



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 5897/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: The Griffin Coal Mining Company Pty Ltd

### 1.3. Property details

Property: Collie Coal (Griffin) Agreement Act 1979, Coal Mining Leases 12/453, 12/454, 12/458, 12/459, 12/460, 12/461, 12/464, 12/465, 12/466, 12/532  
Exploration Licence 12/1  
Local Government Area: Shire of Collie  
Colloquial name: Muja South Exploration Drilling Program

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
21.3		Mechanical Removal	Exploration Drilling, Access Tracks, Drill Lines and Associated Activities

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 14 August 2014

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

**Vegetation Description** Beard vegetation associations have been mapped for the whole of Western Australia and are useful to look at vegetation in a regional context. The following Beard vegetation associations are located within the application area (GIS Database):

3: Medium forest; jarrah-marri; and  
1114: Shrublands tree-heath; paperbark over teatree thickets.

The application area has been surveyed by Bennett Environmental Consulting Pty Ltd (Bennett) as part of a larger flora and vegetation survey over the Muja South area. This comprised three field trips on 1 to 10 September 2005, 4 to 6 September 2006 and 26 to 29 October 2006 (Bennett, 2008). The first involved surveying and mapping the vegetation and flora, the second involved targeting the new taxa located in 2005 and the third involved conducting a late spring survey of the wetland areas. According to The Griffin Coal Mining Company Pty Ltd (Griffin) (2014), the following 17 vegetation units and 4 other areas occur in the application area:

#### High Ground

##### Forest

1. EM: Low Forest A of *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* over Low Heath C of *Xanthorrhoea preissii* or Dense Thicket of *Hakea undulata* or *Dryandra sessilis* or *Hakea lissocarpha* over Very Open Tall Sedges in grey sand with laterite pebbles on the surface and occasionally with laterite outcropping.

2. Af: Forest of *Corymbia calophylla* and *Eucalyptus marginata* subsp. *marginata* over Low Woodland A of *Allocasuarina fraseriana* over Open Scrub of *Kunzea glabrescens* over Open Dwarf Scrub D of mixed species over Very Open Tall Sedges dominated by *Lepidosperma leptostachyum* in brown sandy loam with occasional outcropping laterite.

3. Hr: Low Forest A of *Eucalyptus marginata* subsp. *marginata* over Low Scrub B of *Xanthorrhoea preissii* or *Allocasuarina humilis* or *Hakea ruscifolia* over Dwarf Scrub D of mixed species over Open Herbs and Open Low Sedges dominated by *Desmocladius fasciculatus* in grey sand with scattered laterite pebbles on the surface.

##### Woodland

4. Be: Low Woodland A of *Eucalyptus marginata* subsp. *marginata* and *Allocasuarina fraseriana* over Low Heath D dominated by *Bossiaea eriocarpa* over Open Low Sedges dominated by *Tetraria octandra* or *Lepidosperma leptostachyum* in brown sandy loam with scattered laterite pebbles on the surface.

5. Bi: Open Low Woodland A of *Banksia attenuata* and *Banksia ilicifolia* over Thicket of *Kunzea glabrescens* over Open Low Sedges dominated by *Phlebocarya ciliata* or *Dasypogon bromeliifolius* in grey sand.

6. Ba: Low Woodland A of *Eucalyptus marginata* subsp. *marginata* and *Banksia attenuata* over Dwarf Scrub D

dominated by *Calytrix flavescens* over Open Tall Sedges dominated by *Dasyopogon bromeliifolius* over Open Herbs in grey sand.

**Low Ground Forest**

7. As: Dense Low Forest A of *Corymbia calophylla* over Thicket of *Astartea scoparia* over Tall Sedges of *Cyathochaeta avenacea* in black silty clay.

**Woodland**

8. Pe: Low Woodland A or Dense Low Forest A of *Melaleuca preissiana* over Open Dwarf Scrub D dominated by *Pericalymma ellipticum* over Tall Sedges in silty loam.

9. Hv: Open Low Woodland A of *Melaleuca preissiana* over Scrub of *Xanthorrhoea preissii* over Low Scrub A dominated by *Hakea varia* over Open Tall Sedges of *Mesomelaena tetragona* over Dense Herbs in grey silty sand.

10. Nf: Open Low Woodland A of *Melaleuca preissiana*, *Banksia grandis* and *Nuytsia floribunda* over Low Scrub A dominated by *Allocasuarina humilis* and Tall Sedges in grey silty sand.

11. Ll: Open Low Woodland A of *Melaleuca preissiana* and *Banksia littoralis* over Tall Sedges dominated by *Lepidosperma longitudinale*.

12. MM: Open Low Woodland A of *Melaleuca preissiana* over Low Scrub B to Heath B of *Hakea varia* or *Melaleuca viminea* or *Astartea* species over Tall Sedges of *Lepidosperma longitudinale*.

13. Ha: Open Low Woodland B of *Melaleuca preissiana* with emergent *Eucalyptus marginata* subsp. *marginata* over Dwarf Scrub C of *Hypocalymma angustifolium* over Tall Sedges of *Lyginia barbata* or *Hypolaena exsulca* over Herbs and Low Grass in grey sand.

14. Ca: Open Low Woodland A of *Melaleuca preissiana* over Dense Heath A dominated by *Astartea scoparia* over Open Low Sedges of *Meeboldina scariosa* over Herbs dominated by *Conostylis aculeata* subsp. *aculeata* over black silty sand.

**Thicket**

15. Mv: Dense Thicket of *Melaleuca viminea* over Open Tall Sedges dominated by *Lepidosperma longitudinale* over Open Tall Grass over Dense Herbs.

**Heath**

16. Hm: Dense Heath A of *Hakea varia* or *Astartea* species or *Hakea marginata* or *Melaleuca subtrigona* or *Banksia meisneri* subsp. *meisneri* over Tall or Low Sedges of several species in silty clay.

**Sedgeland**

17. Pa: Low Sedges of *Hypolaena viridis* or *Meeboldina scariosa* or *Platychorda applanata* in sandy clay.

**Other Areas**

18. Deg: Two of the creeks were too degraded to be able to recognise their original vegetation structure.

19. Mosaic of Mv and Ll.

20. Plantation.

21. Cleared.

**Clearing Description**

Muja South Exploration Drilling Program.

The Griffin Coal Mining Company Pty Ltd proposes to clear up to 21.3 hectares of native vegetation within a total boundary of approximately 32.7 hectares, for the purpose of exploration drilling. The project is located approximately 20 kilometres south east of Collie, in the Shire of Collie.

**Vegetation Condition**

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);

To

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

**Comment**

The purpose of the application is to provide more detailed information for the proposed Muja South Project which is an extension to Griffin's existing coal mining operations at Muja (Environ, 2013). The drilling program will comprise clearing for access tracks/drill lines and drill pads. Access tracks will be a maximum of 4.5 metres wide and drill pads approximately 10 metres by 10 metres (Griffin, 2014). The initial drill program will involve 26 drill holes and will require a minimum of 4.4 hectares of clearing. Further drill programs will depend on the results of the initial program.

Vegetation condition is taken from Bennett (2008).

According to Environ (2013), the area is dissected by an old railway line corridor and includes land that has been historically mined, with old open pits and underground workings evident in the centre and south.

High rainfall was recorded at the time of the 2005 survey flooding all low lying areas and swelling all drains and creeks making the assessment of some areas very difficult and access impossible (Bennett, 2008). The winter of 2006 recorded a below average winter rainfall and in addition Collie experienced a severe frost in August. The wetlands had dried out quickly after the low winter rainfall of 2006, but several annual and geophytic taxa were recorded (Bennett, 2008). Many of the previously inundated tracks were dry allowing access into previously

inaccessible areas and several transects were walked through the area enabling a comprehensive list of taxa to be recorded. Bennett (2008) notes that a comprehensive coverage of all areas was successfully achieved except for privately owned land (outside the application area).

### 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 is located within the Southern Jarrah Forest subregion of the Jarrah Forest Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The subregion is characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by Marri-Wandoo woodlands on clayey soils (CALM, 2002). CALM (2002) states that the rare features of the Southern Jarrah Forest subregion are the extensive native forest cover, but that the biota is patchy considering geological and geomorphic uniformity.

The application area comprises highland and lowland vegetation types and intersects a seasonal dampland (wetland) that runs along the eastern edge of the existing Muja operation (Environ, 2013). Vegetation condition ranged from very good to completely degraded with most of the remnant vegetation of the survey area in good to very good condition (Bennett, 2008). According to Bennett (2008), all the high ground had been logged and burnt frequently and the wetlands dominated by weeds. Some degraded areas had a good tree canopy but the understorey was completely or nearly completely replaced by weeds (Bennett, 2008). The remnant bushland is continuous, broken only by narrow tracks, an old railway line, powerline access track and firebreaks (Bennett, 2008). Griffin (2014) notes that the dampland area in the western portion of the application area has been modified by historic activities associated with mining and pastoralism.

Bennett (2008) notes that the highland vegetation units are not uncommon throughout the area. A total of 15 wetland vegetation units were recorded in the larger survey area, eleven of which occur in the application area (Griffin, 2014). The wetland vegetation was found to be diverse in structure, taxa associated with the different vegetation units and the dominant understorey taxa, indicating the diversity and importance of the wetland vegetation units at Muja South (Bennett, 2008). Furthermore, very few areas were found to be comparable to the Muja South wetland vegetation and the large and expansive areas of sedges recorded at Muja South were not represented elsewhere close to Collie (Bennett, 2008). The wetland vegetation was considered potentially restricted due to the variation in its vegetation components. According to Griffin (2014), 417.5 hectares of wetland vegetation has been mapped by Bennett (2008). Griffin (2014) estimates that 5.13 hectares or 1.2% of this amount will be impacted by the proposed clearing comprising impacts of between 0.06% and 5.03% of the individual wetland vegetation units.

Of the vegetation occurring in the application area, Bennett (2008) also considered *Actinostrobus pyramidalis* associated vegetation (included in the Hm vegetation description) and vegetation unit Bi as potentially restricted. *Actinostrobus pyramidalis* associated vegetation is considered potentially restricted as this taxon is very uncommon in the Collie area (Bennett, 2008). Vegetation units Hm and Bi have been mapped outside the application area and Griffin (2014) estimates that 0.16% of Hm and 4.6% of Bi will be impacted by the proposed clearing.

Griffin (2014) states the proposed drill program has been designed to minimise potential impacts to the wetland vegetation units. Griffin (2014) will be clearing a maximum of 4.5 metre wide access tracks and 10 metre by 10 metre drill pads. Griffin's preference is to use raised blade during clearing to minimise disturbance to topsoil and retain plant rootstock (Environ, 2013). The access tracks and drill holes will be rehabilitated as soon as reasonably practicable (Griffin, 2014).

A total of 553 taxa (species, subspecies, varieties, etc) from 254 genera and 72 families were recorded within the larger survey area (Bennett, 2008). A total of 79 weeds were recorded from the remnant bushland, 67 of which were recorded from the wetland areas. The presence of introduced weed species lowers the biodiversity values of the proposed clearing areas. Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

According to available databases (GIS Database), no known Threatened or Priority Ecological Communities are located within the application area. Threatened Flora species *Caladenia* sp. Collie has been recorded in the immediate area and is discussed under Clearing Principle (c).

Six Priority Flora species were recorded within the larger survey area (Bennett, 2008). These include *Leucopogon extremus* (Priority 2) (previously known as *Leucopogon* sp. Collie), *Synaphea petiolaris* subsp. *simplex* (Priority 2), *Synaphea decumbens* (Priority 3), *Acacia semitrullata* (Priority 4), *Eucalyptus rudis* subsp. *cratyantha* (Priority 4) and *Pultenaea skinneri* (Priority 4). It appears a sixth Priority Flora species, *Logania sylvicola* (Priority 2), may also occur in the larger survey area (recorded as *Logania* sp. at the time of the survey). Bennett (2008) considered the identification of *Leucopogon extremus* and *Synaphea petiolaris* subsp. *simplex* as significant. The application area has been designed to avoid the Priority Flora locations recorded by Bennett (2008) with the nearest record approximately 200 metres from the application area.

Two fauna field surveys were conducted by M.J and A.R Bamford Consulting Ecologists (BCE) in the Muja South area in January and September 2006 (BCE, 2008). These surveys recorded a total of 119 species comprising 75 bird, 16 mammals, 18 reptile and 10 frog species. BCE (2008) notes that these species reflect a

faunal assemblage that is typical of the Jarrah forest of the region. BCE (2008) considered 'sandy soil supporting banksia woodland' (corresponds to the Bi vegetation unit which is discussed above) and 'wetlands and associated margins' as significant habitat.

The vegetation, flora and fauna information above indicates the Muja South area has a relatively high level of biodiversity. The application area has been designed to avoid known Threatened and Priority Flora species and to minimise impacts to the wetland vegetation. Potential impacts to the biodiversity of the application area may be minimised by the implementation of conditions that limit clearing of wetland vegetation to no more than 5.13 hectares, limit track width to no more than 4.5 metres wide, requires the use of raised blade clearing, minimises impacts to watercourses and requires rehabilitation following the proposed works. Given the low impact and temporary nature of the proposed activities and the implementation of these conditions, it is unlikely the proposed clearing will have a significant impact on the biodiversity of the Muja South area.

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

**Methodology** BCE (2008)  
Bennett (2008)  
CALM (2002)  
Environ (2013)  
Griffin (2014)  
GIS Database:  
- IBRA WA (Regions – Sub Regions)  
- 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 may be at variance to this Principle**

Two fauna field surveys have been conducted in the Muja South area by BCE (2008). The first field survey was undertaken between 18 and 25 January 2006 and the second between 18 and 25 September 2006. Together these surveys involved pitfall, cage and Elliot trapping; bird surveys; spotlighting; acoustic playback (for owls); mist netting; harp trapping; acoustic surveys (for bats); hand searching; and opportunistic observations (BCE, 2008). Targeted black cockatoo (Carnaby's Black Cockatoo (*Calyptrorhynchus latirostris*), Baudin's Black-Cockatoo (*Calyptrorhynchus baudinii*) and Forest Red-tailed Black-Cockatoo (*Calyptrorhynchus banksia*)) surveys have also been undertaken.

Much of the survey area occurs across low lying areas and adjacent forest (BCE, 2008). BCE (2008) identifies areas of sandy soil supporting banksia woodland and the wetlands and associated margins as significant habitat. According to BCE (2008), the areas of sandy soil supporting banksia woodland are uncommon to rare habitat across the landscape and as such can be expected to contribute to local biodiversity by supporting species, notably invertebrates, that do not occur in the more widespread vegetation types. However, the sampling site in this vegetation type was poor for vertebrates. According to Griffin (2014), the 'sandy soil supporting banksia woodland' habitat corresponds to Bennett (2008) vegetation units Bi and Ep. A total of 46.4 hectares of Bi and 18.4 hectares of Ep have been mapped by Bennet (2008) (Griffin, 2014). Of these, vegetation unit Bi occurs within the application area with the proposed clearing estimated to impact 4.6% of the total mapped amount (Griffin, 2014). This vegetation unit also occurs outside the application area. Based on the above, the proposed clearing is not expected to have a significant impact on this fauna habitat type.

The wetland is unusual within the region and can be expected to support a very distinctive faunal assemblage, particularly of invertebrates (BCE, 2008). A previously unrecorded millipede specimen, *Antichiropus* sp. nov. 'Collie', was collected close to the wetland during the September 2006 survey. This specimen was considered a new species and a short range endemic (SRE) (BCE, 2008). However, following targeted searches in 2008, 2009 and 2011 it was considered the specimen belonged in the *Antichiropus variabilis* species which is widespread and not an SRE (BCE, 2012). BCE (2012) also states that the environments of the project area do not have the relictual characteristics often associated with SRE species. Potential impacts to the wetland may be minimised by the implementation of a condition that limits clearing of wetland vegetation to 5.13 hectares.

A total of 119 fauna species comprising 75 bird, 16 mammals, 18 reptile and 10 frog species were recorded across the two field surveys. BCE (2008) notes that these species reflect a faunal assemblage that is typical of the Jarrah forest of the region. Several Schedule or Priority listed fauna species were recorded across the two field surveys. These include the Forest Red-tailed Black-Cockatoo, Carnaby's Black Cockatoo, Rainbow Bee-eater (*Merops ornatus*), Chuditch (*Dasyurus geoffroii*), Quenda (*Isoodon obesulus fusciventer*) and Brush Wallaby (*Macropus irma*). There is also an unconfirmed record of Baudin's Black-Cockatoo. A further fifteen Schedule or Priority fauna species were also identified as having the potential to occur within the area including the Numbat (*Myrmecobius fasciatus*), Brush-tailed Phascogale (*Phascogale tapoatafa*), Woylie (*Bettongia penicillata*), Quokka (*Setonix brachyurus*), Western Ringtail Possum (*Pseudocheirus occidentalis*), Fork-tailed Swift (*Apus pacificus*), Carpet Python (*Morelia spilota* subsp. *imbricata*), Peregrine Falcon (*Falco peregrines*), Barking Owl (southern) (*Ninox connivens connivens*), Masked Owl (*Tyto novaehollandiae novaehollandiae*), Dell's Skink (*Ctenotus delli*), Crested Shrike-tit (*Falcunculus frontatus*), Western False Pipistrelle (*Falsistrellus mackenziei*), Water Rat (*Hydromys chrysogaster*) and Tamar Wallaby (*Macropus eugenii*).

Black cockatoos are known to use the Muja South area for foraging, roosting and breeding (BCE, 2013). BCE

(2014) has reviewed the proposed clearing and considers clearing within the vicinity of black cockatoo habitat trees which are not nest trees or considered likely to be nest trees poses no risk to black cockatoos. However, clearing close to an active black-cockatoo nest might potentially cause eggs or chicks to be abandoned, or at least for the cycle of incubation or feeding to be disrupted; and clearing close to a known or suspected nest-tree, even if not active at the time of clearing, could disturb birds that are seeking a nest-site for the season (BCE, 2014). Black cockatoo habitat trees are defined by the Department of Environment Regulation as trees that have a diameter, measured at 1.5 metres from the base of the tree, of 50 centimetres or greater.

Nest tree surveys conducted by BCE (2013) have identified 7 actual or highly likely nest trees and 141 possible nest trees in the Muja South area. BCE (2014) recommends surveys are undertaken prior to the exploration drilling program to identify habitat trees, possible nest trees, highly likely nest trees and actual nest trees. Any nesting or highly likely nesting trees identified or trees with hollows that have signs of recent activity should be avoided by a 50 metre buffer (BCE, 2014). For the remaining trees, BCE (2014) recommends these are avoided and soil disturbance within 5 metres of the tree minimised.

Potential impacts to black cockatoos may be minimised by the implementation of a raised blade clearing condition (minimises soil disturbance), targeted survey conditions and black cockatoo habitat conditions.

The Chuditch (Schedule 1) is known to have occupied a wide range of habitats from woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts (DEC, 2012). It dens in hollow logs and burrows and has also been recorded in tree hollows and cavities (DEC, 2012). Suitable hollow or burrow entrance diameters are often at least 30 centimetres in diameter and an adult female Chuditch may utilise an estimated 66 logs and 110 burrows within her home range (approximately 300 to 400 hectares) (DEC, 2012). This species was recorded during the January and September 2006 field surveys and is likely to be a resident within the Jarrah forest of the Muja South area (BCE, 2008). Environ (2013) states that known chuditch dens and hollow logs will be avoided. This includes any encountered in the field. Based on these management measures and given the availability of Jarrah Forest in the area, it is unlikely the proposed clearing of 21.3 hectares will have a significant impact on this species.

Some of the remaining conservation significant fauna species listed above are considered mobile and able to use similar habitat in the surrounding area; have a wide distribution; and/or are able to utilise a wide range of habitat types. BCE (2008) notes that several mammals of conservation significance are known from the broader region but have not been recorded from the Muja South project area (Numbat, Brush-tailed Phascogale, Woylie, Quokka, Western Ringtail Possum, Water Rat and Tammar Wallaby). According to BCE (2008), the Muja South project area may lack suitable habitat for some of these species and while the presence of these species, at least as vagrants or in very low densities, cannot be completely discounted, the trapping effort to date has been considerable.

Given the nature of the proposed activities and the abovementioned management measures and conditions, it is unlikely the proposed clearing will have a significant impact on the remaining conservation significant fauna species.

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

**Methodology** BCE (2008)  
BCE (2012)  
BCE (2013)  
BCE (2014)  
Bennett (2008)  
DEC (2012)  
Environ (2013)  
Griffin (2014)

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

**Comments Proposal may be at variance to this Principle**

Threatened Flora species *Caladenia* sp. Collie has been recorded in the Muja South area (DPaW, 2014b). During the 2005 flora and vegetation survey an un-described orchid (now known as *Caladenia* sp. Collie) was collected from a single location within the Muja South area (Onshore Environmental (Onshore), 2013). Targeted searches have subsequently been undertaken in 2006, 2007, 2008, 2009 and 2012, some of which were undertaken outside the Muja South area.

The 2012 targeted survey was undertaken at Muja South and across several areas in the Collie region between 12 September and 9 October 2012 by a team of up to six botanists from Onshore (Onshore, 2013). The survey commenced by re-surveying known populations and searching outwards from these populations. This provided a cumulative knowledge base of the preferred habitat and allowed target locations to be further delineated during the survey (Onshore, 2013).

A total of 1,016 *Caladenia* sp. Collie plants were recorded during the 2012 targeted survey, including 990 plants determined as *Caladenia* sp. Collie typical form, 19 plants identified as *Caladenia* sp. Collie red morphology and seven plants identified as *Caladenia* sp. Collie hybrid red tip labellum (Onshore, 2013). A

selection of plants recorded in bud or as leaves were resampled later in the survey period to confirm the identification as *Caladenia* sp. Collie or otherwise. There were some isolated records that could not be confirmed as *Caladenia* sp. Collie. In addition to the above, there were approximately 155 records that included other orchids, including forms of *Caladenia* sp. Collie that appeared to be hybrids with local orchids including *Caladenia longicauda*, *Caladenia paludosa* and *Caladenia ferruginea* (Onshore, 2013).

The species was commonly recorded along the edge of tracks, often on graded berms indicating it is likely to be a disturbance species (Onshore, 2013). There was also evidence that fire history played an important role with high orchid numbers recorded in areas where fire was likely to be prevalent. The ground cover was typically open to very open at recorded populations, influenced by surface soil stratum and probably burn history (Onshore, 2013). It was evident that *Caladenia* sp. Collie showed a preference for specific soil/geology type within the habitat, but was also strongly influenced by a dense canopy and slightly higher soil moisture niche (Onshore, 2013).

The 2012 survey recorded thirteen populations of *Caladenia* sp. Collie in Collie with a known distribution extending approximately 15.5 kilometres east-west by 14.5 kilometres north-south and a total footprint area of 1,044 hectares (Onshore, 2013). Based on the 2012 survey, Onshore (2013) provided the following habitat description for *Caladenia* sp. Collie:

*'It was recorded from undulating lateritic hills typically on the 230 - 250 metre elevation contour (range 210 - 270 metre) in the southern portion of the Collie Basin. The habitat was defined by the occurrence of shallow coarse grey sand (quartz) over gravelly loam, typically with heavily weathered outcropping laterite (if not outcropping then very close to surface). The laterite parent rock was heavily weathered, vesicular with fine to medium angular quartz on the outer surfaces. The typical landform feature was upper hill slopes and ridges, although mid and lower slopes also supported major populations where the shallow grey sands occurred amongst outcropping vesicular laterite.'*

Onshore (2013) has mapped the inferred extent of habitat that may support *Caladenia* sp. Collie in the Collie region. This amounts to 12,215 hectares within the Collie region, approximately 9 hectares of which occurs within the application area (Griffin, 2014).

Three of the *Caladenia* sp. Collie populations (Populations 3, 6 and 7) occur in the immediate vicinity of the application area. The application area has been designed to avoid all known locations of the species. DPaW (2014a) notes that it is likely the number of individuals of this species (1,016 plants) has been over estimated. This figure includes known and probable hybrids and also includes 395 leaves which occurred within a three metre radius of a confirmed flowering specimen but could not formally be identified as the species without flowers (DPaW, 2014a). DPaW (2014a) considered that, given the numbers of *Caladenia* sp. Collie have most likely been over estimated and known locations will be avoided, it appears the risk of the exploration program is relatively low. However, plants do not necessarily flower every year and as a result flowering plants may appear in different locations each year within areas of suitable habitat (DPaW, 2014a). For every flowering plant there may also be a number of non-flowering plants. DPaW (2014a) therefore recommended that vegetation clearing is undertaken outside the growth periods when it is present as an underground tuber (December – April), thereby avoiding any potential incidental damage to plants not located in previous surveys. It is also important to use raised blade clearing to avoid damage to the underground tuber and DPaW (2014a) has advised that any blade down clearing should be clearly justified in consultation with DPaW. The Office of the Environmental Protection Authority (OEPA) has also reviewed the proposed clearing and advised that DPaW's recommended management measures should be adopted (OEPA, 2014).

The application area avoids all known locations of *Caladenia* sp. Collie. However, given there is inferred habitat within the application area and plants do not necessarily flower each year, there may be plants that are present in the application area that were not detected during previous surveys. Potential impacts to *Caladenia* sp. Collie may be minimised by the implementation of conditions that require the use of raised blade clearing and limit clearing to between December and April each year in the areas of inferred habitat mapped by Onshore (2013). Griffin has advised there may be circumstances in which these conditions are not feasible. Where this is the case, Griffin will need to apply to the Department of Mines and Petroleum (DMP) to obtain approval. To apply to clear outside the months of December to April in areas of inferred habitat, Griffin will need to undertake a targeted *Caladenia* sp. Collie survey of the proposed clearing area in the flowering period of the species and submit the survey to DMP. This survey will be used to assess the impacts of the proposed clearing. This approach is considered acceptable by DPaW so long as raised blade clearing is utilised (DPaW, 2014a). Where raised blade clearing is not considered feasible, Griffin will need to provide clear justification of its non-use to DMP and consultation with DPaW will be required.

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

**Methodology** DPaW (2014a)  
DPaW (2014b)  
Griffin (2014)  
OEPA (2014)  
Onshore (2013)

**(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**

According to available databases (GIS Database) and Environ (2013), there are no known Threatened Ecological Communities (TECs) within the application area. The nearest known TEC is approximately 50 kilometres west, north west of the application area (GIS Database).

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

**Methodology Environ (2013)**

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 likely to be at variance to this Principle**

The application area falls within the Jarrah Forest Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 54.57% of the pre-European vegetation remains (see table) (GIS Database, Government of Western Australia, 2013). According to the 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources and Environment, 2002), this value gives the region a Conservation Status of 'Least Concern'.

The vegetation of the application area has been mapped as the following Beard vegetation associations (GIS Database):

3: Medium forest; jarrah-marri; and  
1114: Shrublands tree-heath; paperbark over teatree thickets.

Over 60% of these vegetation associations remain at a state, bioregional, subregional and local government level with the exception of vegetation association 1114 within the Southern Jarrah Forest subregion (Government of Western Australia, 2013). Approximately 43% of Beard vegetation association 1114 remains within the Southern Jarrah Forest subregion (Government of Western Australia, 2013). However, within the Shire of Collie approximately 81% of this vegetation association remains (Government of Western Australia, 2013). The levels in the table below are above the 30% threshold level recommended in the National Objectives Targets for Biodiversity Conservation below which, species loss appears to accelerate exponentially at an ecosystem level (EPA, 2000). The levels of pre-European vegetation remaining indicate the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

A review of aerial imagery indicates that vegetation within the application area is not a remnant within the local area (GIS Database). Vegetation is present to the north east, south west and west of the application area. The application area does form part of a linkage that connects forest to the east and west of the application area (GIS Database). However, the application area is comprised of corridors and excludes the vegetation between each corridor. Griffin (2014) will be clearing a maximum of 4.5 metre wide access tracks and 10 metre by 10 metre drill pads. The majority of vegetation will, therefore, remain uncleared between drill lines and will provide corridors for fauna movement. Griffin's preference is to use raised blade during clearing to minimise disturbance to topsoil and retain plant rootstock (Environ, 2013). Griffin will also rehabilitate drill holes, drill lines and tracks following exploration (Environ, 2013). Given vegetation corridors will remain in place and the low impact nature of exploration activities, it is unlikely the proposed clearing will have a significant impact on the linkage.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Extent in DPaW Managed Lands %* (and post clearing %)
IBRA bioregion – Jarrah Forest	4,506,660	2,459,298	~54.57	Least Concern	~38.34 (~68.19)
IBRA Subregion - Southern Jarrah Forest	2,607,879	1,335,801	~51.22	Least Concern	~37.01 (~67.58)
Local Government – Shire of Collie	170,198	141,304	~83.02	Least Concern	~79.89 (~89.33)
Beard vegetation associations - State					
3	2,661,405	1,832,024	~68.84	Least Concern	~58.33 (~80.51)
1114	19,836	12,086	~60.93	Least Concern	~51.12 (~78.85)
Beard vegetation associations - Bioregion					
3	2,390,591	1,631,110	~68.23	Least Concern	~57.65 (~80.00)
1114	19,836	12,086	~60.93	Least Concern	~51.12 (~78.85)
Beard vegetation associations - Subregion					
3	1,482,492	898,443	~60.60	Least Concern	~49.81 (~76.89)
1114	10,001	4,304	~43.04	Depleted	~28.12 (~57.29)

\* Government of Western Australia (2013)

\*\* Department of Natural Resources and Environment (2002)

**Options to select from:** Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002)

Presumed extinct	Probably no longer present in the bioregion
Endangered*	<10% of pre-European extent remains
Vulnerable*	10-30% of pre-European extent exists
Depleted*	>30% and up to 50% of pre-European extent exists
Least concern	>50% pre-European extent exists and subject to little or no degradation over a majority of this area

\* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

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

**Methodology** Department of Natural Resources and Environment (2002)  
 Environ (2013)  
 EPA (2000)  
 Government of Western Australia (2013)  
 Griffin (2014)  
 GIS Database:  
 - Collie 50cm Orthomosaic - Landgate 2006  
 - IBRA WA (Regions - Sub Regions)  
 - 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 at variance to this Principle**

The application area occurs within the drainage basin of Chicken Creek, a tributary to the Collie River East Branch (Environ, 2013). Chicken Creek includes a network of low-lying damplands sitting on the flatter valley floor. Water flow in Chicken Creek is dependent on winter rainfall and the damplands are typically inundated on a seasonal basis (Environ, 2013). Griffin (2014) states that the application area avoids Chicken Creek, however, available databases indicate it could occur within or in close proximity to the application area (GIS Database). The Department of Water (DoW) (2014) recommends that exploration activities are not undertaken within 30 metres of Chicken Creek. Potential impacts to Chicken Creek may be minimised by the implementation of a condition that prevents clearing within 30 metres of Chicken Creek.

A portion of the application area occurs on the damplands (GIS Database). This is predominantly in the western portion of the application area which Griffin (2014) notes has been modified by historic activities associated with mining and pastoralism. Bennett (2008) also mapped two degraded creeklines in this area. According to Bennett (2008), the wetlands included examples of creeks, palusplains and floodplains. Bennett (2008) identified 15 vegetation units associated with a wetland environment. Eleven of the wetland vegetation units occur within the application area (Griffin, 2014). The wetland vegetation was found to be diverse in structure, taxa associated with the different vegetation units and the dominant understorey taxa (Bennett, 2008). It was also considered potentially restricted due to the variation in its vegetation components (Bennett, 2008). According to Griffin (2014), 417.5 hectares of wetland vegetation has been mapped by Bennett (2008). Griffin (2014) estimates that 5.13 hectares or 1.2% of this amount will be impacted by the proposed clearing



comprising impacts of between 0.06% and 5.03% of the individual wetland vegetation units.

Griffin (2014) states the proposed drill program has been designed to minimise potential impacts to the wetland vegetation units. Griffin (2014) will be clearing a maximum of 4.5 metre wide access tracks and 10 metre by 10 metre drill pads. Griffin's preference is to use raised blade during clearing to minimise disturbance to topsoil and retain plant rootstock (Environ, 2013). The access tracks and drill holes will be rehabilitated as soon as reasonably practicable (Griffin, 2014).

Potential impacts to wetland vegetation within the application area may be minimised by the implementation of a condition that limits clearing of wetland vegetation to 5.13 hectares, a watercourse management condition and a rehabilitation condition.

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

**Methodology** Bennett (2008)  
DoW (2014)  
Environ (2013)  
Griffin (2014)  
GIS Database:  
- Hydrography, linear  
- Rivers

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

**Comments Proposal may be at variance to this Principle**

The application area intersects a wetland environment and is located in close proximity to Chicken Creek (GIS Database). These environments are particularly sensitive to erosion and associated turbidity which may result in downstream impacts. Erosion and sediment controls are considered in the 'Environmental Requirements for Drill Site Preparation, Operation and Remediation' procedure which will be followed during the proposed works. Griffin's preference is to utilise raised blade clearing to minimise the risk of erosion (Environ, 2013). Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition and a condition that requires the use of raised blade clearing.

Drill sites and tracks will be rehabilitated including permanent plugging of drill holes, removal of drill hole cuttings, raking or scarifying of drill sites and covering of sites with stockpiled topsoil and vegetation (Environ, 2013). Vehicle access to the cleared drill lines will be progressively blocked upon completion of drilling along each line (Environ, 2013). Potential long term land degradation impacts may be minimised by the implementation of a rehabilitation condition.

Environ (2013) considered the potential for mobilisation and exposure of acid-forming material/acid sulphate soils within the dampland area as low. Environ (2013) adds that where necessary, drill cutting material that has the potential to generate acid or metallic drainage will be directed to existing overburden dumps at Griffin's operations and managed via selective placement and capping to minimise the risk of acid generation.

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

**Methodology** Environ (2013)  
GIS Database:  
- Hydrography, linear  
- Rivers

**(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 may be at variance to this Principle**

According to available databases, the application area is located within a conservation area known as the Muja State Forest (GIS Database). This State Forest is managed for multiple purposes, including conservation. Section 20 of the *Collie Coal (Griffin) Agreement Act 1979* outlines entry to the State Forest by Griffin and notification of entry to the Conservator of Forests who may impose conditions for entry to the State Forest.

The Department of Parks and Wildlife (DPaW) has reviewed the proposed clearing and has provided advice in relation to Threatened Flora species *Caladenia* sp. Collie. This species is discussed under Principle (c). General management recommendations made as part of this advice include the following (DPaW, 2014a):

- Vehicle and machinery movements to be restricted to the project footprint and existing disturbance/tracks. Repeated vehicle movements over the same area should be limited to avoid wheel ruts, reduce soil compaction and improve rehabilitation prospects.
- Implement good dieback and weed hygiene management.
- Non-use of raised blade clearing should be clearly justified.

Griffin's preference is to use raised blade during clearing to minimise disturbance to topsoil and retain plant rootstock (Environ, 2013). Environ (2013) states that vehicular access to the cleared lines will be progressively blocked upon completion of drilling along each line and drill holes, drill lines and tracks will be rehabilitated following exploration.

Environ (2013) notes that dieback is present throughout much of the region and is consistently associated with seasonally wet environments and adjacent lower slopes. There are both dieback infested (particularly associated with the dampland) and dieback un-infested areas in the application area. Dieback management is therefore integral to preventing an increased rate of dieback spread (Environ, 2013). Griffin has several procedures that will be implemented for dieback management including Clean Down Procedure for Dieback Control (7008), Fire Management for *Phytophthora* Dieback (7011), Topsoil Management for *Phytophthora* Dieback (7012), Planning Work in Areas Infected with *Phytophthora* Dieback (7014) and Inspect Mobile Equipment for Dieback Hygiene (7031) (Environ, 2013). Potential impacts from dieback and weeds may be minimised by the implementation of a dieback and weed management condition.

Potential impacts to Muja State Forest may also be minimised by the implementation of conditions that limit clearing of wetland vegetation to no more than 5.13 hectares, limit track width to no more than 4.5 metres wide, require the use of raised blade clearing, minimises impacts to watercourses, prevents clearing of habitat trees and requires rehabilitation following the proposed works.

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

**Methodology** DPaW (2014a)  
Environ (2013)  
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 may be at variance to this Principle**

The application area is located within the Wellington Dam Catchment Area, a Public Drinking Water Source Area (PDWSA), gazetted under the *Country Areas Water Supply Act 1947* (CAWS Act) (GIS Database).

The area is located within an unassigned priority PDWSA and no priority source protection is proposed (Department of Water (DoW), 2014). However, the catchment is subject to CAWS Act native vegetation clearing controls to prevent salinisation of water resources. Available databases show the application area is predominantly within Zone D of the Wellington Dam Catchment Area (GIS Database). This zone is a low salinity risk part of the catchment where DoW Policy and Guidelines for the "Granting of Licences to Clear Indigenous Vegetation" provide for the unconditional grant of a licence subject to the retention of native vegetation on at least 10% of the owner's holding area (DoW, 2014). The proposed clearing will not result in the total vegetation remaining on Griffin Coal's mining leases being reduced below 10%. Available databases show a small portion of the application area occurs within Zone A which is a high salinity risk part of the catchment (GIS Database). Griffin (2014) indicates this is likely to be a scale issue on the database map layers and that there will be no clearing in Zone A. It is the proponent's responsibility to liaise with DoW to determine if a CAWS Act clearing licence is required for the proposed works.

The application area occurs within the drainage basin of Chicken Creek, a watercourse that includes a network of low-lying damplands sitting on the flatter valley floor (Environ, 2013). Water flow in Chicken Creek is dependent on winter rainfall and the damplands are typically inundated on a seasonal basis (Environ, 2013). Griffin (2014) states that the application area avoids Chicken Creek, however, available databases indicate it could occur within or in close proximity to the application area (GIS Database). A portion of the application area occurs on the damplands (GIS Database). This is predominantly in the western portion of the application area which Griffin (2014) notes has been modified by historic activities associated with mining and pastoralism.

DoW (2014) has reviewed the proposed clearing and considers that potential impacts relate to erosion and associated turbidity where the ground is disturbed and cleared. The clearing with the greatest risk/impact will be where the riparian vegetation of Chicken Creek is cleared, with flowing water eroding the banks resulting in sediment transport and turbidity downstream (DoW, 2014). Based on this, DoW (2014) recommended that exploration activities are not undertaken within 30 metres of Chicken Creek. Potential impacts to Chicken Creek and water quality as a result of the proposed clearing may be minimised by the implementation of watercourse management conditions and a staged clearing condition. Other conditions discussed under Principles (a), (b) and (c) may also minimise impacts.

DoW (2014) also provided the following advice should the clearing occur over a waterway or its banks: *'The subject property is located within the Collie River Irrigation District Surface Water Area as proclaimed under the Rights in Water and Irrigation Act 1914. Any taking or diversion of surface water in this proclaimed area for purposes other than domestic and/or stock watering is subject to licensing by the Department of Water. Additionally any interference with the bed or banks of a watercourse in this proclaimed area requires a permit from the Department of Water.'* It is the proponent's responsibility to liaise with DoW to determine whether any of these licences are required for the proposed works.

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

**Methodology** DoW (2014)  
Environ (2013)  
Griffin (2014)  
GIS Database:  
- CAWSA Part IIA Clearing Control Catchments (Zone)  
- Hydrography, linear  
- Public Drinking Water Source Areas (PDWSAs)  
- Rivers

**(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 Wellington Dam Collie River catchment area (GIS Database). Given the size of the area to be cleared (21.3 hectares) in relation to the size of the catchment area (282,909 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

Water flow in Chicken Creek is dependent on winter rainfall and the network of low-lying damplands that characterise Chicken Creek are typically inundated on a seasonal basis (Environ, 2013). Much of the application area occurs within the damplands setting on the flatter valley floor (Environ, 2013). Bennett (2008) found all low-lying areas to be flooded during the September 2005 survey when high rainfall was recorded. Based on the low-lying nature of the application area and the low impact and discontinuous nature of the proposed works, it is unlikely the proposed clearing will lead to an increase in incidence or intensity of flooding.

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

**Methodology** Bennett (2008)  
Environ (2013)  
GIS Database:  
- Hydrographic Catchments – Catchments

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

**Comments**

There are two native title claims over the area under application: WC1998/058 and WC2003/006 (GIS Database). One claim has been filed at the federal court and the other has been registered with the 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*.

According to available databases, 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 noted that the proposed clearing may impact on a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of the Environment for environmental impact assessment under the EPBC Act. The proponent is advised to contact the Department of the Environment for further information regarding notification and referral responsibilities under the EPBC Act.

It is the proponent's responsibility to liaise with the Department of Environment Regulation, the Department of Parks and Wildlife 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 20 January 2014 by DMP inviting submissions from the public. No submissions were received.

**Methodology** GIS Database:  
- Aboriginal Sites of Significance  
- Native Title Claims – Filed at the Federal Court  
- Native Title Claims – Registered with the NNTT

**4. References**

- BCE (2008) Fauna Survey of the Muja South Extension Project, September 2006. Unpublished report prepared by M.J. & A.R. Bamford Consulting Ecologists for Griffin Coal Mining Company Pty Ltd. Dated 30 July 2008.  
BCE (2012) Short-range Endemic Millipede Survey. Unpublished report prepared by Bamford Consulting Ecologists for Griffin

- Coal Mining Company Pty Ltd. Dated 9 March 2012.
- BCE (2013) Black-Cockatoo Values of the Muja South Extension Project Area. Unpublished report prepared by Bamford Consulting Ecologists for Griffin Coal. Dated 26 March 2013.
- BCE (2014) Memorandums from M.J & A.R. Bamford Consulting Ecologists to Griffin Coal. Titled 'Comments on conditions for a clearing permit with respect to impacts upon black-cockatoos; Griffin's Muja South project area' (dated 31 May 2014) and 'Management of possible nest trees for black-cockatoos during exploration drilling in Griffin's Muja South project area' (dated 15 July 2014).
- Bennett (2008) Flora and Vegetation of Proposed Development at Griffin Coal Mine Muja South Collie. Unpublished report prepared by Bennett Environmental Consulting Pty Ltd for The Griffin Group. Dated August 2008.
- CALM (2002) Jarrah Forest 2 (JF2 - Southern Jarrah Forest subregion) in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002'. Department of Conservation and Land Management, Western Australia.
- DEC (2012) Department of Environment and Conservation: Fauna Species Profile - Chuditch. Department of Environment and Conservation, Western Australia. [http://www.dec.wa.gov.au/publications/cat\\_view/365-fauna-management/370-fauna-species-profiles/372-marsupials.html](http://www.dec.wa.gov.au/publications/cat_view/365-fauna-management/370-fauna-species-profiles/372-marsupials.html) (Accessed April 2014).
- 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.
- DPaW (2014a) Advice to the assessing officer for clearing permit application CPS 5897/1. Received on 10 February and 3 June 2014.
- DPaW (2014b) NatureMap - Mapping Western Australia Biodiversity, Department of Environment and Conservation. <http://naturemap.dec.wa.gov.au/default.aspx>, viewed April 2014.
- DoW (2014) Advice to the assessing officer for clearing permit application CPS 5897/1. Received on 3 and 6 February, 31 March and 12 May 2014.
- Environ (2013) Supporting Information for the Native Vegetation Clearing Permit Application for the Muja South Exploration Drilling Program. Unpublished report prepared by ENVIRON Australia Pty Ltd for Griffin Coal Mining Company Pty Ltd. Dated 21 May 2013.
- EPA (2000) Environmental Protection of Native Vegetation in Western Australia. Clearing of Native Vegetation, with Particular Reference to the Agricultural Area. Position Statement No. 2. December 2000. Environmental Protection Authority, Western Australia.
- Government of Western Australia (2013) 2012 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of October 2012. WA Department of Environment and Conservation, Perth.
- Griffin (2014) Further Information provided by The Griffin Coal Mining Company Pty Ltd on 14 January and 1 May 2014.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- OEPA (2014) Advice to the assessing officer for clearing permit application CPS 5897/1. Received on 17 April 2014.
- Onshore (2013) Targeted Flora Survey *Caladenia* sp. Collie (E.Bennett s.n. PERTH 08396051). Unpublished report prepared by Onshore Environmental Consultants Pty Ltd for Griffin Coal Ltd. Dated April 2013.

## 5. Glossary

### Acronyms:

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