Government of Western Australia
Department of Mines, Industry Regulation and Safety

# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

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| **Permit application No.:** | 8928/1 |
| **Permit type:** | Area Permit |

### 1.2. Proponent details

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| **Proponent's name:** | **Hesketh Quarry's Pty Ltd** |

### 1.3. Property details

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| **Property:** | Mining Lease 70/1350 |
| **Local Government Area:** | Shire of Bridgetown-Greenbushes |
| **Colloquial name:** | Yornup Quarry |

### 1.4. Application

| Clearing Area (ha) | No. Trees | Method of Clearing | For the purpose of: |
|---|---|---|---|
| 10.5 | | Mechanical Removal | Quarry and associated activities |

### 1.5. Decision on application

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|---|---|
| **Decision on Permit Application:** | Grant |
| **Decision Date:** | 26 March 2021 |

**Reasons for Decision**

The clearing permit application has been assessed against the clearing principles, planning instruments and other relevant matters, in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act). The assessment has concluded that the proposed clearing is at variance to Clearing Principles (b) and (f), may be at variance to Principles (a), (g), (h) and (i), and is not or is not likely to be at variance to the remaining Clearing Principles.

An assessment was undertaken by the Department of Mines, Industry Regulation and Safety based on the original application for an Area Permit submitted for the proposed clearing of 25.536 hectares of native vegetation within Mining Lease 70/1350. The area applied to clear contained significant Black Cockatoo foraging and potential breeding habitat. The Department considered that significant residual environmental impacts remained after the implementation of avoidance and mitigation measures applied by the proponent.

The Delegated Officer requested that the proponent consider whether any further avoidance or mitigation measures could be applied to the proposal, to further minimise the impacts of the proposed clearing on Black Cockatoo habitat. The Delegated Officer suggested some examples of avoidance or mitigation measures which could be considered, including:

- excluding trees containing large hollows suitable for nesting of Black Cockatoos from the area proposed to be cleared;
- reducing the area of proposed clearing by modifying the project disturbance footprint; and
- the installation of artificial hollows for Black Cockatoos.

The proponent advised the Department that artificial hollows could be installed to mitigate the clearing of potential Black Cockatoo nesting trees, but that no further avoidance or mitigation measures would be considered. The proponent did not provide an offset for the significant residual impacts to Black Cockatoos.

The Delegated Officer considered that the installation of artificial nest hollows was not sufficient to negate the significant residual environmental impacts of the proposal, and determined that a partial approval was appropriate in this instance. Therefore, in accordance with sections 51E(5) and 51E(7) of the EP Act, the permit has been granted subject to the conditions specified in the permit, and authorising the clearing of only 10.5 hectares of the clearing applied for. The reduced area approved to clear has significantly reduced the residual impacts of the proposal to Black Cockatoo foraging and potential breeding habitat. The approved area covers all of the proposed new mining area and includes approximately 2.7 hectares which has been historically cleared for a previous quarry operation at the site.

In reaching this determination, the Delegated Officer has taken into consideration that the reopening of the disused quarry will provide a valuable local source of basic raw materials for the southwest region; while recognising the importance of environmentally sustainable development and minimising environmental harm; and having regard for the object and principles of the EP Act as outlined in section 4A of the Act.

## 2. Site Information

### 2.1. Existing environment and information

*2.1.1. Description of the native vegetation under application*

**Vegetation Description**

According to Statewide vegetation mapping, the vegetation of the original application area is broadly mapped as the following Beard vegetation association:
3: Medium forest: jarrah-marri (GIS Database).

Vegetation mapping of the South West Forest region, has further defined the vegetation associations within the original application area as:
MT1: Open forest of *Eucalyptus marginata* subsp. *marginata*, *Corymbia calophylla*, *Banksia grandis* on low undulating uplands in perhumid and humid zones. (Representing the majority of the original application area, and all of the area approved to clear) (GIS Database); and
YR: Mosaic of open woodland of *Eucalyptus marginata* subsp. *marginata, Corymbia calophylla*, open woodland of *Melaleuca cuticularis*, open woodland of *Melaleuca preissiana, Banksia littoralis, Banksia seminuda*, tall shrubland of Myrtaceae spp. and sedgelands on broad depressions in humid and subhumid zones. (Representing a small area at the southern tip of the original application area, not located within the area approved to clear) (GIS Database).

A flora and vegetation survey was conducted over the original application area by Plantecology Consulting (Plantecology) on 28 and 29 October 2015. The following vegetation associations were recorded within the application area (Plantecology, 2016):

**Remnant native vegetation, representing the majority of the application area:**
Woodland of *Eucalyptus marginata* and *Corymbia calophylla* over open woodland of *Banksia grandis* over shrubland of *Xanthorrhoea preissii* and *Macrozamia riedlei* on gravelly red brown loams (Plantecology, 2016).

**The previously cleared areas:**
Regrowth vegetation around the edges of the old quarry area:
Plantecology (2016) described it as:
Regenerating area of low shrubs of *Leptospermum erubescens, Billardiera fusiformis, Melaleuca incana* subsp. *incana* and *Gastrolobium spinosum*;

Harewood (2015) described it as:
Mainly regrowth of *Eucalyptus marginata – Corymbia calophylla* woodland;

On the floor of the old quarry area, where a small pit lake has formed:
Sedgeland of *Typha orientalis, Juncus krausii* subsp. *australiensis* and **Juncus microcephalus* in a wet depression with free surface water (Plantecology, 2016).

The 10.5 hectare proposed clearing area includes approximately 2.7 hectares which has been historically cleared for a previous quarry operation at the site. The old quarry was not rehabilitated, and some parts remain devoid of vegetation while other parts have some regrowth. The old quarry pit has water pooling in the bottom, which has provided a changed habitat and resulted in some water dependant vegetation which would not otherwise occur at this location.

* Denotes weed species

**Clearing Description**

Yornup Quarry Project.
Hesketh Quarry's Pty Ltd proposes to clear up to 10.5 hectares of native vegetation within a boundary of approximately 10.5 hectares, for the purpose of mineral production and associated activities. The project is located approximately 15 kilometres south of Bridgetown, within the Shire of Bridgetown-Greenbushes.

**Vegetation Condition**

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

To

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

**Comment**

The vegetation condition was derived from a vegetation survey conducted by Plantecology (2016), and was confirmed by the Assessing Officer during a site visit on 13 January 2021.

Plantecology (2016) described the vegetation condition of the remnant vegetation (which represented the majority of the application area), as Excellent on the Keighery scale. The remnant vegetation shows evidence of previous disturbance from historical timber harvesting, and a few weed species were recorded (Plantecology, 2016). The condition of the previously cleared areas within and around the old quarry ranged from Good to Degraded, and weeds were more common in these areas (Plantecology, 2016). The previously cleared areas also include some areas which remain devoid of vegetation.

The proposed clearing is to allow the reopening and expansion of an old hard-rock (basalt) quarry at the site, which was previously operated by the Western Australian Government Railways Commission in approximately the 1980's-1990's. There is some previous disturbance within the application area, including the old quarry pit and access road, representing approximately 2.7 hectares of the proposed clearing area.

## 3. Minimisation and Mitigation Measures

The proponent applied to clear up to 25.536 hectares of native vegetation within an application area of the same size. Prior to submitting the application, the proponent had applied mitigation measures by establishing 10 metre buffer zones along the northern and western tenement boundaries, a variable width buffer zone (to a maximum of 50 metres) along part of the eastern tenement boundary, and an approximately six hectare buffer zone in the northwest corner of the tenement, surrounding a Black Cockatoo breeding tree.

The assessment of the application identified significant residual impacts to Black Cockatoo foraging and potential breeding habitat within the application area. To further minimise and mitigate the potential impacts of the clearing to Black Cockatoo habitat, only 10.5 hectares of the original application area has been approved for clearing, and fauna management conditions have been imposed on the permit. Following the implementation of these additional avoidance and mitigation measures, the residual impacts of the proposed clearing on Black Cockatoo habitats are no longer considered significant.


**Figure 1**: Showing the original 25.536 hectare area applied to clear (pink outline).


**Figure 2:** Showing the reduced 10.5 hectare area approved to clear (yellow outline).

## 4. Assessment of application against Clearing Principles

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

**Comments**

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

The proposed clearing area is located within the Southern Jarrah Forest sub-region of the Jarrah Forest Bioregion of the Interim Biogeographic Regionalisation of Australia (IBRA) (GIS Database). The Southern Jarrah Forest subregion is characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by woodlands of Wandoo - Marri on clayey soils (CALM, 2002). The majority of the diversity in the vegetation communities occurs on the lower slopes or near granite soils where there are rapid changes in site conditions (CALM, 2002).

A Level 1 flora and vegetation survey was conducted by Plantecology Consulting over Mining Lease 70/1350 on 28-29 October 2015 (Plantecology, 2016). A total of 78 native flora taxa and 15 introduced flora taxa were recorded within the survey area (Plantecology, 2016).

The majority of the survey area is vegetated by Jarrah-Marri woodland in Excellent condition, on the Keighery scale (Plantecology, 2016). The woodland shows some evidence of historical timber harvesting, but the vegetation structure is largely intact, and few weed species were recorded within this vegetation unit (Plantecology, 2016). The vegetation condition of the previously cleared areas (within and adjacent to the old quarry) ranged from Good to Degraded, and weeds were more common in these areas (Plantecology, 2016). The previously cleared areas also include some areas which remain devoid of vegetation.

The application area is located within a dieback disease risk zone (GIS Database), and a total of 15 weed species were recorded within the survey area during the flora and vegetation survey (Plantecology, 2016). Weeds and dieback disease have the potential to reduce the biodiversity of an area, and care should be taken to prevent the introduction or spread of weeds and dieback. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a dieback and weed management condition on the permit.

A desktop assessment identified six Threatened flora taxa and 17 Priority flora taxa with the potential to occur within the survey area, based on known distributions (Plantecology, 2016). However, no conservation significant flora species were recorded during the field survey (Plantecology, 2016).

No Threatened Ecological Communities (TEC's) or Priority Ecological Communities (PEC's) are known to occur within the area proposed to clear (GIS Database), and none were recorded during the flora and vegetation survey conducted over the whole tenement (Plantecology, 2016).

A fauna survey conducted over Mining Lease 70/1350 in November-December 2015 recorded evidence of a total of 25 native fauna species within the survey area, comprising one reptile, 22 bird species, and two mammal species (Harewood, 2015). The application area occurs within the known ranges of three Threatened species of Black Cockatoo: Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (VU); Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (EN); and Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) (EN) (DBCA, 2020; DSEWPAC, 2012; Harewood, 2015). The majority of the survey area represented good quality foraging habitat and potential breeding habitat for Black Cockatoos, and evidence of all three species of Black Cockatoo was recorded within the survey area (Harewood, 2015).

The vegetation within the survey area forms part of a regionally significant ecological linkage, identified under the South West Regional Ecological Linkages (SWREL) project (Plantecology, 2016).

The vegetation associations, fauna habitats and landform types present within the survey area, are well represented in surrounding areas, including within adjacent areas of State Forest (Plantecology, 2016; GIS Database). However, the area applied to be cleared contains significant habitat for three conservation significant fauna species (Black Cockatoos). While rehabilitation of the site following completion of the proposed mining activities may result in reinstatement of some of the Black Cockatoo habitat, this will be a long-term process with no guarantee that equivalent habitat values can ever be restored. *Australia's Biodiversity Conservation Strategy 2010-2030* (Natural Resource Management Ministerial Council, 2010) notes that biodiversity is best conserved by protecting existing natural habitats. Fauna species including Black Cockatoo populations depend on forest habitats for their long-term survival, and the long period required for the forest to regenerate following clearing should be taken into account when considering impacts to biodiversity.

The proponent originally applied to clear up to 25.536 hectares of native vegetation, however only 10.5 hectares has been approved to clear. The reduced area approved to clear, has significantly reduced the potential environmental impacts of the project, in both a local and regional context.

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

**Methodology**

CALM (2002)
DBCA (2020)
DSEWPAC (2012)
Harewood (2015)

Natural Resource Management Ministerial Council (2010)
Plantecology (2016)

GIS Database:
- Dieback Occurrence
- IBRA Australia
- Pre-European Vegetation
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened and Priority Flora
- Threatened Fauna

**(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.**

**Comments**

**Proposal is at variance to this Principle**

The vegetation associations recorded during the flora and vegetation survey reflect the basic fauna habitat types within the survey area. Plantecology (2016) described the majority of the vegetation as jarrah/marri woodland, in excellent condition.

A fauna survey was conducted over Mining Lease 70/1350 and immediately adjacent areas during November-December 2015 (Harewood, 2015). The entire tenement was traversed in a series of transects and included daytime and night-time searches for fauna (Harewood, 2015). A total of 25 native fauna species and one introduced species were recorded during the fauna survey, either by direct observation or from secondary evidence such as tracks, scats, foraging evidence and calls (Harewood, 2015).

The fauna species recorded during the survey comprised one reptile: South-western Cool Skink (*Acritoscincus trilineatum*); two mammal species: Common Brushtail Possum (*Trichosurus vulpecula)* and Western Grey Kangaroo (*Macropus fuliginosus*); and 22 bird species: Emu (*Dromaius novaehollandiae*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), Baudin's Black Cockatoo, (*Calyptorhynchus baudinii*), Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), Red-capped Parrot (*Platycercus spurius*), Australian Ringneck Parrot (*Platycercus zonarius*), Fan-tailed Cuckoo (*Cacomantis flabelliformis*), Shining Bronze Cuckoo (*Chrysococcyx lucidus*), Laughing Kookaburra (introduced) (*Dacelo novaeguineae*), Red-winged Fairy-wren (*Malurus elegans*), Broad-tailed Thornbill (*Acanthiza apicalis*), Western Gerygone (*Gerygone fusca*), Striated Pardalote (*Pardalotus striatus*), White-browed Scrubwren (*Sericornis frontalis*), Brown Honeyeater (*Lichmera indistincta*), Western Yellow Robin (*Eopsaltria australis*), Grey Shrike-thrush (*Colluricincla harmonica*), Rufous Whistler (*Pachycephala rufiventris*), Grey Fantail (*Rhipidura fuliginosa*), Black-faced Cuckoo-shrike (*Coracina novaehollandiae*), Dusky Woodswallow (*Artamus cyanopterus*), Australian Raven (*Corvus coronoides)* and Silvereye (*Zosterops lateralis)* (Harewood, 2015).

The fauna survey report described the dominant fauna habitat within the survey area as follows:
- a jarrah (*Eucalyptus marginata)* and marri (*Corymbia calophylla*) dominated woodland with a midstorey/ understory of various tree and shrub species at variable densities on gravelly pisolitic soils with some minor basalt outcropping in higher areas (Harewood, 2015).

Several fauna species of conservation significance have the potential to occur within the survey area based on known distributions, including some migratory bird species which are likely to be only occasional or transitory visitors to the site (Harewood, 2015).

Several fauna species of conservation significance were considered either likely or possible to occur within the survey area based on habitat preferences, and these species were specifically targeted during the fauna survey (Harewood, 2015).

The only fauna species of conservation significance which were recorded during the fauna survey were the three Threatened species of Black Cockatoo, which are listed under both the (WA) *Biodiversity Conservation Act 2016* (BC Act) and the (Federal) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (Vulnerable (VU));
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) (Endangered (EN)); and
- Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) (Endangered (EN)) (DBCA, 2019; Harewood, 2015).

There are three key components of Black Cockatoo habitat: foraging habitat; roosting habitat; and breeding habitat. In considering the relative habitat values of an area of suitable vegetation, the availability of nearby water sources is an important consideration. The Donnelly River occurs in close proximity to the clearing application area (approximately 250 metres away at its nearest point) (GIS Database), enhancing the potential suitability of the site as Black Cockatoo foraging, roosting and breeding habitat.

Foraging habitat

The fauna survey conducted over the Mining Lease by Harewood (2015) recorded foraging evidence (chewed marri and jarrah nuts) of all three threatened species of Black Cockatoo throughout the survey area. The

majority of the survey area represented good quality Black Cockatoo foraging habitat due to the dominance of the primary food source (Marri and Jarrah) and the presence of other suitable food plants such as Banksia species (Harewood, 2015).

Large areas of foraging habitat are required to support black cockatoo populations (DSEWPAC, 2012). Flocks will usually forage within 6 kilometres of a night roost (DSEWPAC, 2012), and it is noted that a confirmed roost occurs within this distance from the clearing application area (GIS Database). Appropriate foraging habitat is essential to support successful breeding, and for a potential Black Cockatoo breeding site to be viable, there must be sufficient foraging habitat available within 6 to 12 kilometres of the nesting site (DSEWPAC, 2012). There are no confirmed current breeding sites within this distance of the clearing application area (GIS Database), however several suitable breeding trees were recorded within the tenement, including one identified Black Cockatoo nesting tree (Harewood, 2015; Kirkby, 2016). Furthermore, Kirkby (2016) considered that with further research, all three Black Cockatoo species were likely to be found breeding in the Yornup area.

DBCA (2020) advised that the vegetation clearing and mining should be carried out in a staged manner, with rehabilitation following in a staged approach, allowing for progressive habitat replacement within the application area over the life of the mining operation. Rehabilitation following mining activities is a requirement under the *Mining Act 1978*, and while rehabilitation activities may result in reinstatement of some of the black cockatoo habitat values, this will be a long-term process and it is likely to take several years for revegetated areas to provide suitable foraging resources. Hence, the clearing of high quality foraging habitat should be minimised.

Roosting habitat

There is a confirmed Forest Red-tailed Black Cockatoo roost site located approximately three kilometres north of the area applied to clear (GIS Database), and vegetation within the clearing application area is likely to be used for foraging by birds utilising this roost site. However, Harewood (2015) did not record any evidence of Black Cockatoo roosting within or adjacent to the application area.

Breeding habitat

Harewood (2015) reported that the majority of the survey area represented good quality Black Cockatoo foraging habitat and potential breeding habitat. The nearest known breeding location for Forest Red-tailed Black Cockatoo and Carnaby's Black Cockatoo is approximately 35 kilometres to the west of the clearing application area, and Baudin's Black Cockatoo approximately 20 kilometres to the south of the clearing application area (DBCA, 2020; Kirkby, 2016). However, Kirkby (2016) considers that all three Black Cockatoo species are likely to be breeding in the general Yornup area. Given the availability of local water sources and suitable foraging habitat in the surrounding forest areas, Black Cockatoo breeding could occur within the clearing application area if suitable nesting hollows were available.

Harewood (2015) conducted a targeted Black Cockatoo habitat tree survey over a total area of approximately 35 hectares in November-December 2015, including all of the original clearing permit application area. The survey covered the whole area of Mining Lease 70/1350, and immediately adjacent areas, bounded by the tenement boundaries to the north and west, and Wagelup Road to the southeast. Harewood (2015) identified a total of 679 Black Cockatoo Habitat Trees (defined as trees with a diameter of 50 centimetres or greater at a height of 1.5 metres above the ground) within the 35 hectare survey area. Of these, 479 trees had no visible hollows; 177 trees had small hollows; and 23 trees had large hollows potentially suitable for nesting by black cockatoos (Harewood, 2015).

Of the 23 trees recorded by Harewood (2015) as containing large hollows potentially suitable for use by Black Cockatoos, one of these trees contained a hollow with signs of use for Black Cockatoo nesting and was determined to be a Black Cockatoo nesting tree (Harewood, 2015; Kirkby, 2016). This tree was excluded from the original clearing permit application area with a large vegetation buffer retained around it, separating the tree by approximately 83 metres from the edge of the clearing application area at its nearest point (GIS Database).

Kirkby (2016) conducted a follow-up Black Cockatoo Habitat Tree inspection in March 2016, inspecting the 23 potential nesting trees identified by Harewood (2015). Kirkby (2016) reported that only eight of the 23 trees contained suitable black cockatoo nesting hollows, six of which were located within the original clearing application area, while two were within the buffer zone outside the original application area.

Black Cockatoos nest in large hollows in mature eucalypt trees including Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) (DSEWPAC, 2012). Research has indicated that it takes between 100 and 200 years for a tree to grow to a size where it could develop a hollow large enough to be suitable for breeding of Black Cockatoos (DEC, 2008; DPaW, 2013; DSEWPAC, 2012). The populations of all three Threatened species of Black Cockatoo are declining due to habitat destruction (SEWPAC, 2012), and nest hollow shortage is considered a significant threat to breeding success and the long-term survival of Black Cockatoo populations (DEC, 2008; DPaW, 2013). Given the long history of timber harvesting throughout the southern jarrah forest, any mature trees containing hollows that may support Black Cockatoo breeding are considered significant (DBCA, 2020).

While recognising the extensive areas of remnant forest in the local area and region, DBCA (2020) has advised that the loss of breeding habitat is the main threat to Black Cockatoos and removal of nesting or breeding trees should be avoided. It should also be noted that trees which currently have smaller hollows may provide important habitat for other fauna species, and that small hollows have the potential to develop into larger hollows becoming the next cohort of Black Cockatoo nesting hollows.

Summary

The original clearing permit application was for the clearing of up to 25.536 hectares. After considering the avoidance and mitigation measures applied to the proposal by the proponent, the assessment of the application identified significant residual impacts to Black Cockatoo foraging and potential breeding habitat within the original application area. Therefore, approval of the total application area was not supported, and approval of a smaller area was considered appropriate in this instance.

A land swap agreement between Hesketh Quarry's Pty Ltd and the Department of Biodiversity, Conservation and Attractions (DBCA) has facilitated the grant of the mining lease and access to this section of the Yornup State Forest for the quarrying operations (refer to Principle (h) for more details). The proponent expressed the view that the land swap agreement constituted an environmental offset for the full extent of the clearing applied for, however, that is not the purpose of the agreement. The proponent has not presented an offset proposal in support of this clearing application, and has not provided the Black Cockatoo habitat values of the land swap area.

The original area applied to be cleared (25.536 hectares) represented a significant impact to good quality Black Cockatoo foraging habitat. The reduced area approved to clear (10.5 hectares), has significantly reduced the impacts to Black Cockatoo foraging habitat. The amount of Black Cockatoo foraging habitat to be cleared has been reduced from approximately 22.8 hectares to approximately 7.8 hectares. The proposed clearing will result in a localised loss of Black Cockatoo foraging habitat, however, the residual impacts of the proposed clearing of approximately 7.8 hectares of foraging habitat are not likely to be significant at a regional scale.

The reduced area approved to clear (10.5 hectares), has significantly reduced the impacts to Black Cockatoo Habitat Trees and potential Black Cockatoo breeding habitat. The reduced clearing area will result in the clearing of approximately 166 Black Cockatoo Habitat Trees, including: 42 trees with small hollows; seven out of the 23 trees identified by Harewood (2015) as having potential black cockatoo nesting hollows; and one of the eight trees identified by Kirkby (2016) as currently having suitable black cockatoo nesting hollows. The proposed clearing of 166 Black Cockatoo Habitat Trees will result in a localised loss of potential Black Cockatoo breeding habitat (both current and future), however, the residual impacts of the proposed clearing to potential breeding habitat are not likely to be significant at a regional scale.

Fauna management conditions have been imposed on the permit, to mitigate the impact of clearing one potential Black Cockatoo nesting tree. The permit conditions require the Permit Holder to engage a fauna specialist to inspect the hollows of the suitable nesting tree prior to clearing, and to install an artificial nesting hollow within the undisturbed portion of the tenement, prior to clearing.

The vegetation to be cleared forms part of a large area of forest vegetation which provides linkages for fauna movements through the landscape. The original clearing application area had an eastern/south-eastern boundary approximately one kilometre long, including approximately 600 metres immediately adjacent to Wagelup Road. The original area of clearing would have created a significant break in the ecological linkages for fauna movements across Wagelup Road and to/from the nearby water source at the Donnelly River on the opposite side of Wagelup Road. However, the area approved to clear (10.5 hectares) located at the northern end of the original application area, has significantly reduced the amount of clearing in close proximity to Wagelup Road, and has retained a substantial fauna linkage across Wagelup Road (see Figures 1 and 2).

The area proposed to be cleared forms part of a significant habitat for fauna, including Threatened species. Although the area to be cleared has been significantly reduced in size, the proposed clearing will still result in localised impacts to significant fauna habitats, including trees with small hollows which may be utilised by a variety of fauna species.

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

**Methodology**

DBCA (2019)
DBCA (2020)
DEC (2008)
DPaW (2013)
DSEWPAC (2012)
Harewood (2015)
Kirkby (2016)
Plantecology (2016)

GIS Database:
- BC roosts
- Carnabys Cockatoo Breeding Areas Confirmed
- Carnabys Cockatoo Feeding JF Unconfirmed
- Carnabys Cockatoo Roost Areas Confirmed
- Imagery
- Pre-European Vegetation
- Threatened Fauna

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

**Comments**

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

There are no known records of Threatened flora occurring within the application area (GIS Database).

A desktop assessment identified the following six threatened flora taxa, with the potential to occur within the application area, based on known ranges (Plantecology, 2016)

- *Caladenia christineae* (EN);
- *Caladenia harringtoniae* (VU);
- *Diuris drummondii* (VU);
- *Diuris micrantha* (VU);
- *Andersonia annelsii* (CR); and
- *Verticordia densiflora* subsp. *pedunculata* (EN).

Plantecology Consulting conducted a Level 1 flora and vegetation survey over the proposed clearing area in Spring 2015, including targeted searches for the above threatened flora taxa (Plantecology, 2016). However, no conservation significant flora taxa were recorded during the field survey.

Plantecology (2016) concluded that the four Threatened orchid species were unlikely to occur, due to habitat preferences, while the other two Threatened flora taxa identified in the desktop search (*Andersonia annelsii* and *Verticordia densiflora* subsp. p*edunculata)* would have been visible during the field survey, if present. DBCA (2020) confirmed that all of the above species were unlikely to occur within the survey area due to a lack of suitable habitat.

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

**Methodology**

DBCA (2020)
Plantecology (2016)

GIS Database:
- Pre-European Vegetation
- 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**

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database).

A flora and vegetation survey of the application area did not identify any TECs (Plantecology, 2016).

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

**Methodology**

Plantecology (2016)

GIS Database:
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

**(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 application area is located within the Southern Jarrah Forest sub-region of the Jarrah Forest Bioregion of the Interim Biogeographic Regionalisation of Australia (IBRA) (GIS Database). More than 50 percent of the pre-European vegetation remains within the Jarrah Forest Bioregion and the Shire of Bridgetown-Greenbushes, while the Southern Jarrah Forest subregion retains just under 50 percent of its pre-European vegetation extent (Government of Western Australia, 2019) (see table below).

The application area is broadly mapped as Beard vegetation association 3: Medium forest; jarrah-marri (GIS Database). Approximately 67% of the pre-European extent of Beard vegetation association 3, remains uncleared at both the State and Bioregional level, and over 50% of this vegetation association remains uncleared within the Southern Jarrah Forest sub-region and the Shire of Bridgetown-Greenbushes (Government of Western Australia, 2019).

Finer scale vegetation mapping of the South West Forest region, further defined the vegetation associations within the original application area as:

MT1: Open forest of *Eucalyptus marginata* subsp. *marginata*, *Corymbia calophylla*, *Banksia grandis* on low undulating uplands in perhumid and humid zones. (Representing the majority of the original application area, and all of the area approved to clear) (GIS Database); and
YR: Mosaic of open woodland of *Eucalyptus marginata* subsp. *marginata, Corymbia calophylla*, open woodland of *Melaleuca cuticularis*, open woodland of *Melaleuca preissiana, Banksia littoralis, Banksia seminuda*, tall shrubland of Myrtaceae spp. and sedgelands on broad depressions in humid and subhumid zones. (Representing a small area at the southern tip of the original application area, but not located within the area approved to clear) (GIS Database).

The area proposed to be cleared occurs within the Yornup State Forest, a large expanse of native forest, and all of the jarrah-marri forest vegetation associations described above are well represented in conservation estate in the surrounding areas (GIS Database).

Therefore, the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared.

| | Pre-European area (ha)* | Current extent (ha)* | Remaining %* | Conservation Status** | Pre-European % in DBCA managed lands (and post clearing %) |
|---|---|---|---|---|---|
| IBRA Bioregion – Jarrah Forest | 4,506,660 | 2,399,838 | ~53 | Least Concern | 39.43 (69.74) |
| IBRA Subregion – Southern Jarrah Forest | 2,607,879 | 1,291,457 | ~49 | Depleted | 37.09 (70.00) |
| Local Government – Bridgetown-Greenbushes | 133,759 | 71,368 | ~53 | Least Concern | 48.66 (85.22) |
| Beard vegetation associations – WA | | | | | |
| 3 | 2,661,404 | 1,803,437 | ~67 | Least Concern | 58.39 (81.50) |
| Beard vegetation associations – Jarrah Forest Bioregion | | | | | |
| 3 | 2,390,591 | 1,604,101 | ~67 | Least Concern | 57.71 (81.00) |
| Beard vegetation associations – Southern Jarrah Forest subregion | | | | | |
| 3 | 1,482,491 | 880,655 | ~59 | Least Concern | 49.88 (78.50) |
| Beard vegetation associations – Shire of Bridgetown-Greenbushes | | | | | |
| 3 | 121,152 | 68,275 | ~56 | Least Concern | 52.37 (86.77) |

* Government of Western Australia (2019)
** 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 Western Australia (2019)

GIS Database:
- IBRA Australia
- 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**

There are no natural watercourses or wetlands within the area proposed to be cleared (Plantecology, 2016; GIS Database). The nearest watercourse is the Donnelly River, which runs roughly parallel with Wagelup Road and is located on the opposite side of the road from the area proposed to be cleared, approximately 250 metres away at its nearest point (GIS Database).

A small shallow pit lake has formed on the floor of the old quarry pit, which has provided a changed habitat and resulted in some water dependant vegetation which would not otherwise occur at this location (Plantecology, 2016). The reopening and expansion of the quarry will result in the clearing of vegetation growing in association with this pit lake.

Based on the above, the proposed clearing is at variance to this Principle. However, as this vegetation type has been introduced to the site as a result of the changes in landform produced by the previous mining activities, the impacts to vegetation growing in association with the wetland are not considered significant.

**Methodology** Plantecology (2016)

GIS Database:
- Hydrography, Lakes
- Hydrography, linear

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

**Comments**

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

Advice was sought from the office of the Commissioner of Soil and Land Conservation in relation to this clearing application. The area proposed to be cleared is mapped as lying within the Mattaband subsystem of the Manjimup land system (DPIRD, 2020).

The Mattaband subsystem is described as mainly hills rising to approximately 20 to 40 metres above the surrounding plateau of deeply weathered granitic rock. Soils are mainly loamy gravels, duplex sandy gravels and brown deep loamy duplexes (DPIRD, 2020).

Removal of vegetation cover can leave soils on elevated terrain exposed and susceptible to wind erosion, however, given the gravelly soils within the proposed clearing area, the risk of wind erosion is considered to be low (DPIRD, 2020).

Steeper slopes with shallow soils are likely to be at high risk of water erosion if vegetation cover is removed, which could potentially lead to eutrophication of nearby waterways (DPIRD, 2020). Considering the high annual rainfall and hillside location of the proposed clearing area, DPIRD (2020) concluded that the proposed clearing of native vegetation had a high risk of causing increased water and sediment runoff, resulting in land degradation and potential water logging on lower slopes. The Donnelly River lies downslope from the proposed clearing area (GIS Database), and there is the potential for the water quality of the river to be impacted, if water and sediment runoff from the site is not adequately managed (DPIRD, 2020).

The proponent has advised that drains and sumps will be established to retain water runoff within the minesite (Hesketh, 2019).

Potential land degradation from erosion may be minimised by the implementation of a staged clearing condition.

Provided appropriate water management measures are implemented, land degradation should be minimised. Based on the above, the proposed clearing may be at variance to this Principle.

**Methodology** DPIRD (2020)
Hesketh (2019)

GIS Database:
- Imagery
- Topographic Contours, Statewide

**(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**

The application area is located within the Yornup State Forest, State Forest 9, which covers a total area of approximately 4,000 hectares and is managed by the Department of Biodiversity, Conservation and Attractions (DBCA) for purposes including conservation (GIS Database).

The area proposed to be cleared (10.5 hectares) includes approximately 2.7 hectares that has been previously cleared for an old quarry pit and access road, and areas immediately surrounding the previous disturbance. The proposed clearing to recommence and expand the quarry operations at the site, will impact the environmental values of the State Forest at a local level, including direct impacts such as reduction in available fauna habitats and ecological linkages, and indirect impacts such as dust and weed invasion.

The *Forest Management Plan 2014-2023*, (Conservation Commission of Western Australia, 2013), recognises the biodiversity and ecological significance of State Forest and requires the net area of intact State Forest to be maintained. A land swap agreement between Hesketh Quarry's Pty Ltd and DBCA has facilitated the grant of the mining lease and access to this section of the Yornup State Forest for the quarrying operations. Under the terms of the land swap agreement, the proponent has provided funds to DBCA to be used for the purchase of an area of land to be added to the State Forest to fulfil the requirements of the Forest Management Plan (DBCA, 2020).

The proposed clearing has been minimised to mitigate potential impacts to the environmental values of the conservation area. The proposed clearing of native vegetation will have a localised impact on the Yornup State Forest, however the reduced area of clearing authorised (10.5 hectares) is unlikely to have a significant impact on the environmental values of the Yornup State Forest or any nearby conservation area.

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

**Methodology**

Conservation Commission of Western Australia (2013)
DBCA (2020)

GIS Database:
- DPaW 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 Donnelly River Water Reserve Public Drinking Water Source Area (PDWSA) (GIS Database).

There are no natural watercourses or wetlands within the area proposed to clear (GIS Database). The proposed clearing area is located on a hillside, upslope from the Donnelly River, approximately 250 metres away at its nearest point (GIS Database). The clearing of native vegetation is likely to result in increased runoff which has the potential to impact on the water quality of the Donnelly River. Management measures should be implemented to minimise any changes in surface water flows which may impact on the Donnelly River.

The proponent has advised that drains and sumps will be established to restrict water and sediment runoff to within the quarry site (Hesketh, 2019). Groundwater depth will be determined at the commencement of quarry operations and will continue to be monitored, and mining will remain a minimum of 300 millimetres above the maximum ground water level (Hesketh, 2019).

Advice was sought from the Department of Water and Environmental Regulation (DWER), in relation to this clearing application. DWER (2020) advised that any tanks for fuel and chemical storage at the site could pose a risk to the Donnelly River, in particular to downstream users, and that any release of chemicals to the soil from vehicles or machinery pose a potential risk to the environment and to the quality of underground water within the PDWSA. As this risk is more directly associated with the proposed mining operations than the clearing of native vegetation, this risk has been addressed under the *Mining Act 1978*, by imposing a tenement condition on Mining Lease 70/1350 which prohibits fuel storage and vehicle servicing within the PDWSA.

Provided appropriate water management measures are implemented, any risks to the quality of surface and underground water should be minimised.

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

**Methodology**

DWER (2020)
Hesketh (2019)

GIS Database:
- Hydrography, Lakes
- Hydrography, Linear
- Public Drinking Water Source Areas
- Topographic Contours, Statewide

**(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**

There are no natural watercourses or waterbodies within the area proposed to be cleared (GIS Database). Water has pooled in the bottom of the old quarry pit, creating a small shallow pit lake (Plantecology, 2016).

The proposed clearing area is located on gravelly soils on a hillside, which slopes downhill towards the south and east (GID Database). The removal of vegetation may result in increased water runoff during rain events. Surface water is likely to flow downslope towards Wagelup Road and the Donnelly River which is located approximately 250 metres downslope from the clearing area, at its nearest point, on the opposite side of Wagelup Road.

The clearing area is located within a high rainfall zone, approximately halfway between Bridgetown and Manjimup, which receive an average annual rainfall of approximately 726 and 986 millimetres, respectively (BOM, 2021; DPIRD, 2020).

The Donnelly River may experience flooding during periods of high rainfall, however, provided that appropriate drainage measures are implemented to minimise water runoff from the quarry site, the proposed clearing is unlikely to cause, or exacerbate, the incidence or intensity of natural flooding events.

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

**Methodology** BOM (2021)
DPIRD (2020)
Plantecology (2016)

GIS Database:
- Hydrographic Catchments - Catchments
- Hydrography, linear
- Topographic Contours, Statewide

## Planning Instrument, Native Title, previous EPA decision or other matter.

**Comments**

The clearing permit application was advertised on 6 July 2020 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

In reaching a decision on this clearing application, the Delegated Officer has taken into consideration that the reopening of the disused quarry will provide a valuable local source of basic raw materials for the southwest region; while recognising the importance of environmentally sustainable development and minimising environmental harm; and having regard for the object and principles of the EP Act as outlined in section 4A of the Act.

There is one native title claim (WC2006/004) over the area under application (DPLH, 2021). The application area is within the South West Native Title Settlement area (DPLH, 2021). This settlement resolves Native Title rights and interests over an area of approximately 200,000 square kilometres within the south west of Western Australia. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2021). 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 Black Cockatoos, which are 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 Agriculture, Water and the Environment for environmental impact assessment under the EPBC Act. The proponent is advised to contact the Department of Agriculture, Water and 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 Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

**Methodology** DPLH (2021)

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## 6. Glossary

### Acronyms:

| | |
|---|---|
| **BC Act** | *Biodiversity Conservation Act 2016,* Western Australia |
| **BoM** | Bureau of Meteorology, Australian Government |
| **DAA** | Department of Aboriginal Affairs, Western Australia (now DPLH) |
| **DAFWA** | Department of Agriculture and Food, Western Australia (now DPIRD) |
| **DAWE** | Department of Agriculture, Water and the Environment, Australian Government |
| **DBCA** | Department of Biodiversity, Conservation and Attractions, Western Australia |
| **DER** | Department of Environment Regulation, Western Australia (now DWER) |
| **DMIRS** | Department of Mines, Industry Regulation and Safety, Western Australia |
| **DMP** | Department of Mines and Petroleum, Western Australia (now DMIRS) |
| **DoEE** | Department of the Environment and Energy (now DAWE) |
| **DoW** | Department of Water, Western Australia (now DWER) |
| **DPaW** | Department of Parks and Wildlife, Western Australia (now DBCA) |
| **DPIRD** | Department of Primary Industries and Regional Development, Western Australia |
| **DPLH** | Department of Planning, Lands and Heritage, Western Australia |
| **DRF** | Declared Rare Flora (now known as Threatened Flora) |
| **DWER** | Department of Water and Environmental Regulation, Western Australia |
| **EP Act** | *Environmental Protection Act 1986*, Western Australia |
| **EPA** | Environmental Protection Authority, 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 |
| **PEC** | Priority Ecological Community, Western Australia |
| **RIWI Act** | *Rights in Water and Irrigation Act 1914*, Western Australia |
| **TEC** | Threatened Ecological Community |

## Definitions:

**{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-**

**T** **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

***Threatened fauna*** is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

***Threatened flora*** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

**CR** **Critically endangered species**
Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

**EN** **Endangered species**
Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

**VU** **Vulnerable species**
Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

**Extinct Species:**

**EX** **Extinct species**
Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

**EW** **Extinct in the wild species**
Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

**Specially protected species:**

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

**MI** **Migratory species**
Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**CD** **Species of special conservation interest (conservation dependent fauna)**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**OS** **Other specially protected species**
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**P** **Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

**P1** **Priority One - Poorly-known species**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

**P2** **Priority Two - Poorly-known species**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

**P3** **Priority Three - Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

**P4** **Priority Four - Rare, Near Threatened and other species in need of monitoring**

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

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.