# Clearing Assessment Report – CPS 818

We're working for Western Australia.

## Tanami Road Upgrade Stage 1 SLK 0-20 Material Areas

October 2022

EOS 1890



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# Contents



**LIST OF FIGURES**

**LIST OF TABLES**

# Amendments

| Report Compilation & Review | Name and Position | Document Revision | Date |
|---|---|---|---|
| Author: | Environment Officer (Kimberley Region) | Draft | 11/10/2022 |
| Reviewer: | Senior Environment Officer | V1 | 26/10/2022 |

# 1 PURPOSE

The purpose of this Clearing Assessment Report (CAR) is to provide a report detailing the assessment of native vegetation clearing that is proposed to be undertaken using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads or MRWA).

The CAR outlines the key activities associated with the project, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the project using the ten Clearing Principles, and the strategies used to manage vegetation clearing.

# 2 SCOPE

## 2.1 Project Scope

**Project Name:** Tanami Road Upgrade Stage 1 SLK 0-20 Material Areas

**Project Purpose / Components:**
Tanami Road is currently an unsealed road in the Kimberley region connecting Halls Creek and Alice Springs (in the Northern Territory). The government has committed to seal the road as it poses a safety hazard to road users and at times becomes inaccessible for long periods of time during the wet season. At over 300km in length, this will represent a substantial upgrade over many years. The upgrade of the road between SLK 0 (Halls Creek) and SLK 311 (where the road intersects the Northern Territory border) will be completed in stages over a 10 year timeframe subject to the availability of government funding.

Main Roads intends to carry out pre-construction works to prepare for the commencement of construction of the first 20km of the Tanami Road in 2023. To allow commencement of the road alignment upgrade at the end of the wet season in 2023 (approximately April), Main Roads needs to investigate and source construction materials (gravel, fill/borrow material, rock etc) from proposed material pits prior to December 2022. Investigating groundwater sources, material pits, and stockpiling gravel prior to the wet season ensures that there will be suitable quantities of materials available when construction commences in 2023, and will make use of natural rainwater to pre-condition the gravel, minimising the amount of groundwater required to be abstracted. The current design for the road upgrade is still in development and will be subject to a future CAR. Cumulative impacts will be considered in future CARs on the Project.

The scope of works under this assessment includes:

- Geotechnical investigations of a number of Material Areas between SLK 0 and 20 on the Tanami Rd within the Project Development Envelope (Figure 1)
- Development (extraction) of gravel and fill from Material Areas where suitable materials are found.
- Construction of water dams and access tracks (a minor component – approx. 5% of the total Project Development Envelope [see below])

**The proposed clearing undertaking using CPS 818 is:** Up to a maximum of 30 ha within a 104.4 ha Project Development Envelope.

The Project Development Envelope sets the boundary of this assessment within which all works will be contained. The layout used for this assessment is indicative but is based on the most conservative estimate of the clearing required (full 30 ha of clearing). Actual on-ground impacts will not exceed the estimated impacts determined in this assessment.

**The proposed temporary clearing undertaking using CPS 818 is:** Nil

**Project Location(s):** The project area is located on Tanami Road (Road No. 0020025) between SLK 0 – 20 (and one area at SLK [Redacted]) approximately 17 km south-west of Halls Creek Townsite, within the Shire of Halls Creek with the proposed work areas shown in Figure 1.

- Latitude: -18.545467
- Longitude: 127.568479

The detailed project area maps are provided in Appendix 3.

The Tanami Road is a Local Government Road under the care and control of the Shire of Halls Creek. In response to the Federal and State Governments committing funding to upgrade and seal the Road to the Northern Territory Border, the Shire of Halls Creek has requested Main Roads Western Australia's assistance in delivering the Project.

## 2.2 Assessment Report Scope

The assessment area is confined to a local area of a 40 km radius as shown in Figure 2. A 40km assessment area is reflective of the remote nature of the Project.

## 2.3 Report Terminology and Sources

The following terms are used in this Clearing Report:

- **Native Vegetation Clearing Area** – The maximum amount of native vegetation to be cleared for the Proposal that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe movement of machinery during construction

- **Development Envelope** – The maximum extent within which the Clearing Area will be located. This envelope larger than the Clearing Area and the Proposal Area to allow for minor changes to the Proposal footprint as the design process continues, and to account for minor and unexpected changes that may occur during construction, such as working to avoid a large tree or encountering buried boulders or services. This flexibility also allows the site personnel to make modifications to the Proposal to avoid areas that may contain better environmental values. The CAR has assessed all environmental values within the Development Envelope as though all of these values will be impacted, up to the amount specified within the Clearing Area

- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the Proposal is confined to a local area of a 40km radius.

[Redacted]

**Figure 1. Project Overview Map**

[Redacted]

**Figure 2. Assessment Area**

## 2.4 Alternatives to clearing

The following alternatives to clearing were considered during the development of the proposal:

- Importing construction materials from a third-party supplier. Due to the remote nature of the project and large volume of material required, a third-party source could not be located. Furthermore, the costs to import material is cost prohibitive, economically unfeasible and provides no net environmental benefit, due to the carbon cost of transporting the material over a larger distance.
- Not conducting the clearing is not considered a feasible option as it does allow for the Tanami Road upgrade and will not address the safety hazards it currently poses to road users.

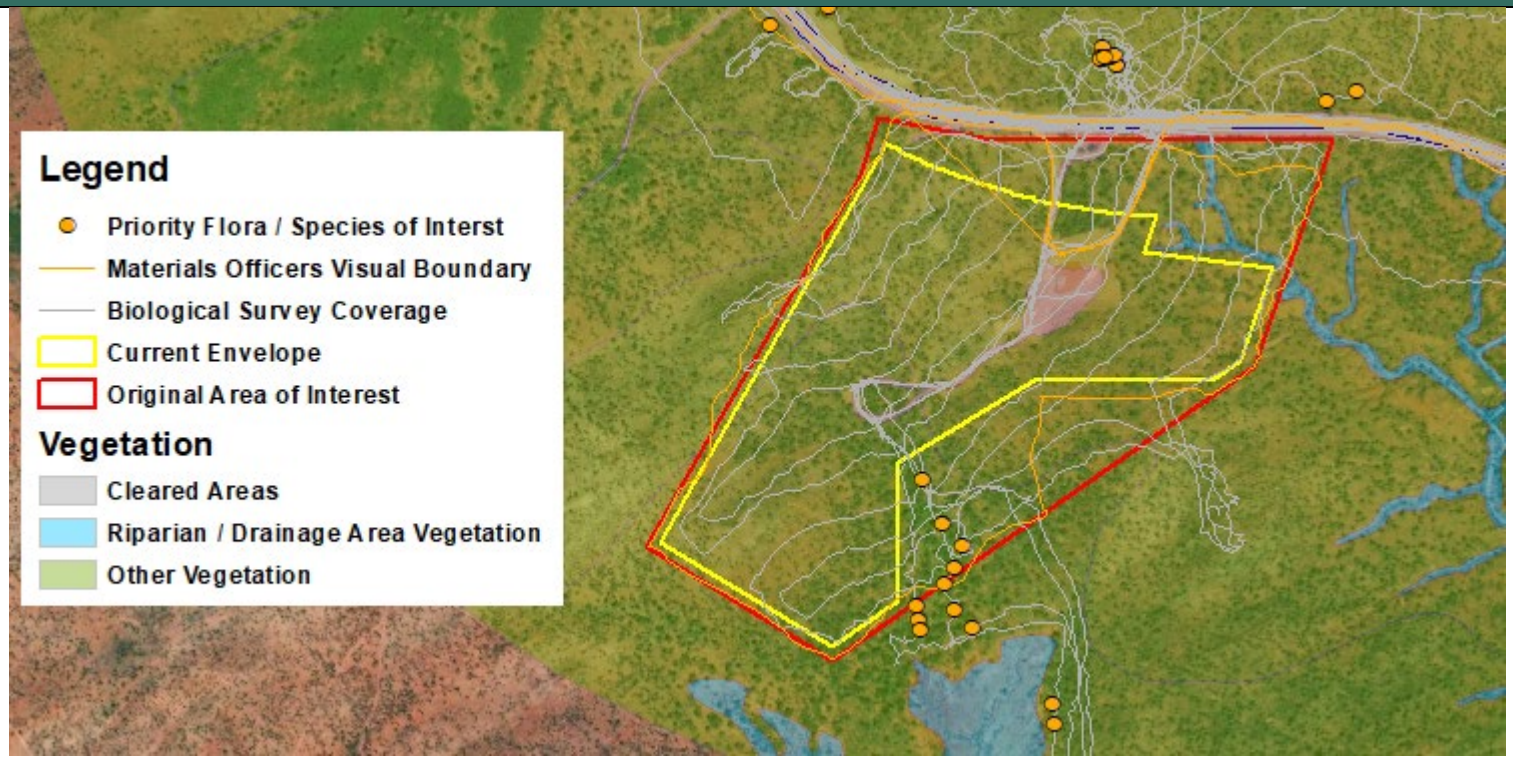
## 2.5 Measures to Avoid, Minimise, Reduce and Manage Project Clearing Impacts

The design and management measures implemented to avoid and minimise the clearing impacts by the project are provided in Table 1. In addition, the following measures have been considered:

- Use of existing access tracks where possible.
- the Project Development Envelope selected to avoid areas of high value vegetation.
- Utilising existing Shire of Halls Creek material pits where possible for material supply, however the amount of material required for the upgrade significantly exceeds the amount currently available
- Implementation of clearing will be supervised by Main Roads Environment Officers.

**Table 1. Measures undertaken to Avoid, Minimise, Reduce and Manage the Project Clearing Impacts**

| Design or Management Measure | Discussion and Justification |
|---|---|
| **Preferential use of existing cleared areas for access tracks, construction storage and stockpiling** | • Existing cleared areas are limited within the project area with to the existing Tanami Road, fencelines, access tracks and existing gravel pits. Material extraction for the majority of the areas are limited as it will require the need for replacement infrastructure and subsequent clearing. However, where existing pits are in place, available material and the existing pit access points have been utilised to access the new material areas that are being developed under this assessment. Refer to Plate 3. |
| **Drainage modification** | • The Material Areas have been selected to avoid watercourses, reducing the risk of impeding natural drainage patters. Refer to Plate 3. |
| **Incentives to Minimise Clearing** | • The Project Development Envelope was refined from original surveyed areas through a visual inspection by Main Roads Materials Officers.<br>• Reductions were made to avoid all populations of Priority Flora and Species of Interest (see Section 4).<br>• Further reductions were made to avoid riparian vegetation where possible (all pit areas avoid riparian vegetation; the only area affected is for an access track to a potential material area as no alternate access was available). |

| Design or Management Measure | Discussion and Justification |
|---|---|
| |  <br>**Figure 3. Example of Envelope design and refinement process** |

## 2.6 Approved Policies and Planning Instruments

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 1.3), Main Roads has also had regard to the below instruments.

**Other Legislation of relevance for assessment of clearing and planning/other matters**

- Biodiversity Conservation Act 2016 (WA) (BC Act)
- Conservation and Land Management Act 1984 (WA) (CALM Act)
- Country Areas Water Supply Act 1947 (WA) (CAWS Act)
- Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)
- Planning and Development Act 2005 (WA) (P&D Act)
- Soil and Land Conservation Act 1945 (WA)
- Rights in Water and Irrigation Act 1914
- Aboriginal Heritage Act 1972 (WA)
- Town Planning and Development Act 1928

**Other Relevant policies and guidance documents:**

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DEC, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, August 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities
- Approved Recovery Plans for threatened species
- Strategic advice - EPA

# 3 SUMMARY OF SURVEYS

## 3.1 Biological Survey

The "Tanami Road Upgrade SLK 0-60 Biological Survey" was conducted on 23rd of May to 8th June 2020 by Biota Environmental Sciences and covers the full extent of the Development Envelope. Section 3.1.1 contains the summary of the survey.

### 3.1.1 Summary of Biological Survey

Main Roads commissioned Biota Environmental Sciences (Biota) to carry out a biological survey to identify key flora and fauna values relevant to the proposed upgrade works on a 60 km section of Tanami Road between SLK 0 - 60. The spatial scopes for the biological survey comprised a Survey area (200-500 m from road corridor), a contextual area (500 m buffer around the survey area) and the study area (40 km buffer around the survey area). A desktop flora and fauna assessment was undertaken for the study area, followed by a field survey which comprised a detailed and targeted flora and vegetation survey and a basic and targeted fauna survey of the survey area.

**Vegetation**
13 vegetation types were identified from the survey area, associated with drainage lines, plains and hills. None of the vegetation types represent listed Threatened Ecological Communities (TECs), or Priority Ecological Communities (PECs). The vegetation type P10 shared some similarities to the two tussock grassland communities in the study area that are listed as PECs and was considered to be of local significance. Two vegetation types from drainage line habitats (D3 and D4) were considered to represent Groundwater Dependent Ecosystems and were also considered to be locally significant.

**Flora**
A total of 414 native vascular flora species from 165 genera and 57 families were recorded from the survey area. No Threatened flora were recorded. Five species were confirmed to be Priority species, while a sixth was tentatively identified as such. These comprised two P1 species- *Goodenia lunata* and *Pentalepis trichodesmoides* subsp. ? *incana*; one P2 species - *Ipomoea racemigera*; and three P3 species - *Glycine falcata, Goodenia crenata* and *Trachymene dusenii*. Nine taxa recorded were designated as "Species of Interest" as they may be new (undescribed species) or cannot be referred to any known taxa recognised for Kimberley. A total of 26 weed species were recorded, including one significant weed species **Calotropis procera* (Calotrope) which is a Declared Plant and was found scattered through plains and drainage lines throughout the survey area.

**Fauna**
A combined total of 114 species of vertebrate fauna were recorded, including 10 mammals, 9 bats, 72 birds, 20 reptiles and 3 amphibians. No fauna species of significance were recorded, however a cluster of burrows and diggings potentially belonging to Bilby *Macrotis lagotis* (VU*)* was recorded from the contextual area. An assessment indicated that 8 fauna species of significance were considered likely to occur within the survey area. These included: Ghost Bat *Macroderma gigas* (VU), Grey Falcon *Falco hypoleucos* (VU), Peregrine Falcon *Falco peregrinus* (OS), Fork-tailed Swift *Apus pacificus* (MI), Oriental Plover *Charadrius veredus* (MI), Oriental Pratincole *Glareola maldivarum* (MI), Gravel Dragon *Cryptagama aurita* (P1) and Yellow-lipped Cave Bat *Vespadelus douglasorum* (P2).

Nine fauna habitats were described for the survey area of which the *Acacia monticola* tall open scrub was considered to have the highest local significance due to its potential provision of habitat for Bilby.

## 3.2 Summary of Additional Survey

Two additional targeted surveys were completed following the work by Biota (2021a):
- "Tanami Road Upgrade Targeted Flora" Survey was conducted on 21st - 25th May 2021 by 360 Environmental (360 Environmental 2022).
- "Tanami Road Upgrade and Great Northern Highway Material Pit Areas: Flora Survey", conducted on 14th – 25th June 2021 by Biota Environmental Sciences (Biota 2021b)

Section 3.2.1 contains the summary of both follow up surveys.

### 3.2.1 Summary of Targeted Flora Survey – 360 Environmental 2022

Main Roads WA commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a Targeted Flora survey of significant flora previously identified by Biota, (2021a). This survey focused on surveying material areas and proposed bore sites.

Based on previous survey findings, seven priority flora taxa, one potential priority taxa and 9 species of interest, were targeted during the survey. Of these, three priority flora, and four species of interest were recorded by the systematic searches as detailed below:
- *Ipomoea racemigera* (P2) - 135 individuals from two locations outside the Survey Area.
- *Goodenia crenata* (P3) and *Goodenia* aff. *crenata* (P3) – Total of 1,301 individuals from 32 locations.
- *Trachymene dusenii* (P3) - 2203 individuals from 155 locations

Three species that are of interest recorded were:
- *Aristida* aff. *jerichoensis* (Potential novel taxon) – 1 individual
- *Cyperus* sp. (TAN14-14) (Potential novel taxon) - 17 individuals from nine locations
- *Solanum echinatum* (Range Extension) - 45 individuals from nine locations

One additional species not previously identified was recorded:
- *Euphorbia schultzii* var. *comans* (Range Extension) - 1 individual

All targeted taxa that were not recorded were considered highly unlikely to occur within the Survey Area.

### 3.2.2 Summary of Targeted Flora Survey – Biota 2021b

Main Roads commissioned Biota to undertake additional targeted surveys for Priority flora species and other species of interest that were identified as occurring or potentially occurring in the survey area during the initial survey by Biota, 2021a. The survey area was traversed at 50-100 m intervals, with the exception of areas that were considered relatively well surveyed in 2020 ( Biota 2021a), and areas surveyed in 2021 by 360 Environmental. This survey focused on surveying the proposed alignment between SLK 0-60.

Additional populations were recorded for all six Priority species documented for the survey area by Biota, 2021a:

- *Goodenia lunata* (P1) –18,619 individuals from 440 locations;
- *Pentalepis trichodesmoides* subsp. *incana* (P1) – 27 individuals from 18 locations;
- *Ipomoea racemigera* (P2) – 12 individuals from 10 locations;
- *Glycine falcata* (P3) –383 individuals from 77 locations;
- *Goodenia crenata* (P3) – 41,972 individuals from 1548 locations; and
- *Trachymene dusenii* (P3) – 2,566 individuals from 202 locations.

Additional populations were also recorded for eight of the 10 species of interest that were initially recorded:

- *Cullen* sp. (TAN-TW07) - 2,682 individuals at 194 locations;
- *Cyperus* sp. (TAN14-14) – 45 individuals at 9 locations;
- *Euphorbia ferdinandi* var. ? *appendiculata* – 23 individuals at 9 locations;
- *Euphorbia* sp. (TAN11-06) – 41 individuals at 16 locations;
- *Pittosporum* aff. *angustifolium* – 4 individuals at 4 locations;
- *Portulaca* ? sp. finely echinate (D.G.Tulloch 41) – 41 individuals at 8 locations;
- *Sida* sp. (TAN01-17) – 66 individuals at 22 locations; and
- *Triodia* sp. (TAN07-02/34) – at least 15,000 individuals at 24 locations.

The remaining two species of interest appear uncommon in the area:

- *Aristida* aff. *jerichoensis* was observed at the original collection location but no other populations were found; and
- Convolvulaceae sp. (TAN02-49) was not found at the original collection site or any other locations.
- *Kohautia australiensis* (P2) – 2 individuals at a single location on the eastern edge of the survey area, a new collection for the area, filling in a gap in the range of the species.

Cumulative population counts from these surveys are presented in Section 4.1.3.

# 4 VEGETATION DETAILS

## 4.1.1 Project Site Vegetation Description

The Biological Survey undertaken by Biota (2021a) mapped 13 vegetation units from within the Project Development Envelope comprising three units on hills (H1, H2 and H4), seven units on plains (P2, P3, P4, P5, P7, P8 and P10) and three units in drainage lines (D3, D4 and D5) as described in detail below:

**Table 2. Surveyed Vegetation Types Representation (Biota, 2021)**

| Type | Description (Biota 2021a) | Extent in Survey Area (ha) | Extent in Envelope (ha) (% Surveyed Area) | Estimated Impact (ha) (% Surveyed Area) | Cumulative Impact (ha)* (% Surveyed Area) |
|---|---|---|---|---|---|
| **Hills** | | | | | |
| **H1** | *Eucalyptus brevifolia, Corymbia opaca* scattered low trees to low open woodland over *Triodia intermedia* hummock grassland. | 1930.6 | 37.1 (1.92%) | **13.9 (0.72%)** | 24.1 (1.25%) |
| **H2** | *Corymbia opaca, Eucalyptus brevifolia* low open woodland over *Triodia wiseana* hummock grassland. | 1066.8 | 0 (0%) | **0 (0%)** | 1.3 (0.12%) |
| **H4** | *Eucalyptus brevifolia* low open woodland over *Triodia* sp. (TAN07-02/34), *T. epactia* open hummock grassland. | 80.9 | 0 (0%) | **0 (0%)** | 0 (0%) |
| **Plains** | | | | | |
| **P2** | *Eucalyptus brevifolia, (Corymbia opaca)* low open woodland over *Triodia intermedia* open hummock grassland over *Eulalia aurea, Chrysopogon fallax* open tussock grassland. | 562.9 | 6.3 (1.12%) | **1.9 (0.34%)** | 2.1 (0.38%) |
| **P3** | *Corymbia opaca, Bauhinia cunninghamii, Atalaya hemiglauca* scattered low trees to low open woodland over *Dichrostachys spicata, Carissa lanceolata* scattered tall shrubs over *Triodia epactia* very open hummock grassland and/or mixed very open tussock grassland. | 817.3 | 0 (0%) | **0 (0%)** | 0.8 (0.10%) |
| **P4** | *Corymbia pachycarpa, Eucalyptus brevifolia* low open woodland over *Acacia calligera, A. lysiphloia* tall open shrubland over *Triodia epactia, T. intermedia* open hummock grassland. | 131.8 | 18.3 (13.92%) | **3.4 (2.60%)** | 4.3 (3.28%) |
| **P5** | *Corymbia opaca, Eucalyptus brevifolia* scattered low trees over *Triodia intermedia* open hummock grassland | 1146.1 | 33.3 (2.90%) | **10.7 (0.93%)** | 13.8 (1.20%) |
| **P7** | *Eucalyptus brevifolia, Bauhinia cunninghamii* scattered low trees to low open woodland over *Dichrostachys spicata, Carissa lanceolata, *Vachellia farnesiana* tall open shrubland over *Triodia intermedia* very open hummock grassland and/or *Cenchrus* spp., *Chrysopogon fallax* open tussock grassland | 515.5 | 1.3 (0.26%) | **0 (0%)** | 2.4 (0.47%) |
| **P8** | *Acacia synchronicia, *Vachellia farnesiana, Carissa lanceolata* scattered shrubs to tall open shrubland over *Chrysopogon fallax, Dichanthium fecundum, *Cenchrus* spp. Open tussock grassland | 466.4 | 0.1 (0.02%) | **0 (0%)** | 1.1 (0.24%) |
| **P10** | *Eriachne festucacea, Dichanthium fecundum* tussock grassland | 227.3 | 0 (0%) | **0 (0%)** | 0 (0%) |
| **Drainage Lines** | | | | | |
| **D3** | *Eucalyptus camaldulensis* open woodland | 102.7 | 0 (0%) | **0 (0%)** | 0.1 (0.10%) |
| **D4** | *Eucalyptus camaldulensis, E. limitaris* open woodland | 47.1 | 0 (0 %) | **0 (0%)** | 0 (0%) |
| **D5** | *Eucalyptus limitaris, Terminalia volucris* low open woodland | 261.2 | 0.4 (0.16%) | **0.1 (0.05%)** | 0.4 (0.16%) |
| **Disturbed** | | 97 | 4.3 (4.47%) | **0.1 (0.09%)** | 1.7 (1.74%) |
| **Cleared** | | 148.4 | 3.2 (2.16%) | **0.2 (0.14%)** | 22.1 (14.9%) |
| **TOTAL (excluding "Disturbed" & 'Cleared' areas)** | | | | **30.0 ha** | 52.1 ha |

* Cumulative Impact calculated using Tanami Road Stage 1 Pre-Construction CAR impact estimates

Tables 3 and 4 provide details of the Pre-European Vegetation Associations with the project area and the remaining extents of these associations.

## Table 3. Summary of Project Area's Mapped Pre-European Vegetation Associations

| Pre-European Vegetation Association(s) | Estimated Clearing Description* | % Vegetation Condition in Envelope (Biota 2021a) | |
|---|---|---|---|
| **Vegetation Association 831** described as Hummock grasslands, sparse tree steppe; snappy gum over hard spinifex *Triodia intermedia* & *T. inutilis* (Government of Western Australia, 2019) | Up to 24 ha for pit investigation and development | Excellent 42.6%<br>Very Good 21.4%<br>Good to Very Good 32.6%<br>Good 0.4%<br>Poor 0.3%<br>Completely Degraded 2.4% | Vegetation description and condition determined from report – "Biota Environmental Sciences, (2021). Tanami Road Upgrade SLK 0-60 Biological Survey. Prepared for Main Roads Western Australia, May 2021." |
| **Vegetation Association 837** described as a Grasslands, short bunch grass savanna low tree; snappy gum over arid short grass on plains (Government of Western Australia, 2019) | Up to 2.6 ha (total area within Envelope) | Poor 25.5%<br>Degraded 29.8%<br>Completely Degraded 44.7% | |
| **Vegetation Association 851** described as a Hummock grasslands, sparse tree steppe; snappy gum & bloodwood (*E. terminalis*) over hard spinifex, / & *T. intermedia* on basalt and dolerite (Government of Western Australia, 2019) | Up to 0.35 ha (total area within Envelope) | Good to Very Good 93.6%<br>Completely Degraded 6.4% | |
| **Vegetation Association 871** described as a Mosaic: Grasslands, curly spinifex, low tree savanna; snappy gum over curly spinifex / Hummock grasslands, grass steppe; hard spinifex, *Triodia intermedia* (Government of Western Australia, 2019) | Up to 6 ha for pit investigation and development | Very Good to Excellent 15.0%<br>Very Good 43.9%<br>Good 23.2%<br>Poor 3.0%<br>Completely Degraded 4.6%<br>Cleared 10.2% | |

* Estimated clearing areas (ha) are maximum areas for each vegetation noting that the total clearing will not exceed 30ha within the Project Development Envelope

## Table 4. Pre-European Vegetation Representation

| Pre-European Vegetation Association | Scale | Pre–European (ha) | Current Extent (ha) | % Remaining | % Remaining in DBCA reserves |
|---|---|---|---|---|---|
| **Veg Assoc No. 831** | **Statewide** | 381,764.51 | 381,594.39 | 99.96 | 8.42 |
| | **IBRA Bioregion** *Ord Victoria Plain* | 380,910.53 | 380,744.09 | 99.96 | 8.44 |
| | **IBRA Sub-region** *Purnululu* | 379,001.70 | 378,835.26 | 99.96 | 8.48 |
| | **Local Government Authority** *Shire of Halls Creek* | 381,764.51 | 381,594.39 | 99.96 | 8.42 |
| **Veg Assoc No. 837** | **Statewide** | 172,815.95 | 172,553.02 | 99.85 | - |
| | **IBRA Bioregion** *Ord Victoria Plain* | 21,278.56 | 21,278.56 | 100.00 | - |
| | **IBRA Sub-region** *South Kimberley Interzone* | 21,182.37 | 21,182.37 | 100.00 | - |
| | **Local Government Authority** *Shire of Halls Creek* | 151,971.74 | 151,708.81 | 99.83 | - |
| **Veg Assoc No. 851** | **Statewide** | 111,037.36 | 110,983.69 | 99.95 | 0.05 |
| | **IBRA Bioregion** *Ord Victoria Plain* | 110,998.40 | 110,944.72 | 99.95 | 0.05 |
| | **IBRA Sub-region** *Purnululu* | 110,984.56 | 110,930.89 | 99.95 | 0.05 |
| | **Local Government Authority** *Shire of Halls Creek* | 111,037.36 | 110,983.69 | 99.95 | 0.05 |
| **Veg Assoc No. 871** | **Statewide** | 230,547.71 | 230,264.07 | 99.88 | - |
| | **IBRA Bioregion** *Central Kimberley* | 230,415.48 | 230,131.84 | 99.88 | - |
| | **IBRA Sub-region** *Hart* | 230,415.48 | 230,131.84 | 99.88 | |
| | **Local Government Authority** | 230,547.71 | 230,264.07 | 99.88 | - |

| Pre-European Vegetation Association | Scale | Pre–European (ha) | Current Extent (ha) | % Remaining | % Remaining in DBCA reserves |
|---|---|---|---|---|---|
| | *Shire of Halls Creek* | | | | |

### 4.1.2 Surveyed Vegetation Condition

The breakdown of vegetation conditions within the areas surveyed by Biota (2021a), along with the condition of vegetation in the Development Envelope and Layout (estimated impact) is provided in Table 5.

**Table 5. Surveyed Vegetation Condition Representation within the Project Development (Biota, 2021a)**

| Condition | Description (Trudgen 1988) | Extent in Survey Area (ha) | Extent in Envelope (ha) (% of Surveyed Area) | Estimated Impact (ha) (% of Surveyed Area) | Cumulative Impact* (ha) (% of Surveyed Area) |
|---|---|---|---|---|---|
| **Excellent** | Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. | 2411 | 30.1 (1.25%) | **11.2 (0.47%)** | 21.2 (0.88%) |
| **Very Good to Excellent** | Intermediate condition | 61.5 | 4.7 (7.59%) | **1.5 (2.40%)** | 1.5 (2.40%) |
| **Very Good** | Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks. | 1646.4 | 28.8 (1.75%) | **7.4 (0.45%)** | 10.5 (0.64%) |
| **Good to Very Good** | Intermediate condition | 942.8 | 23.3 (2.47%) | **7.8 (0.82%)** | 9.5 (1%) |
| **Good** | More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds. | 473.8 | 7.5 (1.58%) | **1.9 (0.41%)** | 2.9 (0.62%) |
| **Poor to Good** | Intermediate condition | 33.8 | 0 (0%) | **0 (0%)** | 0.1 (0.30%) |
| **Poor** | Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds | 1018 | 1.8 (0.18%) | **0.2 (0.02%)** | 2.3 (0.23%) |
| **Degraded** | Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species. | 633.3 | 0.8 (0.12%) | **0 (0%)** | 1.7 (0.27%) |
| **Completely Degraded** | Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs. | 233 | 4.3 (1.86%) | **0.1 (0.04%)** | 2.4 (1.02%) |
| **Cleared** | Areas devoid of native vegetation | 148.4 | 3.2 (2.16%) | **0.2 (0.14%)** | 22.1 (14.90%) |

* Cumulative Impact calculated using Tanami Road Stage 1 Pre-Construction CAR impact estimates

### 4.1.3 Priority Flora & Species of Interest

Table 6 presents the total counts and population estimates collected from the various surveys completed (Biota 2021a; Biota 2021b; 360 Environmental 2022).

**Table 6. Surveyed Priority Flora and Species of Interest**

| Taxon | Abundance in Survey Area | Abundance in Envelope (% of Surveyed Population) | Estimated Impact (% of Surveyed Population) | Cumulative Impact* (% of Surveyed Population) |
|---|---|---|---|---|
| **Priority 1** | | | | |
| *Goodenia lunata* | 19,210 | 0 | **0** | 437 (2.3%) |
| *Pentalepis trichodesmoides* subsp. *Incana* | 28 | 0 | **0** | 0 |
| **Priority 2** | | | | |
| *Ipomoea racemigera* | 150 | 0 | **0** | 0 |

| Taxon | Abundance in Survey Area | Abundance in Envelope (% of Surveyed Population) | Estimated Impact (% of Surveyed Population) | Cumulative Impact* (% of Surveyed Population) |
|---|---|---|---|---|
| *Kohautia australiensis* | 2 | 0 | **0** | 0 |
| **Priority 3** | | | | |
| *Glycine falcata* | 384 | 0 | **0** | 0 |
| *Goodenia crenata* | 44,186 | 0 | **0** | 60 (0.14%) |
| *Trachymene dusenii* | 5,444 | 0 | **0** | 45 (0.82%) |
| **Species of Interest** | | | | |
| *Aristida* aff. *Jerichoensis* | 25 | 0 | **0** | 0 |
| *Convolvulaceae* sp. (TAN02-49) | 1 | 0 | **0** | 0 |
| *Cullen* sp. (TAN-TW07) | 2,684 | 0 | **0** | 2 (0.08%) |
| *Cyperus* sp. (TAN14-14) | 64 | 0 | **0** | 0 |
| *Euphorbia ferdinandi* var. ? *appendiculata* | 25 | 0 | **0** | 0 |
| *Euphorbia schultzii* var. *comans* | 1 | 0 | **0** | 0 |
| *Euphorbia* sp. (TAN11-06) | 46 | 0 | **0** | 0 |
| *Goodenia* aff. *Crenata* | 635 | 0 | **0** | 0 |
| *Pittosporum* aff. A*ngustifolium* | 5 | 0 | **0** | 0 |
| *Portulaca* ? sp. Finely echinate (D.G.Tulloch 41) | 43 | 0 | **0** | 0 |
| *Sida* sp. (TAN01-17) | 69 | 0 | **0** | 0 |
| *Triodia* sp. (TAN07-02/34) | 15,024 | 0 | **0** | 0 |

* Cumulative Impact calculated using Tanami Road Stage 1 Pre-Construction CAR impact estimates

### 4.1.4 Fauna Habitats

Table 7 presents fauna habitats recorded by Biota (2021a) along with the estimated proportions within the Project Development Envelope and indicative layout (estimated impact).

**Table 7. Surveyed Fauna Habitat Representation**

| Type | Fauna Habitat Description (Biota 2021a) | Extent within Survey Area (ha) | Extent in Envelope (ha) (% of Surveyed Area) | Estimated Impact (ha) (% of Surveyed Area) | Cumulative Impact* (ha) (% of Surveyed Area) |
|---|---|---|---|---|---|
| **Hills** | | | | | |
| **LSH** | Low rolling stony hills - Dominant habitat of the contextual area, occurring on hills with rocky and stony substrates. Open *Eucalyptus brevifolia* and *Corymbia opaca* woodland over hummock grasslands dominated by *Triodia intermedia* and/or *T. wiseana*. | 2942 | 37.1 (1.26%) | **13.9 (0.47%)** | 25.5 (0.87%) |
| **RBS** | Ridgeline breakaways and scree slopes - Ironstone and granite ridgeline formations supporting overhangs, caves and rocky boulders. Scattered *Eucalyptus brevifolia* trees over mixed open hummock grasslands often dominated by *Triodia intermedia*. | 124.6 | 0 (0.0%) | **0 (0%)** | 0 (0%) |
| **Plains** | | | | | |
| **AMS** | *Acacia monticola* tall open scrub sandplain - *Acacia monticola* tall open scrub over scattered tussock grasses and herbs on sandplain. | 0.5 | 0 (0%) | **0 (0%)** | 0 (0%) |
| **CCP** | Cracking clay plains - Heavy clay and stony substrates on basalt, supporting *Eriachne festucacea* and *Dichanthium fecundum* open tussock grasslands. | 164.4 | 0 (0%) | **0 (0%)** | 0 (0%) |
| **LOD** | Low open degraded plain - *Corymbia opaca, Eucalyptus brevifolia* scattered low trees over heavily degraded open hummock grassland and/or tussock grassland. | 867.7 | 1.4 (0.17%) | **0 (0%)** | 2.7 (0.31%) |
| **OGP** | Open shrubland/woodland on tussock grass plains - *Corymbia opaca, Bauhinia cunninghamii, Atalaya hemiglauca* scattered low trees to low open woodland over *Dichrostachys spicata, Carissa lanceolata* scattered tall shrubs over *Triodia epactia* very open | 375.5 | 0 (0%) | **0 (0%)** | 0.9 (0.24%) |
| **OSP** | Open shrubland/woodland on spinifex plains - Open *Eucalyptus brevifolia, Corymbia opaca* low open woodland over *Triodia intermedia* spinifex hummock grasslands, over stony substrate on broad undulating plains; occasionally supporting termite mounds. | 2573.3 | 57.9 (2.25%) | **16.0 (0.62%)** | 20.9 (0.81%) |
| **Riverine** | | | | | |

| Type | Fauna Habitat Description (Biota 2021a) | Extent within Survey Area (ha) | Extent in Envelope (ha) (% of Surveyed Area) | Estimated Impact (ha) (% of Surveyed Area) | Cumulative Impact* (ha) (% of Surveyed Area) |
|---|---|---|---|---|---|
| **MDL** | Major drainage lines and associated tributaries - Open *Eucalyptus camaldulensis* and *Terminalia platyphylla* woodland near ephemeral drainage lines. | 308.6 | 0.4 (0.13%) | **0.1 (0.04%)** | 0.4 (0.14%) |
| **MMD** | Man-made dam surrounded by introduced *Eucalyptus* sp. | 4 | 0 (0%) | **0 (0%)** | 0 (0%) |
| **Cleared** | | 241.4 | 7.5 (3.13%) | **0.3 (0.12%)** | 23.7 (9.82%) |

* Cumulative Impact calculated using Tanami Road Stage 1 Pre-Construction CAR impact estimates

[Redacted]

**Figure 4. Pre-European Vegetation Associations**

[Redacted]

**Figure 5. Soil Landscapes[Redacted]**

**Figure 6A. Vegetation Types and Recorded Conservation Significant Flora**

[Redacted]

**Figure 6B. Vegetation Types and Recorded Conservation Significant Flora**

[Redacted]

**Figure 7A. Vegetation Condition and Declared Pests**

[Redacted]

**Figure 7B. Vegetation Condition and Declared Pests**

[Redacted]

**Figure 8A. Fauna Habitats**

[Redacted]

**Figure 8B. Fauna Habitats**

# 5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

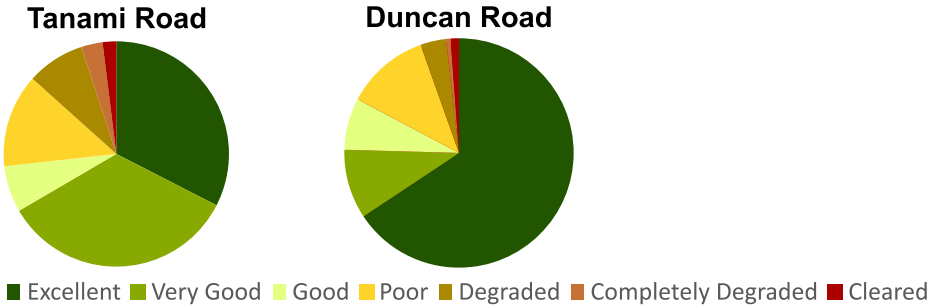
In assessing whether the project's proposed clearing is likely to have a significant impact on the environment, the project was assessed against the ten Clearing Principles (Environmental Protection Act 1986, Schedule 5).

Each principle has been assessed in accordance with DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation' and other relevant CPS Decision Reports prepared by DWER.

The proposed clearing is at variance with one of the 10 Clearing Principles.

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

| **Proposed clearing is not likely to be at variance to this Principle** |
|---|
| Current guidance on the assessment of biological diversity, described in DER 2014, identifies the following metrics as indicators of high diversity:<br>1. Biodiversity hotspots<br>2. Flora and Fauna species diversity<br>3. Priority and other Significant Flora<br>4. Priority Fauna<br>5. Ecological Community Diversity<br>6. Significant Ecological Communities<br>7. Vegetation Condition<br><br>**Biodiversity Hotspots**<br>The proposed clearing is not located in a Biodiversity Hotspot (DER 2014).<br><br>**Species Diversity**<br>A total of 441 species of vascular flora and 114 species of vertebrate fauna were recorded during biological surveys (Biota 2021a; 360 Environmental 2022). Biota (2021a) notes that this represents a large proportion of species recorded from the surrounding IBRA subregions, but also notes that this is likely due to a number of factors:<br>• The linear nature of the survey area, running perpendicular to local landforms (i.e. a range of habitats are intersected);<br>• The length of the corridor crossing a broad geographic range; and<br>• Very high rainfall received prior to the survey resulting in optimal collecting conditions.<br>Biota noted that the Tanami Rd survey area comprises a greater level of diversity in comparison to available surveys from the surrounding areas, with the exception of the Duncan Road Upgrade Survey, located 20km to the east (Biota 2021c). The only other known surveys were:<br>• Elvire to Sandy Creek section of the Great Northern Highway, surveyed by GHD in 2007 (an outdated survey); and<br>• Browns Range Mineral Sands Mine, surveyed by MWH in 2014 (a non-linear survey area focused on a smaller set of landforms [two land systems comprised of six landform units] in the Tanami Desert [MWH 2014]). In comparison, the Tanami Rd Project Development Envelope intersects four land systems comprised of 17 landform units (Payne and Schoknecht 2011). Despite the Project Development Envelope containing almost three times as many landform types, the total vascular taxa was only 12.5% higher than the number recorded by MWH (2014). |




*A breakdown of the vegetation conditions recorded during the two adjacent surveys – There is significantly more vegetation in Excellent condition on the Duncan Road, which partially accounts for the higher diversity in comparison to the Tanami Road.*

Whilst the Tanami Rd survey area consists of a level of biodiversity greater to previously surveyed areas (Elvire to Sandy Creek and Browns Range Mineral Sands Mine) it is notably lower in comparison to the Duncan Road (which closer in proximity to this Tanami Project) where the condition of vegetation was notably better than the Tanami Rd in many areas [Biota 2021c]).

Species diversity within the areas to be cleared is likely to be overall lower than that of surrounding areas because:

- Nearly all areas of clearing are in close proximity to an existing major road and existing gravel pits, which are likely to experience edge effects (as noted in weed data collected by [Biota 2021a])
- There are areas of higher biological diversity in the surrounding areas, notably in the vicinity of the Duncan Road (Biota 2021c).

Furthermore, the current extent of pre-European vegetation associations within the project development envelope is close to 100% at all scales (State IBRA Bioregion, IBRA Subregion, LGA). As such, given the remoteness of the local area (the Tanami Road and attached cattle station infrastructure are the only developments in the local area), it is likely that species diversity is as high if not higher in areas beyond the Project Development Envelope.

**Priority and other Significant Flora**

No known records of Threatened flora taxa were identified from the project study area, and no Threatened flora were recorded during the biological survey by Biota (2021a), the subsequent follow up targeted flora survey by 360 Environmental (2022), or the broader survey area Biota (2021b).

Seven priority flora taxa and 12 species of interest were recorded during biological surveys (Biota 2021a; 2021b; 360 Environmental 2022; Table 8) however the Project Development Envelope have been selected to avoid priority flora and species of interest resulting in the elimination of direct impacts to priority and significant flora.

**Priority Fauna**

No fauna species of conservation significance were recorded during the biological surveys. Several old disused burrows and diggings signs, possibly attributable to Bilby *Macrotis lagotis* (VU), were recorded in a small patch of habitat – "*Acacia monticola* tall open scrub over scattered tussock grasses and herbs on sandplain" outside the Project Development Envelope (AMS habitat type; Table 7). No recent diagnostic evidence (e.g., tracks or scats) attributable to Bilby was found in the area. The majority of the Project Development Envelope is characterised by relatively hard and stony substrates which has low prospectivity for Bilby. Given the lack of recent evidence of occurrence of Bilby, the potential habitat identified being outside of the Project Development Envelope and the low prospectivity of habitat (for Bilby) within the Project Development Envelope, impacts to the species as a result of the project clearing is therefore unlikely.

A likelihood of occurrence assessment of all significant species identified in the desktop assessment was undertaken by Biota (2021a) based on availability of suitable habitat and previous known records in the study area. The assessment indicated that 8 significant species were considered likely to occur and 17 species

may occur within the survey area. Despite these species being specifically targeted during the fauna component of the survey, none were recorded.

However, as the project area is within the mapped distribution of the species, the Project Development Envelope is considered to contain suitable foraging habitat for the following species, but not breeding habitat:

- Short-tailed Mouse
- Ghost Bat
- Yellow-lipped Cave Bat
- Grey Falcon
- Gouldian Finch
- Peregrine Falcon
- Australian Painted Snipe
- Gravel Dragon.

More details of the fauna species that are assessed as likely or may occur within the Project Development Envelope is described in Principle (b). All species listed above have broad distributions across inland or northern Australia, making large areas of habitats in the East Kimberley potential foraging habitat (See Principle B; DoE 2018).

The marine and migratory birds identified in the desktop assessment are mostly non-breeding migrants to Australia and breed in the northern hemisphere. These species have a wide range of occurrence across Australia and the extent of suitable habitat within the project envelope is very limited.

**Ecological Community Diversity**

Of the 13 ecological communities (vegetation units) recorded during biological surveys, the proposed clearing will affect 5 communities out of a maximum of 7 within the Project Development Envelope (Table 4). The Tanami Rd is a linear infrastructure corridor running approximately north to south, perpendicular to the landforms in the area and therefore intersects numerous vegetation units. As stated above the impacts to vegetation units will occur generally adjacent to existing pits or the existing Tanami Road.

In addition, all of the vegetation units (included in the proposed clearing area) were well represented in the survey area. The vegetation unit with the highest level of impact is P4, with a 2.6% of total surveyed area potentially impacted.

To ensure that the clearing of P4 will not compromise the availability of this community in the regional area, an assessment against comparable soil landscape units was completed. P4 corresponds well to the Geebee Land System, specifically Unit 1 (upper slopes and crests), described as 'Wonorah, shallow phase, - red-brown clay loam with much ferruginous gravel, vegetated with snappy gum (*E. brevifolia*) or bloodwoods, over spinifex (Schocknecht and Payne 2011; Appendix F). Rangelands surveys estimates that there is approximately 264,200 ha of Geebee Land System in the Shire of Halls Creek, of which 80% is comprised of Unit 1 (Shocknecht and Payne 2011; Appendix F). Therefore, the estimated extent of vegetation that is comparable to P4, in the Halls Creek region is 211,360 ha. Considering this extent, the clearing of P4 amounts to under 0.002% of total area. Therefore, while being the unit with the highest level of impact from the Project, the level of impact is very low in a Regional context.

All other communities have a direct impact level of under 2%.

**Significant Ecological Communities**

No Environmentally Sensitive Areas (ESAs) and Threatened Ecological Communities (TECs) were identified in the 40km radius desktop database searches nor recorded during the field survey by Biota (2021a).

The desktop assessment identified four Priority Ecological Communities (PECs) from the project Study Area:

- **P1 - Vegetation Association 872** as defined by John Beard's vegetation mapping for the Kimberley (Beard 1979): Described as **"**Hummock grasslands, sparse tree steppe; snappy gum over hard spinifex *Triodia wiseana* and *T. intermedia* on basalt and dolerite" (DBCA 2020).
- **P3 - Vegetation Association 850** as defined by John Beard's vegetation mapping for the Kimberley (Beard 1979): Described as "Grasslands, tall bunch grass savanna, mitchell & blue grass" (DBCA, 2021)
- **P3 - Vegetation Association 834** as defined by John Beard's vegetation mapping for the Kimberley (Beard 1979): Described as "Grasslands, tall bunch grass savanna, mitchell & blue grass" (DBCA, 2021)
- **P3 - Gordon land system:** Described as "Low hilly to undulating limestone country on inland and coastal erosional plains" (DBCA 2021).

None of the vegetation communities recorded during the Biological Survey carried out by Biota, (2021a) represents TECs or PECs. One Tussock Grassland vegetation units recorded during the field survey has been described to share some similarities with P3 PECs - Vegetation Associations 850 and 834:

- **P10 -** *Eriachne festucacea, Dichanthium fecundum* tussock grassland

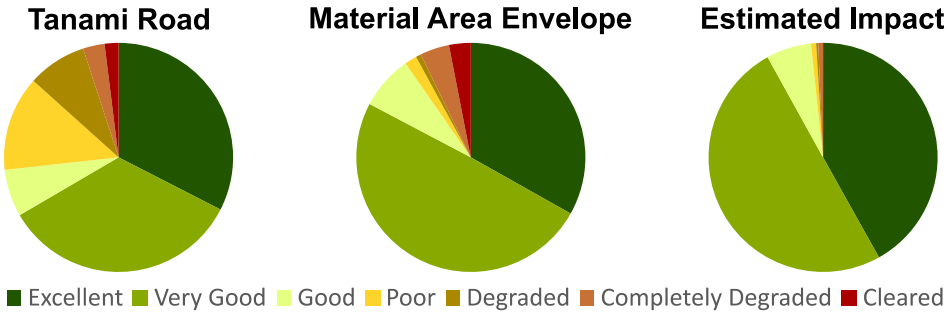
The vegetation unit P10 comprises tussock grassland dominated by *Eriachne festucacea* (Plains Wandarrie Grass) and *Dichanthium fecundum* (Bluegrass) and was considered to be of local significance. No vegetation comprised of P10 is proposed to be cleared as none exists within the Project Development Envelope (Table 4).

**Fauna Habitat Diversity**

Biota (2021a) identified nine fauna habitats during the biological survey, of which only three will require any clearing (Table 9). The amount of clearing required is highest for the LSH (low rolling stony hills) habitat, at a total of 11.6 ha, or 0.39% of the extent mapped in the local area. All of the fauna habitats to be impacted are well represented outside of the Project Development Envelope and proposed clearing impacts are <1% for each of the clearing habitats. The proposed clearing is therefore considered unlikely to have a significant impact on local fauna habitat diversity.

**Vegetation Condition**

The charts below show the proportions of vegetation conditions that will be impacted, in comparison with that of the local area (survey area) as recorded by Biota (2021a).




**intermediate vegetation conditions assigned to the better condition to reduce number of categories for comparison purposes.*

Evidently, the estimated impact area contains a proportionately higher amount of vegetation in 'Good' or better condition. This is caused by a number of factors:

1. The only existing cleared areas in this section of road are for the existing Tanami Road, fencelines, access tracks and existing gravel pits. Materials cannot be extracted from these areas without the need for replacement infrastructure clearing (existing shire pits are likely to be exhausted or not contain enough material for the project);
2. This section of the Tanami Road has minimal pastoral impacts, reducing the availability of pits in areas with poorer vegetation condition.

3. The landscapes that produce good road building materials (e.g. rocks and gravel) are often hilly and stony and therefore relatively unfavourable to the primary source of land degradation in the region, grazing.

Despite a proportionately high level of 'Good' or better condition vegetation, the total amount of clearing required of Good to Excellent condition (29.8 ha) is still a very small subset of the surveyed area in comparable condition (5,535.5 ha). 29.8 ha of clearing amounts to a reduction in 0.5% of comparable quality vegetation (Table 7).

**Summary**

The proposed clearing is considered not likely to be at variance with this principle for the following reasons:

- Conservation Significant Flora: will not be impacted as a result of project activities due to the absence from the Project Development Envelope
- Conservation Significant Fauna: No conservation significant fauna were recorded from the broader survey area and all are not restricted to the Project Development Envelope.
- Priority Ecological Communities: No TECs or PECs will be impacted as a result of project activities. Less than 0.1 ha of riparian vegetation (D5) is expected to be cleared only for a track (i.e. no pit development).
- Vegetation and Fauna Habitat Communities: a maximum of 2.6% and 0.62% of surveyed extents may be cleared for a single Vegetation community (P4) and fauna habitat (OSP) respectively. Regional mapping indicates that these vegetation types and habitats are likely to extend significantly beyond the survey area.
- Vegetation Condition: Although a proportionately higher amount of vegetation in 'Good' or better condition requires clearing, the total clearing required is only 0.5% of available vegetation with comparable quality.

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

**Methodology**

ALA 2022
360 Environmental, (2022)
Biota, (2021a)
Biota, (2021b)
Biota (2021c)
DBCA, (2021)
DBCA shapefiles
DER 2014
EPBC Act Protected Matters Search Report 09/08/2022
Florabase WA Government of WA (2019)
Main Roads GIS Shapefiles
MWH 2014
Schoknecht and Payne 2011

## (b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

**Proposed clearing is not likely to be at variance to this Principle**

Only 3 fauna habitat types out of 9 recorded by Biota (2021a) will be impacted by the proposed clearing; LSH, OSP and MDL (Table 9).

As evident from Table 9, the mapped fauna habitats are widespread throughout the larger survey area and the proposed clearing represents only a small fraction of current extent of each of these habitats. The

maximum clearing required is to the LSH habitat type (Low rolling stony hills): 13.9 ha, or 0.47% of the mapped extent in the survey area. The habitat type with the highest percentage impact was OSP (Open shrubland/woodland on spinifex plains), with an impact of 0.62% of surveyed extents from Biota 2021a.

No fauna species of conservation significance were recorded during the field survey. A disused burrow system possibly attributable to the Bilby, Macrotis lagotis (VU) was recorded from the broader survey area in a fauna habitat AMS (*Acacia monticola* tall open scrub over scattered tussock grasses and herbs on sandplain) which does not occur within the Project Development Envelope. This habitat type consisted of deep red sand suitable for burrowing with stands of *Acacia monticola* which is known to host larval prey, a habitat type known to be associated with the presence of bilbies. The extent of this habitat was small, confined to the single 0.5 ha patch in the survey area. Within this habitat, a cluster of burrowing and digging signs were recorded but all were old and clearly disused. No other evidence (tracks or scats) of Bilbies were found during the survey. This habitat does not occur within the Project Development Envelope and will not be impacted by the project activities. The majority of the survey area is characterised by relatively hard and stony substrates which has low value for Bilbies.

A likelihood of occurrence assessment of all significant species identified in the desktop assessment was undertaken by Biota (2021a) based on availability of suitable habitat and previous known records in the study area. These species were also surveyed for in the field. The assessment indicated that 8 significant species were considered likely to occur and 17 species may occur within the survey area:

**Likely to occur**

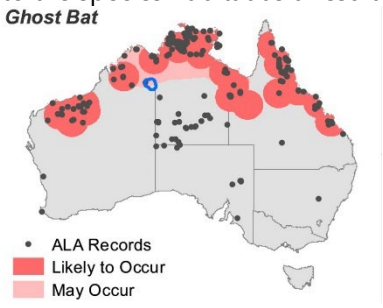
| | |
|---|---|
| *Macroderma gigas* | Ghost Bat (VU) |
| *Falco hypoleucos* | Grey Falcon (VU) |
| *Cryptagama aurita* | Gravel Dragon (P1) |
| *Vespadelus douglasorum* | Yellow-lipped Cave Bat (P2) |
| *Falco peregrinus* | Peregrine Falcon (OS) |
| *Apus pacificus* | Fork-tailed Swift (MI) |
| *Charadrius veredus* | Oriental Plover (MI) |
| *Glareola maldivarum* | Oriental Pratincole (MI) |

**May occur**

| | |
|---|---|
| *Macrotis lagotis* | Bilby (VU) |
| *Calidris ferruginea* | Curlew Sandpiper (MI) (CR) |
| *Rostratula australis* | Australian Painted Snipe (EN) |
| *Erythrura gouldiae* | Gouldian Finch (P4) (EN) |
| *Crocodylus johnstoni* | Freshwater Crocodile (OS) |
| *Leggadina lakedownensis* | Short-tailed Mouse (P4) |
| *Gelochelidon nilotica* | Gull-billed Tern (MI) |
| *Motacilla tschutschensis* | Eastern Yellow Wagtail (MI) |
| *Numenius minutus* | Little Curlew (MI) |
| *Limosa limosa* | Black-tailed Godwit (MI) |
| *Calidris acuminata* | Sharp-tailed Sandpiper (MI) |
| *Calidris ruficollis* | Red-necked Stint (MI) |
| *Calidris melanotos* | Pectoral Sandpiper (MI) |
| *Actitis hypoleucos* | Common Sandpiper (MI) |
| *Tringa stagnatilis* | Marsh Sandpiper (MI) |
| *Tringa glareola* | Wood Sandpiper (MI) |
| *Tringa nebularia* | Common Greenshank (MI) |

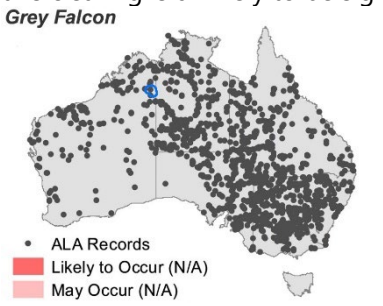
**Ghost Bat (VU)** There are two known records of the species within project 40km radius recorded in 1964. Ghost Bats are known to occur in a broad range of landforms, with distribution influenced by the availability of suitable caves for roost sites. They forage over large areas, with foraging ranges of over 60 ha. However, despite targeted searches, no Ghost Bats nor suitable roost caves for the species were detected during the biological survey despite targeted searches being undertaken. It is considered likely to forage within the

Project Development Envelope particularly over RBS: Ridgeline Breakaways and Scree Slopes and Major Drainage Lines and Associated Tributaries. This habitat type is not proposed to be cleared. As such impact to the species habitat as a result of this clearing is unlikely.




(DoEE 2018)

**Grey Falcon (VU)** There is one record of the species within 9km distance from the project location collected in 1979. Grey Falcon nests usually in the tallest trees along watercourses, particularly River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*) (DAWE, 2021b). No Grey Falcon was detected during the biological survey. They are likely to utilise all the fauna habitats within the Project Development Envelope for foraging particularly Major Drainage Lines and Associated Tributaries. However, only a small portion of this habitat type (0.1 ha out of 308.6 ha in the survey area) is proposed to be cleared while a major portion of suitable habitat types are outside the project clearing. As such impact to the species habitat as a result of this clearing is unlikely to be significant.




(DoEE 2018)

**Gravel Dragon (P1)** There are three historical records of the species approximately 16km from the Project Development Envelope collected in 1979. The species is known to occur in the north-eastern interior of WA and in the adjacent Northern Territory. It is superbly adapted to mimic a gibber stone and has so far only been recorded from stony 'gibber' soils with spinifex. This species was not recorded during the biological survey, however there are areas of suitable spinifex habitat types – OGP: Open shrubland/woodland on spinifex plains, which is not present in the Project Development Envelope. Therefore, impacts as a result of the proposed clearing is unlikely.

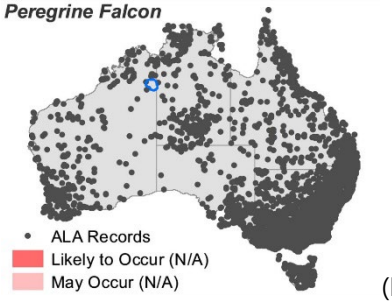

(DoEE 2018)

**Yellow-lipped Cave Bat (P2)** There are two historical records of the species collected in 1965 more than 26 km from the project location. They are restricted to the Kimberley region but are widespread within this range (Atlas of Living Australia, 2021) mostly associated with areas of rainfall greater than 800 mm per annum (Australian Museum, 2021). They utilise caves in both sandstone and limestone, typically near water. Typical habitats from which the species has been recorded include melaleuca and pandanus-lined waterways and adjacent open woodlands. This species was not detected during the analysis of the ultrasonic sound recorders deployed during the survey (Biota 2021a). No core roosting habitats (caves) occur within the survey area, however there is favourable foraging habitat in the form of RBS: Ridgeline Breakaways and Scree

Slopes. None of this habitat type is present in the Project Development Envelope, therefore impacts as a result of the proposed clearing is unlikely.


(DoEE 2018)

**Peregrine Falcon (OS)** – Two known records within the project 40km radius. This species inhabits a wide range of habitats including forest, woodlands, wetlands and open country and nest in cliff faces, tree hollows and along rivers. They were not recorded during the survey and suitable cliffs for breeding do not occur but most habitats within the Project Development Envelope are likely to be used for foraging. Given the small scale clearing and available suitable habitat for the species is outside the Project Development Envelope, any impacts due to proposed clearing is unlikely.




(DoEE 2018)

The marine and migratory birds that are assessed as likely or may occur in the area are non-breeding migrants to Australia and breed in the northern hemisphere. Shorebirds forage primarily on muddy margins and shallow waters of wetlands and other inundated habitats, with some exhibiting preferences for saline or freshwater habitats. They may use freshwater habitats regularly and may use the margins of wetlands and other inundated habitats within the survey area on occasion. However, these species have a wide range of occurrence across Australia and the extent of suitable habitat within the Project Development Envelope is very limited (DAWE 2022).

Two additional species identified in recent database searches, the Northern Brush-tail Possum and Great Desert Skink were both considered as unlikely to occur, detailed below.

The fauna species Northern brushtail possum (Kimberley) *Trichosurus vulpecula arnhemensis* (VU) has 2 known records within 15km from project development envelope. However, the species were not recorded in the field survey. The species is known to occur or shelter mainly in tall eucalypt open forests with large hollow-bearing trees, particularly where the understorey includes some shrubs that bear fleshy fruits (DAWE, 2021b). Though the project is within its distribution range, the project development envelope does not contain core habitat suitable for the species. Both records for this species are considered to be unreliable. One record is from 1931 from a skin held by Aboriginal People with general location notes and the other was identified through skin and skull without a collection date (collected by John Tunney suggesting this record is from 1901-1903; [Storr 1965]). As such this species is considered unlikely to occur.

Great Desert Skink *Liopholis kintorei* (VU)- Generally occurs on red sandplains and sand ridges (DAWE 2022). In the northern parts of the Tanami desert important habitat is palaeodrainage country vegetated with Melaleuca glomerata (white tea tree) and *Triodia pungens* (gummy spinifex). The principle food source for the great desert skink is the termite *Drepanotermes perniger* which has a naturally patchy distribution and burrow systems that appear to be constructed in close proximity to termite mounds (DAWE, 2021b). The project envelope does not contain suitable habitat for the species. Key threats to the species are considered to be predation by feral cats, foxes and potentially dingoes, as well as habitat degradation from feral camels

and rabbits (DAWE, 2021b). The Threatened Species Scientific Committee (TSSC) does not consider habitat loss from land clearing a key threat, in part from the large size and remoteness of the species' distribution.

**Summary**

The proposed clearing does not comprise the whole or a part of or is necessary for the maintenance of a significant habitat for indigenous fauna because:

- The amount of clearing proposed is small in relation to habitat available within the local area, with all habitats to be cleared well represented in adjacent areas. A maximum of 0.62% habitat loss (compared to survey area) is the largest impact to habitat type;
- No conservation significant species were detected during biological surveys, despite being targeted during optimal conditions (Biota 2021a)
- All species that were determined as likely to occur based on the likelihood of occurrence assessments are not restricted to the Project area.
- None of the habitats to be cleared were isolated and/or represented core habitat for conservation significant species.

Therefore, given the above, the project is not likely to be at variance with this Principle.

**Methodology**

Atlas of Living Australia, (2021; 2022)
Australian Museum, (2021)
Biota, (2021a)
DAWE, (2021b)
DBCA shapefiles
DoEE (2018)
EPBC Act Protected Matters Search Report 09/08/2022
Main Roads GIS Shapefiles
Species Profile and Threats Database (Accessed 19/08/2021)

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

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

The Desktop Database Searches (Main Roads ArcGIS files and PMST report) identified no known records of rare flora listed under the Biodiversity Conservation Act 2016 from the project 40km radius desktop search.

The Biological Survey undertaken by Biota, (2021a) and the subsequent Targeted Flora Survey by Biota (2021b) and 360 Environmental, (2022) did not record any rare flora taxa from within the broader survey area.

As such, the project clearing is not at variance to this Principle.

**Methodology**

Biota, (2021a)
Biota, (2021b)
360 Environmental, (2022)
DBCA shapefiles
EPBC Act Protected Matters Search Report 09/08/2022

## (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.

| **Proposed clearing is not at variance to this Principle** |
|---|
| The Desktop database searches (PMST report and DBCA Shapefiles) show no known records of State listed Threatened Ecological Communities (TECs) from within the project 40 km radius desktop search.<br><br>Vegetation communities recorded during the Biological Survey carried out by Biota, 2021 are not representative of TECs.<br><br>As such, the proposed clearing is not at variance to this Principle. |
| **Methodology**<br>Biota, (2021a)<br>DBCA shapefiles<br>EPBC Act Protected Matters Search Report 09/08/2022 |

## (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.

| **Proposed clearing is not at variance to this Principle** |
|---|
| As evident from Table 3 and 4, the current extent of pre-European remnant vegetation is more than 30% "National Threshold Level" at all scales (State IBRA Bioregion, IBRA Subregion, LGA). All of the vegetation associations have 100% or close to 100% of their pre-European extent remaining intact. As such, the project is not located in an area with a regionally significant remnant vegetation. Given that the vegetation associations are widespread throughout the area and are well-represented locally and regionally, impacts due to project clearing is not likely to be significant.<br><br>Based on the above, the project is not at variance to this Principle. |
| **Methodology**<br>EPA (2016)<br>Government of Western Australia (2019)<br>ARCGIS Shapefiles - Pre-European Vegetation |

## (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

| **Proposed clearing is at variance to this Principle** |
|---|
| The Project Development Envelope intersects both the Fitzroy and Ord River Tributaries.<br><br>Biota (2021a) mapped one vegetation unit, Eucalyptus limitaris, Terminalia volucris low open woodland (D5) from minor drainage lines that fall within the proposed Project Development Envelope. A total of 0.1 ha of the D5 vegetation unit is proposed to be cleared under this application for an access track. This 0.1ha of vegetation relates to a minor non-perennial watercourse.<br><br>All major watercourses or wetlands will be avoided and not impacted by any native vegetation clearing.<br><br>Due to the impact of 0.1ha of the D5 vegetation unit, the project is at variance to this Principle. |
| **Methodology** |

Biota, (2021a)
Main Roads Statewide Clearing Permit CPS 8181/15

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

**Proposed clearing is not likely to be at variance to this Principle**

The project is in an area prone to severe rainfall events, which could contribute to land degradation via flooding and heavy runoff. The estimated 30 ha of clearing will be distributed across 17 discrete sites, limiting the size of cleared areas and reducing the likelihood of land degradation, noting that several of the material pit locations are based around areas of existing pits.

There are several minor non-perennial watercourses along the length of the project development envelope which based on the rainfall patterns of the Kimberley region, may lead to short term impacts to surface water quality through sedimentation and minor risks of land degradation through water erosion. Management of these minor short-term risks will be addressed with:

- the clearing of native vegetation restricted to occurring in dry conditions when non perennial minor watercourses are dry
- the material pits constructed to be free draining, and
- through the implementation of the Main Roads Standard environment management plan which include:
    - construction activities undertaken in summer to reduce the potential for soil erosion and drainage line siltation;
    - exposed soil working surfaces will be minimised;
    - material such as gravel, crushed rock and excavated material will be stockpiled away from drainage paths and covered to prevent erosion;
    - processes and procedures will be developed to prevent erosion and sedimentation in the works area and methods of soil stabilisation and sediment control will be implemented where required

Furthermore, works occur within a region where close to 100% of pre-European levels of native vegetation remain and within an area mapped as cq(p4) - Extremely Low Probability of Occurrence of ASS.

As clearing works will be completed in a dry period and no excavation below the groundwater table will occur, impacts to groundwater and interruption of nature surface water flows is not expected. As such the risk of the project causing appreciable land degradation is minimal.

The majority of clearing is expected to take place within the Dockrell and Geebee Land Systems (Figure 5; Schoknecht and Payne 2011). The Geebee system is considered to have low or very low susceptibility to erosion, likely due to the gravelly soils. The Dockrell System is also considered to be 'stable' with very low susceptibility to erosion, as it is predominantly rocky ground with skeletal soils. A small portion of the Project Development Envelope falls within the O'Donnell System, which is moderately susceptible to erosion. It should be noted that the portion of the envelope in the O'Donnell System is for the purpose of a construction water Dam and access track, which are small areas of land uses that are unlikely to cause appreciable land degradation (Appendix 3).

As such, the project is not likely to be at variance to this Principle.

**Methodology**
CSIRO, (2014)
Main Roads ArcGIS Shapefiles

## (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.

**Proposed clearing is not at variance to this Principle**

The Ord River Regeneration Reserve, an area of DBCA-managed conservation estate established to revegetate a degraded portion of the Ord River catchment and reduce downstream siltation, is the closest nature reserve or conservation area, located more than 11km from the project development envelope. The Regeneration Reserve will not be impacted by the proposed activities. Given the distance to the nearest conservation area, the removal of 30 ha of clearing distributed across 17 discrete sites, in a region where close to 100% of pre-European levels of native vegetation remains, the clearing will not impact any buffers, ecological linkages or outliers to a conservation area, and subsequently not impact the environmental values of nearby conservation areas.

Therefore, the project is not at variance to this Principle.

**Methodology**

DBCA shapefiles - Legislated Lands and Waters (DBCA 2022)

## (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.

**Proposed clearing is not likely to be at variance to this Principle**

The Project Development Envelope intersects the Fitzroy River and Tributaries, Ord River and Tributaries/ Ord Irrigation District Surface water areas and Groundwater Area and Canning-Kimberley Groundwater Area both of which are Proclaimed Areas under RIWI Act. The amount of clearing required is a very small proportion of the total catchment size for the Ord and Fitzroy and the Project is therefore unlikely to have an impact to surface water quality. The Halls Creek Water Reserve, a Public Drinking water Source area is located 13 km north east of the project and is unlikely to be impacted.

Clearing of native vegetation will not intersect any large surface water bodies (e.g. Fitzroy River and Tributaries, Ord River and Tributaries), with only minor non-perennial watercourses located along the length of the project development envelope and within proximity to the clearing areas. As detailed under Principal G, the impacts to these non-perennial surface water courses will be minimal and managed through clearing being restricted to dry conditions, material pits constructed to be free draining and erosion and surface water controls within the Main Roads Standard environment management plan (see Principal G).

Furthermore, the Main Roads Standard environment management plan also contains appropriate provisions to manage possible contamination risk as spill incidents due to fuel leakage during on-ground works. Operational controls will include: No storage of hazardous materials, fuels or oils within 100m of any watercourse or wetland; All hazardous materials fuels or oils storage areas will be bunded; Spill kits will be in place at all storage areas and Induction program to make all personnel aware of the appropriate response to spills.

Furthermore, the clearing of 30 ha of native vegetation is spread across 17 small locations within the wider 104.4 ha Project Development Envelope further reducing the likelihood of the deterioration in the quality of surface water.

Clearing of native vegetation for the material areas will not involve excavation below the water table

Based on the above, the project is unlikely to be at variance to this Principle.

**Methodology**

| |
|---|
| ARCGIS shapefiles- Watercourse<br>DWER- Shapefiles |

## (j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

| **Proposed clearing is not likely to be at variance to this Principle** |
|---|
| The subregional climate is described as dry winter and hot semi-arid summer with an average annual rainfall of 438 mm (Ruby Plains (Site ID- 2026) (BoM, 2022)). Extreme weather events are a significant component of Kimberley climate. Tropical cyclones and tropical storms can bring heavy and sustained rainfall, particularly in the months leading up to and during the wet season. It is common for a large proportion of the region's rainfall to be recorded in one single event, leading to extensive flooding of rivers, creeks and roadways.<br><br>The climatic conditions are the main factor influencing flooding in the region. The proposed clearing of 30 ha is distributed amongst 17isolated sites (pit areas) and will be undertaken during dry conditions. It is expected that water may collect within pit areas over the wet season, but will be diverted to natural draiange channels to maintain local hydrological flow.<br><br>No natural drainage lines are directly impacted by the clearing.<br><br>Given the above, the proposed clearing is not likely to be at variance to this Principle. |
| **Methodology**<br>BoM, 2022<br>Main Roads ArcGIS Shapefiles |

# 6 ADDITIONAL ACTIONS REQUIRED

Table 8 summarises what further pre-clearing impact assessment and vegetation management is required in accordance with CPS 818.

**Table 8. Summary of Additional Management Actions Required by CPS 818**

| Impact of Clearing | Yes/No or NA | *Further Action Required* |
|---|---|---|
| **1.** The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.<br><br>Where the clearing is at variance or may be at variance to Clearing Principle (f) and no other Clearing Principle, and the area of the proposed clearing is less than 0.5 hectares in size and the Clearing Principle (f) impacts only relate to:<br>(i) a minor non-perennial watercourse(s);<br>(ii) a wetland(s) classed as a multiple use management category wetland(s); and/or<br>(iii) a wetland that is not a defined wetland;<br>the preparation of an Assessment Report, as required by condition 6(e), is not required. | **Yes** | Clearing of water course/riparian vegetation is less than 0.5ha - No further action required |
| **2.** Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding. | **No** | No further action required |
| **3.** The project involves clearing for temporary works (as defined by CPS 818). | **No** | No further action required. |
| **4 a.** Project is within Region that:<br>- Has rainfall greater than 400mm and<br>- Is South of the 26th parallel and<br>- Works are in 'Other than dry conditions' and<br>- Works have potential for **uninfested** areas to be impacted | **No** | No further action required. |

| Impact of Clearing | Yes/No or NA | *Further Action Required* |
|---|---|---|
| **4b.** Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions? | **No** | No further action required. |
| **5.** Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback | **No** | No further action required. |
| **6.** The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition and weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition | **No** | No further action required.<br>The proposal includes implementation of a Main Roads standard environment management plan which will have appropriate provisions to prevent the spread of weeds to adjacent areas of native vegetation. |

# 7 STAKEHOLDER CONSULTATION

Main Roads have consulted interested parties on the future upgrade works, and the proposed layout takes into consideration the recommendations from these consultations:

1. Koongie Elvire Traditional Owners – Consulted through a number of meetings and an Aboriginal Cultural Heritage Survey (Cultural Research Management 2022a).
2. Jaru Traditional Owners – Consulted through a number of meetings and an Aboriginal Cultural Heritage Survey (Cultural Research Management 2022b).
3. Halls Creek Community – Consulted through three community consultation information sessions where the proposed alignment was presented.
4. Shire of Halls Creek – a key partner for the road upgrade and have been involved throughout the design process.

No concerns relating to clearing of native vegetation were raised by any of the above stakeholders, however Traditional Owners have requested clearing impacts are minimised where possible, and the retention where possible of large termite mounds and trees.

# 8 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum. Vegetation will be managed in accordance with the Main Roads standard environment management plan.

# 9 REFERENCES

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# 10 APPENDICES

| Appendix | Title |
|---|---|
| **Appendix 1** | DBCA Database Searches |
| **Appendix 2** | EPBC Act Protected Matters Search Report |

## Appendix 1: DBCA Database Searches

[Redacted]

## Appendix 2: EPBC Act Protected Matters Search Report

Australian Government
Department of Agriculture, Water and the Environment

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 09-Aug-2022

# Summary

## Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

| | |
|---|---|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance (Ramsar | 2 |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | None |
| Listed Threatened Species: | 12 |
| Listed Migratory Species: | 11 |

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|---|---|
| Commonwealth Lands: | 4 |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 17 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |
| Habitat Critical to the Survival of Marine Turtles: | None |

## Extra Information

This part of the report provides information that may also be relevant to the area you have

| | |
|---|---|
| State and Territory Reserves: | 1 |
| Regional Forest Agreements: | None |
| Nationally Important Wetlands: | None |
| EPBC Act Referrals: | None |
| Key Ecological Features (Marine): | None |
| Biologically Important Areas: | None |
| Bioregional Assessments: | None |
| Geological and Bioregional Assessments: | None |

# Details

## Matters of National Environmental Significance

| Wetlands of International Importance (Ramsar Wetlands) | [ Resource Information ] |
|---|---|
| Ramsar Site Name | Proximity |
| Lakes argyle and kununurra | 150 - 200km upstream from Ramsar site |
| Ord river floodplain | 200 - 300km upstream from Ramsar site |

| Listed Threatened Species | [ Resource Information ] | |
|---|---|---|
| Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID. | | |
| Scientific Name | Threatened Category | Presence Text |
| BIRD | | |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Erythrotriorchis radiatus<br>Red Goshawk [942] | Vulnerable | Species or species habitat may occur within area |
| Erythrura gouldiae<br>Gouldian Finch [413] | Endangered | Species or species habitat known to occur within area |
| Falco hypoleucos<br>Grey Falcon [929] | Vulnerable | Species or species habitat likely to occur within area |
| Pezoporus occidentalis<br>Night Parrot [59350] | Endangered | Species or species habitat likely to occur within area |
| Polytelis alexandrae<br>Princess Parrot, Alexandra's Parrot [758] | Vulnerable | Species or species habitat may occur within area |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Rostratula australis | | |
| Australian Painted Snipe [77037] | Endangered | Species or species habitat may occur within area |
| MAMMAL | | |
| Macroderma gigas | | |
| Ghost Bat [174] | Vulnerable | Species or species habitat likely to occur within area |
| Macrotis lagotis | | |
| Greater Bilby [282] | Vulnerable | Species or species habitat may occur within area |
| Trichosurus vulpecula arnhemensis | | |
| Northern Brushtail Possum [83091] | Vulnerable | Species or species habitat may occur within area |
| REPTILE | | |
| Liopholis kintorei | | |
| Great Desert Skink, Tjakura, Warrarna, Mulyamiji [83160] | Vulnerable | Species or species habitat may occur within area |
| SHARK | | |
| Pristis pristis | | |
| Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756] | Vulnerable | Species or species habitat may occur within area |

| Listed Migratory Species | | [ Resource Information ] |
|---|---|---|
| Scientific Name | Threatened Category | Presence Text |
| Migratory Marine Birds | | |
| Apus pacificus | | |
| Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Migratory Marine Species | | |
| Pristis pristis | | |
| Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756] | Vulnerable | Species or species habitat may occur within area |
| Migratory Terrestrial Species | | |
| Hirundo rustica | | |
| Barn Swallow [662] | | Species or species habitat may occur within area |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Motacilla cinerea | | |
| Grey Wagtail [642] | | Species or species habitat may occur within area |
| Motacilla flava | | |
| Yellow Wagtail [644] | | Species or species habitat may occur within area |
| **Migratory Wetlands Species** | | |
| Actitis hypoleucos | | |
| Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Calidris acuminata | | |
| Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area |
| Calidris ferruginea | | |
| Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos | | |
| Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| Charadrius veredus | | |
| Oriental Plover, Oriental Dotterel [882] | | Species or species habitat may occur within area |
| Glareola maldivarum | | |
| Oriental Pratincole [840] | | Species or species habitat may occur within area |

## Other Matters Protected by the EPBC Act

**Commonwealth Lands** [ Resource Information ]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

| Commonwealth Land Name | State |
|---|---|
| **Unknown** | |
| Commonwealth Land - [51841] | WA |
| Commonwealth Land - [51967] | WA |

| Commonwealth Land Name | State |
|---|---|
| Commonwealth Land - [51843] | WA |
| Commonwealth Land - [51842] | WA |

**Listed Marine Species** [ Resource Information ]

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| **Bird** | | |
| Actitis hypoleucos<br>Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Anseranas semipalmata<br>Magpie Goose [978] | | Species or species habitat may occur within area overfly marine area |
| Apus pacificus<br>Fork-tailed Swift [678] | | Species or species habitat likely to occur within area overfly marine area |
| Bubulcus ibis as Ardea ibis<br>Cattle Egret [66521] | | Species or species habitat may occur within area overfly marine area |
| Calidris acuminata<br>Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area |
| Calidris ferruginea<br>Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area overfly marine area |
| Calidris melanotos<br>Pectoral Sandpiper [858] | | Species or species habitat may occur within area overfly marine area |
| Chalcites osculans as Chrysococcyx osculans<br>Black-eared Cuckoo [83425] | | Species or species habitat likely to occur within area overfly marine area |

| Scientific Name | Threatened Category | Presence Text |
|---|---|---|
| Charadrius veredus | | |
| Oriental Plover, Oriental Dotterel [882] | | Species or species habitat may occur within area overfly marine area |
| Glareola maldivarum | | |
| Oriental Pratincole [840] | | Species or species habitat may occur within area overfly marine area |
| Haliaeetus leucogaster | | |
| White-bellied Sea-Eagle [943] | | Species or species habitat may occur within area |
| Hirundo rustica | | |
| Barn Swallow [662] | | Species or species habitat may occur within area overfly marine area |
| Merops ornatus | | |
| Rainbow Bee-eater [670] | | Species or species habitat may occur within area overfly marine area |
| Motacilla cinerea | | |
| Grey Wagtail [642] | | Species or species habitat may occur within area overfly marine area |
| Motacilla flava | | |
| Yellow Wagtail [644] | | Species or species habitat may occur within area overfly marine area |
| Rostratula australis as Rostratula benghalensis (sensu lato) | | |
| Australian Painted Snipe [77037] | Endangered | Species or species habitat may occur within area overfly marine area |
| Reptile | | |
| Crocodylus johnstoni | | |
| Freshwater Crocodile, Johnston's Crocodile, Johnstone's Crocodile [1773] | | Species or species habitat may occur within area |

## Extra Information

| State and Territory Reserves | | [ Resource Information ] |
|---|---|---|
| Protected Area Name | Reserve Type | State |
| Ord River Regeneration Reserve | 5(1)(h) Reserve | WA |

# Caveat

## 1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

## 2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

## 3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

## 4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.


Department of Agriculture Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111

## Appendix 3: Excerpt from Schoknecht and Payne 2011

[Redacted]