Preliminary Clearing Impact Assessment

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Munjina Roy Hill Road Rail Bridge

February 2021

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Contents

Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	Environment Officer	Draft v1	15/09/2020
Reviewer:	Senior Environment Officer	Rev 0	30/09/2020
Author:	Environment Officer	Rev v1	8/02/2021
Reviewer:	Senior Environment Officer	Rev v1	15/02/2021

1 SUMMARY

1.1 Project Information

Project Name: Munjina Roy Hill Road Rail Bridge

Project Location(s): Local road approx. 55km from GNH/Auski Roadhouse intersection within the Shire of Ashburton.

Project Purpose / Components: The purpose of this project is to eliminate the current level crossing on Munjina Roy Hill Road at the Yandi rail line. Currently the conflict between road and rail occurs due to a large volume of iron ore cartage from Mineral Resources Limited (MRL) Iron Valley Mine and BHP with the rail from Yandicoogina mine in the East Pilbara Region of Western Australia. MRL and Main Roads have jointly agreed to develop and design roadworks, bridgeworks and associated structures for vehicles. The parties intent that Main Roads and BHP will enter into a contract in relation to procurement and delivery of the Project.

The scope of the project will involve a single span teeroff bridge over the rail along with realigning an approximately 1.8km section of the existing road. To avoid the current conflict between road and rail traffic, the road will be realigned to facilitate high embankments in the order of 10m approaching the bridge. It is anticipated embankment fill material is sourced from land adjoining the realignment.

Area Proposed to be Cleared: up to 100 ha within a project area of 319.7 ha.

Temporary Clearing Required: none

A Preliminary Clearing Impact Assessment (PCIA) of the project clearing activities was undertaken. The PCIA outlined the key activities associated with the project, the existing environment and an assessment of native vegetation clearing. This assessment provided an evaluation of the vegetation clearing impacts associated with the project using the ten Clearing Principles and strategies used to manage vegetation clearing. Key clearing impact assessment points are listed below.

- The project clearing is 'not likely to be at' variance with the 10 Clearing Principles
- The main native vegetation clearing impact of the project is the removal of up to 100 ha of native vegetation
- Standard Main Roads management will be sufficient to manage the impacts of the proposed clearing.

Main Roads Statewide Purpose Clearing Permit CPS 818 will be used to undertake native vegetation clearing for the project. Project clearing will be undertaken in accordance with the conditions of CPS 818 and detailed records of native vegetation clearing will be maintained as required under the permit.

2 ASSESSMENT SCOPE

This preliminary clearing impact assessment involved a desktop analysis of environmental aspects and impacts, a site investigation, and an assessment of native vegetation clearing impacts. The study area is confined to a local area of a 40 km radius. This preliminary assessment determined whether further assessment through a Clearing Impact Assessment (CIA) is necessary, the need to seek submissions and develop and obtain approvals from the Department of Water and Environmental Regulation (DWER) for a Revegetation Plan, a Vegetation Management Plan (VMP), a Dieback Management Plan or an Offset Proposal.

3 PROJECT DESCRIPTION

Table 1 describes the project in detail, including the full extent of the proposed work and all the components of the proposal.

The scope of the project will involve a single span teeroff bridge over the rail along with realigning an approximately 1.8km section of the existing road. To avoid the current conflict between road and rail traffic, the road will be realigned to facilitate high embankments in the order of 10m approaching the bridge. It is anticipated embankment fill material is sourced from land adjoining the realignment.

Table 1. Project Description

Project Components	Clearing Required (Y/N)	Estimated Clearing Area (ha)
Material Pits	☒	Up to 50
Bridges/Structures	☒	Up to 50

3.1 Project Location

The project area is located on Munjina Roy Hill Rd, a local road approx. 55km from Great Northern Highway / Auski Roadhouse intersection, in Shire of Ashburton as shown in Figure 1.

- MGA reference: Zone 50
  723490 7504755

The location and boundaries of the study area (40 km radius) for the project are shown in Figure 2.

Figure 1. Project Area

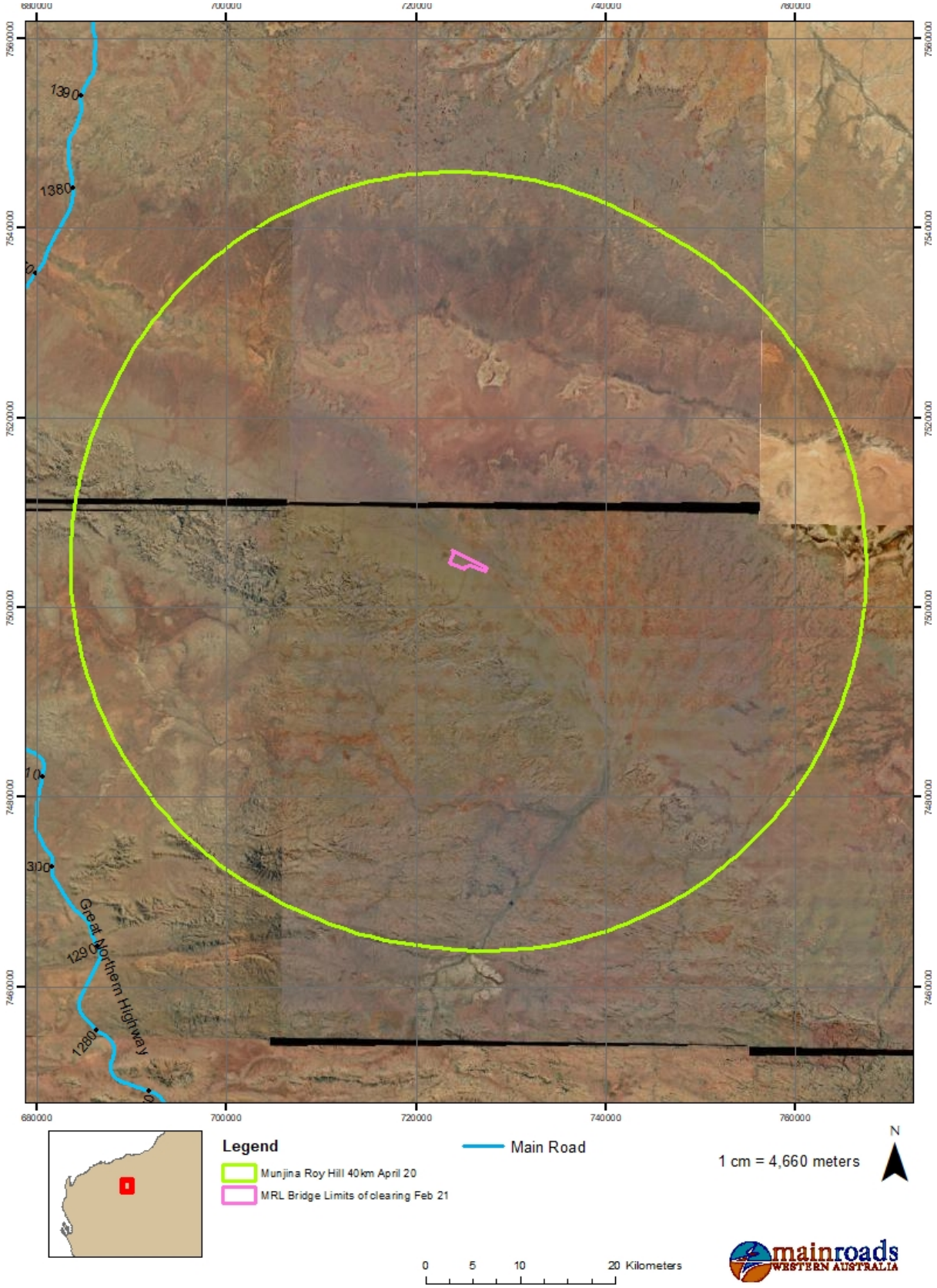


Figure 2. Project Location and Study Area

4 Methodology

4.1 Preliminary Desktop Study

A preliminary assessment of the project area and an assessment of native vegetation clearing were undertaken by reviewing a number of government agency managed databases, viewing GIS shapefiles and consulting with relevant stakeholders where necessary. Results from searches can be found in the relevant Appendix.

GIS layer viewing and mapping is done using ArcMap and referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. All government managed databases that were searched to locate additional information (i.e. further information on contaminated sites, such as basic summary of records) are referenced in Section 8.

5 Summary of Surveys

Biological survey was conducted by Biota in April-May 2020 (Biota 2020). The study involved a desktop review, single-phase detailed flora survey, Level 1 fauna survey, targeted surveys for flora and fauna species of conservation significance, and a habitat assessment for conservation significant fauna. Results of the survey are summarised as follows:

- Vegetation and Flora
    - Two vegetation types were identified, neither of which is a listed Threatened Ecological Community or Priority Ecological Community:
        - 1. *Corymbia hamersleyana* scattered low trees over *Eucalyptus gamophylla* scattered low *mallees* to low open mallee woodland over *Acacia inaequilatera* isolated tall shrubs over *Triodia basedowii* hummock grassland, occurring on sandy plains and occupying 91.4% of the survey area; and
        - 2. *Acacia aptaneura*, (*Corymbia hamersleyana, Acacia aneura*) low open woodland over *Hakea lorea* subsp. *lorea* isolated tall shrubs over **Cenchrus ciliaris, *C. setiger* tussock grassland. This vegetation type occurred in a small stand in the north-east corner of the survey area, occupying 0.7% of the survey area.
    - Approximately 7.9% of the survey area had been cleared.
    - Vegetation was mostly in Excellent or Very Good condition, apart from some areas in Good to Very Poor condition in old borrow pits and in close to infrastructure.
    - No Declared Pests or Weeds of National Significance were recorded.
    - No Threatened flora were recorded or would be expected to occur. No Priority flora were recorded during the field survey, however it is likely that the Priority 4 *Goodenia nuda* would occur.
- Fauna
    - Two fauna habitats were identified: shrubby spinifex plains and Mulga low open woodland.
    - No significant fauna species were recorded during the field survey.
    - Twelve significant fauna species were assessed as either "likely to occur" or "may occur" in the survey area including:
        - Likely to occur:
            - Bilby (*Macrotis lagotis*) – Vulnerable
            - Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* Pilbara form) – Vulnerable
            - Ghost Bat (*Macroderma gigas*) – Vulnerable

- Grey Falcon (*Falco hypoleucos*) – Vulnerable (state level only)
- Fork-tailed Swift (*Apus pacificus*) – Migratory
- Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected Fauna
- Brush-tailed Mulgara (*Dasycercus blythi*) – DBCA Priority 4

▪ May occur:
- Night Parrot (*Pezoporus occidentalis*) – Critically Endangered (state level)/Endangered (federal level)
- Northern Quoll (*Dasyurus hallucatus*) – Endangered
- Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable
- *Anilios ganei* – DBCA Priority 1
- *Ctenotus uber johnstonei* – DBCA Priority 2

▪ Most of the above species would only be expected to utilise the survey area for foraging or as transient visitors, with only the Bilby and Brush-tailed Mulgara considered to have the potential to be resident.

6 Clearing of Native Vegetation

Native vegetation describes all indigenous aquatic and terrestrial vegetation (living or dead). The term does not include vegetation that was intentionally sown, planted or propagated unless it was required under a statutory condition.

Apart from activities that are exempt under the clearing regulation (Section 5 – Prescribed Clearing), all native vegetation clearing completed by Main Roads will be undertaken using a permit.

6.1 Measures to Avoid, Minimise, Mitigate and Manage Project Clearing Impacts

The design and management measures implemented to avoid and minimise the project clearing impacts are provided in Table 2. The following measures will also be implemented:

- The clearing area will be demarcated prior to the commencement of project activities and prior to the commencement of native vegetation clearing.
- Riparian vegetation will be avoided.

Table 2. Justification of Avoiding, Minimising, Mitigating and Managing Project Clearing Impacts

Design or Management Measure	Applied to Current Design	Discussion and Justification
Steepen batter slopes	No	Due to the traffic volumes, vehicle type and posted speeds these batters cannot be changed significantly.
Installation of safety barriers	NA	NA
Alignment to one side of existing road	No	Deviation from the existing centreline will significantly increase the amount of clearing required.
Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas	Yes	Designs will follow the existing road.
Installation of kerbing	NA	NA
Simplification of design to reduce number of lanes and/or complexity of intersections	NA	NA
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	Yes	Existing cleared areas will be prioritised.
Drainage modification	NA	NA

6.2 Vegetation Details

6.2.1 Project Site Vegetation Description

Two vegetation types have been recorded in the project area (Biota 2020):

- *Corymbia hamersleyana* scattered low trees over *Eucalyptus gamophylla* scattered low mallees to low open mallee woodland over *Acacia inaequilatera* isolated tall shrubs over *Triodia basedowii* hummock grassland.
- *Acacia aptaneura, (Corymbia hamersleyana, Acacia aneura) low open woodland over Hakea lorea subsp. lorea isolated tall shrubs over *Cenchrus ciliaris, *C. setiger tussock grassland.*

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)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 111 described as Hummock grasslands, shrub steppe; *Eucalyptus gamophylla* over hard spinifex	Clearing of up to 100 ha for construction of a road over rail bridge within total project area of 319.7 ha.	Excellent – Very Good (EPA 2016)	Vegetation description and condition determined from Biota site visit in June 2020.

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. 111	**Statewide**	762,963.55	762,326.22	99.92	9.49
	IBRA Bioregion Pilbara	550,286.99	550,232.45	99.99	6.87
	IBRA Sub-region Pil 2	454,784.97	454,730.43	99.99	8.24
	LGA Shire of Ashburton	66,773.93	66,719.39	99.92	20.49

6.3 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 (EP 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'.

The proposed clearing is not likely to be at variance with the 10 clearing principles.

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

Comments	**Proposed clearing is** not likely to be at **variance to this Principle**
	The project area is within the mapped Beard vegetation association 111 which is described as hummock grasslands and shrub steppe dominated by Twin-leaf Mallee (*Eucalyptus gamophylla*) over hard spinifex (*Triodia spp.*) (Beard 1975). Approximately 99% of the pre-

	European extent of the vegetation association remains uncleared at both the state and bioregional level. The 319.7 ha of the Fortescue Valley 111 vegetation association within the project area (Biota 2020) equates to 0.8% of the mapped extent of this vegetation association within the 40km study area. No conservation significant flora were recorded during the field survey. No Threatened species are considered likely to occur, based on both the distribution of the three species listed for the Pilbara and the habitats present in the project area. Approximately 7.9% of the project area (Biota 2020) has been cleared. Two vegetation types were identified for the remainder, neither of which is a listed Threatened Ecological Community or Priority Ecological Community: 1. *Corymbia hamersleyana* scattered low trees over *Eucalyptus gamophylla* scattered low mallees to low open mallee woodland over *Acacia inaequilatera* isolated tall shrubs over *Triodia basedowii* hummock grassland, occurring on sandy plains and occupying 91.4% of the project area; and 2. *Acacia aptaneura, (Corymbia hamersleyana, Acacia aneura)* low open woodland over *Hakea lorea* subsp. *lorea* isolated tall shrubs over **Cenchrus ciliaris, *C. setiger* tussock grassland. This vegetation type occurred in a small stand in the north-east corner of the project area, occupying 0.7% of the project area. One Priority 4 flora species may potentially occur: *Goodenia nuda* is widespread in the locality, and this delicate herb can be difficult to detect in patches of dense vegetation. This species has a broad range; it occurs over more than 500 km within the Pilbara bioregion alone, where it is frequently recorded, and is also known from occasional locations to the east and south. It unlikely the clearing associated with the project will be detrimental to this species if it was within the project area. Four weed species have been recorded from the project area: Buffel Grass (*Cenchrus ciliaris), Birdwood Grass (*Cenchrus setiger) and Spiked Malvastrum (*Malvastrum americanum) were common in disturbed areas, while Caltrop (*Tribulus terrestris) was only recorded from quadrat FMG50 (Biota 2004a). All are common and widespread weeds of the Pilbara bioregion and none are WoNS or Declared Pests. ArcMap and the EPBC PMST database searches did not identify any Commonwealth or State listed TECs or PECs within the study area. No Commonwealth or State listed TECs or PECs were identified within the project area during the field survey either. Two fauna habitats were identified for the project area: shrubby spinifex plains, and Mulga low open woodland. A total of 346 vertebrate fauna species were identified through the desktop assessment as having the potential to occur in the project area, however only a subset of these would be expected to actually occur, given the habitats present and the small size of the project area. Two significant species for which preferable habitat was identified during the Biota 2020 biological survey are the brush tail mulgara and bilby. Both have potential to occur in the project area however no signs were found. Pre-disturbance checks will be done for these species and no live burrows will be cleared. The vegetation and fauna habitat types identified in the project area are common locally and regionally. Due to previous disturbance associated with the existing road and rail, the biodiversity values of the project area are likely to be lower than those of the surrounding areas. Based on the above, the clearing for the project is not likely to be at variance to this principle.

Methodology	DOE (2020) Biota (2020) DBCA shapefiles NatureMap (Accessed 16/09/2020)

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

Comments	**Proposed clearing is** not likely to be at **variance to this Principle**
	Two fauna habitats were identified for the project area: shrubby spinifex plains, and Mulga low open woodland. Both of these habitat types are common in the locally and regionally. A total of 346 vertebrate fauna species were identified through the desktop assessment as having the potential to occur in the project area, however only a subset of these would be expected to actually occur, given the habitats present and the relatively small size of the project area. Ten mammals (including two introduced species), 10 birds and five reptiles were recorded during the field survey, none of which comprised species of conservation significance. Two of the mammals were introduced: the Cat (Felis catus) and European Cattle (Bos taurus). A total of 30 taxa of conservation significance were identified as potentially occurring through the desktop assessment. Of these, seven taxa were assessed as "likely to occur" within the project area, while a further five taxa "may occur": • Likely to occur: o Bilby (*Macrotis lagotis*) – Vulnerable o Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* Pilbara form) – Vulnerable o Ghost Bat (*Macroderma gigas*) – Vulnerable o Grey Falcon (*Falco hypoleucos*) – Vulnerable (state level only) o Fork-tailed Swift (*Apus pacificus*) – Migratory o Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected Fauna o Brush-tailed Mulgara (*Dasycercus blythi*) – DBCA Priority 4 • May occur: o Night Parrot (*Pezoporus occidentalis*) – Critically Endangered (state level)/Endangered (federal level) o Northern Quoll (*Dasyurus hallucatus*) – Endangered o Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable o *Anilios ganei* (blind snake) – DBCA Priority 1 o *Ctenotus uber johnstonei* (skink)– DBCA Priority 2 Based on the habitat types available, most of the above species would only be expected to utilise the project area for foraging or as transient visitors, with only the Bilby and Brush-tailed Mulgara considered to have the potential to be resident even though no signs were recorded during the survey. A pre-disturbance inspection for active bilby mounds will carried out prior to construction as per the management plan (Appendix C) to ensure no bilbys or mulgara are active within the project area. Considering the fauna habitat types present in the project area are widespread locally and regionally and the project area is already subject to disturbance from existing road and

	rail, the vegetation proposed to be cleared is unlikely to comprise significant habitat for fauna in the local context. Based on the above, the clearing for the project is not likely to be at variance to this principle.
Methodology	Biota (2020) DBCA Shapefiles DBCA website

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

Comments	**Proposal is** not at **variance to this Principle**
	There are no known records of Threatened flora within the study area (GIS Database). A Biological site inspection of the project area did not record any species of Threatened flora (Biota, 2020) and a likelihood of occurrence assessment determined none are considered likely or possible to occur. Therefore the project is not expected to impact on any Threatened flora. Based on the above, the proposed clearing is not at variance to this Principle.
Methodology	Biota (2020) DBCA shapefiles Florabase (Accessed 16/09/2020)

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments	**Proposed clearing is** not at **variance to this Principle**
	There are no known state listed Threatened Ecological Communities (TECs) located within or in close proximity to the project area (GIS Database). A flora and vegetation survey of the project area did not identify any TECs (Biota, 2020). Based on the above, the proposed clearing is not at variance to this Principle.
Methodology	DBCA shapefiles Biota (2020)

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments	**Proposed clearing is** not at **variance to this Principle**
	The project area falls within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99.6% of the pre-European vegetation still exists in the IBRA Pilbara Bioregion (Government of Western Australia, 2018). The project area is broadly mapped as Beard vegetation association 111: hummock grasslands and shrub steppe dominated by Twin-leaf Mallee (*Eucalyptus*

	gamophylla) over hard spinifex (*Triodia spp*.) (GIS Database). Approximately 99% of the pre-European extent of this vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2018). The 319.7 ha of the Fortescue Valley 111 vegetation unit within the project area equates to 0.8% of the mapped extent of this vegetation unit within the 40km study area. Therefore, the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared.

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 111	**Statewide**	762,963.55	762,326.22	99.92	9.49
	IBRA Bioregion Pilbara	550,286.99	550,232.45	99.99	6.87
	IBRA Sub-region Pil 2	454,784.97	454,730.43	99.99	8.24
	LGA Shire of Ashburton	66,773.93	66,719.39	99.92	20.49

	Based on the above, the proposed clearing is not at variance to this Principle.
Methodology	Biota (2020) EPA (2016) Government of Western Australia (2019)

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

Comments	**Proposed clearing is not at variance to this Principle**
	There are no watercourses or wetlands within the area proposed to clear (Biota 2020). No riparian vegetation was recorded in the project area as per biological surveys conducted by Biota in 2020. Based on the above, the proposed clearing is not at variance to this Principle.
Methodology	Biota (2020)

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

Comments	**Proposed clearing is** not likely to be at **variance to this Principle**
	The project area lies within the Divide land systems (GIS Database). These land system have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development). The Divide land system is described as level or gently undulating sandplains and occasional dunes supporting shrubby spinifex grasslands This land system is not generally susceptible to erosion (van Vreeswyk et al. 2004).

	The project area contains 319.7 ha (100 ha of which may be cleared) of this land system, equating to 4.4% of the mapped extent of the Divide land system within the study area (7,216.0 ha) and 0.06% of the total mapped extent of the land system. The great majority of this land system remains vegetated in the local area. Overall, the clearing for the construction of the rail bridge is unlikely to cause appreciable land degradation. Based on the above, the proposed clearing is not likely to be at variance to this Principle.
Methodology	Biota (2020) Van Vreeswyk et al. (2004)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments	**Proposed clearing is** not likely to be at **variance to this Principle**
	There are no conservation areas in the vicinity of the project area. The nearest DBCA (formerly DPaW) managed land is the Karijini national park which is located approximately 45 kilometres east the project area (GIS Database). At this distance, the proposed clearing is unlikely to impact on the environmental values of any conservation area. Based on the above, the proposed clearing is not likely to be at variance to this Principle.
Methodology	Biota (2020) DBCA shapefiles

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments	**Proposed clearing is** not likely to be at **variance to this Principle**
	There are no Public Drinking Water Source Areas (PDWSA) within or in close proximity to the project area (GIS Database). The nearest PDSWA is approximately 10 km to the east of the project area located at H6 1203 SLK. There are no permanent watercourses or wetlands within the area within the project area. Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. A minor ephemeral drainage line runs approximately 400 m to the east of the project area. The proposed Rail Bridge construction is unlikely to result in significant changes to surface water flows or quality with no significant hydrological features noted at the site. The proposed clearing is unlikely to cause deterioration in the quality of ground water as there is no abstraction, dewatering or deep excavation being proposed. The areas surrounding the proposed clearing areas will remain largely vegetated, which also minimises the risk of water quality deterioration. Based on the above, the proposed clearing is not likely to be at variance to this Principle.
Methodology	Biota (2020) DWER and DBCA shapefiles

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

Comments	**Proposed clearing is** not likely to be at **variance to this Principle**
	The climate of the region is arid, with a low average rainfall of approximately 473.8 millimetres per year (BOM, 2020). Drainage lines in the area are dry for most of the year, only flowing briefly immediately following significant rainfall (BOM 2020). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. There are no permanent watercourses or waterbodies within the project area (GIS Database). The proposed linear clearing within the project area is unlikely to cause or exacerbate the incidence or intensity of flooding. Based on the above, the proposed clearing is not likely to be at variance to this Principle.
Methodology	Biota (2020) Bom (2020)

7 ADDITIONAL ACTIONS REQUIRED

Table 6 summarises what further pre-clearing impact assessment and vegetation management is required in accordance with CPS 818.

Table 6. Summary of Additional Management Actions Required by Permit CPS 818

Impact of Clearing	Yes/No or NA	*Further Action Required*
1. The PCIA indicates that the clearing is 'Seriously at Variance', At Variance' or 'May be at Variance' with one or more of the clearing principles.	**No**	No further action required
2. The PCIA indicates that the 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 the permit under Condition 11 of CPS 818).	**No**	No further action required.
4a. The project is in part of a region that has annual rainfall greater than 400mm and is south of the 26th parallel of latitude. **4b.** The project will require movement of soil in conditions other than dry conditions.	**No**	**4a.** No further action required. **4b.** **NA**
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 proposal requires referral to either the WA EPA or the Commonwealth DAWE.	**No**	No further action required.
7a. The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition **7b.** Are weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition	**Yes**	**7a** yes **7b** No - CEMP requires that all vehicles and machinery arrive on site clean and that weed infested mulch is removed from site; therefore there is a low risk of weed spread.

8 REFERENCES

Australian Soil Resource Information System (ASRIS) (2020). *Australian Soil Resource Information System Maps*. Available online from http://www.asris.csiro.au/ Accessed 16/9/2020.

Biota Environmental Sciences (2020) Munjina to Roy Hill Road Rail Bridge Biological Survey, Prepared for Main Roads Western Australia, July 2020

Bureau of Meteorology (BoM) (2020). *Climate Data Online*. Available from: http://www.bom.gov.au/climate/data/?ref=ftr/ Accessed 14/9/2020

Department of the Environment (DOE). (2020). *Protected Matters Search Tool*. Available online from: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl / Accessed 16/9/20

Department of Biodiversity, Conservation and Attractions (DBCA) (2020). *NatureMap.* Available from: https://naturemap.DBCA.wa.gov.au/ Accessed 16/9/2020.

EPA (2016). *Technical Guide – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment.* Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf

Government of Western Australia. (2019). *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report).* Current as of December 2018. Department of Parks and Wildlife, Perth, Western Australia. Available online from: https://www2.landgate.wa.gov.au/web/guest/downloader.

WA Atlas (2020). *Natural Resource Management Shared Land Information Platform*. Available from: https://data.wa.gov.au/ Accessed 16/9/2020.

Western Australian Herbarium. (1998-2020) *FloraBase* - The Western Australian Flora. Department of Biodiversity, Conservation and Attractions. Available online from: https://florabase.DBCA.wa.gov.au/ Accessed 16/9/2020.

9 APPENDICES

Appendix	Title
Appendix A	DBCA Threatened Flora and Fauna Database Searches
Appendix B	Bilby management plan

Appendix A: DBCA Threatened Flora and Fauna Database Searches

Redacted for publication

Figure 3. DBCA database search

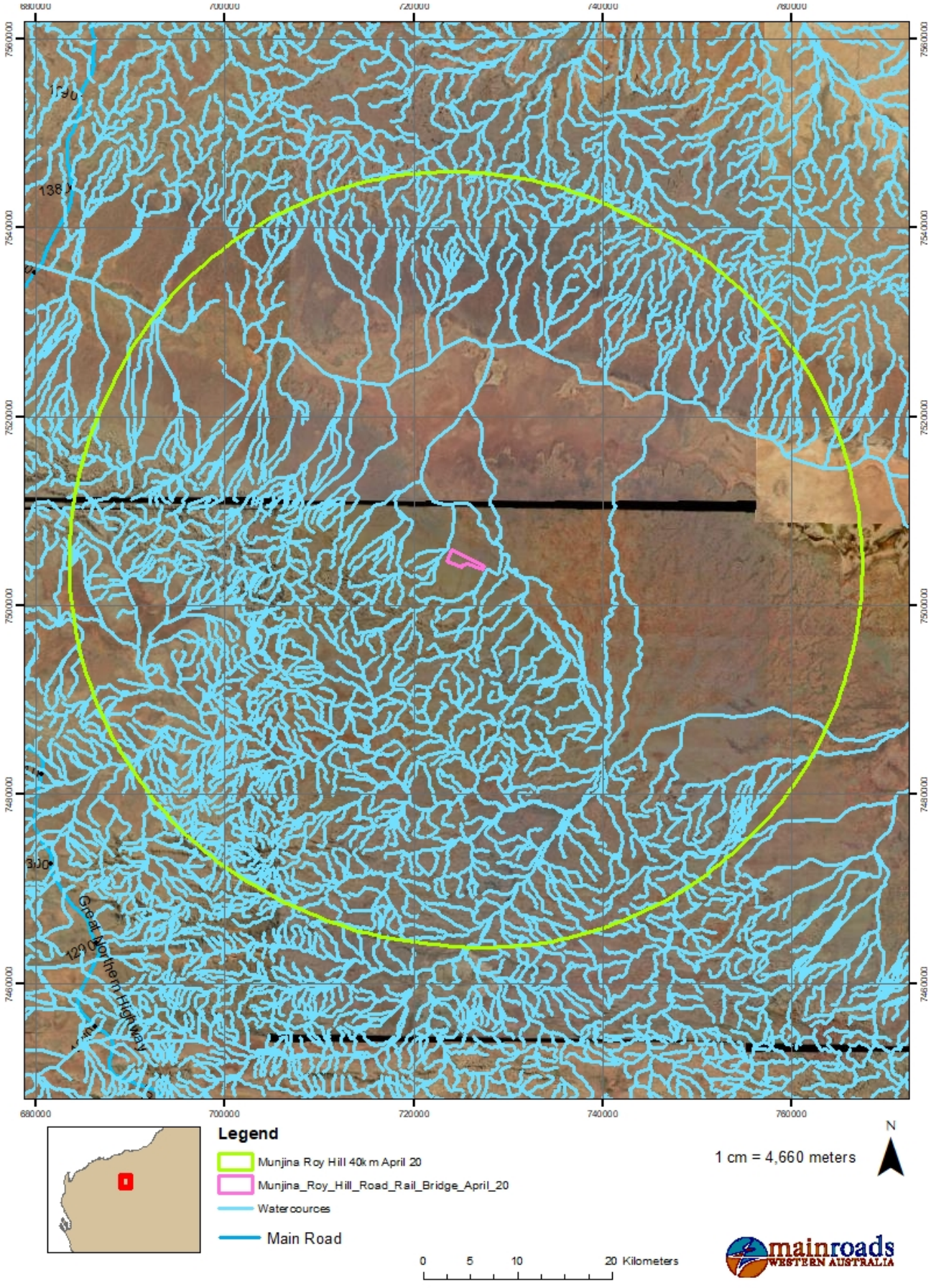


Figure 4 : Hydrological mapping

Appendix B: Bilby Management Plan

mainroads
WESTERN AUSTRALIA

Environment Work Instruction

Animals on Sites and on the Network

Operating the State's Road Network comes with the side effect of increased human and animal interaction, both native and invasive. This interaction can happen during both Project Delivery (Clearing) and Network Operations (Roadkill). In addition to all native wildlife being protected under WA's *Wildlife Conservation Act 1950*, unmanaged human-animal interactions could lead to significant property damage, loss of life and biodiversity.

POTENTIAL ENVIRONMENTAL RISKS

Pre Works Check

- Is it a potentially dangerous animal? (snake, cow, large kangaroo, dog/dingo, bird of prey)
- What is the behaviour of the animal? (threatened, calm etc)
- If you have hit an animal, is it alive or dead?
- Do you have appropriate equipment to attempt removal or dispersal? (PPE, Training, Qualification)

Environmental Operational Controls

- If the animal is a 'Threatened Species' that is still alive, further care may be required
- If animal is dead, move carcass off the road (carcass attracts other animals and can be hazardous to road users)
- If a snake, allow it to leave by itself, or with non-lethal methods of dispersal (e.g. stomping, machinery etc). If not leaving, contact Snake Hotline
- If other dangerous animal, contact WILDCARE or the 24 Hour Removal Service

Post Works Check

- ✓ If the animal is a marsupial, it may have a joey in its pouch. MRWA does not have a responsibility to care for orphaned animals, but you may want to check and to contact your Environment Officer or a DPaW Wildlife Carer who are qualified to respond if a joey is present.
- ✓ Is the area safe to commence operations?
- ✓ Has the Environment Officer been notified?
- ✓ In case of near miss, or safety concern, has the SHW Coordinator been notified?
- ✓ Was the animal a 'Threatened Species'? The Environment Officer must be notified to ensure that deaths or interactions with protected species are accurately logged in case details of incident are needed.

Caution - Remember

- Use non-lethal or no-harm methods of dispersion
  - Loud noises, ground vibrations, plant movement etc.
- Many animals can seriously harm, kill you or transmit diseases
- Keep interaction with animals to a minimum
- An animal that is not behaving like it should (docile / placid / swaggering) is potentially sick or diseased
- Report encounters with potentially dangerous animals to your SHW Coordinator and Environment Officer
- Euthanasia can only be legally carried out by a Vet, or if authorised by a Parks and Wildlife Ranger.

Related References

- Clearing in Potential Bilby Habitat EWI

Key Contacts

- WILDCARE Help Line: (08) 9474 9055
- Derby Wildlife Ranger: (08) 9193 1411
- Broome Native Animal Rescue: 0407 773 258
- Broome Wildlife Carers: (08) 9195 5500
- Broome Snake/Wildlife Removal 24hr: 0428 860 014
- Kununurra Snake/Wildlife Removal 24hr: 0407 691 229
- Fitzroy Crossing Wildlife Carers: (08) 9191 5121

mainroads
WESTERN AUSTRALIA

Environment Work Instruction

Clearing in Potential Bilby Habitat

The Greater Bilby (*Macrotis lagotis*), is one of the most iconic Australian animals. Bilbies used to occupy most of the Australian landmass, but now only occupy a fraction of that area due to the impact of clearing, foxes, cats (introduced by Europeans) and even road death. Many areas of the Kimberley are still relatively intact, with low levels of cat and fox activity and therefore is one of the last 'strongholds' of the species. The Bilby is considered a Threatened Species, listed as 'Vulnerable' under both State and Commonwealth Law.

POTENTIAL ENVIRONMENTAL RISKS

TABLE 1: STANDARD MANAGEMENT REQUIREMENTS

Pre Works

- ✓ Ensure that a Qualified Person assesses the area to be cleared prior to works.
- ✓ Pre-Clearing assessment should be carried out within two weeks of the proposed clearing
- ✓ Pre-Clearing assessments should be carried out using the method described on Page 2 of this EWI
- ✓ Re-design any non-essential infrastructure (e.g. parking bays, drains or laydown) to avoid any active Bilby areas
- ✓ Exclusion zones may be implemented, but must be clearly demarcated and communicated

During Works

- ✓ All personnel to be familiar with identifying signs of Bilby and report any concerns to the Environment Officer

Post Works

- ✓ Report any sightings to the Environment Officer
- ✓ Qualified persons should provide a written report of the methods used during Pre-Clearing Surveys.

Caution - Remember

- Bilby move around a lot, and may return to a recently cleared area if left
- Bilby could die if not removed from their burrows correctly (a State and Federal offence if found guilty of intentionally causing harm/killing a protected species)

Related References

- DBCA Guidelines for Survey of Bilby
- Clearing in Potential Bilby Habitat EWI

Key Contacts

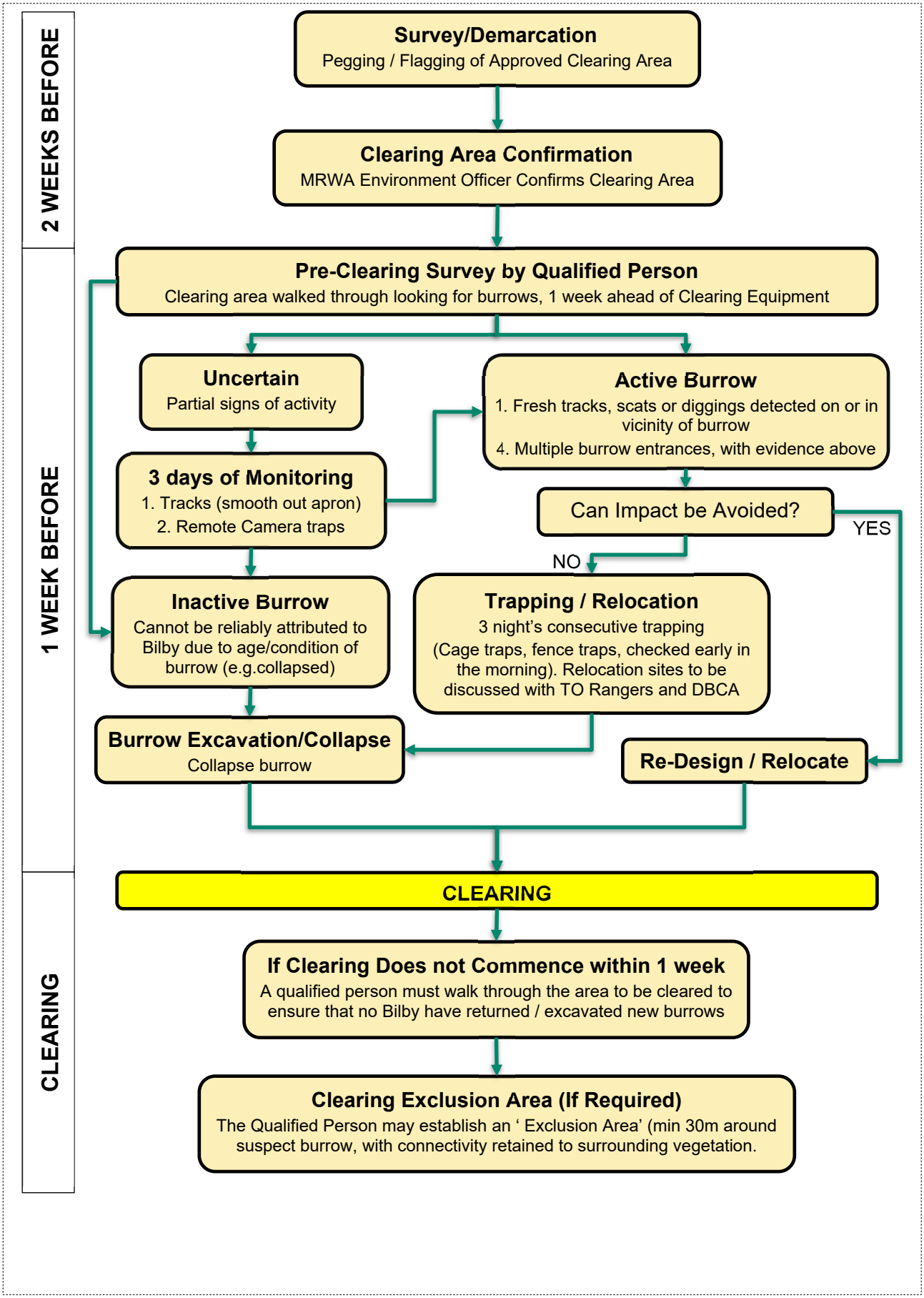
- Kimberley Region Environment Officer: JJ Rao (08 9158 4304)

Burrows

Tracks

Scats

Diggings


2 WEEKS BEFORE
1 WEEK BEFORE
CLEARING
Survey/Demarcation
Pegging / Flagging of Approved Clearing Area
Clearing Area Confirmation
MRWA Environment Officer Confirms Clearing Area
Pre-Clearing Survey by Qualified Person
Clearing area walked through looking for burrows, 1 week ahead of Clearing Equipment
Uncertain
Partial signs of activity
3 days of Monitoring
1. Tracks (smooth out apron)
2. Remote Camera traps
Active Burrow
1. Fresh tracks, scats or diggings detected on or in vicinity of burrow
4. Multiple burrow entrances, with evidence above
Can Impact be Avoided?
YES
NO
Inactive Burrow
Cannot be reliably attributed to Bilby due to age/condition of burrow (e.g.collapsed)
Trapping / Relocation
3 night's consecutive trapping
(Cage traps, fence traps, checked early in the morning). Relocation sites to be discussed with TO Rangers and DBCA
Burrow Excavation/Collapse
Collapse burrow
Re-Design / Relocate
CLEARING
If Clearing Does not Commence within 1 week
A qualified person must walk through the area to be cleared to ensure that no Bilby have returned / excavated new burrows
Clearing Exclusion Area (If Required)
The Qualified Person may establish an ' Exclusion Area' (min 30m around suspect burrow, with connectivity retained to surrounding vegetation.