



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5057/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Talison Lithium Australia Pty Ltd

1.3. Property details

Property:

- Mining Lease 01/2
- Mining Lease 01/3
- Mining Lease 01/4
- Mining Lease 01/5
- Mining Lease 01/6
- Mining Lease 01/7
- Mining Lease 01/8
- Mining Lease 01/9
- Mining Lease 01/10
- Mining Lease 01/11
- Mining Lease 01/16
- Mining Lease 01/18
- Mining Lease 70/765
- General Purpose Lease 01/1
- General Purpose Lease 01/2
- Miscellaneous Licence 01/1

Local Government Area: Shire of Bridgetown-Greenbushes
Colloquial name: Greenbushes Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
10		Mechanical Removal	Rehabilitation Activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 26 July 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>3: Medium forest; jarrah-marri (GIS Database).</p> <p>A Level 2 flora and vegetation survey was undertaken over the application area by botanists from Onshore Environmental in October 2011. Eight vegetation associations were described and mapped over the application area and these were classified into four broad floristic formations according to dominant vegetation strata (Onshore Environmental, 2012).</p> <p>Eucalyptus Dense Forest 1a: <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Corymbia calophylla</i> Dense Forest over <i>Banksia grandis</i>, <i>Bossiaea linophylla</i> and <i>Persoonia longifolia</i> Open Scrub over <i>Pteridium esculentum</i>, <i>Macrozamia riedlei</i> and <i>Leucopogon verticillatus</i> Open Low Scrub B (with <i>Leucopogon</i></p>	<p>Talison Lithium Australia Pty Ltd has applied to clear up to 10 hectares of native vegetation within an application area of approximately 10,060 hectares for the purpose of rehabilitation activities. The clearing is enable Talison Lithium Australia to satisfy rehabilitation completion criteria in disturbed areas outside of the active mining area and to make safe any historical workings that the company has become aware of. The rehabilitation activities are planned between now and 2026.</p> <p>The application area consists of the existing Greenbushes Mine and the surrounding area, near the Greenbushes townsite.</p> <p>The clearing will be undertaken by a</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);</p> <p>To:</p> <p>Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).</p>	<p>The vegetation condition was assessed by botanists from Onshore Environmental (2012).</p>

capitellatus and *Bossiaea ornata* Open Dwarf Scrub D) in brown sandy loam on upper hill slopes and plateaux.

small backhoe, front end loader or bulldozer.

Eucalyptus Dense Forest 1b: *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* Dense Forest over *Bossiaea ornata*, *Hibbertia hypercoides* and *Leucopogon capitellatus* Dwarf Scrub D in brown sandy loam over undulating hill slopes and plateaux.

Eucalyptus Forest 2a: *Eucalyptus marginata* subsp. *marginata*, *Corymbia calophylla* Forest (to Dense Forest) over *Banksia grandis*, *E. marginata* subsp. *marginata*, *C. calophylla* Low Forest A over *Pteridium esculentum*, *Leucopogon capitellatus* and *Bossiaea ornata* Dwarf Scrub C in brown loamy sand on upper hill slopes and plateaux.

Eucalyptus Forest 2b: *Eucalyptus marginata* subsp. *marginata*, *Corymbia calophylla* and *Allocasuarina fraseriana* Forest over *A. fraseriana*, *Banksia grandis* and *Persoonia longifolia* Low Forest A over *Leucopogon capitellatus*, *Pteridium esculentum* and *Bossiaea ornata* Open Dwarf Scrub C in grey loamy sand on upper hill slopes and plateaux.

Eucalyptus Forest 2c: *Eucalyptus rudis*, *Corymbia calophylla* and *Eucalyptus patens* Forest (to Woodland) over *Banksia littoralis* Open Low Woodland A over *Taxandria linearifolia*, *Taxandria parviceps* and *Pteridium esculentum* Heath A in brown sandy clay loam along drainage lines and flats.

Eucalyptus Forest 2d: *Eucalyptus marginata* subsp. *marginata* and *Corymbia calophylla* Forest over *Xanthorrhoea preissii* Open Scrub over *Bossiaea ornata*, *Leucopogon capitellatus* and *Banksia dallanneyi* Dwarf Scrub C in brown loam on lower hill slopes and unincised drainage lines/flats.

Leptospermum Scrub 3: *Leptospermum erubescens* Scrub over *L. erubescens*, *Bossiaea aquifolium*, *Allocasuarina humilis* Heath A over *Hypocalymma angustifolium*, *Babingtonia camphorosmae* and *Thomasia foliosa* Low Heath C in brown loamy sand on granite outcrops and sheets.

*Typha Dense Tall Sedges 4: **Typha orientalis* Dense Tall Sedges.

*indicates introduced species

The application area also included areas that were mapped as plantation, cleared farmland, water body, townsite, mine rehabilitation and mine disturbance (Onshore Environmental, 2012).

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 not likely to be at variance to this Principle

The application area occurs within the Southern Jarrah Forest (JF2) Interim Biogeographic Regionalisation of Australia (IBRA) subregion (GIS Database). This subregion is characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by Wandoo-Marri woodlands on clayey soils (CALM, 2002). Eluvial and alluvial deposits support *Agonis* shrublands and in areas of Mesozoic sediments Jarrah forests occur in a mosaic with a variety of species-rich shrublands (CALM, 2002).

A Level 2 flora and vegetation survey was undertaken over the application area by botanists from Onshore Environmental in October 2011. A total of 368 vascular plant taxa, from 73 families and 208 genera, were recorded within the application area (Onshore Environmental, 2012). Species representation was greatest among the Fabaceae, Poaceae, Myrtaceae, Cyperaceae, Asteraceae and Orchidaceae families (Onshore Environmental, 2012).

One Threatened Flora species and two Priority Flora species have been recorded within the application area (Onshore Environmental, 2012; GIS Database). The known population of *Caladenia harringtoniae* was revisited during the flora and vegetation survey and its extent was expanded. Despite targeted searches at the

appropriate time of the year, no additional populations were recorded (Onshore Environmental, 2012). *Tetratheca parvifolia* (P3) was recorded during the survey at two locations in the north-west of the application area. The first location had scattered plants and the second location had a single plant (Onshore Environmental, 2012). *Grevillea ripicola* (P4) has previously been recorded in the north-west of the application area (Onshore Environmental, 2012; GIS Database). Potential impacts to Threatened and Priority Flora as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

No Threatened Ecological Communities or Priority Ecological Communities were recorded during the flora and vegetation survey or have previously been recorded within the application area (Onshore Environmental, 2012; GIS Database).

A total of 86 introduced flora species were recorded during the flora and vegetation survey by Onshore Environmental (2012). Three weed taxa were Declared Plants under the *Agriculture and Related Resources Act 1976*: Blackberry (*Rubus ulmifolius*), Bridal Creeper (*Asparagus asparagoides*) and Goosegrass (*Galium aparine*) (Onshore Environmental, 2012). The diversity of weeds within the application area is relatively high and reflects the long mining history in the Greenbushes area as well as nearby clearing of native vegetation for farmland and plantation timber (Onshore Environmental, 2012). A weed management program has been implemented at the site and a dedicated weed control officer is employed on site to manage weeds (Onshore Environmental, 2012; Talison Lithium Australia, 2012). Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Dieback has been detected within the application area (Onshore Environmental, 2012; GIS Database) and this poses a risk to biodiversity in the application area and surrounds. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a dieback management condition.

A Level 1 fauna survey of the application area was conducted by zoologists from Biologic which included a field survey to describe fauna habitats and conduct targeted surveys for fauna of conservation significance (Biologic, 2011). Jarrah/Marri forest was the dominant fauna habitat type covering approximately 41% of the application area, while disturbed/rehabilitated areas also covered approximately 41% of the application area (Biologic, 2011). Three threatened Black Cockatoo species were recorded within the application area: Baudin's Cockatoo (*Calyptorhynchus baudinii*), Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Biologic, 2011). The application area provides foraging habitat and potential breeding habitat for all three species of Black Cockatoos (Biologic, 2011). However, the areas proposed to be cleared are disturbed areas which have been mapped as disturbed by mining (Talison Lithium Australia, 2012). The areas proposed to be cleared are likely to provide low quality fauna habitat compared to the rest of the application area and support a lower level of faunal diversity.

The purpose of the clearing is to rehabilitate historic mine disturbances in areas of forest that surround the active mining area. Talison Lithium Australia has reached agreement with the Department of Environment and Conservation (DEC) on a process to hand back management of these areas of forest to DEC (Talison Lithium Australia, 2012). The rehabilitation of previously disturbed areas is likely to enhance the biodiversity of the disturbed areas.

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

Methodology Biologic (2011)
CALM (2002)
Onshore Environmental (2012)
Talison Lithium Australia (2012)
GIS Database:
- Dieback Occurrence
- IBRA WA (Regions - Sub Regions)
- Threatened and Priority Flora
- 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 at variance to this Principle

A Level 1 fauna survey of the application area was conducted by zoologists from Biologic which consisted of a literature and database review, a field survey to map and describe fauna habitats and conducting targeted surveys for fauna of conservation significance (Biologic, 2011). The field survey took place in October 2011 and included habitat tree assessments for three threatened Black Cockatoo species that potentially occur in the application area, nocturnal surveys, bat recordings, motion cameras and opportunistic sightings (Biologic, 2011).

Five broad natural fauna habitats were present within the application area as well as a disturbed category. The mapped fauna habitats were:

- Jarrah/Marri forest over Banksia dominated midstorey;
- Jarrah/Marri forest;
- Marri/Blackbutt/Flooded Gum Woodland over Banksia dominated midstorey;

- Leptospermum scrub;
- Typha dense tall sedges; and
- Disturbed/rehabilitated areas (Biologic, 2011).

The Jarrah/Marri forest habitat was the dominant natural habitat type covering approximately 41% of the application area, while the disturbed/rehabilitated areas also covered approximately 41% of the application area (Biologic, 2011).

A total of 82 vertebrate fauna species were recorded during the fauna survey comprising of eight native mammal, six introduced mammal, 59 bird, four reptile and five amphibian species (Biologic, 2011).

Based on database searches and previous surveys in the region, a total of 22 species of conservation significance have the potential to occur in the application area (Biologic, 2011). Five conservation significant species were recorded during the fauna survey:

- Baudin's Cockatoo (*Calyptorhynchus baudinii*);
- Carnaby's Cockatoo (*Calyptorhynchus latirostris*);
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*);
- Rainbow Bee-eater (*Merops ornatus*); and
- Southern Brush-tailed Phascogale (*Phascogale tapoatafa tapoatafa*) (Biologic, 2011).

The application area does provide significant habitat for indigenous fauna, particularly Black Cockatoo species. However, the areas proposed to be cleared are disturbed areas which have been mapped as 'disturbed by mining' or historical disturbances such as historic pit voids where regrowth must be cleared to improve historic rehabilitation to acceptable standards (Talison Lithium Australia, 2012). The areas proposed to be cleared are likely to provide low quality fauna habitat compared to the rest of the application area.

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

Methodology Biologic (2011)
Talison Lithium Australia (2012)

(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

According to available databases there is one record of Threatened Flora, *Caladenia harringtoniae*, in the southern part of the application area (GIS Database).

A Level 2 flora and vegetation survey was undertaken over the application area by botanists from Onshore Environmental in October 2011. The survey included re-visiting known locations of conservation significant flora and a focus on specific landforms where significant flora may be expected to occur (Onshore Environmental, 2012).

Caladenia harringtoniae was recorded during the survey as 26 plants from an unincised drainage line/dampland in the southern part of the application area. The orchid was in flower at the time of the survey. This was the same location as the previously known location but the extent of the population was expanded (Onshore Environmental, 2012). The vegetation association at this location was described as *Eucalyptus marginata* and *Corymbia calophylla* forest over *Xanthorrhoea preissii* open scrub over *Logania serphyllifolia* subsp. *angustifolia*, *Banksia dallanneyi* and *Bossiaea ornata* Dwarf Scrub C. Extensive ground truthing of the survey area and targeted searches of similar habitat did not result in any new populations being found within the application area (Onshore Environmental, 2012).

Based on the above, the proposed clearing is at variance to this Principle. The population is located outside the active mining area and based on aerial imagery the location is undisturbed (Onshore Environmental, 2012), therefore it is unlikely rehabilitation activities will occur here. Potential impacts to Threatened Flora as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

Methodology Onshore Environmental (2012)
GIS Database:
- Threatened and Priority Flora

(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 40 kilometres north-west of the application area (GIS Database).

No TECs were identified during the flora and vegetation surveys conducted by Onshore Environmental botanists (Onshore Environmental, 2012).

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

Methodology Onshore Environmental (2012)
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 Jarrah Forest Interim Biogeographic Regionalisation for Australia (IBRA) bioregion in which approximately 54.9% of the pre-European vegetation remains (see table) (Government of WA, 2011; GIS Database). This gives it a conservation status of 'Least Concern' 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 mapped as Beard vegetation association 3 'Medium forest; jarrah-marri' (GIS Database). According to Government of WA (2011), approximately 69.3% of this vegetation association remains at a state level (see table). This vegetation association would be given a conservation status of 'Least Concern' (Department of Natural Resources and Environment, 2002).

The vegetation under application is not a 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 - Jarrah Forest	4,506,657	2,473,560	~54.9	Least Concern	14.1 (25.1)
IBRA Subregion - Southern Jarrah Forest	2,607,876	1,349,387	~51.7	Least Concern	17.0 (32.0)
Local Government - Bridgetown-Greenbushes	133,759	73,744	~55.1	Least Concern	12.4 (22.4)
Beard vegetation associations - State					
3	2,661,405	1,844,285	~69.3	Least Concern	18.5 (26.4)
Beard vegetation associations - Bioregion					
3	2,390,592	1,641,272	~68.7	Least Concern	16.3 (23.6)
Beard vegetation associations - subregion					
3	1,482,492	908,058	~61.2	Least Concern	18.8 (30.4)

* 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 at variance to this Principle

The application area contains numerous minor perennial watercourses, dams and a major perennial watercourse (GIS Database). A number of vegetation associations mapped within the application area are

growing along ephemeral drainage lines or around the perimeter of permanent water bodies such as Spring Gully Dam (Talison Lithium Australia, 2012). Vegetation associations 'Eucalyptus Forest 2c' and 'Eucalyptus Forest 2d' are described as being associated with drainage lines and flats (Onshore Environmental, 2012). Historical alluvial mining did occur along many of the drainage lines within the application area. Associated rehabilitation has developed well over time and it is unlikely there will be a requirement to undertake remedial works within these areas (Talison Lithium Australia, 2012).

Based on the above, the proposed clearing is at variance to this Principle. However, any clearing of riparian vegetation is likely to be minimal as rehabilitation is not focussed on these areas.

Methodology Onshore Environmental (2012)
Talison Lithium Australia (2012)

(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

Talison Lithium Australia has applied to clear 10 hectares for the purpose of rehabilitation activities. The application area is not considered to contain acid sulphate soils and it is not expected that waterlogging or soil salinity will be increased by the proposed clearing (Talison Lithium Australia, 2012). The proposed clearing activities are not likely to result in large areas of disturbed or open land. Given the nature and the small size of the proposed activities, the clearing is not likely to result in appreciable land degradation.

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

Methodology Talison Lithium Australia (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 majority of the application area is in Greenbushes State Forest while a small portion in the north-west corner is classified as 'CALM Exec Body Freehold' (GIS Database). The purpose of the clearing is to rehabilitate historic mine disturbances in areas of forest that surround the active mining area. Talison Lithium Australia has reached agreement with the Department of Environment and Conservation (DEC) on a process to hand back management of these areas of forest to DEC (Talison Lithium Australia, 2012). The proposed clearing is likely to enhance the environmental values of DEC managed land within the application area.

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

Methodology Talison Lithium Australia (2012)
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

The application area contains numerous minor perennial watercourses, dams and a major perennial watercourse (GIS Database). The Department of Water (DoW) has advised that clearing within 50 metres of all waterways and waterbodies should be avoided where possible (DoW, 2012). Where it is necessary it should include stabilisation to avoid erosion and sedimentation and shall include revegetation (DoW, 2012). Talison Lithium Australia have stated that there is unlikely be clearing for rehabilitation activities undertaken along drainage lines as rehabilitation has already developed well over these areas (Talison Lithium Australia, 2012).

Within Mining Leases 01/4, 01/5, 01/6 and 01/9 there is an area identified for possible future use as a Public Drinking Water Source Area (PDWSA) (DoW, 2012; GIS Database). DoW (2012) has advised that there is a need to ensure that proposed clearing will include rehabilitation through stabilisation of any waterway banks, drainage lines or waterbodies including revegetation for water quality protection purposes.

The purpose of the clearing is to rehabilitate historic mine disturbances in areas of forest that surround the active mining area. Talison Lithium Australia has reached agreement with the Department of Environment and Conservation (DEC) on a process to hand back management of these areas of forest to DEC (Talison Lithium Australia, 2012). One of the completion criteria for the process is to ensure the rehabilitation sites conform to catchment protection guidelines (DEC and Talison Greenbushes Pty Ltd, 2009). The guidelines for meeting this criteria are ensuring relevant stream water quality standards are met, there is a stable soil surface, and vegetation cover meets the needs of catchment protection and designated land use. The standard used to assess the criteria is the area is stable with no evidence of recent erosion that would compromise stream water quality as determined by visual inspection and evidenced by correspondence from DoW (DEC and Talison Greenbushes Pty Ltd, 2009).

Given the purpose of the clearing is to rehabilitate disturbed areas to a standard set by DEC and DoW, the proposed clearing is unlikely to cause deterioration in the quality of surface or underground water.

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

Methodology DEC and Talison Greenbushes Pty Ltd (2009)
DoW (2012)
Talison Lithium Australia (2012)
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 Hardy Estuary-Blackwood River catchment area (GIS Database). Given the size of the area to be cleared (10 hectares) in relation to the size of the catchment area (1,373,020 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a 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 four native title claims over the application area (WC96/109, WC 98/58, WC 98/70 and WC06/4) (GIS Database). These claims have been registered with the National Native Title Tribunal on behalf of the claimant group. 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 is one registered Aboriginal Site 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 proponents' 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 11 June 2012 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received stating there were no objections to this application.

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

4. References

- Biologic (2011) Greenbushes Level 1 Fauna Survey. Report Prepared by Biologic for Talison Lithium Australia Pty Ltd, November 2011.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Jarrah Forest 2 (JF2 - Southern Jarrah Forest Subregion). Department of Conservation and Land Management, Western Australia.
- DEC and Talison Greenbushes Pty Ltd (2009) Completion Criteria for Historical Upland and Valley Rehabilitation Sites Talison Greenbushes Pty Ltd. Correspondence Between the Department of Environment and Conservation Environmental Management Branch and Talison Greenbushes Pty Ltd, June 2009.
- 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.
- DoW (2012) Advice to Assessing Officer for Clearing Permit Application CPS 5057/1. Department of Water, June 2012.
- Government of WA (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.
- Onshore Environmental (2012) Flora and Vegetation Survey Greenbushes Mining Leases. Report Prepared by Onshore Environmental for Talison Minerals, February 2012.

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 in 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.