| EN | *Goodenia integerrima* | 4 | 4 |
| EN | *Grevillea bracteosa* | 9 | 32 |
| EN | *Grevillea christineae* | 1 | 15 |
| EN | *Grevillea curviloba subsp. incurva* | 32 | 36 |
| EN | *Grevillea involucrata* | 29 | 29 |
| EN | *Hakea aculeata* | 39 | 39 |
| EN | *Jacksonia quairading* | 5 | 5 |
| EN | *Lasiopetalum rotundifolium* | 11 | 12 |
| EN | *Melaleuca sciotostyla* | 3 | 3 |
| EN | *Muehlenbeckia horrida subsp. abdita* | 4 | 4 |
| EN | *Philotheca wonganensis* | 5 | 6 |
| EN | *Ptilotus fasciculatus* | 7 | 13 |
| EN | *Stylidium coroniforme subsp. coroniforme* | 13 | 13 |
| EN | *Thelymitra stellata* | 9 | 36 |
| EN | *Verticordia hughanii* | 2 | 2 |
| VU | *Acacia anomala* | 17 | 32 |
| VU | *Acacia aphylla* | 29 | 40 |
| VU | *Acacia auratiflora* | 23 | 23 |
| VU | *Acacia brachypoda* | 13 | 13 |
| VU | *Acacia caesariata* | 3 | 3 |
| VU | *Acacia denticulosa* | 14 | 15 |
| VU | *Acacia lanuginophylla* | 20 | 20 |
| VU | *Acacia leptalea* | 10 | 10 |
| VU | *Allocasuarina fibrosa* | 6 | 6 |
| VU | *Allocasuarina tortiramula* | 3 | 3 |
| VU | *Anigozanthos bicolor subsp. minor* | 2 | 15 |
| VU | *Asterolasia nivea* | 9 | 9 |
| VU | *Banksia sphaerocarpa var. dolichostyla* | 25 | 27 |
| VU | *Boronia adamsiana* | 27 | 27 |

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| VU | *Boronia capitata subsp. capitata* | 1 | 1 |
| VU | *Boronia revoluta* | 7 | 10 |
| VU | *Calectasia pignattiana* | 8 | 17 |
| VU | *Chamelaucium lullfitzii* | 15 | 15 |
| VU | *Conostylis rogeri* | 7 | 7 |
| VU | *Dryandra aurantia* | 6 | 6 |
| VU | *Eleocharis keigheryi* | 6 | 20 |
| VU | *Eremophila ternifolia* | 6 | 6 |
| VU | *Eucalyptus recta* | 15 | 15 |
| VU | *Eucalyptus steedmanii* | 7 | 7 |
| VU | *Eucalyptus synandra* | 11 | 42 |
| VU | *Frankenia conferta* | 6 | 10 |
| VU | *Gastrolobium graniticum* | 3 | 10 |
| VU | *Grevillea dryandroides subsp. hirsuta* | 14 | 14 |
| VU | *Grevillea flexuosa* | 42 | 43 |
| VU | *Hydatella dioica* | 1 | 3 |
| VU | *Lechenaultia laricina* | 12 | 12 |
| VU | *Microcorys eremophiloides* | 34 | 34 |
| VU | *Muelleranthus crenulatus* | 4 | 4 |
| VU | *Myriophyllum lapidicola* | 5 | 6 |
| VU | *Pultenaea pauciflora* | 24 | 34 |
| VU | *Rhagodia acicularis* | 5 | 5 |
| VU | *Roycea pycnophylloides* | 22 | 22 |
| VU | *Spirogardnera rubescens* | 5 | 21 |
| VU | *Stylidium merrallii* | 8 | 8 |
| VU | *Tetratheca aphylla subsp. aphylla* | 8 | 8 |
| VU | *Tetratheca aphylla subsp. megacarpa* | 4 | 4 |
| VU | *Tetratheca erubescens* | 4 | 4 |
| VU | *Tetratheca harperi* | 2 | 2 |
| VU | *Tetratheca paynterae subsp. cremnobata* | 2 | 3 |
| VU | *Thelymitra psammophila* | 1 | 20 |
| VU | *Thomasia glabripetala* | 8 | 8 |
| VU | *Thomasia montana* | 27 | 27 |
| VU | *Tribonanthes purpurea* | 5 | 9 |
| VU | *Verticordia fimbrilepis subsp. fimbrilepis* | 11 | 22 |
| VU | *Verticordia plumosa var. pleiobotrya* | 1 | 11 |
| VU | *Verticordia staminosa var. cylindracea* | 13 | 13 |
| 1 | *Acacia desertorum var. nudipes* | 8 | 8 |
| 1 | *Acacia lanei* | 14 | 14 |
| 1 | *Acacia mutabilis subsp. stipulifera* | 5 | 5 |
| 1 | *Acacia sclerophylla var. teretiuscula* | 12 | 12 |
| 1 | *Acacia tetraneura* | 9 | 9 |
| 1 | *Acacia trinalis* | 1 | 4 |
| 1 | *Andersonia saxatilis* | 1 | 6 |
| 1 | *Austrostipa geoffreyi* | 3 | 3 |
| 1 | *Baeckea crispiflora subsp. Ongerup(A.Scougall & C.Garawanta E35)* | 2 | 5 |
| 1 | *Beyeria sp. Jackson Range (R. Cranfield & P. Spencer 7751)* | 2 | 2 |

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| 1 | *Brachyloma nguba* | 3 | 3 |
| 1 | *Calandrinia sp. Piawaning (A.C. Beauglehole 12257)* | 3 | 3 |
| 1 | *Commersonia sp. Bindoon (C. Wilkins & F. & J. Hort CW 2155)* | 2 | 2 |
| 1 | *Conostylis caricina subsp. elachys* | 1 | 2 |
| 1 | *Dampiera glabrescens* | 3 | 3 |
| 1 | *Dampiera scaevolina* | 3 | 3 |
| 1 | *Darwinia divisa* | 1 | 1 |
| 1 | *Drosera grievei* | 3 | 3 |
| 1 | *Dryandra pteridifolia subsp. inretita* | 4 | 4 |
| 1 | *Eucalyptus mimica subsp. continens* | 5 | 5 |
| 1 | *Eucalyptus myriadena subsp. parviflora* | 3 | 3 |
| 1 | *Eucalyptus subangusta subsp. virescens* | 11 | 14 |
| 1 | *Gastrolobium crispatum* | 7 | 7 |
| 1 | *Gastrolobium rotundifolium* | 1 | 11 |
| 1 | *Gastrolobium tenue* | 3 | 3 |
| 1 | *Grevillea corrugata* | 6 | 6 |
| 1 | *Grevillea lullfitzii* | 5 | 5 |
| 1 | *Grevillea marriottii* | 5 | 5 |
| 1 | *Grevillea minutiflora* | 14 | 14 |
| 1 | *Grevillea phillipsiana* | 1 | 4 |
| 1 | *Guichenotia glandulosa* | 2 | 2 |
| 1 | *Hakea cygna subsp. needlei* | 3 | 3 |
| 1 | *Hibbertia axillibarba* | 1 | 1 |
| 1 | *Hibbertia glomerata subsp. ginginensis* | 1 | 2 |
| 1 | *Hydrocotyle hexaptera* | 1 | 1 |
| 1 | *Hydrocotyle muriculata* | 6 | 6 |
| 1 | *Hypocalymma sylvestre* | 1 | 1 |
| 1 | *Jacksonia debilis* | 3 | 5 |
| 1 | *Lasiopetalum exiguum* | 1 | 2 |
| 1 | *Lechenaultia magnifica* | 3 | 4 |
| 1 | *Leucopogon compressicarpus* | 1 | 1 |
| 1 | *Leucopogon teretostylus* | 2 | 2 |
| 1 | *Melaleuca agathosmoides* | 3 | 9 |
| 1 | *Mirbelia densiflora* | 4 | 9 |
| 1 | *Pimelea pelinos* | 1 | 2 |
| 1 | *Senecio gilbertii* | 3 | 3 |
| 1 | *Synaphea panhesya* | 1 | 2 |
| 1 | *Thysanotus lavanduliflorus* | 9 | 9 |
| 1 | *Thysanotus sabulosus* | 3 | 3 |
| 1 | *Trymalium myrtillus subsp. pungens* | 1 | 2 |
| 1 | *Xanthoparmelia nashii* | 1 | 1 |
| 1 | *Xanthoparmelia scabrosina* | 1 | 1 |
| 2 | *Acacia browniana var. glaucescens* | 6 | 6 |
| 2 | *Acacia congesta subsp. wonganensis* | 6 | 6 |
| 2 | *Acacia cowaniana* | 4 | 4 |
| 2 | *Acacia drewiana subsp. minor* | 9 | 9 |
| 2 | *Acacia gemina* | 4 | 12 |

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| 2 | *Acacia heterochroa subsp. robertii* | 6 | 6 |
| 2 | *Acacia lirellata subsp. compressa* | 8 | 8 |
| 2 | *Acacia mutabilis subsp. incurva* | 10 | 15 |
| 2 | *Acacia sclerophylla var. pilosa* | 5 | 6 |
| 2 | *Acacia tuberculata* | 9 | 9 |
| 2 | *Amperea micrantha* | 1 | 5 |
| 2 | *Andersonia carinata* | 1 | 11 |
| 2 | *Astartea clavifolia* | 8 | 8 |
| 2 | *Boronia ericifolia* | 9 | 11 |
| 2 | *Calytrix oncophylla* | 2 | 2 |
| 2 | *Cyanicula ixioides subsp. candida* | 1 | 1 |
| 2 | *Dampiera orchardii* | 1 | 2 |
| 2 | *Darwinia sp.Westdale(F.Hort 864)* | 1 | 1 |
| 2 | *Daviesia lineata* | 4 | 4 |
| 2 | *Diplolaena andrewsii* | 6 | 7 |
| 2 | *Drosera salina* | 2 | 4 |
| 2 | *Dryandra conferta var. parva* | 1 | 14 |
| 2 | *Dryandra epimicta* | 6 | 6 |
| 2 | *Dryandra erythrocephala var. inopinata* | 6 | 10 |
| 2 | *Dryandra foliosissima* | 4 | 11 |
| 2 | *Dryandra idiogenes* | 5 | 5 |
| 2 | *Dryandra lindleyana subsp. agricola* | 10 | 10 |
| 2 | *Dryandra nivea subsp. Morangup (M. Pieroni 94/2)* | 2 | 2 |
| 2 | *Dryandra speciosa subsp. speciosa* | 9 | 9 |
| 2 | *Eremophila adenotricha* | 7 | 7 |
| 2 | *Eremophila brevifolia* | 1 | 6 |
| 2 | *Eremophila complanata* | 1 | 1 |
| 2 | *Eremophila sargentii* | 1 | 4 |
| 2 | *Eucalyptus sparsicoma* | 3 | 4 |
| 2 | *Fitzwillia axilliflora* | 4 | 5 |
| 2 | *Gastrolobium effusum* | 3 | 3 |
| 2 | *Gastrolobium nudum* | 7 | 7 |
| 2 | *Gastrolobium rigidum* | 7 | 17 |
| 2 | *Goodenia arthrotricha* | 1 | 4 |
| 2 | *Goodenia sp.Lake King(M.Gustafsson et K.Bremer 132)* | 2 | 2 |
| 2 | *Grevillea biformis subsp. cymbiformis* | 1 | 10 |
| 2 | *Grevillea candolleana* | 9 | 9 |
| 2 | *Grevillea crowleyae* | 1 | 2 |
| 2 | *Grevillea kenneallyi* | 11 | 11 |
| 2 | *Grevillea rosieri* | 2 | 5 |
| 2 | *Guichenotia asteriskos* | 4 | 4 |
| 2 | *Haegiela tatei* | 5 | 10 |
| 2 | *Hakea pendens* | 11 | 11 |
| 2 | *Isotropis cuneifolia subsp. glabra* | 1 | 2 |
| 2 | *Keraudrenia adenogyna* | 7 | 11 |
| 2 | *Lasiopetalum sp.Northam(F.Hort 1196)* | 3 | 3 |
| 2 | *Lechenaultia hortii* | 3 | 3 |

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| 2 | *Lepidium genistoides* | 4 | 4 |
| 2 | *Lepidobolus spiralis* | 1 | 3 |
| 2 | *Leucopogon amplectens* | 6 | 6 |
| 2 | *Leucopogon sp. Bindoon (F. Hort 2766)* | 3 | 3 |
| 2 | *Leucopogon sp. Flynn (F. Hort, J. Hort & A. Lowrie 859)* | 2 | 2 |
| 2 | *Leucopogon sp.Bungulla(R.D.Royce 3435)* | 5 | 5 |
| 2 | *Lissanthe scabra* | 6 | 6 |
| 2 | *Microcorys lenticularis* | 1 | 11 |
| 2 | *Millotia steetziana* | 2 | 2 |
| 2 | *Millotia tenuifolia var. laevis* | 1 | 1 |
| 2 | *Opercularia rubioides* | 1 | 3 |
| 2 | *Persoonia hakeiformis* | 3 | 5 |
| 2 | *Petrophile filifolia subsp. laxa* | 1 | 8 |
| 2 | *Pimelea halophila* | 3 | 7 |
| 2 | *Schoenus capillifolius* | 2 | 7 |
| 2 | *Stylidium sejunctum* | 8 | 9 |
| 2 | *Synaphea boyaginensis* | 1 | 1 |
| 2 | *Synaphea canaliculata* | 5 | 5 |
| 2 | *Synaphea cervifolia* | 8 | 8 |
| 2 | *Synaphea flexuosa* | 3 | 3 |
| 2 | *Synaphea parviflora* | 3 | 3 |
| 2 | *Synaphea tripartita* | 16 | 17 |
| 2 | *Thysanotus acerosifolius* | 3 | 4 |
| 2 | *Verticordia citrella* | 2 | 2 |
| 2 | *Verticordia serrata var. Udumung(D.Hunter & B.Yarran 941006)* | 1 | 1 |
| 3 | *Acacia anarthros* | 11 | 20 |
| 3 | *Acacia brachyphylla var. recurvata* | 3 | 4 |
| 3 | *Acacia campylophylla* | 10 | 10 |
| 3 | *Acacia drummondii subsp. affinis* | 10 | 13 |
| 3 | *Acacia horridula* | 3 | 16 |
| 3 | *Acacia improcera* | 1 | 1 |
| 3 | *Acacia mutabilis subsp. rhynchophylla* | 1 | 1 |
| 3 | *Acacia newbeyi* | 1 | 1 |
| 3 | *Acacia obesa* | 2 | 2 |
| 3 | *Acacia oncinophylla subsp. oncinophylla* | 1 | 6 |
| 3 | *Acacia sedifolia subsp. pulvinata* | 2 | 2 |
| 3 | *Acacia singula* | 2 | 3 |
| 3 | *Acacia undosa* | 5 | 5 |
| 3 | *Acrotriche plurilocularis* | 1 | 1 |
| 3 | *Adenanthos cygnorum subsp. chamaephyton* | 13 | 16 |
| 3 | *Allocasuarina ramosissima* | 1 | 6 |
| 3 | *Angianthus halophilus* | 2 | 2 |
| 3 | *Anigozanthos bicolor subsp. exstans* | 13 | 17 |
| 3 | *Asteridea gracilis* | 1 | 8 |
| 3 | *Astroloma microphyllum* | 2 | 8 |
| 3 | *Astroloma recurvum* | 1 | 2 |
| 3 | *Baeckea sp. Hyden (J.M. Brown 141)* | 2 | 3 |

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| 3 | *Banksia micrantha* | 1 | 11 |
| 3 | *Blennospora phlegmatocarpa* | 2 | 4 |
| 3 | *Boronia penicillata* | 3 | 5 |
| 3 | *Bossiaea divaricata* | 1 | 4 |
| 3 | *Calectasia obtusa* | 3 | 3 |
| 3 | *Cryptandra dielsii* | 11 | 11 |
| 3 | *Cryptandra polyclada subsp. polyclada* | 1 | 1 |
| 3 | *Cyathochaeta teretifolia* | 1 | 5 |
| 3 | *Daviesia elongata subsp. implexa* | 9 | 9 |
| 3 | *Daviesia tortuosa* | 4 | 4 |
| 3 | *Daviesia uncinata* | 8 | 11 |
| 3 | *Dryandra ferruginea subsp. chelomacarpa* | 4 | 4 |
| 3 | *Dryandra ferruginea subsp. flavescens* | 3 | 3 |
| 3 | *Dryandra meganotia* | 1 | 12 |
| 3 | *Dryandra xylothemelia* | 18 | 19 |
| 3 | *Eucalyptus depauperata* | 13 | 15 |
| 3 | *Eucalyptus macrocarpa x pyriformis* | 3 | 17 |
| 3 | *Eucalyptus microschema* | 16 | 16 |
| 3 | *Eucalyptus mimica subsp. mimica* | 11 | 11 |
| 3 | *Eucalyptus quaerenda* | 2 | 2 |
| 3 | *Frankenia drummondii* | 4 | 4 |
| 3 | *Frankenia glomerata* | 2 | 3 |
| 3 | *Galium migrans* | 1 | 9 |
| 3 | *Gastrolobium axillare* | 1 | 18 |
| 3 | *Gastrolobium cruciatum* | 4 | 5 |
| 3 | *Goodenia trichophylla* | 1 | 2 |
| 3 | *Grevillea florida* | 8 | 10 |
| 3 | *Grevillea manglesii subsp. dissectifolia* | 3 | 10 |
| 3 | *Grevillea newbeyi* | 26 | 32 |
| 3 | *Gyrostemon prostratus* | 2 | 2 |
| 3 | *Hakea brachyptera* | 9 | 14 |
| 3 | *Hakea lasiocarpha* | 1 | 1 |
| 3 | *Haloragis tenuifolia* | 1 | 10 |
| 3 | *Johnsonia inconspicua* | 1 | 5 |
| 3 | *Lasiopetalum fitzgibbonii* | 1 | 3 |
| 3 | *Lechenaultia acutiloba* | 3 | 6 |
| 3 | *Leucopogon sp.Ironcaps(N.Gibson & K.Brown 3070)* | 4 | 6 |
| 3 | *Melaleuca sclerophylla* | 2 | 6 |
| 3 | *Melaleuca sculponeata* | 4 | 5 |
| 3 | *Monotoca leucantha* | 6 | 9 |
| 3 | *Myriocephalus appendiculatus* | 1 | 6 |
| 3 | *Myriophyllum echinatum* | 1 | 10 |
| 3 | *Persoonia brevirhachis* | 18 | 18 |
| 3 | *Phebalium brachycalyx* | 4 | 4 |
| 3 | *Phlegmatospermum drummondii* | 2 | 3 |
| 3 | *Pityrodia sp. Yilgarn (A.P. Brown 2679)* | 7 | 21 |
| 3 | *Platysace ramosissima* | 1 | 4 |

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| 3 | *Pultenaea daena* | 1 | 3 |
| 3 | *Rhodanthe pyrethrum* | 1 | 16 |
| 3 | *Stylidium cymiferum* | 2 | 5 |
| 3 | *Stylidium longitubum* | 2 | 7 |
| 3 | *Stylidium pulviniforme* | 5 | 7 |
| 3 | *Stylidium rhipidium* | 2 | 7 |
| 3 | *Tetratheca pilifera* | 6 | 6 |
| 3 | *Tetratheca similis* | 2 | 7 |
| 3 | *Verticordia huegelii var. tridens* | 1 | 10 |
| 3 | *Verticordia serrata var. linearis* | 3 | 4 |
| 4 | *Acacia cuneifolia* | 19 | 20 |
| 4 | *Acacia merrickiae* | 31 | 31 |
| 4 | *Acacia semicircinalis* | 33 | 33 |
| 4 | *Anigozanthos humilis subsp. chrysanthus* | 2 | 34 |
| 4 | *Asterolasia grandiflora* | 20 | 20 |
| 4 | *Astroloma sp.Cataby(E.A.Griffin 1022)* | 4 | 14 |
| 4 | *Baeckea sp.Chittering(R.J.Cranfield 1983)* | 3 | 3 |
| 4 | *Bentleya spinescens* | 27 | 31 |
| 4 | *Boronia tenuis* | 1 | 26 |
| 4 | *Caladenia cristata* | 2 | 8 |
| 4 | *Caladenia integra* | 4 | 18 |
| 4 | *Caladenia speciosa* | 1 | 17 |
| 4 | *Calamphoreus inflatus* | 6 | 6 |
| 4 | *Calothamnus affinis* | 1 | 10 |
| 4 | *Calothamnus brevifolius* | 7 | 8 |
| 4 | *Calothamnus rupestris* | 2 | 6 |
| 4 | *Calytrix sylvana* | 11 | 20 |
| 4 | *Centrolepis caespitosa* | 2 | 34 |
| 4 | *Chordifex chaunocoleus* | 8 | 14 |
| 4 | *Darwinia pimelioides* | 2 | 10 |
| 4 | *Darwinia thymoides subsp. bella* | 1 | 1 |
| 4 | *Daviesia oxylobium* | 20 | 20 |
| 4 | *Daviesia purpurascens* | 3 | 4 |
| 4 | *Daviesia spiralis* | 20 | 20 |
| 4 | *Drosera occidentalis subsp. occidentalis* | 2 | 30 |
| 4 | *Eremaea blackwelliana* | 8 | 8 |
| 4 | *Eremophila caerulea subsp. merrallii* | 4 | 4 |
| 4 | *Eremophila racemosa* | 4 | 4 |
| 4 | *Eremophila serpens* | 2 | 5 |
| 4 | *Eremophila veneta* | 27 | 30 |
| 4 | *Eucalyptus exilis* | 20 | 26 |
| 4 | *Eucalyptus latens* | 8 | 27 |
| 4 | *Eucalyptus loxophleba x wandoo* | 10 | 16 |
| 4 | *Gastrolobium callistachys* | 9 | 24 |
| 4 | *Gastrolobium densifolium* | 15 | 18 |
| 4 | *Gonocarpus intricatus* | 3 | 3 |
| 4 | *Grevillea drummondii* | 1 | 11 |
| 4 | *Grevillea prostrata* | 38 | 38 |

| Conservation Status | Species name | Number of pops Avon | Number of pops WA |
|---|---|---|---|
| 4 | *Hemiandra hancocksiana* | 1 | 14 |
| 4 | *Hydrocotyle lemnoides* | 4 | 10 |
| 4 | *Lechenaultia pulvinaris* | 23 | 46 |
| 4 | *Lepidium pseudotasmanicum* | 1 | 2 |
| 4 | *Microcorys sp.Forrestania(V.English 2004)* | 4 | 4 |
| 4 | *Myriophyllum petraeum* | 7 | 16 |
| 4 | *Persoonia sulcata* | 8 | 11 |
| 4 | *Rinzia affinis* | 3 | 3 |
| 4 | *Schoenus natans* | 2 | 11 |
| 4 | *Sowerbaea multicaulis* | 1 | 2 |
| 4 | *Stylidium scabridum* | 11 | 14 |
| 4 | *Stylidium striatum* | 6 | 9 |
| 4 | *Synaphea grandis* | 1 | 3 |
| 4 | *Templetonia drummondii* | 6 | 14 |
| 4 | *Thysanotus glaucus* | 1 | 11 |
| 4 | *Verreauxia verreauxii* | 45 | 45 |
| 4 | *Verticordia lindleyi subsp. lindleyi* | 2 | 38 |
| 4 | *Villarsia submersa* | 3 | 28 |
| 4 | *Wurmbea drummondii* | 4 | 8 |
| | | | |

**Table A4.3:** The Recovery and Interim Recovery Plans for DRF and Priority taxa of the ANRMR.

| Conservation Status | Species Name | Existing RP/IRP number | RP/IRP operative dates | Current Status |
|---|---|---|---|---|
| CR | *Acacia pharangites* | IRP 20 | 1999-2002 | Update in prep. |
| CR | *Acacia sciophanes* | IRP 77 | 2000-2003 | Update in prep. |
| CR | *Acacia subflexuosa subsp. capillata* | IRP 157 | 2003-2008 | |
| CR | *Acacia volubilis* | IRP 158 | 2003-2008 | |
| CR | *Caladenia drakeoides* | IRP 141 | 2003-2008 | |
| CR | *Cyphanthera odgersii subsp. occidentalis* | | | in prep. |
| CR | *Daviesia cunderdin* | IRP 37 | 1999-2002 | Update in prep. |
| CR | *Daviesia euphorbioides* | IRP 70 | 2000-2003 | |
| CR | *Daviesia microcarpa* | IRP 11 | 1996-1999 | |
| CR | *Eremophila nivea* | IRP 101 | 2001-2004 | |
| CR | *Eremophila verticillata* | IRP 142 | 2003-2008 | |
| CR | *Gastrolobium glaucum* | | | in prep. |
| CR | *Gastrolobium hamulosum* | IRP 113 | 2002-2005 | |
| CR | *Grevillea althoferorum* | IRP 129 | 2003-2008 | |
| CR | *Grevillea curviloba subsp. curviloba* | IRP 72 | 2000-2003 | |
| CR | *Grevillea dryandroides subsp. dryandroides* | IRP 64 | 2000-2003 | |
| CR | *Grevillea scapigera* | IRP 224 | 2006-2011 | |
| CR | *Gyrostemon reticulatus* | IRP 119 | 2002-2007 | |
| CR | *Hemiandra rutilans* | | | in prep. |
| CR | *Philotheca basistyla* | IRP 170 | 2004-2009 | |
| CR | *Pityrodia scabra* | | | in prep. |
| CR | *Rhizanthella gardneri* | IRP 127 | 2003-3008 | |
| CR | *Symonanthus bancroftii* | IRP 84 | 2000-2003 | |
| CR | *Tetratheca deltoidea* | IRP 89 | 2001-2004 | |
| CR | *Tetratheca paynterae subsp. paynterae* | | 2006-2016 | in prep. |
| CR | *Verticordia staminosa subsp. staminosa* | IRP 90 | 2001-2004 | |
| EN | *Acacia ataxiphylla subsp. magna* | IRP 156 | 2003-2008 | |
| EN | *Acacia lobulata* | | | in prep. |
| EN | *Acacia pygmaea* | IRP 9 | 1996-1999 | |

| Conservation Status | Species Name | Existing RP/IRP number | RP/IRP operative dates | Current Status |
|---|---|---|---|---|
| EN | *Banksia cuneata* | | | RP (in prep.) |
| EN | *Eremophila resinosa* | | | in prep. |
| EN | *Eremophila viscida* | IRP 137 | 2003-2008 | |
| EN | *Frankenia parvula* | | | in prep. |
| EN | *Goodenia integerrima* | IRP 136 | 2003-2008 | |
| EN | *Grevillea involucrata* | | | in prep. |
| EN | *Muehlenbeckia horrida subsp. abdita* | IRP 135 | 2003-2008 | |
| EN | *Stylidium coroniforme subsp. coroniforme* | IRP 149 | 2003-2008 | |
| VU | *Acacia auratiflora* | | | in prep. |
| VU | *Acacia lanuginophylla* | | | in prep. |
| VU | *Acacia leptalea* | | | in prep. |
| VU | *Anigozanthos bicolor subsp. minor* | IRP 223 | 2006-2011 | |
| VU | *Frankenia conferta* | | | in prep. |
| VU | *Grevillea dryandroides subsp. hirsuta* | IRP 222 | 2006-2011 | |
| VU | *Myriophyllum lapidicola* | IRP 187 | 2004-2009 | |
| 4* | *Bentleya spinescens* | | | in prep. |
| 4* | *Centrolepis caespitosa* | IRP 159 | 2004-2008 | |

* previously listed as DRF.

**Table A4.4:** The vesting of land on which populations of the ANRMR Threatened and Priority flora are found.

| Vested in | CR | EN | VU | Number DRF | %DRF | 1 | 2 | 3 | 4 | Number Priority | % Priority | Total DRF and P | %DRF and Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chief Exec Dept of Agriculture | 6 | 5 | 2 | 13 | 1 | 1 | 1 | 2 | | 4 | 0 | 17 | 1 |
| Commonwealth of Australia | | 7 | 10 | 17 | 1 | 3 | 1 | 1 | 3 | 8 | 1 | 25 | 1 |
| Conservation Commission – NPNCA - LFC | 36 | 78 | 157 | 271 | 23 | 18 | 115 | 119 | 143 | 395 | 29 | 666 | 26 |
| Dept of Land Administration | 6 | 1 | 10 | 17 | 1 | 10 | 15 | 5 | 1 | 31 | 2 | 48 | 2 |
| Exec Direc CALM | | | 2 | 2 | 0 | | 3 | | 1 | 4 | 0 | 6 | 0 |
| Freehold | | | | 0 | 0 | | | 1 | | 1 | 0 | 1 | 0 |
| Lands and Forests Commission | | 3 | 4 | 7 | 1 | 1 | 1 | 6 | 84 | 92 | 7 | 99 | 4 |
| Main Roads WA | 5 | 12 | 10 | 27 | 2 | 8 | 13 | 29 | 19 | 69 | 5 | 96 | 4 |
| Minister for Agriculture | | | | 0 | 0 | | | 1 | | 1 | 0 | 1 | 0 |
| Minister for Water Resources | 1 | 3 | 7 | 11 | 1 | 2 | 2 | 2 | 1 | 7 | 1 | 18 | 1 |
| Minister for Works | 1 | | 1 | 2 | 0 | | | | | 0 | 0 | 2 | 0 |
| Natural Trust of Australia WA | | | 1 | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Not Vested | 25 | 16 | 59 | 100 | 9 | 28 | 25 | 16 | 20 | 89 | 6 | 189 | 7 |
| NPNCA | | | 1 | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Other | 2 | | | 2 | 0 | | | | | 0 | 0 | 2 | 0 |
| Private | 46 | 105 | 158 | 309 | 26 | 25 | 35 | 28 | 77 | 165 | 12 | 474 | 19 |
| Shire | 84 | 119 | 114 | 317 | 27 | 61 | 77 | 77 | 142 | 357 | 26 | 674 | 26 |
| State of Western Australia | | | | 0 | 0 | | | 4 | | 4 | 0 | 4 | 0 |
| Telstra | | | 1 | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| TOWN | | | 1 | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Unknown | 3 | 2 | 1 | 6 | 1 | 23 | 31 | 40 | 6 | 100 | 7 | 106 | 4 |
| Water & Rivers Commission | | 1 | 3 | 4 | 0 | 3 | 2 | 3 | 1 | 9 | 1 | 13 | 1 |
| Water Corporation | 4 | 8 | 8 | 20 | 2 | 2 | 10 | 5 | 9 | 26 | 2 | 46 | 2 |
| Western Power | | 1 | | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Westrail | 13 | 17 | 11 | 41 | 4 | 8 | 1 | 7 | 7 | 23 | 2 | 64 | 3 |
| **Total** | 232 | 378 | 561 | 1171 | 100 | 193 | 332 | 346 | 514 | 1385 | 100 | 2556 | 100 |

**Table A4.5:** The land purpose on which populations of the ANRMR Threatened and Priority flora are found.

| | CR | EN | VU | Number of DRF | %DRF | 1 | 2 | 3 | 4 | Number Priority | % Priority | Total DRF and Priority | %DRF and Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aerodrome | | | | 0 | 0 | | | 1 | | 1 | 0 | 1 | 0 |
| Airport | 2 | 1 | 2 | 5 | 0 | | 2 | | 1 | 3 | 0 | 8 | 0 |
| Camping | | 3 | | 3 | 0 | | | 1 | 1 | 2 | 0 | 5 | 0 |
| Car Park | | | 1 | 1 | 0 | | 1 | | | 1 | 0 | 2 | 0 |
| Common | | 4 | | 4 | 0 | | | | | 0 | 0 | 4 | 0 |
| Conservation of Fauna | | | 1 | 1 | 0 | | 1 | 3 | 4 | 8 | 1 | 9 | 0 |
| Conservation of Flora | | | 7 | 7 | 1 | | 6 | 5 | 2 | 13 | 1 | 20 | 1 |
| Conservation Of Flora & Fauna | 33 | 68 | 104 | 205 | 18 | 15 | 93 | 108 | 103 | 319 | 23 | 524 | 21 |
| Conservation Park | | | 35 | 35 | 3 | | 4 | | 21 | 25 | 2 | 60 | 2 |
| Defence | | 7 | | 7 | 1 | 3 | | 1 | 2 | 6 | 0 | 13 | 1 |
| Excepted from sale | 1 | | | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Experimental Farm | | 5 | | 5 | 0 | 1 | | 2 | | 3 | 0 | 8 | 0 |
| Firewood | | 2 | 2 | 4 | 0 | | | | | 0 | 0 | 4 | 0 |
| Firing Range | | 1 | 9 | 10 | 1 | | | 1 | 1 | 2 | 0 | 12 | 0 |
| Golf | 1 | | 2 | 3 | 0 | 1 | | | 1 | 2 | 0 | 5 | 0 |
| Government Requirements | 1 | | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 4 | 0 | 6 | 0 |
| Gravel Pit | 1 | | 2 | 3 | 0 | | 2 | 4 | 4 | 10 | 1 | 13 | 1 |
| Heritage Purposes | | | 1 | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Hospital | | 1 | | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Mining lease | 2 | | | 2 | 0 | | | | | 0 | 0 | 2 | 0 |
| Municipal Purposes | 1 | | | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| National Park | | | | 0 | 0 | | 9 | | 8 | 17 | 1 | 17 | 1 |
| Nature Reserve | 1 | 10 | 13 | 24 | 2 | 1 | 1 | 2 | 1 | 5 | 0 | 29 | 1 |
| Other | 7 | 3 | 3 | 13 | 1 | 1 | 2 | 3 | | 6 | 0 | 19 | 1 |
| Parkland (& Recreation) | | 1 | 1 | 2 | 0 | 4 | | 3 | 1 | 8 | 1 | 10 | 0 |
| Pastoral lease | 6 | | 2 | 8 | 1 | 2 | 2 | | 1 | 5 | 0 | 13 | 1 |
| Protection of Flora & Fauna | 1 | | | 1 | 0 | | | 1 | | 1 | 0 | 2 | 0 |
| Public access | | | 1 | 1 | 0 | | | | | 0 | 0 | 1 | 0 |

| | CR | EN | VU | Number of DRF | %DRF | 1 | 2 | 3 | 4 | Number Priority | % Priority | Total DRF and Priority | %DRF and Priority |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Public Open Space | | | 1 | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Public Utility | | | 1 | 1 | 0 | 2 | | 1 | | 3 | 0 | 4 | 0 |
| Racecourse | | 1 | | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Railway Reserve | 12 | 17 | 11 | 40 | 3 | 8 | 1 | 7 | 7 | 23 | 2 | 63 | 2 |
| Recreation | 9 | 1 | 11 | 21 | 2 | 2 | 2 | 1 | 7 | 12 | 1 | 33 | 1 |
| Re-establish Native Plants | 1 | | | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Road Verge | 74 | 116 | 98 | 288 | 25 | 67 | 85 | 101 | 147 | 400 | 29 | 688 | 27 |
| Rubbish | | 2 | 1 | 3 | 0 | | | | | 0 | 0 | 3 | 0 |
| Sand | | | | 0 | 0 | | | | 1 | 1 | 0 | 1 | 0 |
| School-site | 1 | | | 1 | 0 | 2 | | 1 | | 3 | 0 | 4 | 0 |
| Shire Requirements | | | 1 | 1 | 0 | | | | | 0 | 0 | 1 | 0 |
| Soil Conservation | | | | 0 | 0 | | 1 | | | 1 | 0 | 1 | 0 |
| State Forest | | 3 | 4 | 7 | 1 | 3 | 3 | 7 | 87 | 100 | 7 | 107 | 4 |
| Stopping place | | | 1 | 1 | 0 | | | 1 | | 1 | 0 | 2 | 0 |
| Timber | | 4 | | 4 | 0 | | 1 | 1 | 1 | 3 | 0 | 7 | 0 |
| Town-site | 1 | | | 1 | 0 | | | | 1 | 1 | 0 | 2 | 0 |
| Unallocated Crown Land | 12 | 2 | 21 | 35 | 3 | 2 | 5 | 7 | 1 | 15 | 1 | 50 | 2 |
| Unknown | 3 | 1 | 1 | 5 | 0 | 7 | 12 | 14 | 1 | 34 | 2 | 39 | 2 |
| Vacant Crown Land | 6 | 4 | 43 | 53 | 5 | 23 | 26 | 4 | 11 | 64 | 5 | 117 | 5 |
| Vermin Proof Fence | | | 2 | 2 | 0 | | | | | 0 | 0 | 2 | 0 |
| Water | 8 | 15 | 17 | 40 | 3 | 9 | 14 | 6 | 14 | 43 | 3 | 83 | 3 |
| Water & Conservation of F & F | | | 2 | 2 | 0 | | | 4 | | 4 | 0 | 6 | 0 |
| #N/A | 47 | 106 | 159 | 312 | 27 | 39 | 58 | 55 | 84 | 236 | 17 | 548 | 21 |
| Grand Total | 232 | 378 | 561 | 1171 | 100 | 193 | 332 | 346 | 514 | 1385 | 100 | 2556 | 100 |

**Table A4.6:** The species of threatened and priority flora of the ANRMR that are considered to have a high derived salinity risk.
These are species that have all of their populations less than .5m above valley floor (see Section 3.3.3.3). Those species shaded are endemic to the ANRMR.

| Conservation Status | Species name | Number of populations |
|---|---|---|
| CR | Caladenia melanema | 2 |
| CR | Hydatella leptogyne | 1 |
| EN | Goodenia integerrima | 4 |
| EN | Muehlenbeckia horrida subsp. abdita | 4 |
| VU | Frankenia conferta | 6 |
| 1 | Austrostipa geoffreyi | 3 |
| 1 | Baeckea crispiflora subsp. Ongerup (A.Scougall & C.Garawanta E35) | 2 |
| 1 | Hibbertia axillibarba | 1 |
| 1 | Hydrocotyle hexaptera | 1 |
| 1 | Hydrocotyle muriculata | 6 |
| 2 | Astartea clavifolia | 8 |
| 2 | Drosera salina | 2 |
| 2 | Eremophila complanata | 1 |
| 2 | Goodenia sp.Lake King(M.Gustafsson et K.Bremer 132) | 2 |
| 2 | Opercularia rubioides | 1 |
| 2 | Pimelea halophila | 3 |
| 3 | Acacia mutabilis subsp. rhynchophylla | 1 |
| 3 | Angianthus halophilus | 2 |
| 3 | Blennospora phlegmatocarpa | 2 |
| 3 | Eucalyptus quaerenda | 2 |
| 3 | Frankenia glomerata | 2 |
| 3 | Gastrolobium axillare | 1 |
| 3 | Goodenia trichophylla | 1 |
| 3 | Haloragis tenuifolia | 1 |
| 3 | Lechenaultia acutiloba | 3 |
| 3 | Myriophyllum echinatum | 1 |
| 3 | Pultenaea daena | 1 |
| 4 | Caladenia speciosa | 1 |
| 4 | Darwinia thymoides subsp. bella | 1 |

**Table A4.7:** The threatened and priority species of the ANRMR that are already salt-affected.
These are species that have all their populations in areas already affected by salt (see Section 3.3.3.3). Those species shaded are endemic to the ANRMR.

| Conservation Status | Species name | Number of populations |
|---|---|---|
| CR | Caladenia melanema | 2 |
| EN | Goodenia integerrima | 4 |
| 1 | Hydrocotyle hexaptera | 1 |
| 1 | Pimelea pelinos | 1 |
| 2 | Astartea clavifolia | 8 |
| 2 | Goodenia sp.Lake King(M.Gustafsson et K.Bremer 132) | 2 |
| 2 | Millotia steetziana | 2 |
| 2 | Drosera salina | 2 |
| 2 | Pimelea halophila | 3 |
| 3 | Pultenaea daena | 1 |
| 4 | Caladenia cristata | 2 |

## Appendix 4.3 Declared Rare and Priority Flora Prioritisation Database

**Table A4.8:** The fields of a spreadsheet developed for aiding in DRF and Priority on ground action planning.
The spreadsheet is a collation of present operational information (eg LastRFRF, RP/IRP, CONSTATUS), extent (eg Avon only, Range of taxa), tenure based information (PURPOSE and VESTING) as well as derived threat based information (eg DEM_Ht); see Section 3.3.3.4.

| VARIABLE | DESCRIPTION |
|---|---|
| Sp Name | Taxa name |
| POPID1 | Population Number identifier (ie Population 5) |
| POPID2 | Subpopulation Identifier |
| Number of pops Avon | Number of populations of this taxa within the ANRMR |
| Number of pops Buffer | Number of populations of this taxa within the 20km buffer |
| Rest of WA | Number of populations of this taxa within Western Australia |
| Total number of pops | Total Number of populations of this taxa |
| Avon only | A flag for endemics to the ANRMR |
| RP/IRP number | Existing Recovery Plan (RP) or Interim Recovery Plan (IRP)for this taxa |
| RP/IRP operative dates | Operative dates for existing RP or IRP |
| RPs/IRPs in progress | Flag for RP or IRP for this taxa being written |
| Range of taxa | Extent of this taxa as derived from the DEFL database (see Section 2.3.3) |
| Range category | The above extent within predefined categories (ie 0, 0-500m, 1km-2km, etc) |
| CONSTATUS | Conservation Category of the taxa |
| VESTING | Land vesting code for this population |
| VESTING2 | Land vesting full description for this population |
| PURPOSE1 | Land purpose code for this population |
| PURPOSE2 | Land purpose full description for this population |
| ISDIEBACK | Dieback recorded from RFRF |
| DEM_Ht | Height above valley floor as determined from Digital Elevation Model (DEM) |
| Salt | Salt present as determined by ACLP see Section 2.2.1 |
| Extent | Within the ANRMR or the 20km buffer |
| LASTRFRF | The last submitted Rare Flora Report Form (RFRF) |
| DATUM | Datum used to locate population |
| DISTRICT | DEC District with the responsibility to mange this population |
| GDA94LAT | Latitude |
| GDA94LONG | Longitude |
| HABITATNOT | Recorded habitat |
| LANDFORM | Landform as indicated by RFRF |
| LOCATION | Description of location |
| OTHERCOMME | Comments |
| ROCKTYPE | Rock Type as indicated on RFRF |
| SHEETNO | DEFL Sheet number |
| SHIRE | Shire of occurrence of this population |

# Appendix 5 Fauna

## Appendix 5. 1 The Fauna of the ANRMR

This Appendix presents the known fauna of the ANRMR, see Section 2.3.4.1 for how these tables were derived and Section 3.3.4.1 for the caveats in using these results.

**Table A5.1:** The reptiles of the ANRMR.

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Agamidae** | dragon lizards | Ctenophorus cristatus | Crested Dragon | Y | Y | | + | + | dec |
| | | Ctenophorus fordi | Mallee Sand Dragon | Y | Y | | | + | stable |
| | | Ctenophorus inermis | Central Netted Dragon | N | Y | | | + | stable |
| | | Ctenophorus isolepis | Military Dragon | Y | Y | | | + | stable |
| | | Ctenophorus maculatus | Spotted Sand Dragon | Y | Y | | + | | dec |
| | | Ctenophorus ornatus | Ornate Dragon | Y | Y | + | + | | stable |
| | | Ctenophorus pictus | Painted Dragon | N | Y | | | + | stable |
| | | Ctenophorus reticulatus | Southern Netted Dragon | Y | Y | | + | + | dec |
| | | Ctenophorus salinarum | Salt Lake Dragon | Y | Y | | + | + | dec |
| | | Ctenophorus scutulatus | Lozenge-marked Bicycle Dragon | Y | Y | | | + | stable |
| | | Moloch horridus | Mountain Devil | Y | Y | | + | + | dec |
| | | Pogona minor | Western Bearded Dragon | Y | Y | + | + | + | dec |
| | | Rankinia adelaidensis | Western Heath Dragon | Y | N | | | | |
| | | Tympanocryptis adelaidensis | Sandhill Dragon | N | Y | + | | | dec |
| **Gekkonidae** | geckoes | Christinus marmoratus | | Y | N | | | | |
| | | Crenadactylus ocellatus | Clawless Gecko | Y | Y | | + | | dec |
| | | Diplodactylus assimilis | | N | Y | | | + | stable |
| | | Diplodactylus elderi | | N | Y | | | + | stable |
| | | Diplodactylus granariensis | | Y | Y | | + | | dec |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Diplodactylus maini | | Y | Y | | + | | dec |
| | | Diplodactylus polyophthalmus | | Y | N | | | | |
| | | Diplodactylus pulcher | Beautiful Gecko | Y | Y | | + | + | dec |
| | | Diplodactylus spinigerus | Spiny-tailed Gecko | N | Y | | + | | dec |
| | | Diplodactylus stenodactylus | | Y | Y | | | + | stable |
| | | Diplodactylus wellingtonae | | N | Y | | | + | stable |
| | | Gehyra purpurascens | | Y | Y | | | + | stable |
| | | Gehyra variegata | Tree Dtella | Y | Y | | + | + | dec |
| | | Heteronotia binoei | Bynoe's Gecko | Y | Y | | + | + | dec |
| | | Nephrurus stellatus | | Y | Y | | | + | stable |
| | | Nephrurus vertebralis | | Y | N | | | | |
| | | Oedura reticulata | Salmon Gum Gecko | Y | Y | | + | | dec |
| | | Phyllodactylus marmoratus | Marbled Gecko | N | Y | + | | | dec |
| | | Rhynchoedura ornata | Beaked Gecko | Y | Y | | | + | stable |
| | | Strophurus assimilis | | Y | N | | | | |
| | | Strophurus elderi | | Y | N | | | | |
| | | Strophurus spinigerus | | Y | N | | | | |
| | | Underwoodisaurus milii | Barking Gecko | Y | Y | | + | | dec |
| **Pygopodidae** | legless lizards | Aprasia pulchella | | Y | N | | | | |
| | | Aprasia repens | Sandplain Worm Lizard | Y | Y | + | | | dec |
| | | Delma australis | | Y | Y | | + | | dec |
| | | Delma butleri | | Y | Y | | | + | stable |
| | | Delma fraseri | Fraser's Legless Lizard | Y | Y | + | | | dec |
| | | Delma grayii | | Y | Y | + | | | dec |
| | | Delma nasuta | | N | Y | | | + | stable |
| | | Lialis burtonis | Burton's Legless Lizard | Y | Y | + | + | + | dec |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Pletholax gracilis | | Y | N | | | | |
| | | Pygopus lepidopodus | Common Scaleyfoot | Y | Y | + | + | | dec |
| | | Pygopus nigriceps | Hooded Scaleyfoot | Y | Y | | | + | stable |
| **Scincidae** | skinks | Acritoscincus trilineatum | | Y | N | | | | |
| | | Cryptoblepharus carnabyi | | Y | Y | | | + | stable |
| | | Cryptoblepharus plagiocephalus | Fence Skink | Y | Y | + | + | + | ? |
| | | Ctenotus atlas | | Y | Y | | | + | stable |
| | | Ctenotus australis | | Y | Y | | ? | | ? |
| | | Ctenotus brooksi | | Y | Y | | | + | stable |
| | | Ctenotus delli | | Y | N | | | | |
| | | Ctenotus fallens | | Y | N | | | | |
| | | Ctenotus gemmula | | Y | N | | | | |
| | | Ctenotus impar | | Y | Y | + | + | | dec |
| | | Ctenotus labillardieri | | Y | N | | | | |
| | | Ctenotus leonhardii | | Y | Y | | | + | stable |
| | | Ctenotus mimetes | | Y | Y | | | + | stable |
| | | Ctenotus pantherinus | | Y | N | | | | |
| | | Ctenotus pantherinus ocellifer | | N | Y | | | + | stable |
| | | Ctenotus pantherinus pantherinus | | N | Y | | + | | dec |
| | | Ctenotus schomburgkii | | Y | Y | | + | + | dec |
| | | Ctenotus severus | | Y | N | | | | |
| | | Ctenotus uber | | Y | Y | | | + | stable |
| | | Ctenotus xenopleura | | Y | Y | ? | ? | ? | ? |
| | | Cyclodomorphus melanops | | Y | N | | | | |
| | | Egernia carinata | | N | Y | | + | | dec |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Egernia depressa | | Y | Y | | | + | stable |
| | | Egernia formosa | | Y | Y | | | + | stable |
| | | Egernia inornata | | Y | Y | | | + | dec |
| | | Egernia kingii | King's Skink | Y | Y | + | | | dec |
| | | Egernia multiscutata | | Y | Y | | + | | dec |
| | | Egernia napoleonis | | Y | N | | | | |
| | | Egernia pulchra | | Y | N | | | | |
| | | Egernia richardi | | Y | Y | ? | ? | ? | ? |
| | | Egernia stokesii | | Y | Y | | | + | dec |
| | | Eremiascincus richardsonii | | Y | Y | | + | + | dec |
| | | Hemiergis initialis | | Y | Y | + | + | + | dec |
| | | Hemiergis millewae | | N | Y | | | + | ? |
| | | Hemiergis peronii | | Y | Y | + | | | dec |
| | | Hemiergis quadrilineata | | Y | N | | | | |
| | | Lerista christinae | | Y | N | | | | |
| | | Lerista distinguenda | | Y | Y | + | | | dec |
| | | Lerista elegans | | Y | N | | | | |
| | | Lerista gerrardii | | Y | Y | | + | + | dec |
| | | Lerista lineopunctulata | | Y | N | | | | |
| | | Lerista macropisthopus | | Y | Y | | | + | stable |
| | | Lerista muelleri | | N | Y | | | + | stable |
| | | Lerista picturata | | Y | Y | | | + | stable |
| | | Lerista praepedita | | Y | N | | | | |
| | | Menetia greyii | Dwarf Skink | Y | Y | + | + | + | inc? |
| | | Morethia adelaidensis | | N | Y | | | + | stable |
| | | Morethia butleri | | Y | Y | | | + | stable |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Morethia lineoocellata | | Y | N | | | | |
| | | Morethia obscura | Dusky Morethia | Y | Y | | + | | dec |
| | | Tiliqua occipitalis | Western Bluetongue | Y | Y | + | + | + | ? |
| | | Tiliqua rugosa | Bobtail | Y | Y | + | + | + | dec |
| | | Tympanocryptis cephala | Earless Pebble Dragon | N | Y | | | + | stable |
| **Varanidae** | monitor lizards | Varanus caudolineatus | | Y | N | | | | |
| | | Varanus giganteus | | Y | N | | | | |
| | | Varanus gouldii | Gould's Sand Goanna | Y | Y | + | + | + | dec |
| | | Varanus rosenbergi | Rosenberg's Goanna | Y | Y | + | | | dec |
| | | Varanus tristis | Black-tailed Tree Goanna | Y | Y | | + | + | dec |
| **Cheluidae** | side-necked turtles | Chelodina oblonga | Long-necked Tortoise | Y | Y | + | | | dec |
| | | Pseudemydura umbrina | Western Swamp Tortoise | Y | N | | | | |
| **Boidae** | pythons | Antaresia stimsoni | Stimson`s python | Y | Y | | + | | dec |
| | | Aspidites ramsayi | Ramsay`s python or woma | Y | Y | | + | | dec* |
| | | Morelia spilota | Carpet python | Y | N | | | | |
| | | Morelia spilota imbricata | Carpet Python | N | Y | + | + | | dec* |
| **Elapidae** | front-fanged snakes | Acanthophis antarcticus | Southern death-adder | Y | Y | + | | | dec |
| | | Brachyurophis fasciolata | Narrow Banded Snake | Y | Y | | | + | dec |
| | | Brachyurophis semifasciata | Southern shovel-nosed snake | Y | Y | | + | + | dec |
| | | Demansia psammophis | Yellow-faced whipsnake | Y | Y | | + | | dec |
| | | Denisonia fasciata | Rosen's Snake | N | Y | | + | + | dec |
| | | Drysdalia coronatus | Crowned Snake | N | Y | + | | | dec |
| | | Echiopsis curta | Bardick | Y | N | | | | |
| | | Echiopsis curtus | Bardick | N | Y | + | | | dec |
| | | Elapognathus coronatus | Crowned snake | Y | N | | | | |
| | | Furina ornata | Moon Snake | Y | Y | | | + | stable |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Neelaps bimaculatus | Black-naped snake | Y | Y | | | | |
| | | Neelaps calonotos | Black-striped snake | Y | Y | ? | | | dec |
| | | Notechis scutatus | Tiger snake | Y | Y | + | | | dec |
| | | Parasuta gouldii | Gould`s snake | Y | Y | + | + | | dec |
| | | Parasuta monachus | Monk snake | Y | Y | | | + | stable |
| | | Parasuta nigriceps | Black-backed snake | Y | Y | + | | | stable |
| | | Paroplocephalus atriceps | | Y | N | | | | |
| | | Pseudechis australis | Mulga Snake | Y | Y | | + | + | dec |
| | | Pseudonaja affinis | Dugite | Y | Y | + | | | inc? |
| | | Pseudonaja modesta | | Y | Y | | + | + | dec |
| | | Pseudonaja nuchalis | Gwardar | Y | Y | | + | + | inc? |
| | | Simoselaps bertholdi | Jan's Bandy-Bandy | Y | Y | | + | + | dec |
| | | Suta fasciata | | Y | N | | | | |
| | | Suta punctata | Spotted Snake | N | Y | | | ? | ? |
| **Typhlopidae** | blind snakes | Ramphotyphlops australis | | Y | Y | + | + | + | dec |
| | | Ramphotyphlops bicolor | | Y | N | | | | |
| | | Ramphotyphlops bituberculatus | | Y | Y | | | + | stable |
| | | Ramphotyphlops hamatus | | Y | Y | | | + | stable |
| | | Ramphotyphlops pinguis | | Y | Y | + | | | dec |
| | | Ramphotyphlops waitii | | Y | Y | | + | | dec |

**Table A5.2:** The mammals of the ANRMR.

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Tachyglossidae** | echidnas | Tachyglossus aculeatus | Echidna | Y | Y | + | + | + | dec |
| **Burramyidae** | pygmy possums | Cercartetus concinnus | Western Pygmy Possum | N | Y | + | + | + | dec * |
| **Dasyuridae** | quolls and allies | Antechinomys laniger | Kultarr | Y | Y | | | + | dec |
| | | Antechinus flavipes | Yellow-footed Antechinus, Mardo | Y | Y | + | | | dec* |
| | | Dasyurus geoffroii | Western Quoll, Chuditch | Y | Y | + | + | + | dec |
| | | Ningaui ridei | Wongai Ningaui | Y | Y | | | + | stable |
| | | Ningaui yvonneae | Southern Ningaui | Y | Y | | | + | stable |
| | | Parantechinus apicalis | Dibbler | N | N | | | | |
| | | Phascogale calura | Red-tailed Phascogale | Y | Y | | + | | dec * |
| | | Phascogale tapoatafa | Southern Brush-tailed Phascogale | Y | Y | + | | | dec* |
| | | Pseudantechinus woolleyae | Woolley`s Pseudantechinus | Y | N | | | | |
| | | Sminthopsis crassicaudata | Fat-tailed Dunnart | Y | Y | | + | + | inc |
| | | Sminthopsis dolichura | Little Long-tailed Dunnart | Y | Y | + | + | | dec* |
| | | Sminthopsis gilberti | Gilbert`s Dunnart | Y | Y | | + | | dec* |
| | | Sminthopsis granulipes | White-tailed Dunnart | Y | Y | | + | | dec* |
| | | Sminthopsis griseoventer | Grey-bellied Dunnart | Y | Y | + | | | dec* |
| | | Sminthopsis hirtipes | Hairy-footed Dunnart | Y | Y | | | + | stable |
| | | Sminthopsis ooldea | Ooldea Dunnart | N | Y | | | + | stable |
| **Macropodidae** | kangaroos and allies | Lagostrophus fasciatus | Banded Hare-wallaby | Y | Y | | + | | loc Ex |
| | | Macropus eugenii | Tammar | Y | Y | + | | | dec |
| | | Macropus fuliginosus | Western Grey Kangaroo | Y | Y | + | + | + | inc |
| | | Macropus irma | Western Brush Wallaby | Y | Y | + | | | dec |
| | | Macropus robustus | Euro, Biggada | Y | Y | | + | + | inc |
| | | Macropus rufus | Red Kangaroo, Marlu | Y | Y | | | + | stable |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Petrogale lateralis | Rock-wallaby | Y | Y | | + | + | dec |
| | | Lagorchestes hirsutus | Mala Rufous Hare-Wallaby | N | Y | | + | + | loc Ex |
| | | Onychogalea lunata | Crescent Nailtail Wallaby | N | Y | | + | + | Ext |
| | | Setonix brachyurus | Quokka | N | Y | + | | | loc Ex |
| **Myrmecobiidae** | numbat | Myrmecobius fasciatus | numbat, Walpurti | Y | Y | + | + | + | dec |
| **Peramelidae** | bandicoots | Chaeropus ecaudatus | Pig-footed Bandicoot | N | Y | | + | + | Ext |
| | | Perameles bougainville | Western Barred Bandicoot | N | Y | | + | + | loc Ex |
| **Phalangeridae** | brushtail possums | Trichosurus vulpecula | Brushtail Possum | Y | Y | + | + | + | dec |
| **Potoroidae** | bettongs and potoroos | Bettongia lesueur | Burrowing Bettong, Boodie | Y | Y | + | + | + | loc Ex |
| | | Bettongia penicillata | Brush-tailed Bettong, Woylie | Y | Y | + | + | | loc Ex |
| | | Potorous platyops | Broad- faced Potoroo | N | Y | | + | | Ext |
| **Pseudocheiridae** | ring-tailed possums | Pseudocheirus occidentalis | Western Ring-tailed Possum | N | Y | + | | | loc Ex |
| **Tarsipedidae** | honey possums | Tarsipes rostratus | Honey Possum, Noolbenger | Y | Y | + | + | | dec * |
| **Peramelidae** | bandicoots | Isoodon obesulus | Southern Brown Bandicoot, Quenda | Y | Y | + | + | | dec |
| **Thylacomyidae** | bilbies | Macrotis lagotis | Bilby, Dalgyte | Y | Y | + | + | + | loc Ex |
| **Bovidae** | horned ruminants | Bos taurus | European Cattle | Y | N | | | | |
| | | Capra hircus | Feral Goat | N | Y | | | + | inc |
| **Canidae** | dogs and foxes | Vulpes vulpes | Red Fox | Y | Y | + | + | + | inc |
| | | Canis lupus dingo | Dingo | N | Y | + | + | + | loc Ex |
| **Equidae** | horses | Equus caballus | Horse | Y | N | | | | |
| **Felidae** | cat family | Felis catus | Cat | Y | Y | + | + | + | inc |
| **Leporidae** | rabbits | Oryctolagus cuniculus | Rabbit | Y | Y | + | + | + | inc |
| **Molossidae** | free-tailed bats | Mormopterus planiceps | Southern Freetail-bat | Y | Y | + | + | + | dec |
| | | Tadarida Australis | White-striped Freetail-bat | Y | N | | | | |
| | | Nyctinomus australis | White-striped Bat | N | Y | + | + | + | dec |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Muridae** | mice and rats | Hydromys chrysogaster | Water-rat | Y | Y | + | + | | dec |
| | | Leporillus apicalis | Lesser Stick-nest Rat | Y | N | | | | |
| | | Mus musculus | House Mouse | Y | Y | + | + | + | inc |
| | | Notomys alexis | Spinifex Hopping-mouse | Y | Y | | | + | stable |
| | | Notomys mitchellii | Mitchell`s Hopping-mouse | Y | Y | | + | + | dec |
| | | Pseudomys albocinereus | Ash-grey Mouse | Y | Y | | + | | dec |
| | | Pseudomys bolami | Bolam`s Mouse | Y | Y | | | +. | stable |
| | | Pseudomys hermannsburgensis | Sandy Inland Mouse | Y | Y | | | + | stable |
| | | Pseudomys occidentalis | Western Mouse | Y | Y | | + | | dec |
| | | Pseudomys shortridgei | Heath Rat | Y | Y | | + | | dec |
| | | Rattus fuscipes | Western Bush Rat | Y | N | | | | |
| | | Rattus rattus | Black Rat | Y | Y | + | + | | inc |
| | | Leporillus conditor | Wopilkara or Great Stick-nest Rat | N | Y | | | + | loc Ex |
| | | Notomys longicaudatus | Koolawa or Longtailed hopping mouse | N | Y | | ? | | Ext |
| | | Notomys macrotis | Noompa or Big-eared Hopping-Mouse | N | Y | | ? | | Ext |
| **Pteropodidae** | fruit bats | Pteropus scapulatus | Little Red Flying-fox | N | Y | ? | ? | ? | vagrant |
| **Vespertilionidae** | evening bats | Chalinolobus gouldii | Gould`s Wattled Bat | Y | Y | + | + | + | dec |
| | | Chalinolobus morio | Chocolate Wattled Bat | Y | Y | + | + | | dec |
| | | Nyctophilus timoriensis | Greater Long-eared Bat | Y | Y | + | + | | dec |
| | | Scotorepens balstoni | Inland Broad-nosed Bat | Y | Y | | | + | dec |
| | | Vespadelus baverstocki | Inland Forest Bat | Y | N | | | | |
| | | Vespadelus regulus | Southern Forest Bat | Y | N | | | | |
| | | Falsistrellus mackenziei | | N | Y | + | | | dec |
| | | Nyctophilus geoffroyi | Lesser Long-eared Bat | Y | Y | + | + | + | dec |
| | | Nyctophilus gouldii | Gould's Long-eared Bat | Y | Y | + | | | dec |
| | | Scotorepens greyii | Little Broad-nosed Bat | N | Y | | | + | dec |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Vespedalus regulus | King River Eptesicus | N | Y | + | + | | dec |

**Table A5.3:** The birds of the ANRMR.
Family order was derived from Birds Australia (2003).

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Casuariidae** | emus | Dromaius novaehollandiae | Emu | Y | Y | + | + | + | dec |
| **Megapodiidae** | mound-builders | Leipoa ocellata | Malleefowl | Y | Y | + | + | + | dec* |
| **Phasianidae** | quails | Coturnix pectoralis | Stubble Quail | Y | Y | + | + | | inc |
| | | Coturnix ypsilophora | Brown Quail | Y | Y | + | | | dec |
| **Anatidae** | ducks, geese and swans | Anas superciliosa | Pacific Black Duck | Y | N | | | | |
| | | Biziura lobata | Musk Duck | Y | Y | + | | | dec |
| | | Cygnus atratus | Black Swan | Y | Y | + | + | | inc |
| | | Cygnus olor | Mute Swan | Y | Y | + | | | inc |
| | | Malacorhynchus membranaceus | Pink-eared Duck | Y | Y | + | + | + | stable |
| | | Anas castanea | Chestnut Teal | N | Y | + | + | | dec |
| | | Anas gibberifrons | Grey Teal | N | Y | + | + | + | stable |
| | | Anas platyrhynchos | Mallard | N | Y | + | | | inc |
| | | Anas rhynchotis | Australasian Shoveler | N | Y | + | | | dec |
| | | Anas superciliosus | Pacific Black Duck | N | Y | + | + | | stable |
| | | Aythya australis | Hardhead (White-eyed Duck) | N | Y | + | | | dec |
| | | Chenonetta jubata | Australian Wood Duck | N | Y | + | + | | inc |
| | | Oxyura australis | Blue-billed Duck | N | Y | + | | | dec |
| | | Tadorna tadornoides | Australian Shelduck | N | Y | + | + | + | inc |
| **Podicipedidae** | grebes | Podiceps cristatus | Great Crested Grebe | N | Y | + | | | dec |
| | | Tachybaptus novaehollandiae | Australasian Grebe | N | Y | + | + | + | dec |
| | | Poliocephalus poliocephalus | Hoary-headed Grebe | Y | Y | + | + | + | inc |
| **Anhingidae** | darters | Anhinga melanogaster | Darter | N | Y | + | | | stable |
| **Phalacrocoracidae** | cormorants | Phalacrocorax melanoleucos | Little Pied Cormorant | Y | Y | + | + | | stable |
| | | Phalacrocorax carbo | Great Cormorant | N | Y | + | | | stable |
| | | Phalacrocorax sulcirostris | Little Black Cormorant | N | Y | + | | | stable |
| | | Phalacrocorax varius | Pied Cormorant | N | Y | + | | | vagrant |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Pelecanidae** | pelicans | Pelecanus conspicillatus | Australian Pelican | N | Y | + | | | vagrant |
| **Ardeidae** | herons and egrets | Ardea alba | Great Egret | Y | N | | | | |
| | | Ardea novaehollandiae | White-faced Heron | Y | N | | | | |
| | | Ardea pacifica | White-necked Heron | Y | Y | + | | | inc |
| | | Botaurus poiciloptilus | Australasian Bittern | Y | N | | | | |
| | | Ixobrychus minutus | Little Bittern | Y | N | | | | |
| | | Nycticorax caledonicus | Rufous Night Heron | Y | Y | + | | | ? |
| | | Dupetor flavicollis | Black Bittern | N | Y | + | | | dec |
| | | Egretta alba | Great Egret | N | Y | + | | | inc |
| | | Egretta garzetta | Little Egret | N | Y | + | | | vagrant |
| | | Egretta novaehollandiae | White-faced Heron | N | Y | + | + | + | inc |
| **Plataleidae** | ibis and spoonbills | Platalea flavipes | Yellow-billed Spoonbill | N | Y | + | | | inc |
| | | Threskiornis molucca | Australian White Ibis | N | Y | + | | | inc |
| **Threskiornithidae** | ibises and spoonbills | Plegadis falcinellus | Glossy Ibis | Y | N | | | | |
| | | Threskiornis spinicollis | Straw-necked Ibis | Y | Y | + | | | inc |
| **Accipitridae** | kites, hawks and eagles | Accipiter cirrhocephalus | Collared Sparrowhawk | Y | Y | + | + | + | dec |
| | | Accipiter fasciatus | Brown Goshawk | Y | Y | + | + | | dec |
| | | Aquila audax | Wedge-tailed Eagle | Y | Y | + | + | + | ? |
| | | Aquila morphnoides | Little Eagle | Y | N | | | | |
| | | Circus assimilis | Spotted Harrier | N | Y | + | + | + | ? |
| | | Elanus caeruleus | Black-shouldered Kite | Y | N | | | | |
| | | Elanus notatus | Black-shouldered Kite | N | Y | + | + | | inc |
| | | Haliastur sphenurus | Whistling Kite | Y | Y | + | + | + | ? |
| | | Hamirostra isura | Square-tailed Kite | Y | N | | | | |
| | | Hamirostra melanosternon | Black-breasted Buzzard | Y | N | | | | |
| | | Hieraaetus morphnoides | Little Eagle | N | Y | + | + | | ? |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Lophoictinia isura | Square-tailed Kite | N | Y | + | + | | dec |
| | | Circus approximans | Swamp Harrier | N | Y | + | + | | ? |
| **Falconidae** | falcons | Falco berigora | | Y | Y | + | + | + | inc |
| | | Falco cenchroides | | Y | Y | + | + | + | inc |
| | | Falco longipennis | Australian Hobby | Y | Y | + | + | | ? |
| | | Falco peregrinus | Peregrine Falcon | Y | Y | + | + | | ? |
| | | Falco hypoleucos | Grey Falcon | N | Y | | | ? | ? |
| **Rallidae** | crakes and rails | Gallinula ventralis | Black-tailed Native-hen | Y | Y | | + | + | stable |
| | | Gallirallus philippensis | Buff-banded Rail | Y | N | | | | |
| | | Porzana fluminea | Australian Spotted Crake | Y | Y | + | | | ? |
| | | Porzana Pusilla | Baillon`s Crake | Y | Y | + | | | ? |
| | | Fulica atra | Eurasian Coot | N | Y | + | + | | ? |
| | | Gallinula tenebrosa | Dusky Moorhen | N | Y | + | | | dec |
| | | Porphyria porphyrio | Purple Swamphen | N | Y | + | | | dec |
| | | Porzana tabuensis | Spotless Crake | N | Y | + | + | | ? |
| | | Rallus philippensis | Buff-banded Rail | N | Y | + | | | ? |
| **Otididae** | bustards | Ardeotis australis | Australian Bustard | N | Y | | + | + | dec |
| **Turnicidae** | button-quails | Turnix varia | Painted Button-quail | Y | Y | + | + | | dec |
| | | Turnix velox | Little Button-quail | Y | Y | | + | + | ? |
| **Scolopacidae** | sandpipers | Calidris acuminata | Sharp-tailed Sandpiper | Y | Y | + | + | | inc |
| | | Calidris subminuta | Long-toed Stint | Y | N | | | | |
| | | Calidris ruficollis | Red-necked Stint | N | Y | + | + | | inc |
| | | Tringa glareola | Wood Sandpiper | N | Y | + | | | ? |
| | | Tringa hypoleucos | Common Sandpiper | N | Y | + | + | | inc |
| | | Tringa nebularia | Common Greenshank | N | Y | + | + | + | inc |
| | | Tringa stagnatalis | Marsh Sandpiper | N | Y | + | | | stable |
| **Burhinidae** | stone-curlews | Burhinus grallarius | Bush Stone-curlew | Y | Y | + | + | + | dec* |
| **Recurvirostridae** | stilts and | Cladorhynchus leucocephalus | Banded Stilt | Y | Y | + | + | + | inc |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | avocets | | | | | | | | |
| | | Himantopus himantopus | Black-winged Stilt | Y | N | | | | |
| | | Recurvirostra novaehollandiae | Red-necked Avocet | Y | Y | + | + | | inc |
| | | Himantopus himantopus | Black-winged Stilt | N | Y | + | + | | inc |
| **Charadriidae** | lapwings and plovers | Charadrius melanops | Black-fronted Dotterel | Y | N | | | | |
| | | Charadrius rubricollis | Hooded Plover | Y | N | | | | |
| | | Charadrius ruficapillus | Red-capped Plover | Y | Y | + | + | | inc |
| | | Erythrogonys cinctus | Red-kneed Dotterel | Y | Y | | + | + | inc |
| | | Peltohyas Australis | Inland Dotterel | Y | N | | | | |
| | | Vanellus tricolor | Banded Lapwing | Y | Y | + | + | + | inc |
| | | Charadrius australis | Inland Dotterel | N | Y | | + | + | ? |
| | | Elseyornis melanops | Black- Fronted Dotterel | N | Y | + | + | + | inc |
| | | Thinornis rubricollis | Hooded Plover | N | Y | | + | + | stable |
| **Laridae** | gulls and terns | Larus novaehollandiae | Silver Gull | Y | Y | + | + | | inc |
| | | Chlidonias hybrida | Whiskered Tern | N | Y | + | | | ? |
| **Columbidae** | doves and pigeons | Columba livia | Domestic Pigeon | Y | Y | + | + | | inc |
| | | Geopelia cuneata | Diamond Dove | Y | Y | | | + | stable |
| | | Phaps chalcoptera | Common Bronzewing | Y | Y | + | + | + | dec |
| | | Streptopelia senegalensis | Laughing Turtle-Dove | Y | Y | + | + | | inc |
| | | Ocyphaps lophotes | Crested Pigeon | N | Y | + | + | + | inc |
| | | Streptopelia chinensis | Spotted Turtle-Dove | N | Y | + | | | inc |
| **Cacatuidae** | cockatoos | Calyptorhynchus latirostris | Short-billed Black-Cockatoo | N | Y | + | + | | dec* |
| **Psittacidae** | lorikeets and parrots | Cacatua galerita | Sulphur-crested Cockatoo | Y | N | | | | |
| | | Cacatua leadbeateri | Major Mitchell`s Cockatoo | Y | Y | | + | + | dec |
| | | Cacatua pastinator | Western Long-billed Corella | Y | Y | | + | | inc |
| | | Cacatua roseicapilla | Galah | Y | Y | + | + | + | inc |
| | | Cacatua sanguinea | Little Corella | Y | Y | | + | + | inc |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Calyptorhynchus banksii | Red-tailed Black Cockatoo | Y | Y | + | + | | inc |
| | | Calyptorhynchus baudinii | Baudin`s Cockatoo | Y | Y | + | | | dec |
| | | Glossopsitta porphyrocephala | Purple-crowned Lorikeet | Y | Y | + | + | | dec |
| | | Melopsittacus undulatus | Budgerigar | Y | Y | | | + | stable |
| | | Neophema bourkii | Bourke`s Parrot | Y | N | | | | |
| | | Neophema elegans | Elegant Parrot | Y | Y | + | + | | ? |
| | | Nymphicus hollandicus | Cockatiel | Y | Y | | + | + | ? |
| | | Pezoporus wallicus flaviventrus | Western Ground Parrot | N | N-buffer | | | | |
| | | Platycercus icterotis | Western Rosella | Y | Y | + | + | | dec |
| | | Platycercus spurius | Red-capped Parrot | Y | N | | | | |
| | | Platycercus varius | Mulga Parrot | Y | N | | | | |
| | | Platycercus zonarius | Australian Ringneck (Ring-necked Parrot) | Y | N | | | | |
| | | Polytelis anthopeplus | Regent Parrot | Y | Y | + | + | | dec |
| | | Barnardius zonarius | Australian Ringneck | N | Y | + | + | + | inc |
| | | Psephotus varius | Mulga Parrot | N | Y | | + | + | ? |
| | | Purpureicephalus spurius | Red-capped Parrot | N | Y | + | | | dec |
| **Cuculidae** | cuckoos | Cacomantis flabelliformis | Fan-tailed Cuckoo | Y | N | | | | |
| | | Chrysococcyx basalis | Horsfield`s Bronze Cuckoo | Y | Y | + | + | | ? |
| | | Chrysococcyx lucidus | Shining Bronze Cuckoo | Y | Y | + | + | | dec |
| | | Chrysococcyx osculans | Black-eared Cuckoo | Y | Y | | | + | dec |
| | | Cuculus pallidus | Pallid Cuckoo | Y | Y | + | + | + | ? |
| | | Cuculus pyrrhophanus | Fan-tailed Cuckoo | N | Y | + | + | | dec |
| **Strigidae** | hawk-owls | Ninox novaeseelandiae | Boobook Owl | Y | Y | + | + | + | ? |
| | | Ninox connivens | Barking Owl | N | Y | + | + | | dec |
| **Tytonidae** | barn owls | Tyto alba | Barn Owl | Y | Y | + | + | | inc |
| **Podargidae** | frogmouths | Podargus strigoides | Tawny Frogmouth | Y | Y | + | + | + | dec |
| **Caprimulgidae** | owlet-night jars | Eurostopodus argus | Spotted Nightjar | Y | Y | | + | + | ? |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Aegothelidae** | owlet-night jars | Aegotheles cristatus | Australian Owlet-nightjar | Y | Y | + | + | + | dec |
| **Apodidae** | swifts | Apus pacificus | Fork-tailed Swift | N | Y | + | + | | stable |
| **Halcyonidae** | forest kingfishers | Todiramphus pyrrhopygia | Red-backed Kingfisher | Y | Y | | | + | stable |
| | | Todiramphus sanctus | Sacred Kingfisher | Y | Y | + | + | | dec |
| | | Dacelo novaeguineae | Laughing Kookaburra | N | Y | + | | | inc |
| **Meropodidae** | bee-eaters | Merops ornatus | Rainbow Bee-eater | Y | Y | + | + | + | stable |
| **Climacteridae** | treecreepers | Climacteris rufa | Rufous Treecreeper | Y | Y | + | + | | dec* |
| | | Climacteris affinis | White-browed Treecreeper | N | Y | | | + | stable |
| **Maluridae** | fairy-wrens | Amytornis textilis | Thick-billed Grasswren | Y | Y | | + | + | loc Ex |
| | | Malurus lamberti | Variegated Fairy-wren | Y | Y | | + | + | dec* |
| | | Malurus leucopterus | White-winged Fairy-wren | Y | Y | | + | + | dec* |
| | | Malurus pulcherrimus | Blue-breasted Fairy-wren | Y | Y | + | + | | dec* |
| | | Malurus lamberti | Variegated Fairy-wren | Y | N | | | | |
| | | Malurus leucopterus | White-winged Fairy-wren | Y | N | | | | |
| | | Malurus pulcherrimus | Blue-breasted Fairy-wren | Y | N | | | | |
| | | Malurus splendens | Splendid Fairy-wren | Y | Y | + | + | + | dec* |
| | | Stipiturus malachurus | Southern Emu-wren | N | Y | + | | | dec* |
| **Acanthizidae** | Australian warblers | Acanthiza apicalis | Broad-tailed Thornbill (Inland Thornbill) | Y | Y | + | + | + | dec* |
| | | Acanthiza chrysorrhoa | Yellow-rumped Thornbill | Y | Y | + | + | + | dec |
| | | Acanthiza robustirostris | Slaty-backed Thornbill | Y | N | | | | |
| | | Acanthiza uropygialis | Chestnut-rumped Thornbill | Y | Y | | + | + | dec* |
| | | Aphelocephala leucopsis | Southern Whiteface | Y | Y | | | + | stable |
| | | Calamanthus campestris | Rufous Fieldwren | Y | N | | | | |
| | | Gerygone fusca | Western Gerygone | Y | Y | + | + | | dec* |
| | | Hylacola cauta | Shy Groundwren (Shy Heathwren) | Y | Y | | + | | dec* |
| | | Pyrrholaemus brunneus | Redthroat | Y | N | | | | |
| | | Sericornis frontalis | White-browed Scrubwren | Y | Y | + | + | | dec* |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Smicrornis brevirostris | Weebill | Y | Y | + | + | + | dec* |
| **Pardalotidae** | pardalotes | Pardalotus punctatus | Spotted Pardalote | Y | Y | + | | | dec* |
| | | Dasyornis longirostris | Western Bristlebird | N | N -buffer | | | | |
| | | Pardalotus striatus | Striated Pardalote | Y | Y | + | + | + | dec* |
| | | Acanthiza inornata | Western Thornbill | N | Y | + | + | | dec* |
| | | Sericornis brunneus | Redthroat | N | Y | | + | + | dec* |
| | | Sericornis campestris | Rufous Fieldwren | N | Y | + | + | | dec* |
| **Meliphagidae** | honeyeaters | Acanthagenys rufogularis | Spiny-cheeked Honeyeater | Y | Y | | + | + | dec* |
| | | Acanthorhynchus superciliosus | Western Spinebill | Y | Y | + | | | dec* |
| | | Anthochaera carunculata | Red Wattlebird | Y | Y | + | + | + | dec* |
| | | Epthianura albifrons | White-fronted Chat | Y | Y | + | + | | inc |
| | | Epthianura tricolor | Crimson Chat | Y | Y | | + | + | stable |
| | | Lichenostomus cratitius | Purple-gaped Honeyeater | Y | Y | | + | | dec* |
| | | Lichenostomus leucotis | White-eared Honeyeater | Y | Y | | + | | dec* |
| | | Lichenostomus ornatus | Yellow-plumed Honeyeater | Y | Y | | + | | dec* |
| | | Lichenostomus plumulus | Grey-fronted Honeyeater | Y | Y | | | + | stable |
| | | Lichenostomus virescens | Singing Honeyeater | Y | Y | + | + | + | dec* |
| | | Lichmera indistincta | Brown Honeyeater | Y | Y | + | + | + | dec* |
| | | Manorina flavigula | Yellow-throated Miner | Y | Y | + | + | + | inc |
| | | Melithreptus brevirostris | Brown-headed Honeyeater | Y | Y | + | + | | dec* |
| | | Melithreptus chloropsis | Western White-naped Honeyeater | Y | N | | | | |
| | | Phylidonyris albifrons | White-fronted Honeyeater | Y | Y | | + | + | dec* |
| | | Phylidonyris melanops | Tawny-crowned Honeyeater | Y | Y | + | + | | dec* |
| | | Phylidonyris nigra | White-cheeked Honeyeater | Y | Y | + | + | | dec* |
| | | Phylidonyris novaehollandiae | New Holland Honeyeater | Y | Y | + | | | dec* |
| | | Anthochaera chrysoptera | Little Wattlebird | N | Y | + | + | | dec* |
| | | Certhionyx niger | Black Honeyeater | N | Y | | | + | stable |
| | | Certhionyx variegatus | Pied Honeyeater | N | Y | | | + | stable |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | | Lichenostomus leucotis | White-eared Honeyeater | Y | Y | | + | | dec* |
| | | Melithreptus lunatus | White-naped Honeyeater | N | Y | + | | | dec* |
| **Petroicidae** | Australian robins | Drymodes brunneopygia | Southern Scrub-robin | Y | Y | | + | | dec* |
| | | Eopsaltria Australis | Yellow Robin | Y | N | | | | |
| | | Eopsaltria georgiana | White-breasted Robin | Y | N | | | | |
| | | Eopsaltria griseogularis | Western Yellow Robin | N | Y | | + | | dec* |
| | | Melanodryas cucullata | Hooded Robin | N | Y | | + | + | dec* |
| | | Microeca fascinans | Jacky Winter | Y | N | | | | |
| | | Microeca leucophaea | Jacky Winter | N | Y | + | + | | dec* |
| | | Petroica cucullata | Hooded Robin | Y | N | | | | |
| | | Petroica goodenovii | Red-capped Robin | Y | Y | | + | + | dec* |
| | | Petroica multicolor | Scarlet Robin | Y | Y | + | | | dec* |
| **Pomatostomidae** | Australian babblers | Pomatostomus superciliosus | White-browed Babbler | Y | Y | + | + | | dec* |
| **Cinclosomatidae** | quail-thrushes and allies | Cinclosoma castanotus | Chestnut Quail-thrush | Y | N | | | | |
| | | Psophodes nigrogularis | Western Whipbird | Y | Y | + | | | loc Ex |
| | | Cinclosoma castanotum | Chestnut Quail-thrush | N | Y | | | + | dec* |
| **Neosittidae** | sittellas | Daphoenositta chrysoptera | Varied Sittella | Y | Y | + | + | + | dec* |
| **Pachycephalidae** | whistlers | Colluricincla harmonica | Grey Shrike-thrush | Y | Y | + | + | + | dec* |
| | | Oreoica gutturalis | Crested Bellbird | Y | Y | | + | + | dec* |
| | | Pachycephala inornata | Gilbert`s Whistler | Y | Y | | + | + | dec* |
| | | Pachycephala pectoralis | Golden Whistler | Y | Y | + | + | | dec* |
| | | Pachycephala rufiventris | Rufous Whistler | Y | Y | + | + | + | dec* |
| | | F Falcunculus frontatus | Crested Shrike-tit | N | Y | + | + | | dec* |
| **Dicruridae** | flycatchers | Grallina cyanoleuca | Magpie-lark | Y | Y | + | + | + | ? |
| | | Myiagra inquieta | Restless Flycatcher | Y | Y | + | + | | dec* |
| | | Rhipidura fuliginosa | Grey Fantail | Y | Y | + | + | | dec* |
| | | Rhipidura leucophrys | Willie Wagtail | Y | Y | + | + | + | inc |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Campephagidae** | cuckoo-shrikes | Coracina novaehollandiae | Black-faced Cuckoo-shrike | Y | Y | + | + | + | ? |
| | | Lalage tricolor | White-winged Triller | Y | N | | | | |
| | | Coracina maxima | Ground Cuckoo-shrike | N | Y | | + | + | dec* |
| | | Lalage sueurii | White-winged Triller | N | Y | + | + | + | dec* |
| **Artamidae** | woodswallows | Artamus cinereus | Black-faced Woodswallow | Y | Y | + | + | + | stable |
| | | Artamus cyanopterus | Dusky Woodswallow | Y | Y | + | + | | dec |
| | | Artamus minor | Little Woodswallow | Y | N | | | | |
| | | Artamus personatus | Masked Woodswallow | Y | Y | | | + | stable |
| | | Gymnorhina tibicen | Australian Magpie | N | Y | + | + | + | inc |
| **Cracticidae** | butcherbirds and relatives | Cracticus nigrogularis | Pied Butcherbird | Y | Y | | + | + | inc |
| | | Cracticus tibicen | Australian Magpie | Y | N | | | | |
| | | Cracticus torquatus | Grey Butcherbird | Y | Y | + | + | + | dec |
| | | Strepera versicolor | Grey Currawong | Y | Y | + | + | | dec |
| **Corvidae** | ravens and crows | Corvus bennetti | Little Crow | Y | Y | | | + | inc |
| | | Corvus coronoides | | Y | Y | + | + | | inc |
| | | Corvus orru | Torresian Crow | Y | N | | | | |
| | | Corvus splendens | House Crow | Y | N | | | | |
| **Motacillidae** | pipits | Anthus Australis | Australian Pipit | Y | N | | | | |
| | | Anthus novaeseelandiae | Richard's Pipit | N | Y | + | + | | inc |
| **Passeridae** | finches and allies | Stagonopleura oculata | Red-eared Firetail | Y | N | | | | |
| | | Taeniopygia guttata | Zebra Finch | Y | Y | | + | + | inc |
| **Dicaeidae** | flower-peckers | Dicaeum hirundinaceum | Mistletoebird | Y | Y | + | + | + | dec |
| **Hirundinidae** | swallows | Cheramoeca leucosternus | White-backed Swallow | Y | Y | | + | + | ? |
| | | Hirundo neoxena | Welcome Swallow | Y | Y | + | + | + | inc |
| | | Hirundo nigricans | Tree Martin | Y | Y | + | + | + | ? |
| | | Hirundo ariel | Fairy Martin | N | Y | | + | + | ? |
| **Sylviidae** | Old World | Cincloramphus cruralis | Brown Songlark | Y | Y | + | + | + | inc |

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/ Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| | warblers | | | | | | | | |
| | | Cincloramphus mathewsi | Rufous Songlark | Y | Y | + | + | + | inc |
| | | Megalurus gramineus | Little Grassbird | N | Y | + | | | dec |
| | | Acrocephalus stentoreus | Clamorous Reed-Warbler | N | Y | + | | | dec |
| | | Cincloramphus cruralis | Brown Songlark | Y | Y | + | + | + | inc |
| **Zosteropidae** | white-eyes | Zosterops lateralis | Grey-breasted White-eye (Silvereye) | Y | N | | | | |
| | | Zosterops lateralis | Silvereye | N | Y | + | + | | dec* |

**Table A5.4:** The frogs of the ANRMR.

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Hylidae** | tree frogs | Litoria adelaidensis | Slender Tree Frog | Y | Y | + | | | dec |
| | | Litoria cyclorhyncha | Spotted-thighed Frog | Y | N | | | | |
| | | Litoria moorei | Motorbike Frog or Bell Frog | Y | Y | + | | | dec |
| **Myobatrachidae** | ground frogs | Crinia georgiana | Quacking Frog | Y | Y | + | | | dec |
| | | Crinia glauerti | Glauert`s Froglet | Y | N | | | | |
| | | Crinia insignifera | Squelching Froglet | Y | N | | | | |
| | | Crinia pseudinsignifera | Bleating Froglet | Y | Y | + | + | | dec |
| | | Geocrinia leai | Lea`s Frog | Y | N | | | | |
| | | Heleioporus albopunctatus | Western Spotted Frog | Y | Y | + | + | | dec |
| | | Heleioporus barycragus | Western Marsh Frog | Y | Y | + | | | dec |
| | | Heleioporus eyrei | Moaning Frog | Y | Y | + | + | | dec |
| | | Heleioporus inornatus | Whooping Frog | Y | N | | | | |
| | | Heleioporus psammophilus | Sand Frog | Y | Y | + | | | dec |
| | | Limnodynastes dorsalis | Bullfrog or Banjo Frog | Y | Y | + | + | | dec |
| | | Myobatrachus gouldii | Turtle Frog | Y | Y | + | + | | dec |
| | | Neobatrachus albipes | White-footed Trilling Frog | Y | Y | | + | | dec |
| | | Neobatrachus kunapalari | Kunapalari Frog or Wheatbelt Frog | Y | Y | | + | + | dec |
| | | Neobatrachus pelobatoides | Humming Frog | Y | Y | + | + | | dec |
| | | Neobatrachus sutor | Shoemaker Frog | Y | Y | | | + | stable |
| | | Neobatrachus wilsmorei | Wilsmore`s Frog | Y | N | | | | |
| | | Pseudophryne guentheri | Crawling Frog or Günther`s Toadlet | Y | Y | + | + | | dec |
| | | Pseudophryne occidentalis | Western Toadlet | Y | Y | | + | + | dec |

**Table A5.5:** The fish of the ANRMR.

| Family | Family Common | Species | Common Name | Museum | Safstrom | Bass | Bass/Erem | Erem | Status |
|---|---|---|---|---|---|---|---|---|---|
| **Atherinidae** | hardyheads | Atherinosoma wallacei | Inland Water Silverside | Y | N | | | | |
| | | Leptatherina wallacei | Western Hardyhead | N | Y | + | + | | ? |
| **Cetorhinidae** | basking sharks | Cetorhinus maximus | Basking Shark | Y | N | | | | |
| **Cyprinidae** | minnows or carps | Carassius auratus | Goldfish | Y | N | | | | |
| | | Cyprinus carpio | Carp | Y | N | | | | |
| **Galaxiidae** | Australian minnows | Galaxias occidentalis | Western Minnow | Y | Y | + | | | dec |
| | | Galaxielia nigrostriata | Black-striped Minnow | N | Y | ? | | | ? |
| | | Galaxiella munda | Mud Minnow | Y | Y | ? | | | ? |
| **Geotriidae** | pouched lampreys | Geotria australis | Pouched Lamprey | N | Y | + | | | dec |
| **Gobiidae** | gobies | Afurcagobius suppositus | Big Headed Goby | Y | N | | | | |
| | | Pseudogobius olorum | Bluespot Goby/Swan River Goby | Y | Y | + | + | | ? |
| **Gonorynchidae** | beaked salmons | Gonorynchus greyi | Beaked Salmon | Y | N | | | | |
| **Nannopercidae** | pygmy-perches | Edelia vittata | Pygmy Perch | Y | Y | + | | | dec |
| **Ophichthidae** | snake and worm eels | Ophisurus serpens | Serpent Eel | Y | N | | | | |
| **Ostraciidae** | Cowfishes and trunkfishes | Aracana Aurita | Shaws Cowfish | Y | N | | | | |
| | | Lactoria concatenatus | Nil | Y | N | | | | |
| **Percichthyidae** | Australian perches | Bostockia porosa | Nightfish. | Y | Y | + | | | dec |
| **Percidae** | perches and true perches | Perca fluviatilis | Redfin Perch | Y | N | | | | |
| **Plotosidae** | eel-tailed catfish | Tandanus bostocki | Freshwater Cobbler | N | Y | + | | | dec |
| **Poeciliidae** | live-bearing tooth-carps | Gambusia affinis | Western Mosquitofish | Y | N | | | | |
| | live-bearing tooth-carps | Gambusia holbrooki | Mosquito Fish | N | Y | + | + | | inc |
| **Scorpaenidae** | scorpionfishes | Gymnapistes marmoratus | Cobbler | Y | N | | | | |
| **Sillaginidae** | whitings | Sillago schomburgkii | Yellowfin Whiting | Y | N | | | | |
| **Terapontidae** | grunters | Leiopotherapon unicolor | Spangled Perch | Y | N | | | | |

## Appendix 5.2 The Threatened and Priority Fauna of the ANRMR

**Table A5.6:** Threatened and Priority fauna species records from within the Avon NRM Region.
This species list has been derived from DEC's Threatened and Priority Fauna database (see Section 2.3.4). These data were reviewed (see Appendix 5.3 below) to determine which species are considered regionally extant and the table was attributed to reflect that discussion as well as current recovery/conservation activities.

| | | | Conservation Code | | | Range, extant in | | Current recovery Action[3] |
|---|---|---|---|---|---|---|---|---|
| Main Group | Common Name | Scientific name | WA | IUCN | C'wealth | ANRMR[1] | Buffer only | |
| Mammals | Big-eared Hopping Mouse (Noompa)[2] | *Notomys macrotis* | E | EX | EX | | 1 | |
| Mammals | Boodie (mainland) | *Bettongia lesueur graii* | E | EX | | | | |
| Mammals | Pig-footed Bandicoot (Kantjilpa) | *Chaeropus ecaudatus* | E | EX | EX | | | |
| Mammals | Long-tailed Hopping Mouse (Koolawa) | *Notomys longicaudatus* | E | EX | EX | | | |
| Mammals | Crescent Nailtail Wallaby | *Onychogalea lunata* | E | EX | EX | | | |
| Inverts | Bothriembryon praecelsus | *Bothriembryon praecelsus* | E | | | | | |
| Birds | Western Ground Parrot[2] | *Pezoporus wallicus flaviventrus* | T | CR | EN | | 1 | IRP |
| Reptiles | Western Swamp Tortoise | *Pseudemydura umbrina* | T | CR | EN | 1 | | RP |
| Inverts | Crystal Cave Crangonyctoid[2] | *Hurleya* sp (WAM642-97) | T | CR | | | 1 | |
| Inverts | Yorkrakine Trapdoor Spider | *Kwonkan eboracum* | T | CR | | 1 | | ACC |
| Inverts | Minnivale Trapdoor Spider | *Teyl* sp (BY Main 1953/2683, 1984/13) | T | CR | | 1 | | IRP; ACC |
| Birds | Baudin's Black-Cockatoo | *Calyptorhynchus baudinii* | T | EN | | 1 | | |
| Birds | Carnaby's Black-Cockatoo | *Calyptorhynchus latirostris* | T | EN | VU | 1 | | RP, ACC |
| Reptiles | Western Spiny-tailed Skink | *Egernia stokesii badia* | T | EN | EN | 1 | | |
| Inverts | Graceful Sunmoth[2] | *Synemon gratiosa* | T | EN | | | 1 | SCC |
| Inverts | Leioproctus douglasiellus | *Leioproctus douglasiellus* | T | EN | | 1 | | SCC |
| Inverts | Tree-stem Trapdoor Spider | *Aganippe castellum* | T | EN | | 1 | | ACC |
| Mammals | Dibbler[2] | *Parantechinus apicalis* | T | EN | EN | | 1 | |
| Mammals | Western Barred Bandicoot | *Perameles bougainville bougainville* | T | EN | EN | | | |

| | | | Conservation Code | | | Range, extant in | | |
|---|---|---|---|---|---|---|---|---|
| **Main Group** | **Common Name** | **Scientific name** | **WA** | **IUCN** | **C'wealth** | **ANRMR[1]** | **Buffer only** | **Current recovery Action[3]** |
| Mammals | Red-tailed Phascogale | *Phascogale calura* | T | EN | EN | 1 | | |
| Birds | Western Bristlebird[2] | *Dasyornis longirostris* | T | VU | EN | | 1 | |
| Birds | Australasian Bittern | *Botaurus poiciloptilus* | T | VU | | 1 | | |
| Birds | Western Whipbird (western heath subsp.) | *Psophodes nigrogularis nigrogularis* | T | VU | EN | | | |
| Birds | Recherche Cape Barren Goose | *Cereopsis novaehollandiae grisea* | T | VU | VU | | | |
| Birds | Australian Painted Snipe | *Rostratula benghalensis australis* | T | VU | | 1 | | |
| Birds | Malleefowl | *Leipoa ocellata* | T | VU | VU | 1 | | |
| Inverts | Shield-backed Trapdoor Spider | *Idiosoma nigrum* | T | VU | | 1 | | ACC |
| Mammals | Quokka | *Setonix brachyurus* | T | VU | | ??xx | | |
| Mammals | Greater Stick-nest Rat (Wopilkara) | *Leporillus conditor* | T | VU | EN | ??xx | | |
| Mammals | Banded Hare-wallaby | *Lagostrophus fasciatus fasciatus* | T | VU | EN | 0 | | |
| Mammals | Western Ringtail Possum | *Pseudocheirus occidentalis* | T | VU | VU | ??xx | | |
| Mammals | Heath Mouse (Dayang) | *Pseudomys shortridgei* | T | VU | EN | 1 | | |
| Mammals | Bilby | *Macrotis lagotis* | T | VU | VU | ??xx | | |
| Mammals | Black-flanked Rock-wallaby | *Petrogale lateralis lateralis* | T | VU | VU | 1 | | RP in prep., ACC |
| Mammals | Numbat | *Myrmecobius fasciatus* | T | VU | EN | 1 | | |
| Mammals | Chuditch | *Dasyurus geoffroii* | T | VU | EN | 1 | | RP |
| Reptiles | Woma (southwest pop) | *Aspidites ramsayi* | P1 | | | ??xx | | |
| Inverts | Austromerope poultoni[2] | *Austromerope poultoni* | P1 | | | 1 | 1 | |
| Inverts | Branchinella simplex | *Branchinella simplex* | P1 | | | 1 | | |
| Inverts | Arbanitis inornatus | *Arbanitis inornatus* | P1 | | | 1 | | |
| Inverts | Bothriembryon bradshawi | *Bothriembryon bradshawi* | P1 | | | 1 | | |
| Inverts | Ixalodectes flectocercus | *Ixalodectes flectocercus* | P1 | | | 1 | | |
| Inverts | Parartemia contracta | *Parartemia contracta* | P1 | | | 1 | | |
| Inverts | Daphnia jollyi | *Daphnia jollyi* | P1 | | | 1 | | |
| Birds | Black Bittern | *Ixobrychus flavicollis australis* | P2 | | | 1 | | |
| Birds | Barking Owl (southwest pop) | *Ninox connivens connivens* | P2 | | | 1 | | |

| | | | Conservation Code | | | Range, extant in | | Current recovery Action[3] |
|---|---|---|---|---|---|---|---|---|
| **Main Group** | **Common Name** | **Scientific name** | **WA** | **IUCN** | **C'wealth** | **ANRMR[1]** | **Buffer only** | |
| Inverts | Leioproctus contrarius | *Leioproctus contrarius* | P3 | | | 1 | | |
| Birds | Masked Owl (SW ssp) | *Tyto novaehollandiae novaehollandiae* | P3 | | | 1 | | |
| Birds | Forest Red-tailed Black-Cockatoo | *Calyptorhynchus banksii naso* | P3 | | | 1 | | |
| Birds | Western Rosella (inland ssp) | *Platycercus icterotis xanthogenys* | P3 | | | 1 | | |
| Fish | Black-stripe Minnow[2] | *Galaxiella nigrostriata* | P3 | | | 1 | 1 | |
| Inverts | Austrosaga spinifer[2] | *Austrosaga spinifer* | P3 | | | 1 | 1 | |
| Inverts | Mogumber Bush Cricket[2] | *Throscodectes xederoides* | P3 | | | 1 | 1 | |
| Inverts | Hylaeus globuliferus | *Hylaeus globuliferus* | P3 | | | 1 | | |
| Mammals | Southern Brush-tailed Phascogale | *Phascogale tapoatafa tapoatafa* | P3 | | | 1 | | |
| Birds | Little Bittern[2] | *Ixobrychus minutus* | P4 | | | 1 | 1 | |
| Birds | Rufous Fieldwren (western wheatbelt) | *Calamanthus campestris montanellus* | P4 | | | 1 | | |
| Birds | Crested Shrike-tit (sw subsp) | *Falcunculus frontatus leucogaster* | P4 | | | 1 | | |
| Birds | Australian Bustard | *Ardeotis australis* | P4 | | | 1 | | |
| Birds | Western Whipbird (sthn WA subsp) | *Psophodes nigrogularis oberon* | P4 | | EN | 1 | | |
| Birds | Hooded Plover | *Charadrius rubricollis* | P4 | | VU | 1 | | |
| Birds | Bush Stonecurlew | *Burhinus grallarius* | P4 | | | 1 | | |
| Birds | Shy Heathwren (western ssp) | *Hylacola cauta whitlocki* | P4 | | | 1 | | |
| Birds | Crested Bellbird (southern) | *Oreoica gutturalis gutturalis* | P4 | | | 1 | | |
| Birds | White-browed Babbler (western wheatbelt) | *Pomatostomus superciliosus ashbyi* | P4 | | | 1 | | |
| Fish | Western Mud Minnow[2] | *Galaxiella munda* | P4 | | | 1 | 1 | |
| Reptiles | Dell's Skink[2] | *Ctenotus delli* | P4 | | | 1 | 1 | |
| Inverts | Guildford Springtail[2,4] | *Australotomurus* sp (SAM122621) | P4 | | | 1 | 1 | |
| Inverts | Westralunio carteri | *Westralunio carteri* | P4 | | | 1 | | |
| Mammals | Western False Pipistrelle | *Falsistrellus mackenziei* | P4 | | | 1 | | |
| Mammals | Central Long-eared Bat | *Nyctophilus timoriensis* (central form) | P4 | | | 1 | | |

| | | | Conservation Code | | | Range, extant in | | Current recovery Action[3] |
|---|---|---|---|---|---|---|---|---|
| **Main Group** | **Common Name** | **Scientific name** | **WA** | **IUCN** | **C'wealth** | **ANRMR[1]** | **Buffer only** | |
| Mammals | Water-rat (Rakali) | *Hydromys chrysogaster* | P4 | | | 1 | | |
| Mammals | Western Mouse | *Pseudomys occidentalis* | P4 | | VU | 1 | | |
| Mammals | Western Brush Wallaby | *Macropus irma* | P4 | | | 1 | | |
| Mammals | Woylie | *Bettongia penicillata ogilbyi* | P5 | CD | | 1 | | RP |
| Mammals | Quenda | *Isoodon obesulus fusciventer* | P5 | CD | | 1 | | |
| Mammals | Tammar Wallaby | *Macropus eugenii derbianus* | P5 | CD | | 1 | | |
| Birds | Major Mitchell's Cockatoo | *Cacatua leadbeateri* | S | | | | | |
| Birds | Peregrine Falcon | *Falco peregrinus* | S | | | | | |
| Reptiles | Carpet Python | *Morelia spilota imbricata* | S/P4 | | VU | | | |

[1] These species are those that are known to live in the ANRMR after records from DEC's Threatened Fauna Database for the ANRMR and the buffer were reviewed (see Methods).
[2] These species are found in the buffered area only.
[3] This field identifies current recovery actions such as the existence of a Western Australia Recovery Plans (RP) or Interim Recovery Plans (IRP); it also identifies other recovery actions undertaken as part of ACC investment within the Natural Diversity projects (ACC) or Swan Catchment Council (SCC).
[4] This species has now been removed from DEC's Threatened and Priority Species list.

**Appendix 5.3 Review of the Threatened and Priority Fauna of the ANRMR**

The list of regional threatened and priority fauna has been derived from the Fauna File (see Section 2.3.4). The following discussion looks at each of these species with the intent of improving the understanding of each species distribution, conservation activities and status through enquires of experts and from literature review.

From the Fauna File database there are 1159 records of Threatened and Priority fauna from within the ANRMR; their status is:

- The pulmonate gastropod *Bothriembryon praecelsus* is presumed extinct under WA legislation and has been nominated for Federal listing in August 2006. There is only one record for this species collected from near Kellerberrin prior to 1939.
- Records for the Critically Endangered (CR) Western Ground Parrot (*Pezoporus wallicus flaviventrus*), have been recorded only within the 20 kilometre buffer of the ANRMR boundary. It is considered unlikely for the species to exist in the ANRMR (pers. comm. Alan Burbidge[6]). There is an Interim Recovery Plan (Burbidge *et al*., 1997) for the species.
- The CR Western Swamp Tortoise (*Pseudemydura umbrina*) has natural extant populations only within the ANRMR at Ellen Brook Nature Reserve and Twin Swamps Nature Reserve; there is a translocated population at Mogumber (just outside the ANRMR). This species has a recovery plan (Burbidge and Kuchling, 2004).
- The CR Yorkrakine Trapdoor Spider (*Kwonkan eboracum*) is an ANRMR endemic and is only known from three records, only one of which was post 2000. It is assumed that this species is still extant in the ANRMR. A conservation plan is currently in preparation for this species as part of ANRM investment.
- The CR Minnivale Trapdoor Spider (*Teyl* sp (BY Main 1953/2683, 1984/13) is known from only six records across the State. Four of these are from within the ANRMR. This species has an interim recovery plan (Burbidge *et al*.,1999) and conservation plan is currently in preparation for this species as part of ANRM investment.
- The Endangered (EN) Baudin's Black-Cockatoo (*Calyptorhynchus baudinii*) is uncommonly recorded from within the ANRMR; these records are from the western edge of the ANRMR within the marri/jarrah forests.
- The EN Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) is found with the southern and western parts of the ANRMR. A recovery plan (Cale, 2003) exists for the species, and there is an ACC funded program for this species.
- The southern range of the EN Western Spiny-tailed Skink (*Egernia stokesii badia*) is within the ANRMR, where this species has been recently recorded around Wyalkatchem.
- The Endangered Graceful Sunmoth (*Synemon gratiosa*) has only been located on the Swan Coastal Plain (Anon. 2006) though it is possible that the species may be found in the western edge of the ANRMR. Swan Catchment Council (SCC) has a project to reassess existing records through resurveying to identify habitat and distribution (pers. comm. Nicole Withers[7]).

[6] Alan Burbidge, Research Scientist, DEC, Perth.
[7] Nicole Withers, Fauna Conservation Officer, DEC's Swan Region.

- The EN bee, *Leioproctus douglasiellus* is only known from a single 1954 record within the ACC. Most of the records for this species are from the Swan Coastal Plain where SCC has a project to reassess existing records through resurveying to identify habitat and distribution (pers. comm. Nicole Withers[2]).
- All but one of the records for the EN Tree-stem Trapdoor Spider (*Aganippe castellum*) is from within the ANRMR; the exception is a 1994 record from near Mullewa. A conservation plan is currently in preparation for this species as part of ANRM investment.
- There is only a single record of the EN Dibbler (*Parantechinus apicalis*) within the ANRMR and the 20km buffer. This is an1843 record from New Norcia, this species is considered regionally extinct.
- The EN Western Barred Bandicoot has only one record from the ANRMR from 1906. The only known wild populations of this species are on islands; it is considered to be locally extinct.
- The EN Red-tailed Phascogale (*Phascogale calura*) is probably still extant in the ANRMR, though recent records for this species are scant with only 5 disparate records from 2000 or later. There are some historical monitoring sites attributed to Tony Friend.
- Database records for the VU Western Bristlebird (*Dasyornis longirostris*) within the ANRMR are only a single record within the buffer. It is considered unlikely that this species is resident in that area and hence within the ANRMR.
- The VU Australasian Bittern (*Botaurus poiciloptilus*) has only one record within the ANRMR, with two in the buffer. The most recent record is 1997. It may be an occasional visitor to the region and as such should be retained on regional lists.
- The Vulnerable (VU) Western Whipbird (western heath subsp.; *Psophodes nigrogularis nigrogularis*) is known from the ANRMR from single record from Wongan Hills in 1842, it is assumed to not to be extant within the ANRMR.
- The VU Recherche Cape Barren Goose (*Cereopsis novaehollandiae grisea*) is known from the ANRMR from single record from near Lake Grace in 1933. Other records from the State are generally from the south coast. While it is not considered a resident of the ANRMR it may be an occasional visitor and retained as a potential regional species.
- The VU Australian Painted Snipe (*Rostratula benghalensis australis*) is known from two recent (2002) records from the Goomalling Shire both on private property, a month apart. These records highlight the lack of survey effort for birds (and indeed many other species) across the ANRMR.
- The VU Malleefowl (*Leipoa ocellata*) is a well known resident of many areas of the ANRMR. There is a research program currently underway through CSIRO looking at the conservation status of the species.
- The VU Shield-backed Trapdoor Spider (*Idiosoma nigrum*) extends from just south of the Exmouth Gulf south to and including the ANRMR. A conservation plan is currently in preparation for this species as part of ANRM investment.
- Within the ANRMR the VU Quokka (*Setonix brachyurus*) is believed to now only be found in Karakamia Sanctuary.
- The VU Greater Stick-nest Rat (*Leporillus conditor*) is locally extinct with the only regional records are of nest materials.
- None of the VU Banded Hare-wallaby (*Lagostrophus fasciatus fasciatus*) records are dated within the database, however the records come from Gould's collections in the Natural History Museum, London or Western Australian Museum. These records have been attributed to either Gould or Shortridge

collections from the 1800s and early 1900s respectively. This species is locally extinct.

- The VU Western Ringtail Possum (*Pseudocheirus occidentalis*) was in Tutanning Nature Reserve until the mid-1970s and probably elsewhere[8]. In the ANRMR it is now only known from Karakamia Sanctuary.
- The VU Heath Mouse (*Pseudomys shortridgei*) is known recently from Lake Magenta Nature Reserve and from the 1990s in Dragon Rocks Nature Reserve, in 1994 there was a record from near Burngup (north-east of Lake Grace).
- There is only one post-1980 record of the Bilby (*Macrotis lagotis*) in the ANRMR: a 2003 record 5.5 kilometres from Chiddarcooping Nature Reserve. This record may warrant further investigation, as previous records are all quite old.
- Most records of the VU Black-flanked Rock-wallaby (*Petrogale lateralis lateralis*) come from known populations at: Nangeen Hill Nature Reserve, Kokerbin Nature Reserve, Mount Caroline Nature Reserve, Querekin Rock and Mount Stirling Nature Reserve. They have been translocated to Walyunga National Park, Paruna Sanctuary and Avon Valley National Park, the success of these translocations is unknown. There are some single records the status of these populations is unknown: a 1986 record from Gundaring Nature Reserve; and the clustered 1960, 1969, 1986, 1997 and 2003 records on private property. A recovery plan is currently in preparation for this species (pers. comm. Dave Pearson[9]) and there is some ACC investment for this species within the Natural Diversity program.
- The Numbat (*Myrmecobius fasciatus*) is considered Threatened under WA legislation and VU under IUCN criteria. There are recent (post-2000) records at Tutanning Nature Reserve and Boyagin Nature Reserve. There is an extant population at Karakamia Sanctuary. There have been translocations to Qualen and Dale Conservation Park (in the Hills Forest) and Karroun Hill Nature Reserve in the 1990s but the success of these translocations are unknown. There are many pre-1985 records scattered across the western edge of the ANRMR. There is no recovery plan for this species.
- The Chuditch (*Dasyurus geoffroii*) is considered Threatened under WA legislation and VU under IUCN criteria. There are numerous records of this iconic dasyurid with recent (post-2000) records from the Perth Hills and foothills, a 2004 record at Mukinbudin, 2005 east of the clearing line at Forrestiana, just north of Beverley in 2003. There is a recovery plan for this species (Orell and Morris, 1994). This species is monitored as part of DEC's Western Shield program.
- The sole record of the Priority Level 1 (P1) Woma python is an unlikely 1996 record from Julimar State Forest. The closest confirmed record for this species is 135 kilometres north at Watheroo National Park, this species has been retained in the potential list for the ANRMR, but is not considered a priority for action.
- There are 17 records of the P1 scorpion-fly (*Austromerope poultoni*) across WA from Eneabba to Pemberton. The most recent of these records is from 1982; there are no records from within the ANRMR, but one 1962 record is from within the buffer. Clearly, more work needs to be done on this species, but it is not considered a NRMR priority.
- The P1 brine shrimp (*Branchinella simplex*) is only known from two records; one near Meekatharra, the other within the ANRMR approximately 80km east of

8 Paul de Torres, DEC Science Division
9 David Pearson, Research Scientist, Department of Environment and Conservation.

Hyden. Like many Priority invertebrates it needs substantially more work to confirm its conservation status.

- The P1 spider *Arbanitis inornatus* is only known from two records, one of which is within the ANRMR; this is a 1950 record from Bullsbrook. The paucity of records infers more work needs to be on this group (and on spiders generally).
- The P1 pulmonate gastropod *Bothriembryon bradshawii* is only known from five records, two of which are in the ANRMR (both in Lake Magenta Nature Reserve in 1999 and 2002); the other records are from private property near Kojonup. As snails are comparatively easy to locate it is suggested that there may be some contribution to this species distribution throughout the life of the ACC funding.
- The P1 orthopteran *Ixalodectes flectocercus* is a poorly known (five records) endemic to the ANRMR and clearly needs more work. It is recommended that this species gets some attention.
- The P1 brine shrimp *Parartemia contracta* is known from eight records, one of which is from north of Exmouth, the other records are within or nearby to the ANRMA. Aquatic invertebrates need considerable work across the Wheatbelt to identify conservation status and concerns. It is recommended that support be given for those types of projects.
- The P1 Water Flea (*Daphnia jollyi*) is known from only 11 records, eight of which are in the ANRMR. Aquatic invertebrates need considerable work across the Wheatbelt to identify conservation status and concerns. It is recommended that support be given for those types of projects.
- There are only two old (1930 and 1948) records for P2 Black Bittern (*Ixobrychus flavicollis australis*) within the ANRMR. While it is unlikely that the species is a resident it may use the area occasionally, thus it is retained as a species from within the region but will not be recommended for any action.
- The P2 Barking Owl (southwest pop.) (*Ninox connivens connivens*) has rarely (three times) been recorded within the ANRMR. The species may have unrecorded populations and has been recently (2005) recorded from the nearby Dryandra State Forest. It is recommended that some effort be made to improve the collection of records for his species.
- The P3 bee *Leioproctus contrarius* has three records from within the ANRMR and buffer, two from 1954 the remaining from 1982. DEC records show that an application to have this species listed as EN was to be submitted in the mid-1990s but it was subsequently found to be more widely distributed including on the conservation estate, than previously thought (pers. comm. Kellie Mantle[10]). Most of these populations are on the Swan Coastal Plain. Thus, this species is not considered a regional priority.
- The P3 Masked Owl (SW ssp) (*Tyto novaehollandiae novaehollandiae* ) has only two records from the ANRMR, both from the 1970s and both near Northam. As with the Barking Owl we recommend that some effort be made to improve the collection of records for his species.
- Recent ANRMR records of the P3 Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) are only from the western edge of the region; most records are to the west and south of these. This species is not considered a priority for regional action.
- The P3 Western Rosella (inland ssp) (*Platycercus icterotis xanthogenys*) has only been recorded in two locations post-2000 within the ANRMR: in Boyagin Nature

[10] Kellie Mantle, Species and Communities Branch, Dept. of Environment and Conservation, Perth.

Reserve and Forrestiana. As with the other birds we recommend that some effort is made to improve the collection of records for his species.

- There are 146 records of the P3 Black-stripe Minnow (*Galaxiella nigrostriata*) on DEC's Threatened and Priority Fauna database; one of these was located within the buffer, near Ellen Brook. Most of the remaining records are near the south coast. It is presumed that the species may be found within that part of the Avon boundary below the Darling Scarp. As the species is found elsewhere it is not considered a priority species for regional action.
- There are only four records for the State for the Priority 3 insect *Austrosaga spinifer*. Two of these records are within the 20km buffer (14 km west of the Avon boundary), both of these are from Neerabup National Park from the early 1980s. The other two records are from Nambung National Park (also from the early 1980s). As so little is known about this insect, it is retained as a species that may possibly exist within the ANRMR but it is not considered a priority for regional action.
- There are only four records for the State for the Priority 3 Mogumber Bush Cricket (*Throscodectes xederoides*), two of which are within 3 kilometres of the Avon NRM boundary. It is assumed that this species may be found within the region, but it is not considered a priority for regional action.
- Only two of the 19 records of the P3 bee *Hylaeus globuliferus* are from the ANRMR, both from 1996. Little is known of this species, but it is not considered a priority for regional action.
- The P3 Southern Brush-tailed Phascogale (*Phascogale tapoatafa tapoatafa*) is only recorded from the marri/jarrah forests on the western end of the ANRMR in the Shires of Chittering, Mundaring and Northam. The majority of records for this species are to the west and south of the ANRMR. There is no active project unique to this species underway within the ANRMR.
- There are four records of the Little Bittern (*Ixobrychus minutus*) within the buffer, all of these are at Wanneroo (two records from 2001) or Lake Jandabup (one record from 1986 the other from 1983. It is assumed that this species could be found within the ANRMR. It is not considered a regional priority.
- The P4 Rufous Fieldwren (western wheatbelt) (*Calamanthus campestris montanellus*) is an uncommonly recorded species: 11 records from the State, only 2 old records (1967 and 1982) for the ANRMR. As with many birds of-concern for the ANRMR little is known of the species current location or status. It is not considered a regional priority.
- The P4 Crested Shrike-tit (south-western subsp.) (*Falcunculus frontatus leucogaster*) is an uncommonly recorded species. The easterly records from within the ANRMR are typically old with the more western edge more recent. As with many birds of-concern for the ANRMR little is known of the species current location or status. It is not considered a regional priority.
- The P4 Australian Bustard (*Ardeotis australis*) is known from quite a few 2005 records from within the ANRMR. As with many birds of-concern for the ANRMR little is known of the species current location or status. It is not considered a regional priority.
- The P4 Western Whipbird (sthn WA subsp) (*Psophodes nigrogularis oberon*) is largely only known from old records pre/mid-1990s from the southern part of the ANRMR; it is mainly been recorded to the south of the ANRMR. This species is considered EN under the Commonwealth legislation. It is assumed that the species is still extant within the region.
- The P4 Hooded Plover (*Charadrius rubricollis*), typically a coastal species, is known from several recordings within the ANRMR, including a 2000 record in the pastoral zone in the north west of the region. There are few records within the

region and it is assumed that the species uses the regional occasionally. This species is considered VU under Commonwealth legislation. As with many birds of-concern for the ANRMR little is known of the species current location or status. It is not considered a regional priority.

- The P4 Bush Stone curlew (*Burhinus grallarius*) is known from several records mainly in the western half of the ANRMR. As with many birds of-concern for the ANRMR little is known of the species current location or status. It is not considered a regional priority.
- The P4 Shy Heathwren (western ssp) (*Hylacola cauta whitlocki*) is known from 35 records in the central southern part of the south-west of WA. There are few records within the ANRMR, though recent (2005) records have come from the western edge of the region. . As with many birds of-concern for the ANRMR little is known of the species current location or status. It is not considered a regional priority.
- The P4 Crested Bellbird (southern) (*Oreoica gutturalis gutturalis*) has mainly been recorded in the south-west of the WA. It is clearly resident but, as with many birds of-concern for the ANRMR little is known of the species current location or status. It is not considered a regional priority.
- The P4 White-browed Babbler (western wheatbelt) (*Pomatostomus superciliosus ashbyi*) is a south-west subspecies with many records within the ANRMR. It is not considered a regional priority.
- The P4 Western Mud Minnow (*Galaxiella munda*) is mainly known from the Southern Jarrah Forest and Warren IBRA regions except for a single record at Gingin Brook 2003 which is within the buffered area. It is presumed that this species may be found within that part of the ANRMR below the Darling Scarp. It is not considered a regional priority.
- Dell's Skink (*Ctenotus delli*) is known from a single record within the buffer 6 miles east of Kalamunda in 1970. It is presumed that this Priority 4 species can live within the Avon NRM Region. It is not considered a regional priority.
- The P4 Guildford Springtail (*Australotomurus* sp (SAM122621) is known from three records within the 20 kilometre buffer. This species has been recently (late 2006) taken off the Threatened and Priority Fauna list.
- The P4 Freshwater Mussel (*Westralunio carteri* ) has largely been recorded from near ocean areas on the south coast and has not been recorded in the ANRMR since 1971. It is presumed to still be extant within the ANRMR.
- Of the 42 records State records for the P4 bat the Western False Pipistrelle (*Falsistrellus mackenziei*) only one (from 1973) is within the ANRMR. Most records are west and south of the ANRMR. Most records for this species are pre-1985 with only single record from 2000 or later. That record is 17km outside the ANRMR. It is assumed to still be extant within the region.
- There are only seven records for the P4 Central Long-eared Bat (*Nyctophilus timoriensis* (central form)), all but two of these are from the eastern edge of the ANRMR. It is assumed that this species is still extant within the ANRMR.
- The P4 Water-rat (*Hydromys chrysogaster*) has been recorded across the State with most records being from the Kimberley and the far south-west. Within the ANRMR the only recent records (1997 and 2000) are from near York Township. Previous records are from the 1960s or earlier. It is assumed that this species is still extant in that area. As the species may have suffered decline due to changes increases in the salinity of waterways, extant populations of this species may indicative of relatively healthy and intact pools. It is recommended that some effort be put into identifying if these populations are still extant.

- The P4 Western Mouse (*Pseudomys occidentalis*) has recent records from Dragon Rocks Nature Reserve and Lake Magenta Nature Reserve and older (typically 1970s) records from Tarin Rock Nature Reserve, Chinocup Nature Reserve, North Karlgarin Nature Reserve, Bendering Nature Reserve, Flat Rock Nature Reserve, an unnamed Nature Reserve, Dunn Rock Nature Reserve as well as from private property. Many of these locations are within areas baited for foxes. There is no active program specifically for this species.
- The P4 Western Brush Wallaby (*Macropus irma*) is generally known from the western and southern parts of the ANRMR. There is no active program specifically for this species.
- The P5 (conservation dependent) Woylie (*Bettongia penicillata ogilbyi*) is found in numerous areas within the ANRMR including Boyagin NR, Dryandra State Forest and Tutanning NR and the privately managed Paruna Sanctuary. This species has also been translocated to Avon Valley National Park, Dobaderry NR, Mundaring State Forest, a Timber Reserve abutting Youraling State Forest, and , in 2005 to North Karlgarin Nature Reserve. There is a recovery plan (Start *et al*., 1995) written for the species and there is a recovery group in place. The species is extant in the ANRMR and is not considered a priority for action.
- Records for the P5 Quenda (*Isoodon obesulus fusciventer*) across the ANRMR are uncommon with at least three known extant populations: the privately owned and managed Paruna and Karakamia Sanctuaries and Tutanning Nature Reserve. The remaining records from DEC's database are single instances. In 1996 there was a record from Lake Magenta Nature Reserve; in 1977 locals reported them at Manmanning Dam Nature Reserve; there is an unconfirmed record (scratchings) from Damboring Nature Reserve from 1980; a 1984 record of scratchings from Walyunga National Park; a 1967 record of scratchings from Tarin Rock Nature Reserve; a road-kill from the Upper Swan on the Great Northern Highway, beside Ellen Brook Nature Reserve, in 2004; a 2005 record 25 kilometres east of Pingelly on Pingelly/Bullaring Road; a 1997 record on the Brookton Highway about 0.7 km east of Metro Road. It is recommended that the current locations of Quendas across the ANRMR be resolved.
- The P5 Tammar Wallaby (*Macropus eugenii derbianus*) has been recorded regularly and recently but patchily across the ANRMR. While there are extant populations within ANRMR, there are also historical records that need confirmation and more recent records for established populations. For instance, there are no records from Tutanning Nature Reserve but one of us (JR) has seen the species there regularly. Likewise, they have not been recorded in Chinocup Nature Reserve since 1992 and it is unknown if there are extant populations there (there was also a record 6 km west of Chinocup from 1954) ; in Tarin Rock Nature Reserve they have not been recorded since 1987 including during recent surveys (eg Robinson 2003, 2005a, 2005b); in Boyagin Nature Reserve they have not been recorded since 1993 though they are regularly trapped there (pers. comm. P.Orell[11],.); in Merilup Nature Reserve they have been unrecorded since 1988 and it is unknown if they are still there, in the privately owned and managed Karakamia and Paruna Sanctuaries there are healthy populations; in Mount Caroline Nature Reserve the last record was in 1963, this reserve is trapped regularly and they have not been seen so it is unlikely that they are extant in the reserve (pers. comm. P.Orell[1]); there have been translocations (in 2003 and 2004) of Tammars to Walyunga National Park but the success of these is unknown; there was a translocation to Julimar State Forest in 1998, a Tammar was seen spotlighting in 2004, but otherwise the

[11] Peter Orell, Zoologist, DEC, Perth.

translocation success is unknown; in 2004 there were two sightings in Morangup on private property; there were Tammar scats and sightings in 1999 on a private property abutting an Nature Reserve 20046; in 1991 there was a road-killed Tammar at Petercarring Nature Reserve (Reserve No. 20095), approximately three kilometres north-west of Tutanning Nature Reserve; in 1996 a road kill Tammar was found one kilometre from Petercarring Nature Reserve in a Timber Reserve (No. 20097), it was commented that there have been others found at this location; in 1991 a Tammar was spotlighted near Kulin. It is recommended that the current locations of Tammars across the ANRMR be resolved.