GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10273/1
Permit Holder:	Commissioner of Main Roads Western Australia
Duration of Permit:	From 19 October 2023 to 19 October 2033

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of material extraction for road construction and maintenance.

2. Land on which clearing is to be done

Lot 33 on Deposited Plan 240249 (Reserve 38991) , Fortescue.

3. Clearing authorised

The permit holder must not clear more than 70 hectares of *native vegetation* within the area cross-hatched yellow in Figures 1 and 2 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 19 October 2028.

PART II – MANAGEMENT CONDITIONS

5. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the clearing of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of clearing on any environmental value.

6. Weed management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known *weed*-affected soil, *mulch, fill*, or other material is brought into the area to be cleared; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

7. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner in a single direction to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

8. Revegetation and rehabilitation – temporary works

The permit holder must:

(a) Retain the vegetative material and topsoil removed by clearing authorised under this Permit and stockpile the vegetative material and topsoil in an area that has already been cleared.

(b) At an *optimal time* within 12 months following the completion of works authorised under this Permit, *revegetate* and *rehabilitate* the area(s) that are no longer required for the purpose for which they were cleared (*temporary works*) under this Permit by:

  (i) re-shaping the surface of the land so that it is consistent with the surrounding five (5) metres of uncleared land; and

  (ii) ripping the ground on the contour to remove soil compaction; and

  (iii) laying the vegetative material and topsoil retained under condition 8(a) on the cleared area(s) no longer required for the purpose for which they were cleared under this Permit.

(c) within 24 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 8(b) of this permit:

  (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and

  (ii) engage an *environmental specialist* to make a determination as to whether the composition, structure and density determined under condition 8(c)(i) of this permit will, without further *revegetation*, result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area.

(d) If the determination made by the *environmental specialist* under condition 8(c)(ii) is that the species composition, structure, and density determined under condition 8(c)(i) will not, without further *revegetation*, result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, the permit holder must *revegetate* the area by deliberately *planting local provenance* propagating material and/or *direct seeding* of *local provenance* seeds that will result in a similar species composition, structure, and density of *native vegetation* to pre-clearing vegetation types in that area.

(e) Where additional *planting* or *direct seeding* of *native vegetation* is undertaken in accordance with condition 8(d), the permit holder must repeat the activities required by condition 8(c) and 8(d) within two years of undertaking the additional *planting* or *direct seeding* of *local provenance native vegetation*.

(f) Where a determination is made by an *environmental specialist* under condition 8(c)(ii) that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, that determination shall be submitted to the *CEO* within three months of the determination being made by the *environmental specialist*.

(g) During the next *optimal time* occurring after receiving notice from the *CEO*:

(i) stating that the *CEO* disagrees with the determination submitted under condition 8(f); and

(ii) specifying the required further *planting* of *local provenance* propagating material and/or *direct seeding* of *local provenance* seeds that in the *CEO*'s reasonable opinion are necessary to ensure that the *native vegetation* will result in a similar species composition, structure and density to that of preclearing vegetation types in that area, the permit holder must carry out the further *planting* and/or *direct seeding* specified in the notice.

PART III - RECORD KEEPING AND REPORTING

9. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; (f) actions taken to minimise the risk of the introduction and spread of *weeds* in accordance with condition 6; and (g) actions taken in accordance with condition 7.

No.	Relevant matter	Specifications
2.	In relation to the *revegetation* and *rehabilitation* of *temporary works* pursuant to condition 8	(a) actions taken in accordance with condition 8 to *revegetate* and *rehabilitate* temporarily cleared areas; (b) the size of the area(s) *revegetated* and *rehabilitated*; (c) the date(s) on which the *revegetation* and *rehabilitation* was undertaken; (d) the boundaries of the area(s) *revegetated* and *rehabilitated* (recorded digitally as a shapefile); (e) a copy of the *environmental specialist's* report

10. Reporting

The permit holder must provide to the *CEO* the records required under condition 13 of this permit when requested by the *CEO*.

DEFINITIONS

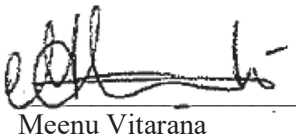
In this permit, the terms in Table have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
direct seeding	means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of 2 years work experience relevant to the type of environmental advice that an environmental specialist is required to provide under this permit, or who is approved by the CEO as a suitable environmental specialist.
EP Act	*Environmental Protection Act 1986* (WA)
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.

Term	Definition
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
optimal time	means the period from November December for undertaking seeding and planting
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species
rehabilitate/ed/ion	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
revegetate/ed/ion	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area
temporary works	means access tracks, spoil areas, side tracks, site offices, storage areas, laydown areas, extraction sites, camps, project surveys, pre-construction activities, and similar works associated with a project activity that are temporary in nature.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Meenu Vitarana
A/SENIOR MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

26 September 2023

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1 and 2).

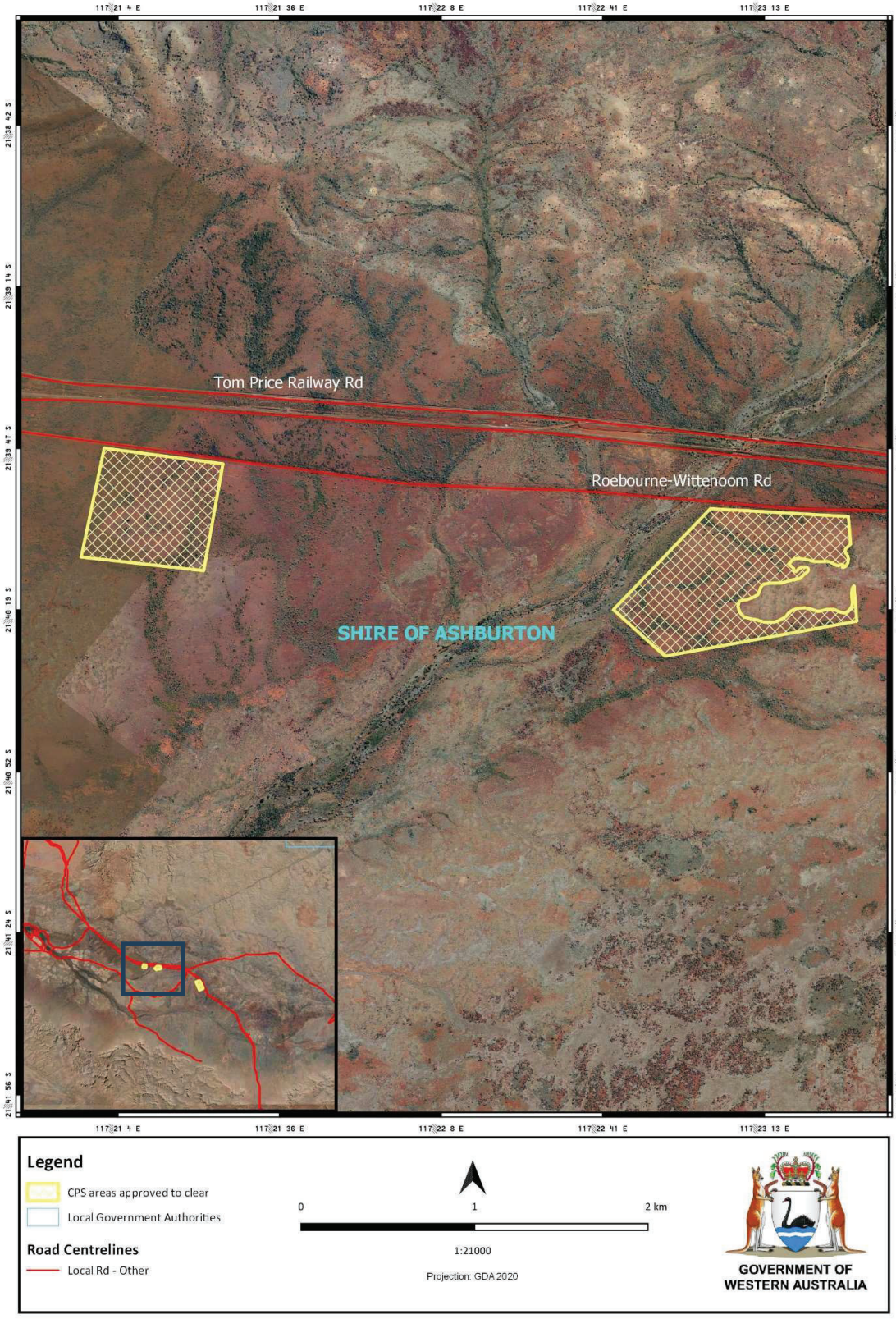


Figure 1: Map of the boundary of the western areas within which clearing may occur.

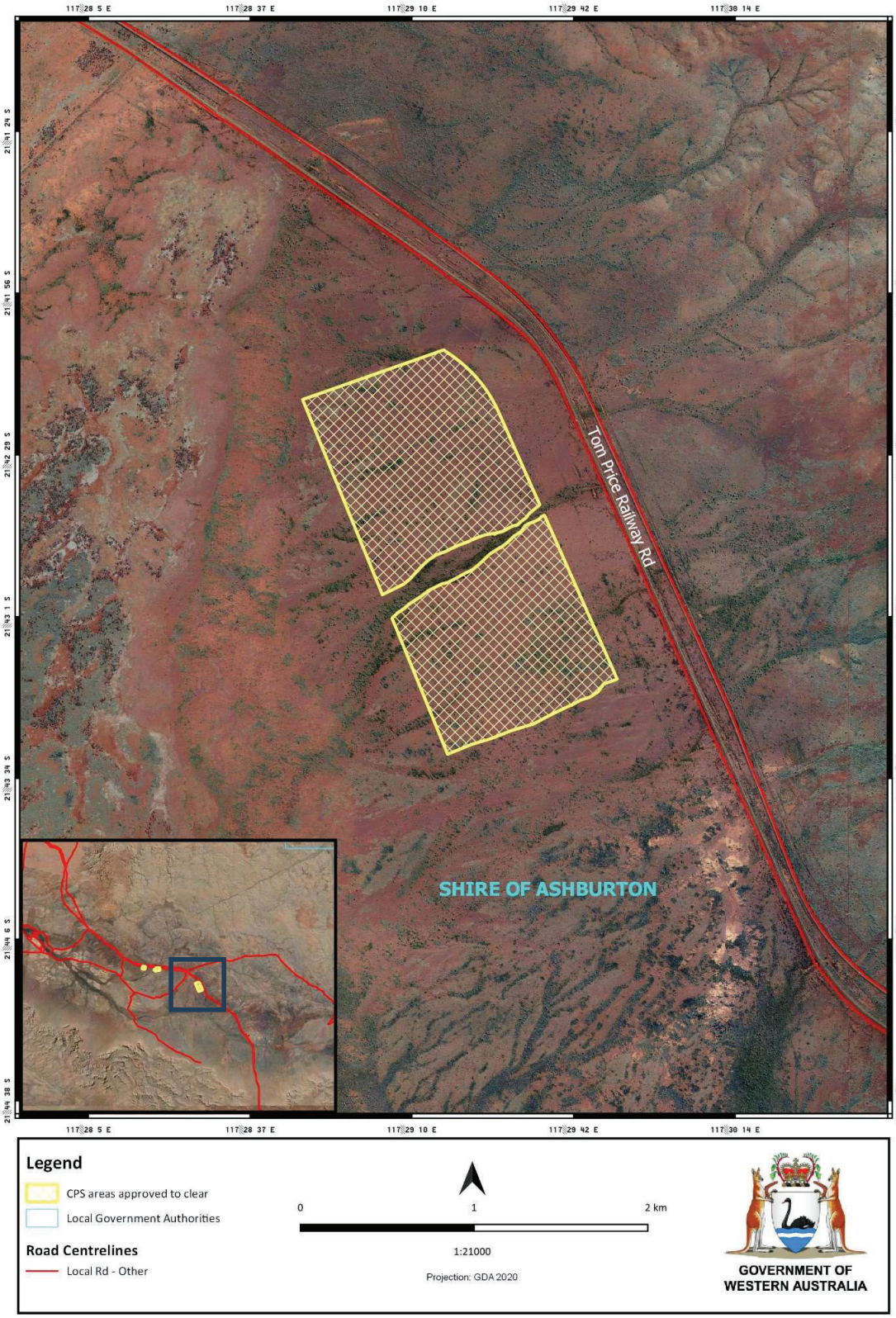


Figure 2: Map B of the eastern boundary of the area within which clearing may occur.

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10273/1
Permit type:	Purpose permit
Applicant name:	Main Roads Western Australia
Application received:	11 July 2023
Application area:	70 hectares of native vegetation
Purpose of clearing:	Material extraction for road construction and maintenance
Method of clearing:	Mechanical removal
Property:	Lot 33 on Deposited Plan 240249 (Reserve 38991)
Location (LGA area/s):	Shire of Ashburton
Localities (suburb/s):	Fortescue

1.2. Description of clearing activities

The vegetation applied to be cleared consist of 70 hectares located within three discrete areas within a larger footprint of 349.05 hectares. All three areas are contained within a single contiguous area (see Figure 1, Section 1.5).

Main Roads has identified these areas to source material which will be utilised in the construction of ten kilometres of the Manuwarra Red Dog Highway (MRDH) Stage 4 and other road maintenance and construction works within the area (Main Roads WA, 2023). The precise location of the material to be targeted for extraction within the proposed borrow pits will be determined following laboratory analysis of geotechnical samples that are currently being collected (Jacobs, 2023). Native vegetation clearance will be required to access the proposed borrow pits and allow for extraction, stockpiling and loading of material (Jacobs, 2023).

1.3. Decision on application

Decision:	Granted
Decision date:	26 September 2023
Decision area:	70 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E), the findings of a biological survey (see Appendix D), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration the materials sourced will be utilised for a public benefit project.

The assessment identified that the proposed clearing will result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.
- injury to fauna individuals that may utilise the application areas during the time of clearing.
- impact on the habitat for the western pebble-mound mouse.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have long-term adverse impacts on threatened fauna or flora and can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

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

- avoid and minimise measures to reduce the impacts and extent of clearing.
- take hygiene steps to minimise the risk of the introduction and spread of weeds.
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.
- revegetation of the material pits post extraction.

1.5. Site maps

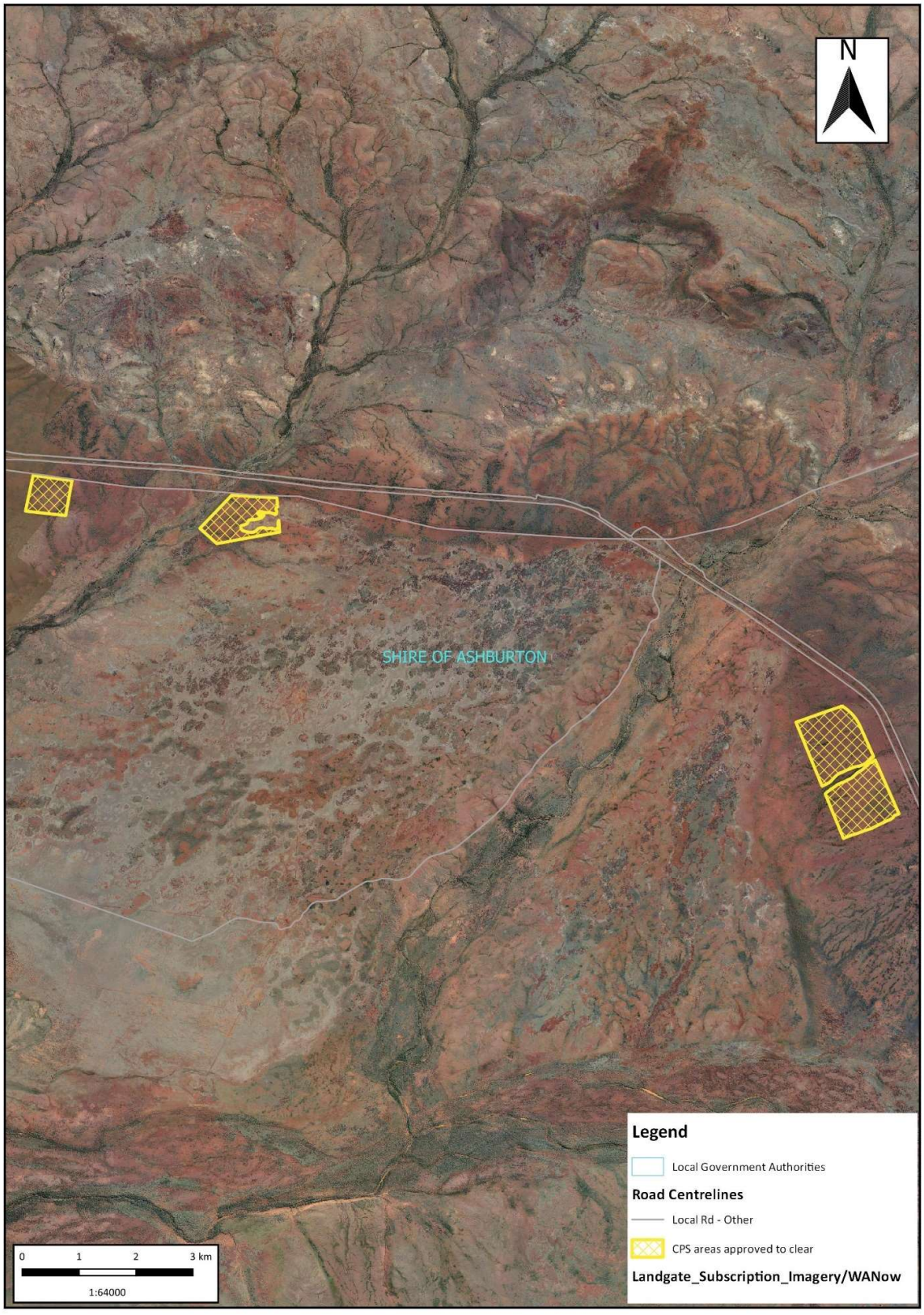


Figure 1 Map of the application areas

The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Country Areas Water Supply Act 1947 (WA) (CAWS Act)*
- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The mitigation hierarchy was applied to the clearing application selection as follows (Jacobs, 2023):

- Avoid: The boundary of the application areas was amended to exclude areas mapped as supporting habitat for Threatened fauna, riparian vegetation, vegetation with similarities to the Priority 3 Priority Ecological Community (PEC) Mitchell grass and Roebourne Plain grass (*Eragrostis xerophila*) plain on gilgai (a component of the Four plant assemblages of the Wona Land System) and habitat for the Priority 3 species *Dolichocarpa sp. Hamersley Station*. With these modifications, no significant vegetation types or conservation significant flora were recorded within the application areas.
- Sourcing material from third party commercial supplier was considered as an alternative to creating new material pits. This was deemed to not be feasible however, due to the significant costs associated with haulage of material from Karratha or Tom Price, where these commercial suppliers are located.
- Minimise: A Vegetation management plan will be prepared as part of the Contractor's Construction Environmental Management Plan (CEMP). The exact clearing area will be flagged on the ground prior to any clearing commencing. A 15 metres buffer will be cleared beyond the edge of the deposit. Topsoil and overburden will be pushed to the edge of the pit batter, allowing a dozer width between the vegetation and overburden stockpile to facilitate easy pit rehabilitation. Locations of Priority Flora or significant vegetation that are not within the clearing application areas will be identified as "no-go" zones and flagged in the field. Areas of dense vegetation will be preferentially avoided in siting the specific extraction areas, where this is practical.
- Rehabilitate: Cleared areas will be reinstated and revegetated once the material pits are no longer required.

The proposed clearing areas are located on Reserve 38991 with management responsibility vested in the Water Corporation for the purpose of water supply. As such Main Roads has entered into an agreement with the Water Corporation. This agreement, amongst others, obligated Main Roads to the following:

- "Maintain and keep the areas of the Land and Premises in good, clean and tidy condition including lawn;
- Not to store chemicals, flammable liquids, acetylene gas or volatile or explosive oils or compounds or substances or any other hazardous substance upon the Land and Premises;
- Make good any damages to the Land and Premises due to the Licensee's activities;
- Not cause or permit any Contamination of the Premises or Land in pursuit of the Licensee's activities. If any contamination occurs, the Licensee is to do everything necessary to minimise the effect of the contamination and make good any damaged caused by the contamination.
- Ensure all machinery to be adequately serviced/maintained and not leaking fluids. Any maintenance is to occur outside the Premises where possible. Should there be any on-site maintenance, appropriate bunding and removed of chemicals from the Premises immediately after maintenance is required.

- Ensure temporary toilet facilities are to be outside the Premises where possible or at least 200m from any feeder stream."

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

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

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

3.2.1. Environmental value: Biological values (flora and priority ecological communities) - Clearing Principles (a & c)

Flora and vegetation

According to available datasets, there are records of 35 conservation significant flora species mapped within the local area (50 kilometre radius). A previous biological survey was conducted along the main Manuwarra Red Dog Highway project corridor by Biota in 2021.The applicant subsequently commissioned Biota to undertake a biological survey of 12 potential material pits and two potential road realignment areas located along the MRDH Stage 4 corridor (only three borrow pit areas are the subject of this application). The biological surveys consist of a reconnaissance and targeted flora and vegetation survey as well as a fauna survey.

The application areas are on gently undulating plains supporting minor drainages concentrated in the northern section. The reconnaissance and targeted flora and vegetation survey (Biota, 2023) recorded the vegetation units within the application areas as P2: *Corymbia hamersleyana* low open woodland over mixed *Acacia* shrubland over *Triodia epactia* hummock grassland. The shrub layer within the application areas comprised a mixture of *Acacia* species, including *Acacia ancistrocarpa, Acacia atkinsiana* and *Acacia trachycarpa*. *Triodia epactia* was the dominant hummock grass, however *Triodia wiseana* was also present in sparse patches (Biota, 2023). The vegetation condition was recorded as Excellent (Biota, 2023).

No Threatened flora species listed under State or Commonwealth legislation were recorded from the survey area (Biota, 2023). Eight state-listed Priority flora species were recorded from the larger survey area (Biota, 2023):

- *Euphorbia inappendiculata var. queenslandica* (Priority 2);
- *Astrebla lappacea* (Priority 3);
- *Dolichocarpa* sp. Hamersley Station (A. A. Mitchell PRP 1479) (Priority 3);
- *Glycine falcata (Priority 3; outside the survey area boundary);*
- *Streptoglossa* sp. Cracking clays (S. van Leeuwen et al. PBS 7353) (Priority 3);
- *Swainsona thompsoniana* (Priority 3);
- *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) (Priority 3); and
- *Triodia basitricha* (Priority 3).

The survey recorded no significant vegetation types or Threatened flora species listed under the *Biodiversity Conservation Act 2016* (BC Act), or DBCA listed Priority flora species within the application areas (Biota, 2023). Further, no Threatened Ecological Communities (TECs) are identified within the application areas.

The application areas were amended during the project planning phase to exclude an occurrence of *Dolichocarpa* sp. Hamersley Station (A. A. Mitchell PRP 1479) (Priority 3). The applicant has indicated that no clearing of this *Dolichocarpa* sp. Hamersley Station (A. A. Mitchell PRP 1479) individual or the vegetation within a 20-meter buffer of its location will occur (Jacobs, 2023). This species is broadly distributed across the Pilbara, with 31 vouchered records from the Chichester, Hamersley, Fortescue and Roebourne subregions, but is generally restricted to heavy clay soils (Biota, 2023).

Five significant vegetation types were identified in the greater survey area, largely associated with the clay plains of the Tom Price realignment area (Biota, 2023). The proposed clearing avoided vegetation unit P7, considered as

locally significant due to its similarities to the Priority 3 Priority Ecological Community (PEC) Mitchell grass and Roebourne Plain grass (Eragrostis xerophila) plain on gilgai (a component of the four plant assemblages of the Wona Land System).

Weeds

Five weed species were recorded during the field survey (Biota, 2023):

- *Cenchrus ciliaris* (Buffel Grass);
- *Cenchrus setiger* (Birdwood Grass);
- *Malvastrum americanum* (Spiked Malvastrum);
- *Sonchus oleraceus* (Common Sowthistle); and
- *Vachellia farnesiana* (Mimosa Bush).

None of the identified weed species are listed as Declared pest plants under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) and/or are Weeds of National Significance (WoNS).

No weeds were identified within the application areas, however vegetation units situated adjacent to the application areas showed some evidence of scattered weeds (Biota, 2023). The proposed clearing will increase the risk of weeds spreading into adjacent areas of native vegetation.

Conclusion

Based on the above assessment, and findings of the reconnaissance and targeted flora and vegetation survey, the proposed clearing is unlikely to have a significant impact on any threatened or priority flora species or vegetation communities. However, the proposed clearing may increase the risk of weeds spreading into adjacent native vegetation, noting that non-native species were recorded in the vegetation survey.

Outcome

To address the potential spread of weeds into adjacent native vegetation, the clearing permit contains a condition that requires the applicant to undertake weed hygiene management measures.

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

Fauna Habitat and Suitability

According to available datasets, there are records of 22 conservation significant priority fauna species mapped within the local area (50-kilometre radius) including freshwater and migratory species. A terrestrial fauna survey was undertaken as part of the biological survey by Biota. The fauna survey identified that the application areas are characterised by *Corymbia* trees with mixed *Acacia* shrublands over *Triodia epactia* on stony substrates (ASM – Mixed *Acacia* shrublands) (Biota, 2023).

Four significant fauna species were recorded from the larger survey area, namely the northern quoll (*Dasyurus hallucatus*), western pebble-mound mouse (*Pseudomys chapmani*), ghost bat (*Macroderma gigas*), and Pilbara leaf-nosed bat (*Rhinonicteris aurantia*).

The boundaries of the application areas were modified to exclude any habitat for the northern quoll (*Dasyurus hallucatus*), ghost bat (*Macroderma gigas*), and Pilbara leaf-nosed bat (*Rhinonicteris aurantia*), in order to avoid potential impacts to these significant fauna species. The only remaining significant fauna species with habitat still occurring within the application areas is the western pebble-mound mouse (*Pseudomys chapmani*).

Western pebble-mound mouse (Priority 4)

Western pebble-mound mouse is known to occur widely across the entire Pilbara region and into the Gascoyne, where it is commonly found on stony hillsides with hummock grasslands. The mouse species is nocturnal, largely solitary, and individuals spend the day in simple, single-chambered burrows. The species is well known for the extensive mounds of small stones it constructs, which are the most obvious indication of the species' occurrence in

an area. Mounds are most common on spurs and gentle slopes where suitably sized stones are present (Biota, 2023).

While ten active pebble mounds were recorded in the greater survey area, no signs of pebble mounds were recorded within the application areas (Biota 2023). The closest record is 37 kilometres north of the application areas. Given the distance to this record and the abundance of potential habitat for the species in the local area, including vegetation immediately surrounding the application areas, the proposed clearing is not considered to be locally significant for the survival of the western pebble-mound mouse, should they be present within the application areas.

The application areas are also suitable habitat for the grey falcon (*Falco hypoleucos*), peregrine falcon (*Falco peregrinus*) and the fork-tailed swift (*Apus pacificus*). However, it is likely that should these species utilised the application areas it would only be as they overfly the areas and would not make use of the area for roosting or nesting due to a lack of tall trees or cliffs (Biota, 2023). Additionally, the fork-tailed swift is a largely aerial species, rarely coming to land. The application areas are therefore not considered critical habitat for these species.

No threatened, priority or conservation significant fauna were recorded within the application areas during the fauna survey (Biota, 2023).

Conclusion

Based on the above assessment, the proposed clearing is unlikely to impact on significant habitat for any conservation listed fauna species. However, the proposed clearing may result in fauna fatalities should they occur within the application areas at the time of clearing. Impacts to fauna are not expected to be significant given the extent of vegetation to be cleared within an extensive vegetated local and regional extent. Conducting clearing in a slow, progressive manner from one direction to the other will allow any fauna present to move into adjacent native vegetation ahead of the clearing activity.

Outcome

To address the above impacts and reduce any potential risks to fauna, the clearing permit contains conditions that require the applicant to undertake the following management measures:

- slow, directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity.

3.3. Relevant planning instruments and other matters

The proposed clearing activities are located in the Millstream Public Drinking Water Source Area which is proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI). The Millstream Water Reserve was proclaimed under the *Country Areas Water Supply Act 1947* (CAWS) in 1969. A Drinking Water Source Protection Plan was prepared for the Millstream Water Reserve in June 2010 (Millstream Water Reserve drinking water source protection plan) (DWER, 2023). The DWER North West Region recommends that during the disturbance and operation activities, hydrocarbons, chemicals and potentially hazardous substances are stored and disposed of in accordance with the Departments' Guidelines and Water Quality Protection Notes (DWER, 2023). The permit proposal is unlikely to impact on the water quality of water resources, provided clearing activities are undertaken with the advice and the department's water quality protection notes and guidelines (DWER, 2023).

The Shire of Ashburton did not have any objections to the proposed clearing.

Several Aboriginal sites of significance and scattered artifacts have been mapped within the local area. It is the permit holder's responsibility to ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The areas proposed to be cleared is a part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is surrounded by vast expanses of vegetation of similar types. Spatial data indicates the local area (50 km radius of the proposed clearing area) retains approximately 99.96% of the original native vegetation cover.
Ecological linkage	The application areas align broadly with the landforms present and are not considered to represent a key ecological linkage.
Conservation areas	Approximately 14 kilometre north of the proposal site boundary is Millstream Chichester National Park.
Vegetation description	Vegetation survey (Biota, 2023) indicate the vegetation within the proposed clearing area consists of *Corymbia hamersleyana* low open woodland over mixed *Acacia* shrubland over *Triodia epactia* hummock grassland (P2). The full survey descriptions and maps are available in Appendix Appendix DD. This is consistent with the mapped vegetation types: • Beard 607, which is described as Hummock grassland with scattered bloodwoods & snappy gum *Triodia spp., Corymbia dichromophloia, Eucalyptus leucophloia* (Shepherd et al, 2001) • Beard 646, which is described as Hummock grassland with scattered shrubs or mallee *Triodia spp. Acacia spp., Grevillea spp. Eucalyptus spp* (Shepherd et al, 2001) *The mapped vegetation types retain approximately 99.84 and 100 per cent of the original extent respectively (Government of Western Australia, 2019).*
Vegetation condition	The Biological survey (Biota, 2023) indicates the vegetation within the proposed clearing area is in Excellent (Trudgen, 1991) condition. The full Trudgen (1991) condition rating scale is provided in 0. The full survey descriptions and mapping are available in Appendix D.
Climate and landform	Very hot summers, mild winters and low and variable rainfall. The Pilbara is a semi-arid and arid region with a monsoonal climate. Peak rainfalls occur in the warmer summer months between December and March (i.e. the wet season) as a result of monsoonal thunderstorm activity. Tropical lows or cyclones may occur during these months also.
Soil description	The soil is mapped as: • Boolgeeda land system comprises stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands. • Hooley land system comprises alluvial clay plains supporting a mosaic of snakewood shrublands and tussock grasslands.
Land degradation risk	The risk for both soil types is very low for wind and water erosion and low for Acid Sulphate Soil Risk (Jacobs, 2023).
Waterbodies	There are several nonperennial watercourses of the Fortescue River mapped within the application areas, however the application areas avoided significant riparian vegetation (Jacobs, 2023). No wetlands are mapped within the application areas.

Characteristic	Details
Hydrogeography	The application areas are within the Millstream Water Reserve, Public Drinking Water Source Area which is proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI). The proposed future purpose does not pose a significant risk to the drinking water supply (DWER, 2023).
Flora	There are records of 35 flora of conservation significance within the local (50 km radius) area. The Vegetation survey by Biota (2023) found that the application areas did not contain conservation significant flora species.
Ecological communities	No Threatened Ecological Communities (TECs) are located within the proposed clearing area.
Fauna	There are records of 22 fauna of conservation significance within the local (50 km radius) area including migratory species.

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The areas proposed to be cleared do not contain locally significant flora, fauna, habitats or assemblages of plants. The vegetation type and fauna habitat to be cleared is common and widespread in the region and comprises a similar level of biological diversity compared to the surrounding area.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The areas proposed to be cleared do not contain significant habitat for conservation significant fauna.	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The areas proposed to be cleared are unlikely to contain habitat for flora species listed under the BC Act.	Not likely to be at variance	No
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The areas proposed to be cleared do not contain species that can indicate a threatened ecological community.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.	Not likely to be at variance	No
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of conservation areas.	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: There are several nonperennial watercourses of the Fortescue River mapped within the application areas, however the application areas avoided significant riparian vegetation (Jacobs, 2023). Given the absence of riparian vegetation within the application areas, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are not susceptible to wind and water erosion, and the application areas are located within an area mapped as low risk for acid sulphate soils. The proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance	No
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: The removal of 70 hectares of vegetation across three locations that are located in relatively flat terrain and surrounded by large areas of vegetation is unlikely to alter the current hydrological regime of the area as the clearing is unlikely to impact the velocity, flow path or quantity of surface water traveling across the cleared areas (Jacobs, 2023). In addition, the proposed clearing is not likely to contribute to issues such as groundwater level rise, mobilisation of salts within soils or dryland salinity. Interaction with the groundwater is anticipated to be minimal given the shallow depths of excavation associated with the proposed clearing works (Jacobs, 2023). Given the absence of riparian vegetation within the application areas, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding. Given the absence of riparian vegetation within the application areas, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No

Appendix C. Vegetation condition rating scale

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

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
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.
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.
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.
Very poor	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.
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.

Appendix D. Biological survey information excerpts

Biota Environmental Sciences (Biota) was commissioned to undertake a biological survey to identify key environmental values.

The scope of the study was to:

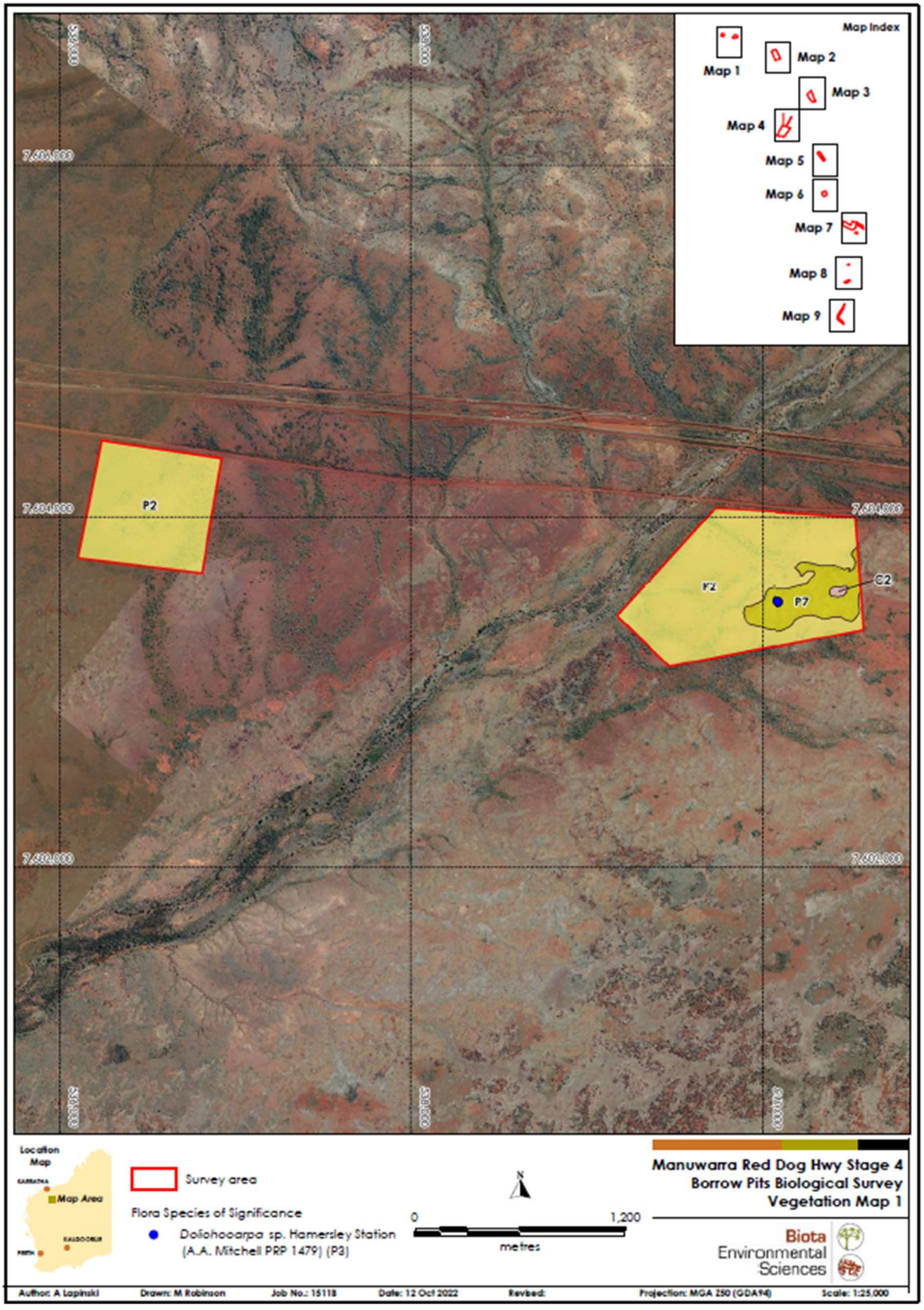
- conduct a desktop study of a 40 km area around the survey area, to identify species or communities of significance previously recorded from the study area and to assess their likelihood of occurrence in the survey area; and
- conduct a reconnaissance and targeted flora and vegetation survey and a basic fauna survey to verify the findings of the desktop study; these surveys were conducted over three mobilisations in April, June and July 2022.

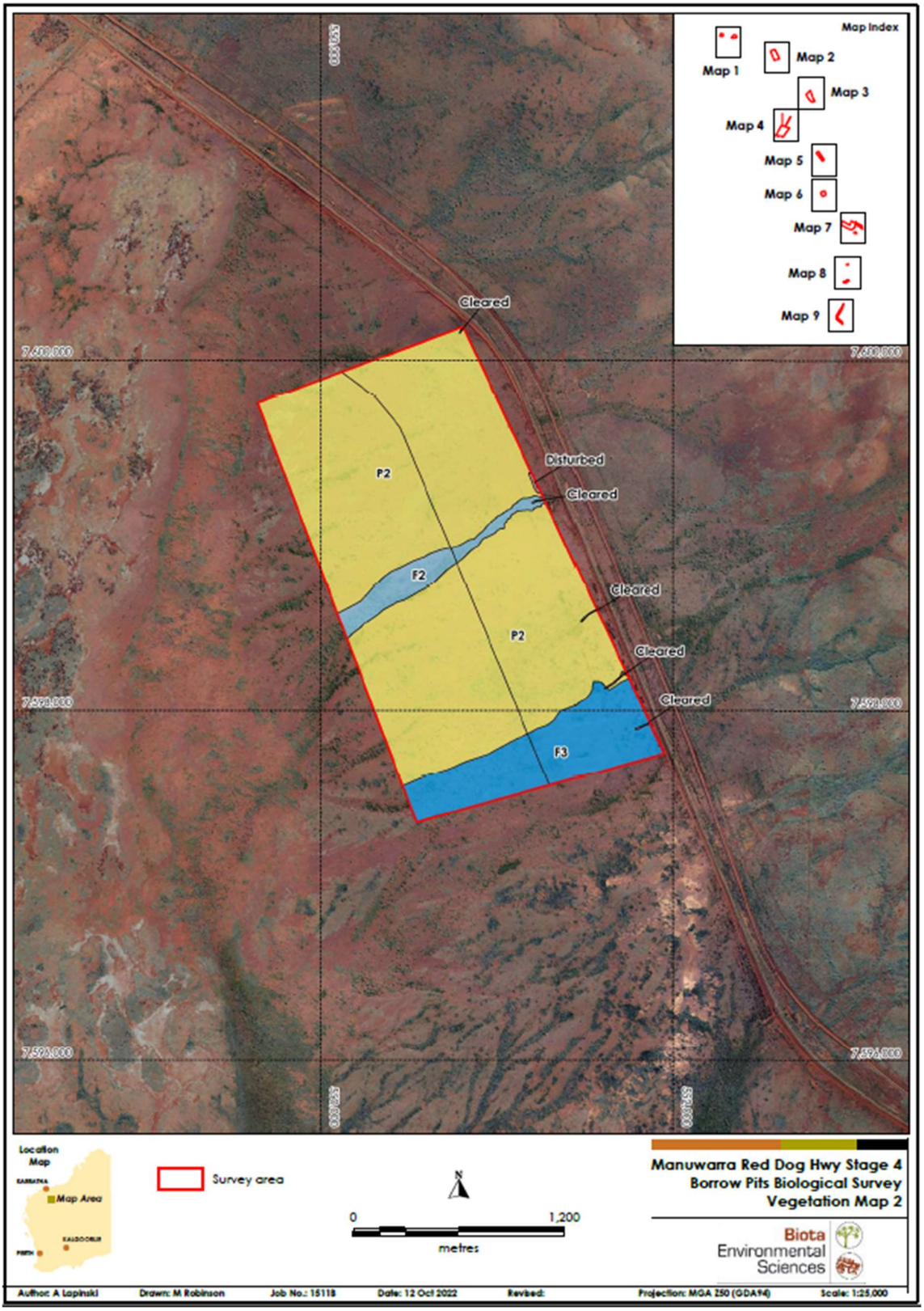
Vegetation unit mapped for the application areas:

P2	***Corymbia hamersleyana* low open woodland over mixed *Acacia* shrubland over *Triodia epactia* hummock grassland.**
Distribution and habitat	This vegetation type was found on gently undulating plains supporting minor drainages, throughout the survey area but concentrated in the northern section (Plate 5.22 and Plate 5.23). The shrub layer comprised a mixture of *Acacia* species, including *A. ancistrocarpa*, *A. atkinsiana* and *A. trachycarpa*. *Triodia epactia* was the dominant hummock grass, however *T. wiseana* was also present in sparse patches.
Other associated species	Shrubs: *Acacia sclerosperma* subsp. *sclerosperma*, *A. dictyophleba*, *A. tenuissima*, *A. maitlandii*, *A. trudgeniana*, *Grevillea wickhamii* subsp. *hispidula*, *Carissa lanceolata*, *Eremophila longifolia*, *Indigofera monophylla*. Grasses: *Eriachne aristidea*, *E. pulchella*, *Aristida holathera* var. *holathera*, *Eulalia aurea*, *Sporobolus australasicus*, *Paspalidium clementii*. Herbs: *Duperreya commixta*, *Dysphania kalpari*, *Rhynchosia minima*, *Evolvulus alsinoides* var. *villosicalyx*, *Trianthema glossostigmum*.
Vegetation condition	Excellent.
Sites	KTF18, KTF30, KTF31, KTF32, KTF40, KTF41, KTF43, KTF44, KTF48, KTF49, KTF51(Biota 2021); MRO03, MRO06.

Plate 5.22: Unit P2 (KTF43).

Plate 5.23: Unit P2 (MRO06).


Map Index
Map 1
Map 2
Map 3
Map 4
Map 5
Map 6
Map 7
Map 8
Map 9
P2
P2
P7
C2
7,494,000
Location Map
Map Area
Survey area
Flora Species of Significance
Dolichoocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3)
0
1,200
metres
Manuwarra Red Dog Hwy Stage 4
Borrow Pits Biological Survey
Vegetation Map 1
Biota Environmental Sciences
Author: A Lapinski
Drawn: M Robinson
Job No.: 15118
Date: 12 Oct 2022
Revised:
Projection: MGA 250 (GDA94)
Scale: 1:25,000



A combined total of 53 vertebrate fauna species were recorded from the survey area during the field survey, four of which are considered to be significant (the Northern Quoll, Western Pebblemound Mouse, Ghost Bat, and Pilbara Leaf-nosed Bat).

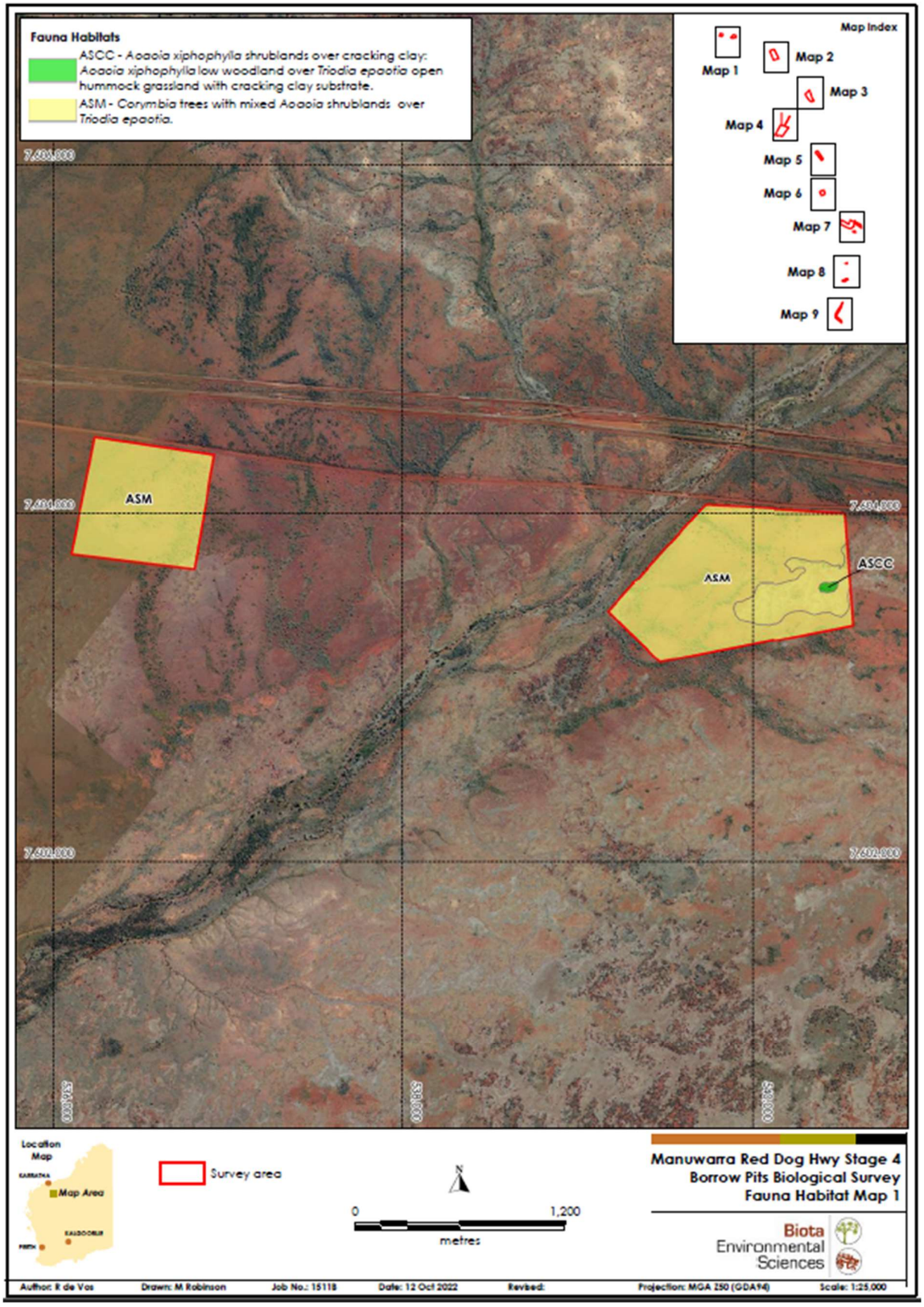
Table 7.1: Overview of vertebrate fauna species recorded during the field survey work.

Fauna Group	Status	No. of Species	No. of Significant Species
Ground-dwelling Mammals	Native	2	2*
	Introduced	0	0
Bats	Native	11	2
Birds	Native	36	0
Reptiles	Native	4	0
Amphibians	Native	0	0
	Total	**53**	**4***

* Pebble-mound Mouse from secondary evidence only.

Fauna habitat of the application areas:

ASM - Mixed *Acacia* shrublands	*Corymbia* trees with mixed *Acacia* shrublands over *Triodia epactia* on stony substrates.	P1, P2, P7, P8	1,532.6 (56.6%)	Excellent	Species expected to occur in this habitat include those with particular associations to spinifex (e.g. mammals that forage on seeds, such as Sandy Inland Mouse *Pseudomys hermannsburgensis* and Desert Mouse *P. desertor*), or with associations to stony flats (e.g. the dragon species Fortescue Pebble-mimic Dragon *Tympanocryptis fortescuensis*, *Hamersley Pebble-mimic Dragon T. diabolicus* and Southern Pilbara Tree Dragon *Diphoriphora valens*), along with a wide range of species that utilise shrubs and spinifex for cover and/or foraging. Some shrublands support *Acacia* species that contain root-dwelling larvae, an important food resource for the threatened Bilby (*Macrotis lagotis*), however the substrates in the survey area are not considered optimal for burrowing by the Bilby.


Fauna Habitats
ASCC - Acacia xiphophylla shrublands over cracking clay; Acacia xiphophylla low woodland over Triodia epactia open hummock grassland with cracking clay substrate.
ASM - Corymbia trees with mixed Acacia shrublands over Triodia epactia.
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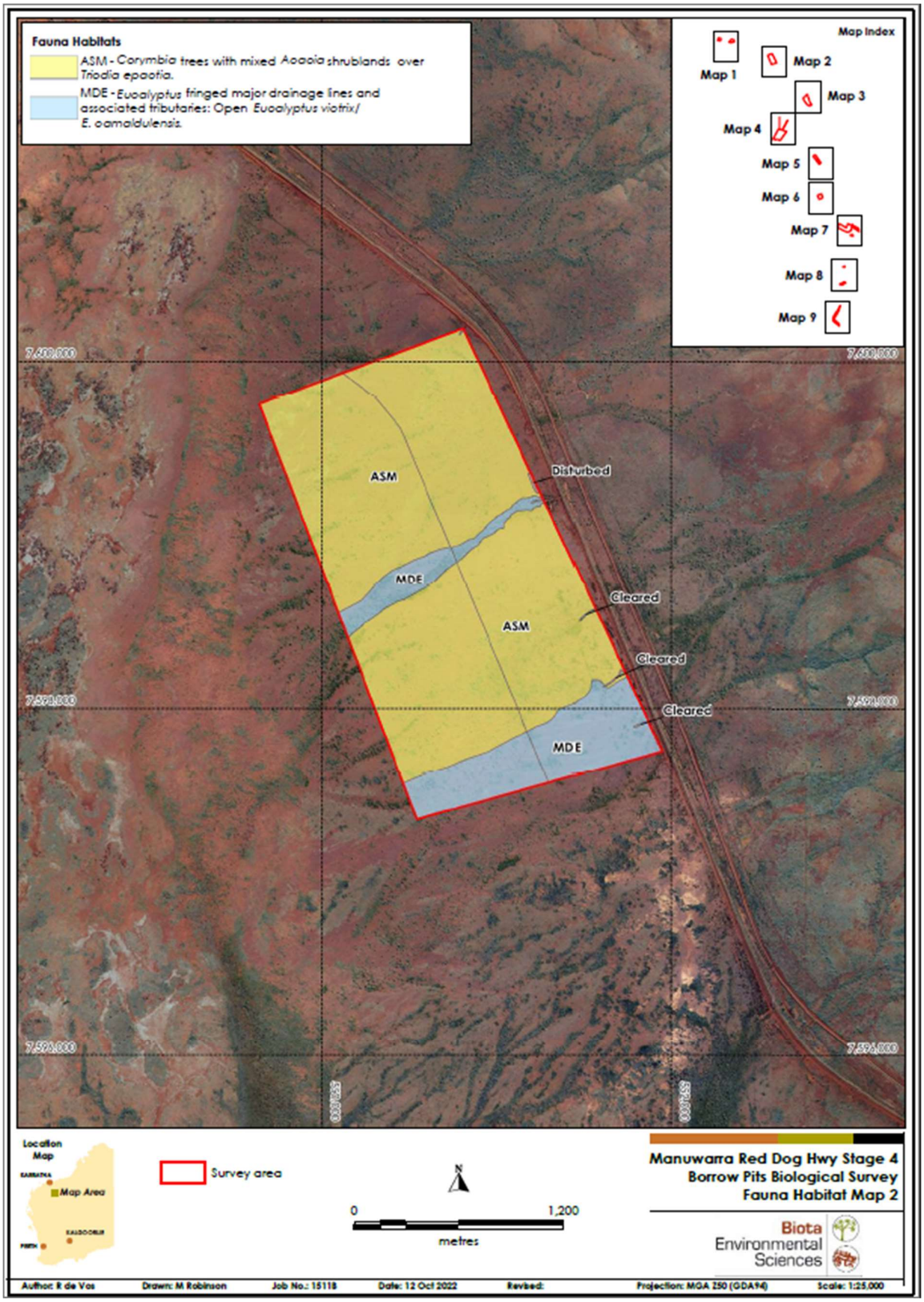
Map 7
Map 8
Map 9
ASM
ASM
ASCC
Location Map
Map Area
Survey area
0
1,200
metres
Manuwarra Red Dog Hwy Stage 4
Borrow Pits Biological Survey
Fauna Habitat Map 1
Biota Environmental Sciences
Author: R de Vos
Drawn: M Robinson
Job No.: 15118
Date: 12 Oct 2022
Revised:
Projection: MGA 250 (GDA94)
Scale: 1:25,000


Fauna Habitats
ASM - Corymbia trees with mixed Acacia shrublands over Triodia epactia.
MDE - Eucalyptus fringed major drainage lines and associated tributaries: Open Eucalyptus viatrix/ E. camaldulensis.
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Map 8
Map 9
ASM
Disturbed
MDE
Cleared
ASM
Cleared
Cleared
MDE
7,600,000
7,599,000
7,598,000
552,000
554,000
Location Map
Map Area
Survey area
N
0
1,200
metres
Manuwarra Red Dog Hwy Stage 4
Borrow Pits Biological Survey
Fauna Habitat Map 2
Biota Environmental Sciences
Author: R de Vos
Drawn: M Robinson
Job No.: 15118
Date: 12 Oct 2022
Revised:
Projection: MGA Z50 (GDA94)
Scale: 1:25,000

Appendix E. Sources of information

E.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

E.2. References

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