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

Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9707/1
Permit type:	Purpose Permit
Applicant name:	GMA Garnet Pty Ltd
Application received:	19 April 2022
Application area:	58.96 hectares
Purpose of clearing:	Mineral exploration, mineral production and associated activities.
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 70/204
	Mining Lease 70/1330
Location (LGA area/s):	Shire of Northampton
Colloquial name:	Lynton Project

1.2. Description of clearing activities

GMA Garnet Pty Ltd proposes to clear up to 58.96 hectares of native vegetation within a boundary of approximately 58.96 hectares, for the purpose of mineral exploration, mineral production and associated activities. The project is located approximately 2 kilometres northeast of Gregory, within the Shire of Northampton.

The application is to allow for the exploration and mining of garnet at the Lynton project. Specifically, clearing will be undertaken to expand the north pit, reaccesing the old dune pit and topsoil stockpiles, expanding the haul road, upgrading other access roads and mineral exploration (GMA Garnet, 2022).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	23 August 2022
Decision area:	58.96 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 19 April 2022. DMIRS advertised the application for a public comment for a period of 21 days, and one submission was received. The application was amended during the assessment and subsequently readvertised for a period of 7 days.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix F), supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey (Appendix E), the clearing principles set out in Schedule 5 of the EP Act (Appendix C), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- the loss of native vegetation that is significant as a remnant of vegetation;
- potential land degradation in the form of wind erosion.

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 is not likely to have long-term adverse impacts on fauna, remnant vegetation and land degradation and the impacts of the clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;

- staged clearing to minimise wind erosion;
- retain cleared vegetation and topsoil and respread this on a cleared area of equivalent size within the mining tenements to ensure fauna habitat is not permanently lost.

1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.

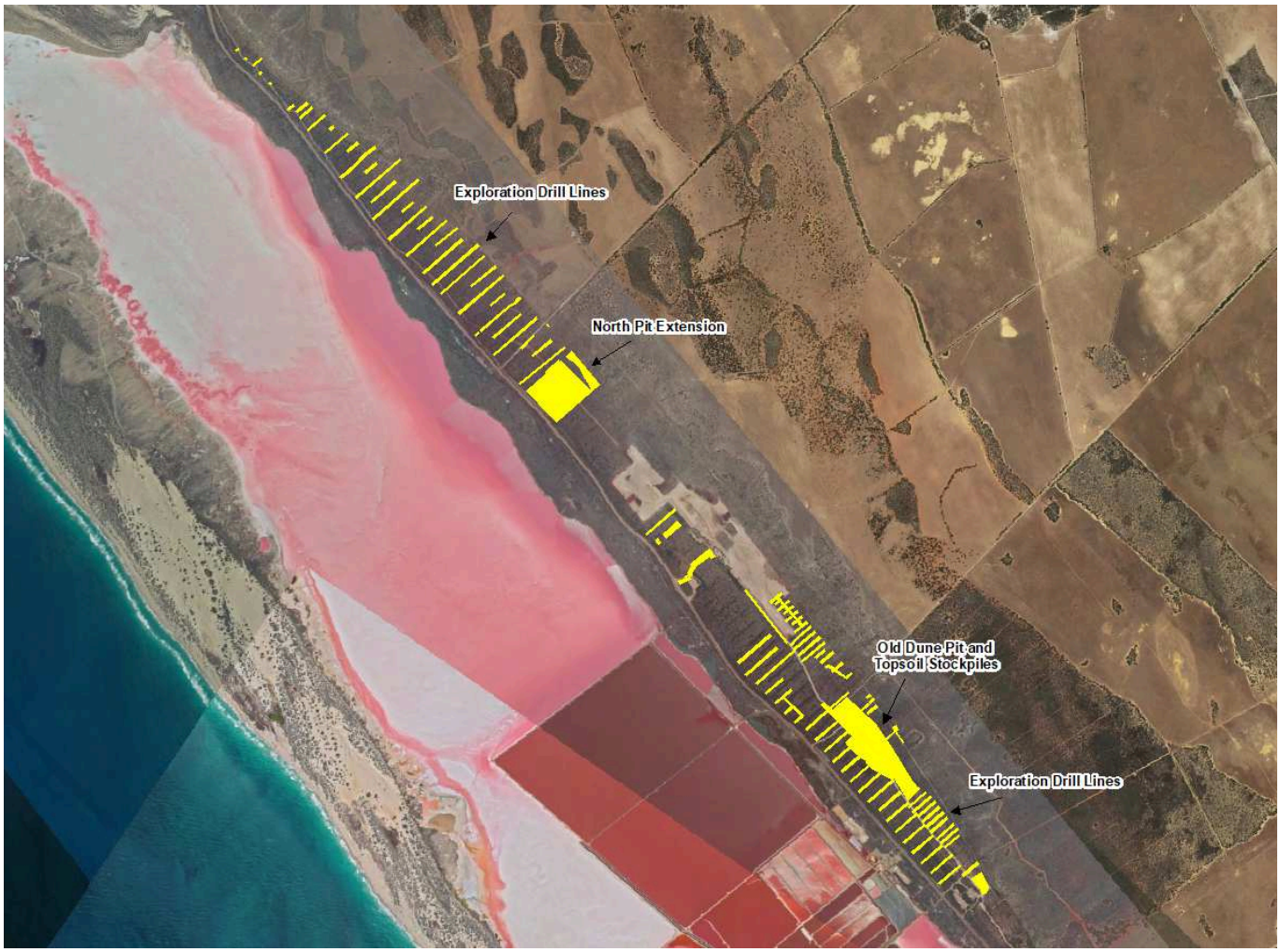

Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

Figure 2. Map of the application area in a local context. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

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.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Mining Act 1978* (WA)

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 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values. Avoidance and mitigation measures include the following (GMA Garnet, 2022):

Mining Activities

- Clearing will be undertaken progressively;
- The mining voids will be progressively backfilled and rehabilitated at the trailing edge of the pit;
- Existing mining voids at the Lynton project will also be rehabilitated.

Exploration Activities

- Track widths will be limited to the width of a scrub rake;
- Where possible clearing of tracks will avoided to retain vegetation;
- Clearing will be done using a blade up method to preserve topsoil.

Dust Management

- Use of water trucks on sandy and unsealed areas;
- Undertaking staged clearing to minimise open areas;
- Undertaking rehabilitation as soon as practicable to reduce open areas;
- Scheduling topsoil stripping to avoid periods of high winds;
- Apply dust suppressant to overburden/topsoil stockpiles;
- Cease activities where causing dust lift-off where dust management measures have not prevented dust generation affecting sensitive receptors.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B), 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 fauna values, significant remnant vegetation and land resources. 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 Principle (a)

Assessment

A reconnaissance flora and vegetation survey on Mining Leases 70/204 and 70/1330 which includes the application area was conducted by GHD (2020) from 8-12 December 2019. The vegetation of the application area was dominated by *Acacia rostellifera* woodland (GHD, 2020). No Threatened or Priority Ecological Communities were identified as potentially occurring in the application area and none were identified during the field assessment (GHD, 2020; GIS Database).

A total of 64 flora species representing 26 families and 50 genera were recorded within the greater survey area (GHD, 2020). There are 58 species of conservation significant flora species which have been recorded in the local area (20 kilometres) (GIS Database). Based on the habitat present, there was seven of these species which are considered to possibly be within the application area. No species of Threatened or Priority flora were identified during a flora survey of the application area and surrounding areas (GHD, 2020).

Fifteen species of weeds were recorded during the greater field survey of the application area and surrounding areas (GHD, 2020). None were listed as a Declared Pest according to the *Biosecurity and Agriculture Management Act 2007* (GHD, 2020). Weeds have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction of weeds may be minimised by the implementation of a weed management condition.

Conclusion

For the reasons set out above, it is considered that the vegetation within the application area is not likely to represent an area of high diversity. The proposed clearing does have the potential to exacerbate the spread of weeds in the local area.

Conditions

To address the above impacts, the following management measures will be required as a condition on the clearing permit:

- Take hygiene steps to minimise the risk of the introduction and spread of weeds

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

Assessment

There were three fauna habitats; Acacia woodlands, Melaleuca shrubland on limestone and rehabilitated area recorded within the application area (GHD, 2020). Other areas were mapped as ‘cleared’ which were previously cleared and contained little or no native vegetation. The old dune pit and topsoil stockpile area is mostly mapped as cleared as it contains previously disturbed areas. The north pit expansion area and exploration drill lines to the north have largely been uncleared and are mostly comprised of the Acacia woodlands with some areas of Melaleuca shrubland on limestone habitat on the eastern side of the area at the top of the slope (GHD, 2020). The exploration drill lines in the south are mostly Acacia woodlands with some areas of rehabilitated vegetation at the top of the slope in the east (GHD, 2020).

The Acacia woodlands habitat contains a high level of wood and branches from previously cleared trees which would provide suitable habitat for birds and reptiles (GHD, 2020). The Melaleuca shrubland on limestone habitat contains good ground cover, litter, debris and some areas of outcropping rock which would provide excellent cover for a range of fauna species (GHD, 2020). Both of these habitats have evidence of high grazing impacts, including from feral pigs (GHD, 2020). The patchy vegetation and drive tracks may increase the use of the area by feral animals (GHD, 2020). The rehabilitation areas contain moderate level of wood and branches (GHD, 2020). This habitat contains more open areas and shows evidence of high grazing impacts from feral pigs (GHD, 2020).

There are a number of conservation significant fauna species which have been recorded in the local area (20 kilometre radius) (GHD, 2020; GIS Database). The large majority of these records are migratory shorebirds which are likely to utilise nearby Hutt Lagoon and coastal areas. Based on the habitat present, the application area is not likely to be suitable for these species. Several species such as Peregrine Falcon (*Falco peregrinus*) and Fork-tailed Swift (*Apus pacificus*) are likely pass through the application area as part of a larger home range however, the vegetation is not likely to represent significant habitat. Carnaby's Cockatoo (*Zanda latirostris*) has been recorded in the local area however, there is no suitable roosting or foraging habitat present within the application area (GHD, 2020). The Geraldton Sandplain shield-backed trapdoor spider (*Idiosoma arenaceum*) has been recorded in the local area from similar habitat to the application area (GIS Database). This species has a moderately widespread distribution within the Geraldton Sandplains and far northern Wheatbelt bioregions with a range of over 250 kilometres (Rix et al., 2018; GIS Database). No burrows have been observed within the application area (GHD, 2020). Whilst the proposed clearing may remove potential habitat for this species, it is not likely to have a significant impact on this species. An Osprey (*Pandion cristatus*) was observed nesting in a dead Acacia tree in vegetation outside of the application area between the old dune pit and pit expansion areas (GHD, 2020). As this species is piscivorous the vegetation within the application area is not used for foraging and the vegetation in the application is not likely to be significant habitat for this species.

The application area forms part of an ecological linkage running north-west to south-east, with Hutt Lagoon to the west and large areas of cleared farmland to the east (GIS Database). This linkage is likely to be significant for fauna species in the local area. The old dune pit is largely already cleared and the clearing of this area will not have a significant impact on the linkage. The exploration drill lines will not sever the linkage however, the clearing has the potential to increase the spread of weeds and also create additional open areas which can hinder the movement of fauna through the area. The vegetation within the pit expansion area has a greater significance in the maintenance of this ecological linkage. The proposed clearing will not sever the linkage, however, it may have an impact on the ability for fauna to move through the landscape.

The application area does not contain any significant habitat features (such as caves, hollows or water sources) (GHD, 2020). Whilst the vegetation is likely to contribute to an ecological linkage, is not likely to support a high level of faunal diversity given the impacts from weeds and feral grazers.

Conclusion

Based on the above assessment, the proposed clearing will result in the reduction of vegetation within an ecological linkage. This may have an impact on the ability for some fauna to move through the landscape. Whilst the proposed clearing will have potential impacts on fauna in the local area, these impacts can be management by the implementation of conditions on the permit to ensure that clearing is undertaken in stages and areas are rehabilitated in a timely manner.

Conditions

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

- A staged clearing condition to ensure that only areas that are needed are cleared at any one time.
- A rehabilitation condition to reduce the risk of soil erosion by minimising the amount of open ground at any point in time.

3.2.3. Significant remnant vegetation - Clearing Principles (e)

Assessment

The application area falls within the Geraldton Sandplains Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 44% of the pre-European vegetation still exists in the IBRA Geraldton Sandplains Bioregion (Government of Western Australia, 2019), which gives it a conservation status of 'Depleted' according to the Department of Natural Resources and Environment (2002). The local area (20 kilometres radius) has been extensively cleared for agricultural purposes.

The application area is broadly mapped as Beard vegetation associations 17: shrublands; *Acacia rostellifera* thicket; and 371: low forest; *Acacia rostellifera* (GIS Database). Approximately 83-88% of the pre-European extent of vegetation association 17 remains uncleared at the state, bioregional and subregional level (Government of Western Australia, 2019). Approximately 10% of the pre-European extent of vegetation association 371 remains uncleared at both the state, bioregional and subregional level (Government of Western Australia, 2019). This gives vegetation association 371 a conservation status of 'Vulnerable' according to the Department of Natural Resources and Environment (2002). A vegetation and flora survey conducted by GHD (2020) mapped the vegetation of the application area at a much finer scale than the Beard vegetation mapping. The vegetation of the application area was mapped as VT01: *Acacia rostelifera* open woodland to woodland, which was inferred to represent Beard vegetation association 17: Shrublands; *Acacia rostellifera* thicket (GHD, 2020). Therefore, the proposed clearing will not reduce the extent of Beard vegetation association 371. Over 83% of the pre-European extent of vegetation association 17 remains uncleared at the state, bioregional and subregional levels (Government of Western Australia, 2019).

The application area is located on the intermediate slopes between the dune system in the east and Hutt Lagoon and the coastal plains in the west. The majority of the area to the east of the application area has been cleared for agriculture (GIS Database). The application area is located within a relatively intact band of vegetation along the eastern edge of Hutt Lagoon (GIS Database). The old dune pit area is largely already cleared and the clearing of this area will not have a significant impact on the remnant. There are also areas associated with the existing haul road area and previous exploration which are have

previously been cleared and rehabilitated. The vegetation within the pit expansion area has a greater significance in the maintenance of the ecological linkage the remnant provides. The proposed clearing will not sever the linkage, however it may have an impact on the ability for fauna to move through the landscape. The condition of the vegetation within the pit expansion area is mostly good condition due to the existing disturbances and weeds within the application area. Further clearing of the remnant may contribute to the continued decline in the condition of the remnant. Monitoring of previously rehabilitated areas has shown that the vegetation has the potential to return to a relatively similar composition and condition of the vegetation within the remnant (GMA Garnet, 2020). If cleared areas are rehabilitated in a timely manner, the long term impacts of the clearing may be mitigated. Potential impacts to remnant vegetation may be minimised by the implementation of a staged clearing condition and rehabilitation condition.

Conclusion
Based on the above assessment, the proposed clearing will result in the clearing of vegetation which is part of a significant remnant vegetation. However, the clearing will not sever the ecological linkage and the impacts can be minimised through the implementation of conditions on the permit.

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

- A staged clearing condition to ensure that only areas that are needed are cleared at any one time.
- A rehabilitation condition to reduce the risk of soil erosion by minimising the amount of open ground at any point in time.

3.2.4. Land and water resources - Clearing Principles (f) and (g)

Assessment

There are no permanent watercourses or wetlands within the area proposed to clear (GHD, 2020; GIS Database). Minor non-perennial watercourses and surface flow lines can be seen adjacent to the application area (GIS Database), however the field survey did not record any drainage lines or vegetation associated with drainage lines (GHD, 2020).

The application area is situated approximately 100-200 metres east of Hutt Lagoon at its closest points (GIS Database). Hutt Lagoon is a wetland listed in the Directory of Important Wetlands in Australia as an important stop-over for migratory waterbirds and a good example of a coastal brine lake (DEC, 2009; GIS Database). The existing garnet mine east of Hutt Lagoon is described as a threat to the ecology of Hutt Lagoon in DEC's Resource Condition Report because of its potential to alter the hydrology and water quality of Hutt Lagoon if not managed properly (DEC, 2009). The threats of the garnet operations are focussed on operational aspects of groundwater use with groundwater draw down potentially causing a seawater intrusion and impacting nearby Utcha Swamp (DEC, 2009). Groundwater management during operations is assessed in the Mining Proposal under the *Mining Act 1978*.

The application area is interpreted to be in the Port Gregory soil-landscape zone which is summarised as coastal dunes, calcareous in places, with undulating sandplain on limestone (DPIRD, 2022). The application area has been mapped as Map Unit 231Ta_2 of the Tamala North System, described as low hills and relic dunes with some limestone outcrops forming a coastal band three to seven kilometres wide (DPIRD, 2022). Water erosion has the potential to occur in cleared areas due primarily to the land slope (DPIRD, 2022). However, rainfall events that generate significant run-off are infrequent and the surface flow is generally very localised (DPIRD, 2022).

There is the risk of wind erosion from the proposed clearing due to the loose sandy nature of the soils and when cleared, these soils have the potential to mobilise under strong prevailing winds (DPIRD, 2022). This may impact on neighbouring and surrounding vegetation and properties. GMA Garnet Pty Ltd has protocols to manage risks associated with dust and include measures detailed in Section 3.1.

Conclusion
Based on the above assessment, the proposed clearing is not likely to have a significant impact on any watercourses however, there is potential for localised impacts associated with wind erosion if areas are cleared of vegetation.

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

- A staged clearing condition to ensure that only areas that are needed are cleared at any one time.
- A rehabilitation condition to reduce the risk of soil erosion by minimising the amount of open ground at any point in time.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 10 May 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. The application was amended during the assessment and subsequently readvertised for a period of 7 days. There was one submission received in relation to Aboriginal Heritage matters. These concerns were passed onto the applicant to liaise directly with the submitter.

There is one native title claim over the area under application (DPLH, 2022). This claim has been determined by the Federal Court on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (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.

Other relevant authorisations required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.
- A Mining Proposal / Mine Closure Plan approved under the *Mining Act 1978*.

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.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Updated application form and supporting documentation.	GMA Garnet amended the application to include additional areas for exploration drill lines. The amount of clearing also increased from 46.33 hectares to 58.96 hectares.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of a remnant patch of native vegetation in the intensive land use zone of Western Australia. It is surrounded by areas of cleared agricultural land to the east and there are also some adjacent areas of garnet mining in the southern area. The proposed clearing area contributes to an ecological linkage between areas on the dune system to the east and the coastal plain to the west (GIS Database). Spatial data indicates the local area (20 kilometre radius from the centre of the area proposed to be cleared) retains approximately 41 per cent of the original native vegetation cover.
Ecological linkage	The application area is located on the intermediate slopes between the dune system in the east and Hutt Lagoon and the coastal plains in the west. The majority of the area to the east of the application area has been cleared for agriculture (GIS Database). The application area is located within a relatively intact band of vegetation along the eastern edge of Hutt Lagoon (GIS Database).
Conservation areas	The closest conservation area is the Utcha Well Nature Reserve which is located approximately 3.3 kilometres northwest of the permit area (GIS Database).
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation associations: **17:** Shrublands; *Acacia rostellifera* thicket; and **371:** Low forest; *Acacia rostellifera* (GIS Database). A flora and vegetation survey was conducted over the application area and surrounding areas on Mining Leases 70/204 and 70/1330 by GHD during December, 2019. The following vegetation associations were recorded within the application area (GHD, 2020): **VT01 - *Acacia rostellifera* open woodland to woodland** *Acacia rostellifera* open woodland to woodland over *Rhagodia preissii* subsp. *obovata*, *Pimelea microcephala* subsp. *microcephala*, *Olearia* sp. Kennedy Range (G. Byrne 66) and *Stylobasium spathulatum* open shrubland over *Austrostipa elegantissima* and **Ehrharta longiflora* open grassland to grassland. Other common species include *Alyogyne hakeifolia, Roepera fruticulosa, Commicarpus australis* and *Euphorbia boophthona*. Occurs over lower and middle slopes on brown to orange sands. **VT02 - *Melaleuca cardiophylla* shrubland to open shrubland** *Melaleuca cardiophylla* shrubland to open shrubland over *Alyogyne hakeifolia*, *Pimelea microcephala* subsp. *microcephala* and *Rhagodia preissii* subsp. *obovata* open shrubland over *Ptilotus divaricatus* scattered forbland. Other common species include *Roepera fruticulosa*, *Pimelea gilgiana* and **Bromus diandrus*. Areas that contain deeper soils *Acacia rostellifera* was also recorded. Occurs on upper mid slopes on white-brown sand with limestone outcropping. *denotes weed species Areas of the application area have also been mapped as cleared and rehabilitated.
Vegetation condition	The vegetation survey and aerial imagery indicate the vegetation within the proposed clearing area is in good to degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix D. Representative photos are available in Appendix E.
Climate and landform	The application area is mapped within elevations of 4-40 metres AHD (GMA Garnet, 2022). The annual average rainfall (Kalbarri) is 339.7 millimetres (BoM, 2022).

Characteristic	Details
Soil description	The soil is mapped as the Tamala North System which is described as Low hills with relict dunes and some limestone outcrop and forms a coastal band 3 to 7 kilometres wide (DPRID, 2022).
Land degradation risk	The risk of eutrophication is unlikely and the risk of water erosion is low (DPIRD, 2022). Wind erosion is a hazard in the proposed area to be cleared because of the loose sandy nature of the soil (DPIRD, 2022).
Waterbodies	The desktop assessment and aerial imagery indicated that there are no watercourses within the application area (GIS Database).
Hydrogeography	The mapped groundwater salinity is 1,000-3,000 milligrams per litre total dissolved solids which is described as brackish (GIS Database).
Flora	According to available databases, there are 58 conservation significant flora species within the local area (GIS Database). The most frequently recorded species is *Malleostemon costatus* which is a Priority 2 species. The closest recorded species is *Caladenia elegans* which is listed as Threatened.
Ecological communities	There are no mapped Priority or Threatened Ecological Communities (TEC/PEC) within the application area. The Kalbarri Ironstone Community PEC is mapped within 10 kilometres of the application area (GIS Database).
Fauna	According to available databases, 40 species of conservation significant fauna species have been recorded within the local area (GIS Database). The large majority of these species are migratory bird species.

B.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 - Geraldton Sandplains	3,136,038	1,404,424	45%	568,255	18%
IBRA Subregion - Geraldton Hills	1,964,263	901,447	46%	355,757	18%
Local Government – Shire of Northampton	1,258,429	930,229	74%	230,958	18%
Beard vegetation associations - State					
17	76,634	67,605	88%	8,831	12%
371	32,816	3,500	11%	242	1%
Beard vegetation associations - Bioregion					
17	54,078	45,160	84%	6,067	13%
371	32,808	3,499	11%	242	1%
Beard vegetation associations - subregion					
17	49,605	42,016	85%	5,573	11%
371	32,808	3,499	11%	242	1%

Government of Western Australia (2019)

B.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and biological survey information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Anthocercis intricata	Priority 3	Y	Y	Y	<10	Y
Balladonia aervoides	Priority 3	Y	Y	Y	<5	Y
Caladenia bryceana subsp. cracens	Threatened	Y	Y	Y	<10	Y
Calytrix purpurea	Priority 2	Y	Y	Y	<15	Y
Geleznowia sp. Binnu (K.A. Shepherd & J. Wege KS 1301)	Priority 3	Y	Y	Y	<15	Y
Melaleuca huttensis	Priority 3	Y	Y	Y	<15	Y
Scholtzia oleosa	Priority 3	Y	Y	Y	<15	Y

B.4. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Dasyurus geoffroii	Vulnerable	N	Y	<20	N
Idiosoma arenaceum	Priority 3	Y	Y	<20	N
Zanda latirostris	Endangered	N	N	<5	Y
Pandion cristatus	Migratory	Y	Y	0	Y
Falco peregrinus	Other specially protected fauna	Y	Y	<5	Y
Apus pacificus	Migratory	Y	Y	<5	Y

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

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: A total of 64 flora species representing 26 families and 50 genera were recorded within the greater survey area (GHD, 2020). There are seven species of conservation significant flora which have been recorded in the local area (20 kilometres) which are considered to possibly be within the application area. No species of Threatened or Priority flora were identified during a flora survey of the application area and surrounding areas. Fifteen species of weeds were recorded during the greater field survey of the application area and surrounding areas (GHD, 2020).	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
The impacts from weeds and grazing means the application area is not likely to support a high level of faunal diversity.		
Principle (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."* Assessment: The area proposed to be cleared is part of a remnant of vegetation and is likely to act as an ecological linkage for fauna species moving through the landscape.	May be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: There are no known records of Threatened flora within the application area (GIS Database). There are records of nine Threatened flora species within 20 kilometres of the application area (GIS Database). Based on the habitat present within the application area, only *Caladenia bryceana* subsp. *cracens* was considered possibly to be present (GHD, 2020). The '*Melaleuca cardiophylla* shrubland to open shrubland' vegetation type was identified as being potential habitat for *Caladenia bryceana* subsp. *cracens* (GHD, 2020). A known location of this species was visited with staff from DBCA in August 2020. It was confirmed that this species was flowering and suitable habitat on Mining Lease 70/204 was searched for the species. Flora surveys of the application area did not record any species of Threatened flora (GHD, 2020). The habitat within the application area is also significantly degraded through weeds and evidence of feral pig grazing (GMA Garnet, 2020).	Not likely to be at variance	No
Principle (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."* Assessment: 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 (GHD, 2020).	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (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."* Assessment: The application area is broadly mapped as Beard vegetation associations 17 and 371 (GIS Database). Vegetation association 371 has been extensively cleared as there is less than 11% of the pre-European extent remaining (Government of Western Australia, 2019). The application area is located within a relatively intact band of vegetation along the eastern edge of Hutt Lagoon (GIS Database).	At variance	Yes *Refer to Section 3.2.3, above.*
Principle (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."* Assessment: There are no conservation areas in the vicinity of the application area. The nearest DBCA managed land is the Utcha Well Nature Reserve which is located approximately 3.3 kilometres north-west of the application area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area.	Not likely to be at variance	No
Environmental value: land and water resources		

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: There are no permanent watercourses within the application area (GIS Database). The application area is located approximately 100-200 metres east of Hutt Lagoon which is listed in the Directory of Important Wetlands in Australia (GIS Database).	Not likely to be at variance	Yes *Refer to Section 3.2.4, above.*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Wind erosion is a hazard in the application area because of the loose sandy nature of the soil (DPIRD, 2022). In exposed locations on the upper slopes and crests of dunes, areas of unprotected soil have potential to create mobile dune fields because of strong prevailing winds (DPIRD, 2022).	May be at variance	Yes *Refer to Section 3.2.4, above.*
Principle (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."* Assessment: The nearest waterbody is Hutt Lagoon located approximately 200 metres west of the application area (GIS Database). The application area is located on a slope which can cause localised areas of erosion however, the risk of water erosion in the area is low (DPRID, 2022). The proposed clearing is not likely to cause sediment runoff into the nearby Hutt Lagoon. There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). In the local area, stable or declining groundwater levels are observed in landscapes that are substantially cleared for agriculture (DPIRD, 2022).	Not likely to be at variance	No
Principle (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."* Assessment: There are no permanent water courses or waterbodies within the application area (GIS Database). The application area is located on a slope and any removal of vegetation has the potential to increase the velocity of water runoff following rainfall events. Based on the soils present the proposed clearing has a low risk of increasing the incidence or intensity of natural flooding events (DPIRD, 2022).	Not likely to be at variance	No

Appendix D. 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.

Condition	Description
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 E. Representative photographs of the vegetation

Photo 1: VT01 - *Acacia rostellifera* open woodland to woodland.

Photo 2: VT02 - *Melaleuca cardiophylla* shrubland to open shrubland.

Photo 3: Rehabilitation areas.

Photo 4: Cleared areas (including mine areas, tracks, cleared areas containing no native species).

Appendix F. Sources of information

F.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)
- 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
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Interim Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

F.2. References

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Environmental Protection Authority (EPA) (2020) Technical Guidance – Terrestrial Fauna Surveys. Available from: 2020.09.17 - EPA Technical Guidance - Vertebrate Fauna Surveys - Final.pdf

GHD (2020) Lynton Mine Expansion Biological Survey. Report prepared by GHD Pty Ltd for GMA Garnet Pty Ltd, February 2020.

GMA Garnet (2022) GMA Mining Australia, Mining Tenement M70/204 and M70/1330 Supporting Documentation for a Native Vegetation Clearing Permit Application, July 2022.

Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

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4. 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.

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.