# Ecosystem Prioritisation Workshop Report

By Jeff Richardson DEC June 2007

AVON CATCHMENT COUNCIL

Government of Western Australia

Australian Government

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## 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[1]: 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.

[1] 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).

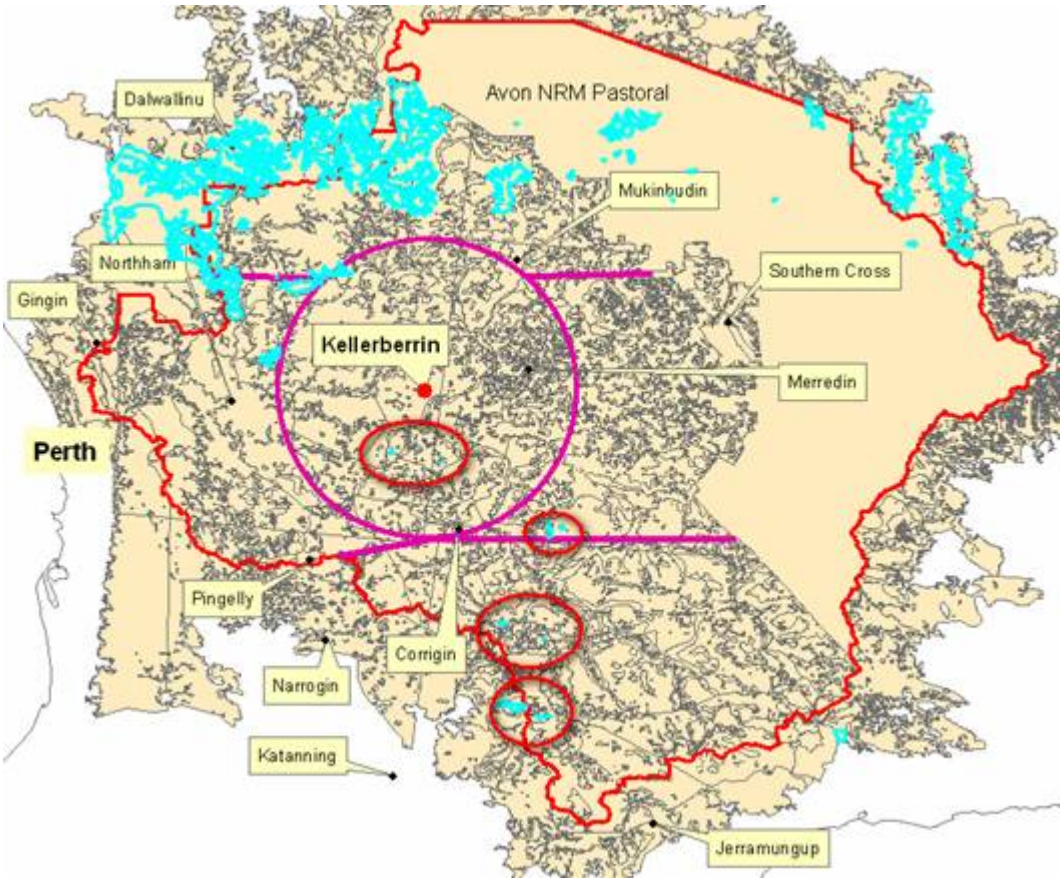


**Figure 1:** BHVA 142 (blue polygons) within the ANRMR (reddish boundary). Purple was used to segregate the ANRMR into central, north, south etc. Red ovals are used to indicate small patches of BHVA 142. See text for details.

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 | |
| 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 | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 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 | |
| 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 |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 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 | |
| 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. |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 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 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 | | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 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 | | |
| 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 | | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 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 | | |
| 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 | | |

| BHVA # | Beards Description | Rank | Soil/Land-scape Position | Comments |
|---|---|---|---|---|
| 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 | | |
| 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. |