



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5032/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Tiwest Pty Ltd

1.3. Property details

Property: Exploration Licence 70/2263
Mining Lease 70/1198
Local Government Area: Shire of Irwin
Colloquial name: Dongara Exploration Program

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.07		Mechanical Removal	Mineral Exploration

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 31 May 2012

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>Beard vegetation associations have been mapped for the whole of Western Australia. One Beard vegetation association has been mapped within the application area:</p> <p>378: Shrublands; scrub-heath with scattered <i>Banksia</i> spp., <i>Eucalyptus tottiana</i> and <i>Xylomelum angustifolium</i> on deep sandy flats in the Geraldton Sandplain Region (GIS Database).</p> <p>Woodman Environmental Consultants (WEC) conducted vegetation mapping over the area as part of mapping several tenements in the Dongara area (WEC, 2009). Two Floristic Community Types (FCTs) were mapped over the application area:</p> <p>5a: Species rich woodlands and heaths on grey sand in the eastern portion of the Eneabba sandplain. Common species include <i>Conospermum boreale</i> subsp. <i>boreale</i>, <i>Ecdeiocolea monostachya</i>, <i>Eremaea beaufortoides</i>, <i>Hakea polyanthema</i> and <i>Banksia candolleana</i>; and</p> <p>6c: Heath to low heath dominated by <i>Banksia</i> spp. and <i>Melaleuca</i> spp. over <i>Ecdeiocolea monostachya</i> on grey or brown sandy clay or gravel on lower slopes and plains (WEC, 2009; WEC, 2011).</p>	<p>Tiwest Pty Ltd has applied to clear up to 0.07 hectares of native vegetation for the purpose of mineral exploration. The proposed clearing is part of Tiwest Pty Ltd's 2012 exploration drilling program for mineral sands.</p> <p>The application area consists of two separate areas, approximately 15 kilometres apart. The northern section of the application area is approximately 0.16 hectares while the southern section is approximately 0.11 hectares. The northern and southern sections of the application area are located approximately 30 and 42 kilometres south-east of Dongara, respectively.</p> <p>Native vegetation clearing will be minimised by driving over vegetation where possible. In areas where vegetation is too dense to employ this technique a rubber tyred front end loader will flatten vegetation using a raised blade.</p>	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994);</p> <p>To:</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p>	<p>The vegetation condition is based on a description by botanists from WEC. WEC (2009) considered that the majority of vegetation within the Dongara tenements was in pristine or excellent condition, with exceptions including previous exploration disturbance. Aerial imagery shows that the northern section of the application area includes existing tracks (GIS Database).</p>

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal is at variance to this Principle

The application area occurs within the Leseur Sandplain subregion of the Geraldton Sandplains Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion contains shrub-heaths rich in endemics occurring on a mosaic of lateritic mesas, sandplains, coastal sands and limestones (CALM, 2002). The subregion exhibits extremely high floristic endemism and is also regarded as having particularly high floristic diversity (CALM, 2002).

The vegetation within the application area is broadly mapped as Beard vegetation association 378, which has 64.1% of its pre-European vegetation extent remaining (Government of WA, 2011; GIS Database). Structural vegetation mapping and flora surveying was undertaken by botanists from Woodman Environmental Consulting (WEC) over several Dongara tenements during October to December 2006, October to November 2007, and August and October 2008 (WEC, 2009). The vegetation of the application area has been mapped as Floristic Community Types (FCT) 5a and 6c (WEC, 2011). Both of these FCTs have high conservation significance due to their potential as habitat for conservation significant flora species (WEC, 2011).

A Threatened and Priority Flora survey was undertaken by botanists from WEC over the application area and the proposed 2012 exploration program area in November 2011 (WEC, 2011). Five *Paracaleana dixonii* plants, listed as Threatened Flora, were recorded within the application area and are within a 10 metre wide corridor within which exploration activities will be undertaken (Strategen, 2012). As this species is an orchid, Tiwest Pty Ltd will undertake works in the vicinity of the plants outside of the late spring/early summer flowering period in order to avoid damage (as far as possible) to above ground parts of the plant (Strategen, 2012). Individuals will be avoided entirely where possible (Strategen, 2012). An application to take Threatened Flora under the *Wildlife Conservation Act 1950* has been submitted to the Department of Environment and Conservation (DEC) for any possible inadvertent damage to *Paracaleana dixonii* (Strategen, 2012).

Tiwest Pty Ltd have adopted a strategy to minimise the impact on Threatened Flora, Priority Flora and significant vegetation communities that is described in their Exploration Environmental Management Plan and based on recommendations by WEC following extensive vegetation mapping in the region. Consultation with DEC and the Department of Mines and Petroleum (DMP) has occurred during the development of the exploration program. Tiwest Pty Ltd's Exploration Environmental Management Plan has previously been endorsed by DEC (DEC, 2012) and during a recent site visit by the assessing officer and DEC officers it was expressed that the approach used by Tiwest Pty Ltd adequately minimised impacts associated with exploration drilling. Standard management measures for flora and vegetation incorporated into the exploration program include:

- Drive around vegetation where practical and locate drill hole sites in areas where impacts on surrounding vegetation is minimised;
- In areas where the vegetation is too dense to access the drill site, flat roll the vegetation using a front end loader with blade raised, thereby not disturbing the root stock or the topsoil;
- Avoid trees and thick vegetation where possible;
- All vehicle movements will be restricted to defined tracks and survey lines;
- The number of vehicle passes to and from the drill sites is to be minimised; and
- When the clearing is conducted, locations of Threatened Flora will be recognised by flagging and/or GPS data and drill holes will be located away from the sites. Individual plants will be avoided where practical (Strategen, 2012; Tiwest Pty Ltd, 2012).

No Threatened Ecological Communities or Priority Ecological Communities were recorded within the application area or the larger Dongara tenements (WEC, 2009; WEC, 2011; GIS Database).

Thirty six introduced flora taxa were recorded from the Dongara tenements but in general weed invasion was very low (WEC, 2009). No Declared Plant species, listed by the Department of Agriculture and Food, were recorded (WEC, 2009). The presence of weed species lowers the biodiversity value of the area. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Preliminary results from a field survey conducted in November 2011 indicate that no dieback (*Phytophthora cinnamomi*) is present in the Dongara 2012 drilling program area, including the application area (Strategen, 2012). Tiwest Pty Ltd have committed to pathogen and *Phytophthora cinnamomi* hygiene management to prevent the introduction of dieback (Tiwest Pty Ltd, 2012). Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a dieback management condition.

The fauna diversity of the application area is likely to be similar to that of the surrounding area. The fauna habitats provided by the vegetation in FCTs 5a and 6c are likely to occur throughout the Northern Sandplains area where these FCTs occur. There are no notable fauna habitat features within the application area that would encourage a higher level of faunal diversity compared to surrounding areas, such as wetlands, watercourses, ridges or hill tops (GIS Database).

The application area occurs within a subregion and locality known for its high biodiversity and it provides

habitat for Threatened Flora. To minimise the impact on both Threatened Flora and the vegetation in general, Tiwest Pty Ltd have developed low impact drilling practices and management measures for their 2012 Dongara exploration program.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology CALM (2002)
DEC (2012)
Government of WA (2011)
Tiwest Pty Ltd (2012)
Strategen (2012)
WEC (2009)
WEC (2011)
GIS Database:
- Arrowsmith 50 cm Orthomosaic - Landgate 2006
- Hydrology, Linear
- IBRA WA (Regions - Subregions)
- Mingenew 1.4 m Orthomosaic - Landgate 2001
- Pre-European Vegetation
- Threatened Ecological Sites Buffered

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments **Proposal is not likely to be at variance to this Principle**
Tiwest Pty Ltd's Dongara tenements provide habitat for a number of species of native fauna including foraging habitat for conservation significant species (Strategen, 2012). Fauna studies have been undertaken over the Dongara tenements and a broad range of habitat types exist:

- Dense mixed shrublands/heathlands/sedgeland on white and yellow sands;
- Dampland areas of tall mixed thickets over white sandy loams to sandy clays;
- Allocasuarina/Banksia woodland over shrubs and sedges on yellow sand; and
- Seasonal wetlands/Melaleuca dominated claypans (Bamford, 2011 cited in Strategen, 2012).

Based on vegetation mapping undertaken by WEC (2009), the fauna habitat type of the application area is likely to be 'dense mixed shrublands/heathlands/sedgeland on white and yellow sands'.

The application area contains existing disturbance from previous drill site tracks (GIS Database). This disturbance somewhat diminishes the quality of fauna habitat and its potential to be significant habitat for native fauna. The application area does not contain notable habitat features such as watercourses or wetlands, ridges or hill tops (GIS Database).

The proposed clearing will involve low impact clearing of 0.07 hectares of native vegetation. In accordance with the Exploration Environmental Management Plan, low impact vegetation flattening techniques will be employed and large trees and thick vegetation will be avoided wherever possible (Tiwest Pty Ltd, 2012). Flattening of vegetation in corridors which will be 2.6 metres wide (with the exception of drilling locations and the end of drill lines which will be approximately 4 metres in width) is unlikely to result in a loss of significant habitat for any fauna species indigenous to Western Australia.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Strategen (2012)
Tiwest Pty Ltd (2012)
WEC (2009)
GIS Database:
- Arrowsmith 50 cm Orthomosaic - Landgate 2006
- Hydrology, Linear
- Mingenew 1.4 m Orthomosaic - Landgate 2001

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments **Proposal is at variance to this Principle**
A Threatened and Priority Flora survey was undertaken by botanists from WEC over the application area and the proposed 2012 exploration program area in November 2011 (WEC, 2011). Five *Paracaleana dixonii* plants, listed as Threatened Flora, were recorded within the application area and are within a 10 metre wide corridor within which exploration activities will be undertaken (Strategen, 2012). As this species is an orchid, Tiwest Pty Ltd will undertake works in the vicinity of the plants outside of the late spring/early summer flowering period in order to avoid damage (as far as possible) to above ground parts of the plant (Strategen, 2012). Individuals will be avoided entirely where possible (Strategen, 2012). An application to take Threatened Flora under the *Wildlife Conservation Act 1950* has been submitted to the Department of Environment and

Conservation (DEC) for any possible inadvertent damage to *Paracaleana dixonii* (Strategen, 2012).

Tiwest Pty Ltd have adopted a strategy to minimise the impact on Threatened Flora, Priority Flora and significant vegetation communities that is described in their Exploration Environmental Management Plan and based on recommendations by WEC following extensive vegetation mapping in the region. Consultation with DEC and the Department of Mines and Petroleum (DMP) has occurred during the development of the exploration program. Tiwest Pty Ltd's Exploration Environmental Management Plan has previously been endorsed by DEC (DEC, 2012) and during a recent site visit by the assessing officer and DEC officers it was expressed that the approach used by Tiwest Pty Ltd adequately minimised impacts associated with exploration drilling. Standard management measures for flora and vegetation incorporated into the exploration program include:

- Drive around vegetation where practical and locate drill hole sites in areas where impacts on surrounding vegetation is minimised;
- In areas where the vegetation is too dense to access the drill site, flat roll the vegetation using a front end loader with blade raised, thereby not disturbing the root stock or the topsoil;
- Avoid trees and thick vegetation where possible;
- All vehicle movements will be restricted to defined tracks and survey lines;
- The number of vehicle passes to and from the drill sites is to be minimised; and
- When the clearing is conducted, locations of Threatened Flora will be recognised by flagging and/or GPS data and drill holes will be located away from the sites. Individual plants will be avoided where practical (Strategen, 2012; Tiwest Pty Ltd, 2012).

Based on the above, the proposed clearing is at variance to this Principle. The clearing will impact the habitat of *Paracaleana dixonii* plants. However, the proposed clearing has been designed to minimise disturbance to Threatened Flora and its habitat.

Methodology DEC (2012)
Strategen (2012)
Tiwest Pty Ltd (2012)
WEC (2011)

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments Proposal is not likely to be at variance to this Principle

A search of available databases revealed there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest recorded TEC is located approximately 21 kilometres east of the application area (GIS Database). At this distance, the proposed clearing is unlikely to impact on the TEC.

Botanists from WEC undertook comprehensive structural vegetation mapping studies over several Dongara tenements during October to December 2006, which included the application area. None of the Floristic Community Types recorded in the survey area corresponded to TECs (WEC, 2009).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology WEC (2009)
GIS Database:
- Threatened Ecological Sites Buffered

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposal is not at variance to this Principle

The clearing application area falls within the Geraldton Sandplains Interim Biogeographic Regionalisation for Australia (IBRA) bioregion in which approximately 44.9% of the pre-European vegetation remains (see table) (Government of WA, 2011; GIS Database). This gives it a conservation status of 'Depleted' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The vegetation of the clearing application area has been broadly mapped as Beard vegetation association 378 'Shrublands; scrub-heath with scattered *Banksia* spp., *Eucalyptus todtiana* and *Xylomelum angustifolium* on deep sandy flats in the Geraldton Sandplain Region' (GIS Database). According to Government of WA (2011) approximately 64.1% of Beard vegetation association 378 remains at the state and bioregional levels and 66.6% remains at a subregional level. This vegetation association would be given a conservation status of 'Least Concern' (Department of Natural Resources and Environment, 2002).

Whilst the subregion has been extensively cleared, the proposed clearing of 0.07 hectares of native vegetation is unlikely to be a significant reduction to current vegetation levels. The vegetation under application is not likely to be a significant remnant of vegetation in an area that has been extensively cleared.

	Pre-European Area (ha)*	Current Extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and Post Clearing %)
IBRA Bioregion – Geraldton Sandplains	3,136,026	1,408,070	~44.9	Depleted	15.4 (34.1)
IBRA Subregion – Leseur Sandplain	1,171,770	504,200	~43.0	Depleted	17.9 (41.3)
Local Government – Shire of Irwin	236,968	117,340	~49.5	Depleted	12.1 (24.4)
Beard Veg Assoc. – State					
378	95,109	60,977	~64.1	Least Concern	14.1 (22.0)
Beard Veg Assoc. – Bioregion					
378	95,109	60,977	~64.1	Least Concern	14.1 (22.0)
Beard Veg Assoc. – Subregion					
378	90,923	60,547	~66.6	Least Concern	14.8 (22.2)

* Government of WA (2011)

** Department of Natural Resources and Environment (2002)

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology Department of Natural Resources and Environment (2002)
Government of WA (2011)
GIS Database:
- IBRA WA (Regions - Subregions)
- Pre-European Vegetation

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is not at variance to this Principle

According to available databases, there are no watercourses or wetlands within the application area (GIS Database). The vegetation of the application area has been mapped as Floristic Community Types (FCT) 5a and 6c and neither of these FCTs are associated with watercourses or wetlands (WEC, 2011).

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology WEC (2011)
GIS Database:
- Geodata, Lakes
- Hydrography, Linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal is not likely to be at variance to this Principle

The proposed clearing area is located on the Swan Coastal Plain and occurs within the Eneabba Plain sub-unit (Strategen, 2012). The Eneabba Plain is described as an area of undulating but gently rising plain between the Tamala Limestone or Spearwood Dunes to the west, and the Gingin Scarp to the east (Blandford, 2007 cited in Strategen, 2012).

Tiwest Pty Ltd (2012) will implement low impact vegetation clearing techniques to minimise the potential for land degradation. For example, vegetation will be driven over or flattened using a rubber tyred front end loader using a raised bucket, as opposed to blade-down clearing. This technique will leave vegetation in situ, thereby preserving rootstock and minimising disturbance to topsoil. Wheel rutting and the creation of preferential flow paths for surface water run-off will also be reduced, minimising the potential for soil erosion. Other management strategies to be implemented during the proposed vegetation clearing include (Strategen, 2012; Tiwest Pty Ltd, 2012):

- All vehicle movements will be restricted to defined tracks and survey lines;
- All vehicles will engage four wheel drive mode to minimise the potential for wheel rutting;
- All vehicles used during the proposed clearing and exploration drilling are relatively light, thereby reducing the potential for soil compaction;

- Drilling is conducted using an aircore rig which does not involve the use of any drilling fluids, mud or other materials with potential for land contamination; and
- Large trees and thick vegetation will be avoided where possible.

Provided that the management strategies as outlined above are implemented, the proposed clearing is unlikely to cause appreciable land degradation.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Strategen (2012)
Tiwest Pty Ltd (2012)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments Proposal is not likely to be at variance to this Principle

The proposed clearing is not located within a conservation reserve (GIS Database). The nearest Department of Environment and Conservation (DEC) managed conservation reserve is an un-named Nature Reserve (R47436) which is located approximately 5 kilometres west of the application area (GIS Database). Another nearby conservation area is Yordanogo Nature Reserve which is located approximately 6 kilometres west of the application area (GIS Database). Despite the close proximity to several conservation areas, it is considered that the proposed clearing is low impact and of a small scale and will not significantly impact on the environmental values of the nearby conservation areas.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Database:
- DEC Tenure

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal is not likely to be at variance to this Principle

There are no surface water bodies within the application area (GIS Database). Therefore, it is unlikely the small amount of clearing associated with this proposal will cause a deterioration in surface water quality.

According to available databases the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Allanooka - Dongara Water Reserve, which is located approximately 23 kilometres north of the application area (GIS Database).

The small area of proposed clearing is unlikely to cause deterioration in the quality of underground water.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Database:
- Hydrography, Linear
- Public Drinking Water Source Areas (PDWSAs)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

The application area is located within the Arrowsmith River catchment area of the Greenough River basin (GIS Database). Given the size of the area to be cleared (0.07 hectares) in relation to the size of the catchment area (160,418 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Database:
- Hydrographic Catchments - Catchments

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

There are two Native Title Claims (WC97/72 and WC04/2) over the area under application (GIS Database). These claims have been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (GIS Database). It is the

proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 7 May 2012 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received stating there were no objections to the proposed clearing.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims - Registered with the NNTT

4. References

- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Geraldton Sandplain 3 (GS3 - Lesueur Sandplain Subregion). Department of Conservation and Land Management, Western Australia.
- DEC (2012) Advice in Relation to Program of Work (POW) Applications for Tiwest Joint Venture, Dongara Tenements. Midwest Region, Department of Environment and Conservation, February 2012.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Government of Western Australia (2011); 2011 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, Perth.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Strategen (2012) 2012 Dongara Exploration Program Application Supporting Document. Unpublished Report Prepared by Strategen Environmental Consultants Pty Ltd for Tiwest, January 2012.
- Tiwest Pty Ltd (2012) Environmental Management Plan Dongara Project. Report Prepared by Tiwest Pty Ltd, January 2012.
- WEC (2009) Dongara Tenements Flora and Vegetation Studies Regional FCT Analysis. Report Prepared by Woodman Environmental Consulting for Tiwest Pty Ltd, October 2009.
- WEC (2011) Dongara Exploration Drilling Programme 2012 Flora and Vegetation Impact Assessment. Report Prepared by Woodman Environmental Consulting for Tiwest Pty Ltd, December 2011.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1 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.
- P2 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.
- P3 Priority Three - Poorly Known taxa:** taxa which are known from several 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 need of further survey.
- P4 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.
- R Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** 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, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- 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, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

- Schedule 1 Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2 Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3 Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4 Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1 Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2 Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3 Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens 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.
- P4 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 present circumstances change. These taxa are usually represented on conservation lands.
- P5 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.

Categories of threatened species (Environment Protection and Biodiversity Conservation Act 1999)

- EX Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W) Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past

range; or

(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

CR **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

EN **Endangered:** A native species which:

(a) is not critically endangered; and

(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

VU **Vulnerable:** A native species which:

(a) is not critically endangered or endangered; and

(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

CD **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.