



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9286/1
Permit type:	Purpose Permit
Applicant name:	Urban Resources Ltd
Application received:	12 May 2021
Application area:	30.83 hectares
Purpose of clearing:	Sand Extraction
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 70/1262
Location (LGA area/s):	City of Rockingham
Colloquial name:	Karnup Sand Project

1.2. Description of clearing activities

Urban Resources Ltd proposes to clear up to 30.83 hectares of native vegetation within a boundary of approximately 30.83 hectares, for the purpose of mining sand. During the course of the assessment the permit application was amended to be clearing 30.78 hectares of native vegetation within a permit boundary of 30.78 hectares. The project is located adjacent to Stakehill Road, approximately 48 kilometres south of Perth, within the City of Rockingham.

The application is to allow for sand extraction for use predominately in the construction industry (Strategen-JBS&G, 2021).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	2 June 2022
Decision area:	30.78 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 12 May 2021. DMIRS advertised the application for a public comment for a period of 21 days, and one submission was received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix C), relevant datasets (Appendix G), supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act, proposed avoidance and minimisation measures (Section 3.1), advice from the Commissioner of Soil and Land Conservation on land degradation impacts, relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3). The Delegated Officer also took into consideration the submission received during the assessment (Appendix B).

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing will result in the following significant residual impacts (SRI):

- the loss of 6.49 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), Baudin's cockatoo (*Calyptorhynchus baudinii*) and forest red-tailed black cockatoo (*Calyptorhynchus banksia* subsp. *naso*) (collectively referred to as black cockatoos herein this report).
- the loss of 6.49 hectares of native vegetation representative of the Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community.

To address the above SRIs and applying the WA environmental offsets metric (offset calculator and guideline), the Delegated Officer determined that the following land acquisition (through monetary contribution) offset is required (Section 4):

- provision of a monetary contribution of \$352,740 for the acquisition and conservation (in perpetuity) of 43.71 hectares of native vegetation with the following values:
 - 43.71 hectares of significant habitat for black cockatoos;
 - 43.71 hectares of Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community.

The above offset will address 100 percent of the SRIs of the proposed clearing.

The assessment also identified that the proposed clearing may result in:

- the introduction and spread of weeds and dieback into adjacent native vegetation
- the loss of vegetation which is significant as a remnant of vegetation in the local area
- direct impacts to fauna during clearing activities
- potential land degradation in the form of wind erosion.

The Delegated Officer decided to grant a clearing permit subject to the following conditions, which have been imposed on the clearing permit, to manage and address the impacts and extent of clearing:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback;
- development activities must occur within three months of clearing to minimise wind erosion;
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- inspect any potential habitat trees for the presence of hollows being utilised by black cockatoos to ensure no individuals are present at the time of clearing;
- rehabilitate areas of remnant vegetation cleared in the permit area;
- provide a monetary offset contribution for the purchase of native vegetation to be placed in conservation for perpetuity.

1.5. Site map

A site map of proposed clearing is provided in Figures 1 and 2 below.



Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.



Figure 2. Map of the application area showing areas of remnant vegetation.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.
- the polluter pays principle

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

- *Mining Act 1978 (WA)*

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy (2011)*

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- *Environmental Offsets Guidelines* (August 2014)
- *Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- *Technical guidance – Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

Urban Resources designed the application area to avoid areas of wetlands to the east of the permit boundary and provide a suitable buffer to these wetlands. These wetland areas have significant environmental values and are also more likely to support species of threatened flora. The application area has also been reduced to allow for a 40 metre setback from Stakehill Road. Mitigation measures proposed for the clearing activities include (Strategen-JBS&G, 2020):

- Staged clearing and retention of tree stumps as long as possible prior to mining to assist with soil stabilisation and reduce surface water flow velocities;
- Progressive rehabilitation following clearing;
- Designated vehicle routes and appropriate speed limits to be enforced to minimise fauna vehicle interactions
- Activities with high dust-causing potential, such as stripping, will not be carried out in sensitive areas during adverse wind conditions.

After consideration of avoidance and mitigation measures, it was determined that offsets were necessary to counterbalance the significant residual impacts to threatened fauna and threatened ecological communities. In accordance with the Government of Western Australia's Environmental Offsets Policy and Environmental Offsets Guidelines, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset provided are summarised in Section 4.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C), survey data, current datasets and other supporting information, and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to flora and fauna values and these required further consideration. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora) - Clearing Principles (a), (c), (d)

Assessment

There are three vegetation associations mapped within the permit area (Strategen-JBS&G, 2021). The majority of the permit area was previously pine plantation which was cleared and is now comprised of regrowth native vegetation (Strategen-JBS&G, 2021). These regrowth areas contain two of the three vegetation associations within the permit area (Strategen-JBS&G, 2021). The other vegetation association is associated with areas of remnant native vegetation which form a broken corridor down the western boundary of the permit area (Strategen-JBS&G, 2021). The vegetation condition within the areas of regrowth was mostly 'good' with the areas of remnant vegetation in 'very good' condition (Strategen-JBS&G, 2021).

According to available databases the two northern sections of remnant vegetation within the application area have been mapped as the 'Banksia Woodlands of the Swan Coastal Plain' Threatened Ecological Community (TEC) listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and by the DBCA as a Priority 3 Priority Ecological Community (PEC) (GIS Database).

The flora and vegetation survey of the application area was conducted in 2015 prior to the listing of this TEC in 2016. Based on the vegetation identified during the 2015 survey, the vegetation type VT2, of which 6.49 hectares is proposed for clearing, is considered likely to represent the TEC (Strategen-JBS&G, 2021). Banksia Woodlands are characterised by a high species richness and high species geographic turnover, particularly in the shrub and herbaceous layers (TSSC, 2016). Banksia Woodlands also provide foraging habitat for the Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*).

This Commonwealth listed TEC is restricted to areas in and immediately adjacent to the Swan Coastal Plain IBRA bioregion, including the Dandaragan plateau. This coastal plain stretches from around Jurien Bay in the north, to Dunsborough in the south (DotEE, 2016). This Banksia Woodlands TEC has undergone a decline of approximately 60 per cent in its original extent, and

almost all that remains occurs as highly fragmented patches less than 10 hectares in size (DotEE, 2016). This TEC has a dominant *Banksia* component, which includes at least one of four key species - *Banksia attenuata* (candlestick banksia), *Banksia menziesii* (firewood banksia), *Banksia prionotes* (acorn banksia) and/or *Banksia ilicifolia* (holly-leaved banksia) (DotEE, 2016). It provides habitat for many native plants and animals that rely on *Banksia* woodlands for refuge and foraging opportunities. Remaining patches of the ecological community provide important wildlife corridors and refuges in a mostly fragmented landscape (DotEE, 2016). The greatest threat to this community is fragmentation which includes mining for basic raw materials that involves vegetation clearing (DotEE, 2016). All patches of the Banksia Woodland which meet the criteria of the TEC are considered to be critical to the survival of the ecological community (DotEE, 2016).

There were 41 flora species from 34 genera and 18 families recorded within the larger flora survey area (Strategen, 2015a). The relatively low number of plant genera recorded reflects the largely disturbed state of the permit area (Strategen, 2015a). Based on the habitat present within the permit area there were three species of Threatened flora and four species of priority flora which were considered as possibly occurring within the permit area (Strategen-JBS&G, 2021). There are no known records of Threatened or Priority flora within the application area (GIS Database). No species of Threatened flora or Priority flora were recorded during a flora survey undertaken in May 2015 (Strategen, 2015a). This survey identified suitable habitat for the Threatened flora species *Caladenia huegelii* and *Drakaea micrantha* within the permit area (Strategen, 2015a). There is also potential habitat for *Drakaea elastica* in adjacent areas of wetlands however, this habitat is not present within the permit area (Strategen, 2015b). Due to the timing of the survey these three species may not have been recorded during the original survey. An additional targeted survey for *Caladenia huegelii* and *Drakaea micrantha* was undertaken in September 2015 when these species are likely to be flowering (Strategen, 2015b). No individuals were identified during the targeted searches of suitable habitat in the permit area (Strategen, 2015b).

Six weed species were identified within the application area (Strategen-JBS&G, 2021). Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. No dieback assessment has been undertaken over the application area (Strategen-JBS&G, 2021). Potential impacts to the biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed and dieback management condition.

Conclusion

Based on the above assessment, the majority of the proposed clearing will not impact on vegetation with a high level of diversity, however, it will result in the clearing of approximately 6.49 hectares of Banksia Woodlands of the Swan Coastal Plain TEC, which also provides significant foraging habitat for Carnaby's cockatoo. Given that all patches of this community are considered to be critical to the survival of this community, the proposed clearing is likely to constitute a significant residual impact.

Conditions

To address the above impacts, the following offset and management measures will be required as conditions of the permit:

- Take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.
- Offset - monetary contribution to fund the purchase of a 43.71 hectare land parcel comprising native vegetation that is representative of the Banksia Woodlands of the Swan Coastal Plain TEC in the nearby area, to be conserved in perpetuity.

3.2.2. Biological values (fauna) - Clearing Principles (a) and (b)

Assessment

Based on the vegetation associations identified, there are two broad fauna habitats within the permit area (Strategen-JBS&G, 2021):

- Banksia and Eucalyptus open woodland (remnant vegetation)
- Mixed shrubland regenerated in areas of cleared pine plantation.

Over three quarters of the permit area is areas of regrowth of native vegetation in areas of previously cleared pine plantation (cleared between 2006 to 2010) (Strategen-JBS&G, 2021). Whilst fauna may pass through this vegetation, it is not likely to support large numbers of fauna species. It is also a more open habitat than the areas of remnant vegetation, making any fauna utilising the area more exposed to predation. This vegetation is not likely to be significant for fauna in the local area.

The area of remnant vegetation was not previously cleared for the establishment of the previous pine plantation. The vegetation within the remnant is less open than the surrounding areas of regrowth and is largely in a very good condition (Strategen-JBS&G, 2021). The vegetation contains a number of mature banksia, jarrah and sheoak (*Allocasuarina fraseriana*) trees which are likely to provide shelter for fauna species. Within the permit boundary the remnant vegetation consists of three separate remnants separated by gaps of approximately 330 metres and 60 metres, and is a corridor approximately 50 metres wide (GIS Database). Whilst the gaps between areas of remnant may impede some species of fauna from utilising the area as an ecological linkage, more mobile species such as birds and kangaroos are likely to utilise this vegetation when moving through the landscape. During a site visit (Appendix G), the assessing officer noted several species of bird passing through the northern most remnant of vegetation. Urban Resources proposes to revegetate this corridor following the completion of mining activities (Strategen-JBS&G, 2020). Revegetation of the remnant vegetation will minimise the long term impacts of clearing this corridor.

The Carnaby's Cockatoo (*Calyptorhynchus latirostris* – Endangered), Baudin's Cockatoo (*Calyptorhynchus baudinii* - Endangered) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso* – Vulnerable) (herein referred to collectively as black cockatoos) were all considered likely to utilise foraging habitat within the permit area (Strategen-JBS&G, 2021).

Black cockatoos nest in hollows in live or dead trees of karri, marri, wandoo, tuart, salmon gum, jarrah, flooded gum, York gum, powder bark, bullich and blackbutt (Commonwealth of Australia, 2017). They are known to forage on the seeds and flowers of a large variety of plants including Eucalypt species and Corymbia species (Valentine & Stock, 2008). Black cockatoo habitat can be considered in terms of breeding habitat, night roosting habitat, and foraging habitat. Black cockatoos will generally forage up

to 12 kilometres from an active breeding site (DSEWPaC, 2012; DoEE, 2017; DPaW, 2013). Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DSEWPaC, 2012; DoEE, 2017; DPaW 2013), but may range up to 20 kilometres (Commonwealth of Australia, 2017). Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites, particularly within 12 kilometres of an impact area (Commonwealth of Australia, 2017).

The Carnaby's Cockatoo recovery plan (DPaW, 2013) summarises habitat critical to the survival for Carnaby's cockatoos as:

- The eucalypt woodlands that provides nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding;
- Woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established; and
- In the non-breeding season the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resource.

The Carnaby's Cockatoo Recovery Plan states that there are multiple reasons for the decline of Carnaby's Cockatoos, however the decline to date has primarily been through the extensive clearing of nesting and feeding habitat (DPaW, 2013). Ongoing counts of Carnaby's Cockatoo numbers on the Perth-Peel Coastal Plain estimate that there has been a 35 per cent reduction in their population from 2010-2019 (Peck, Barrett and Williams, 2019). The long-term survival of Carnaby's Cockatoos depends on the availability of suitable breeding habitat and hollows, as well as foraging habitat capable of providing enough food to sustain the population (DPaW, 2013).

Both the Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo are known to breed in the Baldvis area and are likely to utilise the vegetation within the permit area for foraging (Strategen-JBS&G, 2021). The area is not likely to be as important for Baudin's Cockatoo but they may forage in the area during the non-breeding season (Strategen-JBS&G, 2021). There a number of Jarrah trees present within the application area, several of which were observed during a site visit by the assessing officer (Strategen-JBS&G, 2021; Appendix G). No trees with any suitable hollows have been identified in the application area (Strategen, 2015a). Given the presence of Jarrah trees, the areas of remnant vegetation to be cleared should be inspected prior to clearing to ensure that no birds are utilising the tree and trees which have evidence of breeding should be avoided where possible. A black cockatoo habitat assessment found that the vegetation within the VT2 vegetation association had high foraging habitat value for all three species of black cockatoo as it contained a high density of suitable foraging plants and the presence of food sources at several strata. There were signs of Carnaby's Cockatoo foraging observed within this vegetation association during the habitat assessment (Strategen-JBS&G, 2021). There are known roosting areas for Carnaby's Cockatoos within 3 kilometres of the permit area so the area is considered to be significant foraging habitat for Carnaby's Cockatoos (GIS Database).

Based on the habitat present, conservation significant species jewelled southwest Ctenotus (*Ctenotus gemmula* – Priority 3), black-striped snake (*Neelaps calonotos* – Priority 3) and Quenda (*Isodon fusciventer* – Priority 4) could all possibly be found within the application area (Strategen-JBS&G, 2021). The vegetation within the permit area is not likely to be significant habitat for these species. There is however potential for individuals to be impacted during the clearing process. To minimise the impacts on fauna during clearing the permit includes a condition requiring slow one directional clearing to allow fauna the opportunity to move into adjacent areas.

Conclusion

Based on the above assessment, the proposed clearing will result in the clearing of 6.49 hectares of significant foraging habitat for black cockatoos and will have significant residual impacts for these species.

Conditions

To address the above impacts, the following offset and management measures will be required as conditions of the permit:

- Directional clearing, which requires slow, progressive, one directional clearing to allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing;
- A fauna management condition requiring the inspection of potential black habitat cockatoo trees to ensure that there are no breeding hollows and that no cockatoos are utilising the trees at the time of clearing.
- Offset - monetary contribution to fund the purchase of a 43.71 hectare land parcel comprising native vegetation that provides significant foraging habitat for black cockatoos, to be conserved in perpetuity

3.2.3. Environmental values (significant remnant vegetation) - Clearing Principle (e)

Assessment

The application area falls within the Swan Coastal Plain Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 38.62% of the pre-European vegetation still exists in the Swan Coastal Plain Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation association 1001 (GIS Database). Approximately 22.05% of the pre-European extent of this vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2019). Heddle et al. (1980) also described and mapped two separate vegetation complexes within the permit area; the Karrakatta complex-central and south which has 23.49% remaining and the Serpentine River complex which has 9.77% remaining (GIS Database). Spatial data indicates the local area (10 kilometre radius from area proposed to be cleared) retains approximately 29% of the original native vegetation cover.

The Serpentine River complex is described as closed scrub of Melaleuca species and fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca raphiophylla* (Swamp Paperbark) along streams (Heddle et al., 1980). The majority of the permit area has been previously cleared for pine plantation and is therefore not representative of this vegetation complex. The area of remaining vegetation does not contain Melaleuca species or *Eucalyptus rudis* and there are no nearby streams (Strategen-JBS&G, 2021; GIS Database). Therefore it is considered that the vegetation within the permit area is not representative of this

vegetation complex. The vegetation is representative of the Karrakatta complex-central and south complex which is described as predominantly open forest of *Eucalyptus gomphocephala* (Tuart), *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri) and woodland of *Eucalyptus marginata* (Jarrah) - Banksia species (Heddlie et al., 1980).

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

These vegetation units are all below the 30 per cent threshold of the Government of Western Australia (2019). However, the Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region as a constrained area, which provides for the reduction of vegetation complexes to a minimum of 10 per cent of their pre-European extent (EPA, 2008). The Serpentine River complex is below the 10 per cent threshold however, the vegetation being cleared within the permit area is not representative of this vegetation complex.

The majority of the permit area was previously pine plantation which has regrown following the clearing of the pines (cleared from 2006 to 2010). The area to the west of the permit area was also part of the same pine plantation which was cleared during this period. There is approximately 6.49 hectares of remnant vegetation within the permit area which was never previously cleared for the pine plantation. The remnant vegetation consists of three separate remnants separated by gaps of approximately 330 metres and 60 metres, and runs in a corridor approximately 50 metres wide (GIS Database). Whilst the gaps between areas of remnant may impede some species of fauna from utilising the area as an ecological linkage, more mobile species such as birds and kangaroos are likely to utilise this vegetation when moving through the landscape. During a site visit (Appendix G), the assessing officer noted several species of bird passing through the northern most remnant of vegetation.

This strip of remnant vegetation links with a similar corridor to the north known as the Baldivis Tramway Reserve. This reserve is a narrow strip of vegetation approximately 22 kilometres long which was originally set aside for a tramline between Jandakot and Karnup but was never cleared (City of Rockingham, 2021). This resulted in a significant corridor of vegetation within an increasingly urbanised landscape. Urban Resources proposes to revegetate this corridor following the completion of mining activities (Strategen-JBS&G, 2020). Revegetation of the remnant vegetation will minimise the long term impacts of clearing this corridor.

Conclusion

Based on the above assessment, the proposed clearing will impact a significant remnant of vegetation in a highly cleared area. Impacts from the clearing of remnant vegetation can be minimised by ensuring that a corridor of vegetation is re-established following the completion of mining activities.

Conditions

To address the above impacts, the following management measures will be required as conditions of the permit:

- Revegetation of the areas of remnant vegetation.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 31 May 2021 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. One submission was received in relation to this application (see Appendix B).

The permit area is within the South West Native Title Settlement area (DPLH, 2022). This settlement resolves Native Title rights and interests over an area of approximately 200,000 square kilometres within the south west of Western Australia. 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 (DPLH, 2022). 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 Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Baudin's Cockatoo (*Calyptorhynchus baudinii*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) and Banksia Woodlands of the Swan Coastal Plain ecological community, which are protected matters under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Urban Resources referred the project to the Department of Environment in July 2015 and the referral was deemed to not be a controlled action under the EPBC Act. However, this referral was prior to the listing of the Banksia Woodlands of the Swan Coastal Plain ecological community in 2016.

This clearing permit application is related to the broader Karnup Sand Project which was referred to the Environmental Protection Authority (EPA), under Part IV of the *Environmental Protection Act 1986* (EP Act). On 29 June 2016, the EPA determined that the proposal did not require assessment under Part IV of the EP Act, and could be dealt with under Part V Division 2 of the EP Act (clearing of native vegetation provisions) (EPA, 2016).

The application area is within an area mapped as an extraction site under State Planning Policy 2.4: Planning for Basic Raw Materials. Under this policy extraction sites comprise all commercial sites from which basic raw materials are extracted, and quarries (Western Australian Planning Commission, 2021). These may include future, proposed, approved and operating commercial extractive industries under the *Planning and Development (Local Planning Schemes) Regulations 2015*, *Local Government Act 1995*, *Mining Act 1978* or a combination of these acts (Western Australian Planning Commission, 2021).

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.

4. Suitability of offsets

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that the following significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- The loss of 6.49 hectares of black cockatoo foraging habitat;
- The loss of 6.49 hectares of native vegetation that is representative of the federally listed Banksia Woodlands of the Swan Coastal Plain TEC and state listed Banksia Woodlands of the Swan Coastal Plain PEC;

To counterbalance the above impacts, the applicant has committed to providing \$352,740 as a monetary contribution to fund the purchase of a 43.71 hectare land parcel in the nearby area, to be conserved in perpetuity. The land acquired will contain the following values:

- 43.71 hectares of native vegetation containing significant foraging habitat for black cockatoos; and
- 43.71 hectares of native vegetation that is representative of the federally listed Banksia Woodlands of the Swan Coastal Plain TEC and state listed Banksia Woodlands of the Swan Coastal Plain PEC.

In assessing whether the proposed offset is adequate and proportionate to the significance of environmental values being impacted, a calculation using the WA Environmental Offsets Metric was undertaken. The calculation indicates that when combined, the proposed offsets will address 100 percent of the significant residual impacts of clearing and is consistent with the WA Environmental Offsets Policy September 2011. The offset calculations are available at Appendix F. Collaboration between DWER and DBCA has identified numerous nearby freehold parcels that contain appropriate values for purchase.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
<p>DMIRS review of the proposed clearing and associated supporting information identified that the proposed clearing would result in significant environmental impacts including:</p> <ul style="list-style-type: none"> The loss of 6.49 hectares of significant foraging habitat for black cockatoos; The loss of 6.49 hectares of the Banksia Woodlands of the Swan Coastal Plain TEC; The loss of vegetation significant as a remnant of vegetation. 	<p>Urban Resources provided additional information which proposed that the significant residual impacts could be offset by the provision of a stand-alone monetary offset contribution to acquire land for long term conservation.</p>
<p>The City of Rockingham requested that the application area is amended to allow for a 40 metre buffer to Stakehill Road.</p>	<p>Urban Resources agreed to amend the permit area to allow for the buffer. This resulted in both the amount of clearing and permit boundary being reduced to 30.78 hectares.</p>

Appendix B. Details of public submissions

Summary of comments	Consideration of comment
<p>The City of Rockingham does not support the application for a Clearing Permit in its current form for the following reasons:</p> <ol style="list-style-type: none"> The clearing will prevent the future extension of the Baldivis Tramway Reserve; The project will result in the clearing of 6.5 hectares of remnant vegetation in 'Good' to 'Very Good' condition; The project will result in the clearing of 6.5 hectares of a Threatened Ecological Community (TEC); The proposal will result in the clearing of 6.5 hectares of 'Very Good' Black Cockatoo foraging habitat; The proposal will result in the severing of a 25km long corridor of remnant vegetation, which is a rare feature for the Perth Metropolitan Region and allows for fauna movement. <p>In light of the above, it is recommended that DMIRS request the applicant to amend the application for a Clearing Permit Form to exclude the strip of remnant vegetation on the western clearing boundary, which represents a natural continuation of the Baldivis Tramway Reserve and contains 6.5 hectares of high quality remnant vegetation and fauna habitat.</p>	<p>The assessment against the clearing principles found that the proposed clearing will result in a significant residual impact on vegetation used for foraging for black cockatoo species, vegetation representative of the Banksia Woodlands of the Swan Coastal Plain TEC and significant remnant vegetation. In order to counterbalance the above impacts, the applicant has committed to providing \$352,740 as a monetary contribution to fund the purchase of a 43.71 hectare land parcel in the local area, to be conserved in perpetuity. A rehabilitation condition has been placed on the permit to mitigate the impact of clearing the ecological linkage which currently exists.</p>
<p>The City recommends that DMIRS request the applicant to provide detailed earthworks drawings detailing how the interface between the retained Tramway reserve and mining area will be managed to ensure the ongoing protection of the Tramway.</p>	<p>This request was passed on to the applicant and they were encouraged to liaise with the City of Rockingham to address any concerns.</p>
<p>The City recommends that DMIRS request the applicant to provide the City with earthworks drawings detailing the final design and levels of the site following the end of the sites operational life. The earthworks drawings must detail the interface between the retained Tramway reserve and mining area.</p>	<p>This request was passed on to the applicant and they were encouraged to liaise with the City of Rockingham to address any concerns.</p>
<p>The DMIRS consult with the Western Australian Planning Commission and the Department of Planning Lands and Heritage regarding this application given the site is zoned "Parks and Recreation" under the Metropolitan Region Scheme.</p>	<p>Compatibility with Metropolitan Region Scheme and development of the site post mining was considered during the grant of Mining Lease 70/1262.</p>
<p>The applicant is encouraged by DMIRS to prepare a Fauna Management and Relocation Plan for the strip of remnant vegetation along the western boundary to ensure no native fauna are injured or killed during clearing. The City of Rockingham is able to provide the applicant with advice in this regard.</p>	<p>A directional clearing condition and habitat tree inspection condition has been placed on the permit to minimise the risk of fauna being injured during clearing activities.</p>

Summary of comments	Consideration of comment
The proposal to clear 6.5 hectares of 'Very Good' Black Cockatoo foraging habitat must be referred to the Department of Agriculture, Water and the Environment under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act).	Urban Resources referred the project under the EPBC Act 1999 in July 2015 and the referral was deemed to not be a controlled action. However, this referral was prior to the listing of the Banksia Woodlands of the Swan Coastal Plain ecological community in 2016. DMIRS has advised Urban Resources of their obligations under the EPBC Act 1999.
The applicant is advised that proposal to clear 6.5 hectares of 'Very Good' Black Cockatoo foraging habitat must be referred to the Department of Agriculture, Water and the Environment under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act).	Urban Resources referred the project under the EPBC Act 1999 in July 2015 and the referral was deemed to not be a controlled action. However, this referral was prior to the listing of the Banksia Woodlands of the Swan Coastal Plain ecological community in 2016.
The DMIRS request the applicant to amend the plans to show a 40 metre setback from Stakehill Road.	The application area has been amended to allow for a 40 metre setback from Stakehill Road.
The City recommends that DMIRS advise the applicant that the City of Rockingham would appreciate an opportunity to discuss matters relating to engineering, traffic, dust and noise considerations resulting from the proposed expansion to the mining footprint.	Both DMIRS and the applicant have met with the City of Rockingham to discuss their concerns with the clearing permit application. These concerns were considered during the assessment of the clearing permit application.

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is a 30.78 hectare area of native vegetation, occurring across a number of patches as a result of previous clearing for a pine plantation. The majority of the vegetation was previously covered by pine plantation but approximately 6.49 hectares of the vegetation has not been previously cleared (see Section 1.5). The proposed clearing area is surrounded by an existing sand quarry to the west, cleared pine plantation to the south and east and remnant vegetation to the north.</p> <p>Spatial data indicates the local area (10 kilometre radius from area proposed to be cleared) retains approximately 29% of the original native vegetation cover.</p>
Ecological linkage	The remnant vegetation consists of three separate remnants separated by gaps of approximately 330 metres and 60 metres, and runs in a corridor approximately 50 metres wide. This strip of remnant vegetation links with a similar corridor to the north known as the Baldivis Tramway Reserve. This reserve is a narrow strip of vegetation approximately 22 kilometres long which was originally set aside for a tramline between Jandakot and Karnup but was never cleared (City of Rockingham, 2021).
Conservation areas	Part of the application area is within Reserve 37090 which is vested in the Department of Biodiversity, Conservation and Attractions and the Department of Mines, Industry Regulation and Safety for the purposes of forestry and explosives (GIS Database).
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation association (GIS Database):</p> <p>1001: Medium very sparse woodland; jarrah with low woodland banksia and casuarina.</p> <p>A flora and vegetation survey was conducted over the application area and adjacent areas by Strategen during May 2015. The following vegetation associations were recorded within the application area (Strategen-JBS&G, 2021):</p> <p>VT1: <i>Macrozamia fraseri</i>, <i>Daviesia triflora</i> and <i>Acacia stenoptera</i> mid open shrubland over <i>Lyginia barbata</i>, <i>Conostylis aculeata</i> and <i>Phlebocarya ciliata</i> low open sedgeland with <i>Xylomelum occidentale</i> and <i>Eucalyptus rudis</i> occurring as isolated trees.</p> <p>VT2: <i>Banksia menziesii</i>, <i>B. attenuata</i>, <i>Allocasuarina fraseriana</i> and <i>Eucalyptus marginata</i> open woodland over <i>Kunzea glabrescens</i>, <i>Acacia pulchella</i> and <i>Macrozamia fraseri</i> mid sparse shrubland over <i>Hibbertia hypericoides</i>, <i>Conostephium pendulum</i> and <i>Gompholobium tomentosum</i> low sparse shrubland.</p> <p>VT3: <i>Jacksonia sternbergiana</i> and <i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i> mid shrubland over <i>Conostylis aculeata</i> and <i>Lyginia barbata</i> low sparse sedgeland.</p> <p>There were also parts of the permit area mapped as 'cleared areas' (Strategen-JBS&G, 2021).</p>

Characteristic	Details
Vegetation condition	The vegetation survey (Strategen, 2015a) indicates the vegetation within the proposed clearing area is in very good to good (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix E.
Climate and landform	The application area is mapped within elevations of 5-10 metres AHD. The annual average rainfall (Mandurah) is 649.2 millimetres (BoM, 2022).
Soil description	The soils and landforms around the Karnup area are described in DPIRD's Coastal Plain South soil surveys (DPIRD, 2021). The area within the permit boundary has been mapped as the Bassendean B2 Phase unit. This soil-landscape system is described as being mainly flat to very gently undulating sandplain with soils that are mainly well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan at 1-2 metres (DPIRD, 2021).
Land degradation risk	The sandy topsoils within the permit area may be prone to wind erosion if they are dry and loose with little or no groundcover however, the subdued nature of the terrain decreases the exposure to the wind and the likelihood of erosion (DPIRD, 2021). The soils in the permit area are dominated by rapidly drained soils which are positioned on gentle slopes which reduced the likelihood of water erosion (DPRID, 2021). There is also a low risk of the clearing leading to increased salinity causing land degradation (DPIRD, 2021).
Waterbodies	The desktop assessment and aerial imagery indicated that there are no waterbodies or wetlands within the area proposed to be cleared (GIS Database).
Hydrogeography	There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database).
Flora	There are records of 6 priority flora species within 5 kilometres, the closest of which are 200 metres from the application area and on the same soil type.
Ecological communities	The Banksia Woodlands of the Swan Coastal Plains community is mapped within the application area. This community is listed as a Threatened Ecological Community under the EPBC Act and a Priority Ecological Community at a state level.
Fauna	There are records of six fauna species of conservation significance within the local area (10 kilometre radius). The most common records were of the quenda. There is also a known black cockatoo roost site within 3 kilometres of the application area.

C.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion – Swan Coastal Plain	1,501,222	579,813	~39	222,917	~18
Beard vegetation associations - State					
1001	57,410	12,661	~22	1,796	~6
Beard vegetation associations - Bioregion					
1001	57,410	12,661	~22	1,796	~6
Hedde vegetation complexes					
Karrakatta Complex-Central and South	53,081	12,467	~23	4,283	~8
Serpentine River Complex	19,855	1,940	~10	517	~3

Government of Western Australia (2019)

C.3. Flora analysis table

Flora analysis of records within 5 kilometres of the permit area which is consistent with the Department's desktop assessment findings (Strategen-JBS&G, 2021).

Species	Conservation status		Description	Potential to occur
	EPBC Act	BC Act / DBCA listing		
<i>Andersonia gracilis</i>	Threatened - Endangered	Threatened	A slender shrub to 50 cm tall with few, spreading branches. Flowers are pink to pale mauve. Habitat for this species occurs within seasonally damp, black sandy clay flats near swamps (Western Australian Herbarium 1998-, DotE 2015e).	Unlikely – Preferred soil type/habitat does not occur within the Project area– wetland areas will not be impacted by the proposed mining.
<i>Caladenia huegelii</i>	Threatened – Endangered	Threatened	A slender orchid from 30 to 50 cm tall. One or two striking flowers characterised by a greenish-cream lower petal with a maroon tip. Other petals are cream with red or pink suffusions. Habitat for this species occurs within well-drained, deep sandy soils in low mixed Banksia, Allocasuarina and Jarrah woodlands (Western Australian Herbarium 1998, DotE 2015e).	Possible – Preferred soil type/habitat occurs within the Project area.
<i>Centrolepis caespitosa</i>	Threatened – Endangered	Priority 4	A diminutive, densely tufted, glabrous annual herb. Flowers are red/brown and are singular. Habitat for this species is relatively unknown. Brown et al. (1998) identified that this species occurs within winter-wet claypans dominated by low shrubs and sedges.	Unlikely – Preferred soil type/habitat does not occur within the Project area– wetland areas will not be impacted by the proposed mining. DBCA has removed this species from its Threatened flora listing and is now classed as Priority 4.
<i>Darwinia foetida</i>	Threatened – Critically Endangered	Threatened	An erect, spreading shrub to 70 cm tall. Green flowers, visible from October to November. Habitat for this species occurs within wet/winter-damp clay under Myrtaceous shrubland (DotE 2015e).	Highly unlikely – Preferred habitat does not occur within the Project area as wetland areas will not be impacted by the proposed mining. Both Western Australian Herbarium (1998) and DotE (2015e) list this species' distribution to be highly restricted within the Muchea area (approximately 70 km north of Perth).
<i>Diuris drummondii</i>	Threatened – Vulnerable	Threatened	A perennial orchid to 105 cm tall. Often forms dense colonies with individuals displaying between three and eight widely spaced yellow flowers. Habitat for this species occurs in low-lying depressions in peaty and sandy clay swamps (DotE 2015e).	Unlikely – Preferred soil type/habitat does not occur within the Project area– wetland areas will not be impacted by the proposed mining.
<i>Diuris micrantha</i>	Threatened – Vulnerable	Threatened	A slender orchid to 60 cm tall. Yellow flowers with reddish-brown markings measuring 1.3 cm across. Habitat for this species occurs within clay-loam substrates in winter-wet depressions or swamps (DotE 2015e).	Unlikely – Preferred soil type/habitat does not occur within the Project area– wetland areas will not be impacted by the proposed mining.
<i>Diuris purdiei</i>	Threatened – Endangered	Threatened	A slender orchid to 45 cm tall. Unusually flattened flowers, marked with brown blotches on their under surface. Habitat for this species occurs in areas subject to winter inundation within dense heath with scattered Myrtaceous trees (DotE 2015e).	Unlikely – Preferred soil type/habitat does not occur within the Project area – wetland areas will not be impacted by the proposed mining.
<i>Drakaea elastica</i>	Threatened – Endangered	Threatened	A slender orchid to 30 cm tall with a prostrate, round to heart shaped leaf. Singular, bright green, glossy flower. Habitat for this species is within bare patches of white sand over dark sandy loams on damp areas (DotE 2015e).	Possible – Preferred soil type/habitat occurs within the Project area.
<i>Drakaea micrantha</i>	Threatened – Vulnerable	Threatened	A tuberous, terrestrial orchid to 30 cm tall. Silvery-grey heart shaped leaf with prominent green veins. Red and yellow singular flower. Habitat for this species occurs within cleared, open sandy patches (Brown et al. 1998).	Possible – Preferred soil type/habitat occurs within the Project area.
<i>Lepidosperma rostratum</i>	Threatened – Endangered	Threatened	A rhizomatous sedge to 30 cm in diameter. Stems are circular in cross section and flowers are spike-like and up to 4 cm long. Habitat for this species occurs in sandy soils among low heath comprised of <i>Banksia telmatiaea</i> and <i>Calothamnus hirsutus</i> in winter-wet swamps.	Unlikely – Preferred soil type/habitat does not occur within the Project area– wetland areas will not be impacted by the proposed mining.
<i>Synaphea stenoloba</i>	Threatened – Endangered	Threatened	A caespitose shrub to 45 cm tall. Yellow flowers visible from August to October. Habitat for this species occurs within loamy soils in low-lying areas that are seasonally inundated (DotE 2015e).	Unlikely – Preferred soil type/habitat does not occur within the Project area – wetland areas will not be impacted by the proposed mining.
<i>Acacia benthamii</i>	Not listed	Priority 2	A shrub to 1 m tall. Flowers are yellow and visible from August to September (Western Australian Herbarium 1998). Habitat for this species is typically on limestone breakaways.	Unlikely – Preferred soil type/habitat does not occur within the Project area.
<i>Cardamine paucijuga</i>	Not listed	Priority 2	A slender, erect annual herb to 0.4 m tall. Flowers are white and visible from September to October (Western Australian Herbarium 1998). Habitat for this species occurs in a broad range of settings.	Possible – Preferred soil type/habitat could occur within the Project area.
<i>Sphaerolobium calcicola</i>	Not listed	Priority 3	A slender, multi-stemmed, scandent or erect shrub to 1.5 m tall. Flowers are orange-red and visible in June or from September to November (Western Australian Herbarium 1998). Habitat for this species occurs in a broad range of settings.	Possible – Preferred soil type/habitat could occur within the Project area.
<i>Dillwynia dillwynioides</i>	Not listed	Priority 3	A decumbent or erect, slender shrub to 1.2 m tall. Flowers are red and yellow/orange and visible in August to December (Western Australian Herbarium 1998). Habitat for this species is in winter-wet depressions and sandy soils.	Possible – Preferred soil type/habitat occurs within the Project area.
<i>Schoenus capillifolius</i>	Not listed	Priority 3	A semi-aquatic, tufted, annual grass-like herb to 5 cm tall. Flowers are green and visible from October to November (Western Australian Herbarium 1998). Habitat for this species is in brown mud in claypans.	Unlikely – Preferred soil type/habitat does not occur within the Project area– wetland areas will not be impacted by the proposed mining.
<i>Stylidium longitubum</i>	Not listed	Priority 3	An erect annual herb to 12 cm tall. Flowers are pink and visible from October to December (Western Australian Herbarium 1998). Habitat for this species occurs in sandy clay in seasonal wetlands.	Unlikely – Preferred soil type/habitat does not occur within the Project area– wetland areas will not be impacted by the proposed mining.
<i>Jacksonia sericea</i>	Not listed	Priority 4	A low spreading shrub to 0.6 m tall. Flowers are orange and visible from December to February (Western Australian Herbarium 1998). Habitat for this species occurs in calcareous and sandy soils.	Possible – Preferred soil type/habitat occurs within the Project area.

C.4. Fauna analysis table

Fauna analysis of records within 5 kilometres of the permit area which is consistent with the Department's desktop assessment findings (Strategen-JBS&G, 2021).

Species	Conservation status ¹		Habitat description	Potential to occur
	EPBC Act	BC Act / DBCA listing		
Reptiles				
<i>Ctenotus gemmula</i> (Jewelled Ctenotus)	Not listed	P3	Pale sands with heath and Banksia spp. or mallee woodlands.	Possible – areas of remnant banksia woodland.
<i>Lerista lineata</i>	Not listed	P3	Coastal heath on sand, shrubland.	Unlikely – lack of suitable habitat.
<i>Morelia spilota imbricata</i> (Carpet Python)	Not listed	Schedule 4 (Other specially protected fauna)	Undisturbed bushland and rocky outcrops.	Unlikely – while potentially present in the region, the lack of connecting habitat to Project area renders it unlikely this species would be present.
<i>Neelaps calonotos</i> (Black-striped Snake)	Not listed	P3	Dunes and sand plains with heath or eucalypt or banksia woodlands.	Possible .
Birds				
<i>Oxyura australis</i> (Blue-billed Duck)	Not listed	P4	Deep and well vegetated freshwater lakes, dams and swamps.	Unlikely – habitat not present within or near Project area.
<i>Ardea alba</i> (Great Egret)	Marine, migratory (CAMBA, JAMBA)	IA	Estuaries, tidal flats, rivers, freshwater lakes, sewage ponds and dams.	Unlikely – Project area does not comprise wetlands. Possibly present as a vagrant within adjacent wetlands but unlikely to be permanently reliant on these due to their poor quality.
<i>Ardea ibis</i> (Cattle Egret)	Marine, migratory (CAMBA, JAMBA)	IA	Paddocks, pastures, wetlands, and tidal mudflats.	Unlikely .
<i>Ixobrychus minutus</i> (Little Bittern)	Not listed	P4	Dense vegetation (reeds, rushes, sedges) in or adjacent to freshwater wetlands.	Unlikely – lack of suitable habitat within Project area and adjacent wetlands.
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	Threatened (Endangered)	Threatened	Dense vegetation (reeds, rushes, sedges) in or adjacent to freshwater wetlands, drains and, occasionally, salt marshes.	Unlikely – lack of suitable habitat within Project area and adjacent wetlands.
<i>Falco peregrinus</i> (Peregrine Falcon)	Not listed	Schedule 4 (Other specially protected fauna)	Cliffs, gorges, timbered watercourses, and tall man-made infrastructure.	Unlikely – known from the area but unlikely to be resident in Project area.
<i>Tringa nebularia</i> (Common Greenshank)	Marine, migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	IA	Estuaries, tidal flats, mangroves, rivers, wetlands, sewage ponds and salt fields.	Unlikely – lack of suitable habitat within Project area and adjacent wetlands.
<i>Actitis hypoleucos</i> (Common Sandpiper)	Marine, migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	IA	Estuaries, tidal flats, mangroves, rivers, wetlands, sewage ponds and salt flats.	Unlikely – lack of suitable habitat within Project area and adjacent wetlands.
<i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black-Cockatoo)	Threatened (Vulnerable)	Threatened	Open forests and woodlands, suburban gardens.	Likely – known to breed in the Baldy area.
<i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo))	Threatened (Endangered)	Threatened	Open forests and woodlands, Kwongan heath, sand plains, suburban vegetation and pine plantations.	Likely – known to breed in the Baldy area.
<i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo)	Threatened (Vulnerable)	Threatened	Jarra, Marri and Karri forests, woodlands, coastal scrub.	Likely – though may forage in the general area during the non-breeding season.
<i>Ninox connivens connivens</i> (Barking Owl)	Not listed	P2	Open forests, woodlands, dense scrub and timbered watercourses.	Unlikely .
<i>Merops ornatus</i> (Rainbow Bee-eater)	Marine, migratory (JAMBA)	IA	Open woodlands, sand ridges, sand pits, riverbanks, beaches, dunes, cliffs, mangroves and man-made grassed fields.	Likely – known to be present in the area.
<i>Tringa glareola</i> (Wood Sandpiper)	Marine, migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	IA	Well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes.	Unlikely – due to lack of suitable habitat.
Mammals				
<i>Dasyurus geoffroyi</i> (Chuditch)	Threatened (Vulnerable)	Threatened	Wet and dry sclerophyll forest, mallee.	Unlikely – to be present due to lack of large remnants.
<i>Isoodon obesulus fusciventer</i> (Southern Brown Bandicoot, Quenda)	Not listed	P5	Sandy soils with low ground cover. Prefers areas that are regularly burnt. Highest densities occur in association with wetlands and damplands.	Possible .
<i>Macropus irma</i> (Brush Wallaby)	Not listed	P4	Open dry sclerophyll forests with open, seasonal wet flats with low grasses and open scrub.	Unlikely – due to lack of large remnants.
<i>Falsistrellus mackenziei</i> (Western False Pipistrelle)	Not listed	P4	Karri, Jarrah and Tuart forests and Banksia woodlands.	Unlikely – due to lack of large remnants.
<i>Hydromys chrysogaster</i> (Water Rat, Rakali)	Not listed	P4	Permanent bodies of fresh or brackish water.	Unlikely – due to lack of permanent water bodies.

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The majority of the application area is previously cleared pine plantation and does not support a high diversity of flora and fauna. The 6.49 hectare area of remnant vegetation provides habitat for threatened black cockatoo species.</p> <p>A 6.49 hectare portion of the application area is mapped as, and is representative of the ‘Banksia Woodlands of the Swan Coastal Plain’ (Priority 3) priority ecological community (PEC).</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains 6.49 hectares of foraging habitat for threatened black cockatoo species. It also contains remnant vegetation in a highly cleared landscape which provides linkage values and habitat for fauna in the local area.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared may contain habitat for flora species listed under the BC Act. The proposed clearing is not likely to impact on these species.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The permit area contains 6.49 hectares of native vegetation considered representative of the Banksia Woodlands of the Swan Coastal Plain TEC. This TEC is listed as Endangered under the EPBC Act.</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The vegetation proposed to be cleared is considered to be part of a significant ecological linkage within an area that has been extensively cleared.</p>	At variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>Part of the application area is within Reserve 37090 which is vested in the Department of Biodiversity, Conservation and Attractions and the Department of Mines, Industry Regulation and Safety for the purposes of forestry and explosives (GIS Database). The site previously comprised a pine plantation that was cleared between 2006 to 2010 (Strategen-JBS&G, 2021). It is not anticipated that this reserve will be managed for conservation purposes into the future as the area has been zoned for urban development and parks and recreation with plans for some areas to be turned into residential areas (City of Rockingham, 2021; Strategen-JBS&G, 2021).</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>There are no watercourses or wetlands within the area proposed to clear (Strategen-JBS&G, 2021; GIS Database). There are several wetland areas in close proximity (within 100 metres) to the east of the permit area (Strategen-JBS&G, 2021; GIS Database). The proposed clearing will not clear any vegetation growing in association with these wetland areas (Strategen-JBS&G, 2021). Mining is not proposed below the water table and surface runoff rarely occurs in the area so the proposed clearing is not likely to significantly impact on these wetlands (DPIRD, 2021; Strategen-JBS&G, 2021).</p>	Not at variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The soils and landforms around the Karnup area are described in DPIRD’s Coastal Plain South soil surveys (DPIRD, 2021). The area within the permit boundary has been mapped as the Bassendean B2 Phase unit. This soil-landscape system is described as being mainly flat to very gently undulating sandplain with soils that are mainly well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan at 1-2 metres (DPIRD, 2021).</p> <p>The sandy topsoils within the permit area may be prone to wind erosion if they are dry and loose with little or no groundcover however, the subdued nature of the terrain decreases the exposure to the wind and the likelihood of erosion (DPIRD, 2021). Potential impacts from wind erosion will be minimised by the implementation of a staged clearing condition.</p> <p>The soils in the permit area are dominated by rapidly drained soils which are positioned on gentle slopes which reduced the likelihood of water erosion (DPRID, 2021). There is also a low risk of the clearing leading to increased salinity causing land degradation (DPIRD, 2021).</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u></p> <p>There are no watercourses or wetlands within the area proposed to clear (GIS Database). Surface runoff rarely occurs in the area as the infiltration capacity of the sandy soil is rarely exceeded by the rainfall intensity (DPRID, 2021). The proposed clearing is unlikely to result in significant changes to surface water flows.</p> <p>There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). The majority of the permit area was previously covered by pine plantation. The proposed clearing is unlikely to cause deterioration in the quality of underground water.</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this Principle.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>There are no permanent water courses or waterbodies within the application area (GIS Database). Surface runoff rarely occurs in the area as the infiltration capacity of the sandy soil is rarely exceeded by the rainfall intensity. The likelihood of flooding in this landscape is considered to be low (DPRID, 2021).</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Based on the above, the proposed clearing is not likely to be at variance to this Principle.		

Appendix E. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix F. Offset calculator value justification

Offset calculator values for residual impacts to foraging habitat for black cockatoos.

Environmental value to be offset		
Calculation	Score (Area)	Rationale
Conservation significance		
Description	Black cockatoo foraging habitat	The application area will clear 6.49 ha of significant foraging habitat for black cockatoo species.
Type of environmental value	Species (flora/fauna)	All three species of threatened black cockatoo species (Carnaby's Cockatoo, Baudin's Cockatoo, Forest Red-tailed Black Cockatoo) have the potential utilise the application area as foraging habitat.
Conservation significance of environmental value	Rare/threatened species - endangered	Carnaby's Cockatoo and Baudin's Cockatoo are listed as Endangered and Forest Red-tailed Cockatoo is listed as Vulnerable.
Landscape-level value impacted	yes/no	No
Significant impact		
Description	6.49 ha of black cockatoo foraging habitat	
Significant impact (hectares) / Type of feature	6.49	
Quality (scale) / Number	7.00	The area of foraging habitat is mostly in a very good condition and contains suitable species for black cockatoo feeding. Evidence of foraging has been observed in the area and there are breeding and roosting sites within 12 km of the permit area
Rehabilitation credit		
Description	Rehabilitation of Banksia woodland.	The 6.49 ha area of foraging habitat will be rehabilitated to provide foraging values for Black cockatoos.
Proposed rehabilitation (area in hectares)	6.49	
Current quality of rehabilitation site / Start number (of type of feature)	0.00	The area will be totally cleared.
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	1.00	It is likely that there would be some natural reversion if no rehabilitation was undertaken.
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	5.00	It is assumed that the rehabilitated area would provide similar foraging values to the proposed clearing area once completed.
Time until ecological benefit (years)	15.00	It is expected that the values of revegetation would be present after 15 years.
Confidence in rehabilitation result (%)	0.7	There is a relatively high level of confidence that the site could be revegetated to a similar condition to the current application area, with consideration to some difficulties of successful vegetation.
Offset		
Description	Purchase of land for conservation	
Proposed offset (area in hectares)	43.71	This value represents 100% of the significant residual impact.
Current quality of offset site / Start number (of type of feature)	7.00	It is assumed that an offset site will provide the same value that the area proposed to be cleared.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	7.00	It is assumed that the offset vegetation will retain the same value into the future.
Future quality WITH offset (scale) / Future number WITH offset	7.00	It is assumed that the offset vegetation is likely to remain the same without ongoing management measures committed to be the applicant.
Time until ecological benefit (years)	1.00	As the offset is purchasing existing vegetation, the benefit would be realised once the offset site is secured (estimated at 1 year).
Confidence in offset result (%)	0.95	There is a high level of confidence that conservation (in perpetuity) would successfully mitigate the future risk of loss of the site.
Duration of offset implementation (maximum 20 years)	20.00	The offset site would be protected in perpetuity and therefore the maximum value of 20 years has been selected.
Time until offset site secured (years)	1.00	It is expected that the land for acquisition for conservation could be made within 1 year.
Risk of future loss WITHOUT offset (%)	20.0%	Assumed that the land acquired would be zoned rural or similar, and not be subject to any existing planning approvals.
Risk of future loss WITH offset (%)	10.0%	The future conservation (in perpetuity) of the site would result in a substantial increased security and reduce the risk of loss.
Offset ratio (Conservation area only)	N/A	

Offset calculator values for residual impacts to the Banksia Woodland of the Swan Coastal Plain TEC.

Environmental value to be offset		
Calculation	Score (Area)	Rationale
Conservation significance		
Description	Banksia Woodlands of the Swan Coastal Plain	The application area will clear 6.49 ha of Banksia Woodlands TEC.
Type of environmental value	Ecological community	
Conservation significance of environmental value	Rare/threatened species - endangered	Banksia Woodlands of the Swan Coastal Plain is listed as a TEC under the federal EPBC Act and state listed as a PEC
Landscape-level value impacted	yes/no	No
Significant impact		
Description	6.49 ha of Banksia Woodlands TEC	
Significant impact (hectares) / Type of feature	6.49	
Quality (scale) / Number	7.00	The area of vegetation is mostly in a very good condition.
Rehabilitation credit		
Description	Revegetation of vegetation to Banksia Woodlands TEC	The 6.49 ha area TEC will be rehabilitated to provide similar values to the TEC.
Proposed rehabilitation (area in hectares)	6.49	
Current quality of rehabilitation site / Start number (of type of feature)	0.00	The area will be totally cleared.
Future quality WITHOUT rehabilitation (scale) / Future number WITHOUT rehabilitation	1.00	It is likely that there would be some natural regeneration if no rehabilitation was undertaken.
Future quality WITH rehabilitation (scale) / Future number WITH rehabilitation	5.00	It is assumed that the rehabilitated area would be similar to the TEC currently in the application area.
Time until ecological benefit (years)	15.00	It is expected that the values of revegetation would be present after 15 years.
Confidence in rehabilitation result (%)	0.7	There is a relatively high level of confidence that the site could be revegetated to a similar condition to the current application area, with consideration to some difficulties of successful vegetation.
Offset		
Description	Purchase of land for conservation	
Proposed offset (area in hectares)	43.71	This value represents 100% of the significant residual impact.
Current quality of offset site / Start number (of type of feature)	7.00	It is assumed that an offset site will provide the same value that the area proposed to be cleared.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	7.00	It is assumed that the offset vegetation will retain the same value into the future.
Future quality WITH offset (scale) / Future number WITH offset	7.00	It is assumed that the offset vegetation is likely to remain the same without ongoing management measures committed to be the applicant.
Time until ecological benefit (years)	1.00	As the offset is purchasing existing vegetation, the benefit would be realised once the offset site is secured (estimated at 1 year).
Confidence in offset result (%)	0.95	There is a high level of confidence that conservation (in perpetuity) would successfully mitigate the future risk of loss of the site.
Duration of offset implementation (maximum 20 years)	20.00	The offset site would be protected in perpetuity and therefore the maximum value of 20 years has been selected.
Time until offset site secured (years)	1.00	It is expected that the land for acquisition for conservation could be made within 1 year.
Risk of future loss WITHOUT offset (%)	20.0%	Assumed that the land acquired would be zoned rural or similar, and not be subject to any existing planning approvals.
Risk of future loss WITH offset (%)	10.0%	The future conservation (in perpetuity) of the site would result in a substantial increased security and reduce the risk of loss.
Offset ratio (Conservation area only)	N/A	

Appendix G. Photographs of the application area

Figure 3. Photographs of the application area taken during a site visit on 17 August 2021











Appendix H. Sources of information

H.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Bush Forever (Regional Scheme) (DPLH-022)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Black Cockatoo WTBC Breeding
- Black Cockatoo FRTBC Breeding
- Black Cockatoo BC Roosts
- Black Cockatoo BC Feeding SCP
- Black Cockatoo Feeding JF

- Black Cockatoo Feeding Areas Buffered
- Black Cockatoo Baudins Distribution
- Black Cockatoo Forest Red Tail Distribution
- Black Cockatoo Carnabys Distribution
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

H.2. References

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- Strategen-JBS&G (2020) Urban Resources Pty Ltd Karnup Sand Mining Project (M70/1262) Mining Proposal. Prepared for Urban Resources, by Strategen-JBS&G, 2 September 2020.
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5. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , 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	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (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
RWI Act	<i>Rights in Water and Irrigation Act 1914</i> , 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.

Principles for clearing native vegetation:

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened 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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (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.
- (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.
- (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.