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Clearing Assessment Report – CPS 818

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Western Australia.*

Great Eastern Highway (H005) Karalee
SLK 394.69 to SLK 414.02
Goldfields-Esperance
2283

Contents

1	PROPOSAL	5
1.1	Purpose and Justification.....	5
1.1.1	Main Roads Approach to Road Safety and the Environment	5
1.2	Proposal Scope.....	5
1.3	Proposal Location.....	6
1.4	Clearing Details.....	6
1.5	Alternatives to Native Vegetation Clearing Considered During Proposal Development.....	8
1.6	Measures to Avoid, Minimise, Reduce and Manage Proposal Clearing Impacts	8
1.7	Approved Policies and Planning Instruments.....	10
2	SCOPE AND METHODOLOGY ASSESSMENT OF CLEARING	11
2.1	Report Terminology and Sources.....	11
2.2	Desktop Assessment	11
2.3	Surveys and Assessments	11
3	SURVEY RESULTS	13
3.1	Summary and Analysis of Flora and Vegetation Surveys	13
3.2	Summary and Analysis of Fauna Surveys	15
3.3	Summary and Analysis of Desktop Assessment	16
4	DESKTOP ASSESSMENT OF VEGETATION	17
4.1	Desktop Vegetation Description.....	17
5	ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES	21
6	VEGETATION MANAGEMENT	46
7	REHABILITATION, REVEGETATION AND OFFSETS	46
7.1	Revegetation and Rehabilitation	46
7.2	Offset Proposal.....	46
8	STAKEHOLDER CONSULTATION	46
9	COMPLIANCE WITH CPS 818	47
10	REFERENCES	49
11	APPENDICES	52
	Appendix 1: Vegetation of the Karalee Clearing Area.....	53

List of Figures

Figure 1: Proposal Locality	7
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List of Tables

Table 1. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Proposal Clearing Impacts	9
Table 2. Summary of Surveys and Assessments Relevant to the Proposal	12
Table 3: Priority flora recorded within the Karalee Survey Area	14
Table 4: Conservation Significant Fauna and Fauna Habitat of the Survey and Clearing Area	15
Table 5. Pre-European Vegetation Representation	17
Table 6: Summary of Vegetation Types within Clearing Area	19
Table 7: Fauna Habitat of the Survey and Clearing Area (GHD 2016).....	27
Table 8. Pre-European Vegetation Remaining	39
Table 9. Summary of Additional Management Actions Required by CPS 818.....	47

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1 PROPOSAL

1.1 Purpose and Justification

Main Roads Western Australia proposes to upgrade Great Eastern Highway (GEH) between the town sites of Southern Cross and Coolgardie (SLK 394.69 to 414.02). This section of GEH (approximately 30 km east of Southern Cross) has a deteriorating pavement and narrow sealed width, which requires sections to be reconstructed, overlaid and widened. The aim of the project is to undertake road improvements by installing an overlay to raise the existing road and widen its sealed width, improve the road's geometry and drainage and improve the overall safety for road users.

1.1.1 Main Roads Approach to Road Safety and the Environment

Main Roads is committed to minimising the environmental impacts of all of its activities and manages the State road network to achieve balanced economic, social, safety and environmental benefits for the community. Main Roads recognises that Western Australia's environment is significant from a global perspective and the unique conservation values that are contained within its road reserve. Main Roads road network often adjoins natural areas and, in some locations, the reserve itself hosts remnant vegetation with high environmental values. Although the reserves were not established for this purpose, Main Roads recognises that it has a responsibility to conserve the environmental values that occur within the State's road network and minimise the impact its proposals have on the environment. In addition to providing a safe and efficient road network for all people using the roads under its control, Main Roads is also committed to protecting the natural environment.

In accordance with National and State Government road safety policies, Main Roads is also committed to substantially reducing road trauma on the road network through Safe System principles. The Safe System approach acknowledges that more than two thirds of all serious crashes are due to human error rather than deliberate risk taking (e.g. speeding or drink driving) and seeks to improve behaviour through education and enforcement while managing the safety of vehicles, speeds and the road and road infrastructure. It is shown that improving sub-optimal road formation will substantially reduce the likelihood and severity of road crashes. For example, according to the Road Safety Management Guideline, increasing the sealed shoulder from 0.5 m to 2 m will reduce Killed and Seriously Injured numbers by more than 50%.

As the statutory authority responsible for providing and managing a safe and efficient main road network in Western Australia, Main Roads focuses on improving road safety by thoroughly considering all environmental, economic and community benefits and impacts. It operates on a hierarchy of avoiding, minimising, reducing and then, if required, offsetting our environmental impacts. This has been achieved through changes in proposal scope and design. Main Roads regularly reduces its clearing footprint by restricting earthworks limits for proposals, steepening batters, installing barriers, establishing borrow pits in cleared paddocks and avoiding temporary clearing for storage, stockpiles and turn around bays to avoid and minimise its impacts.

Further details on measures to avoid, minimise and reduce are provided in Section 1.5.

1.2 Proposal Scope

Main Roads proposes to upgrade 19.3 km section of GEH between Southern Cross and Coolgardie. The upgrade will comprise the following components:

- Reconstruction of road to correct the vertical and horizontal standard geometry

- Overlay and widening to increase formation width to 11 m
- Construction of new parking bay
- Construction of 3 km passing lanes west and east bound between SLK 409 to 413
- Culvert upgrades increasing water capacity
- Improved drainage including new A-Drains, F-drains, and table drains
- Upgraded intersections and driveway tie-ins
- New road delineation, signage and line marking

Materials will be sourced from separately approved pits.

1.3 Proposal Location

The Clearing Area is located on Great Eastern Highway between SLK 394.69 and SLK 414.02, in the Shire of Yilgarn, as shown in Figure 1.

The central coordinate of the proposal is 119.7046894°E 31.2901411°S.

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818:

The area of native vegetation proposed to be cleared is **38.56 ha**.

Areas of Native Vegetation Clearing:

The areas of native vegetation to be cleared, is restricted to areas immediately adjacent to the existing Great Eastern Highway and road verge, shown in the map series outlined in Appendix 1.

Type of Native Vegetation:

According to the broad scale mapping undertaken by Beard (Shepherd et al. 2002), pre-European vegetation associations are of the Coolgardie Interim Biogeographic Regionalisation for Australia (IBRA) and Southern Cross sub-region, including:

- Boorabbin Veg Assoc No. 141 - Medium woodland; York gum, salmon gum & gimlet
- Boorabbin Veg Assoc No. 1413 - Shrublands; acacia, casuarina & melaleuca thicket
- Boorabbin Veg Assoc No. 128 - Bare areas; rock outcrops

The type of vegetation to be cleared under this clearing permit has been mapped at a finer scale by GHD (2016) and includes vegetation units that broadly align with the Beard vegetation associations of the Coolgardie IBRA region. Vegetation units mapped by GHD (2016) are presented in Appendix 1.

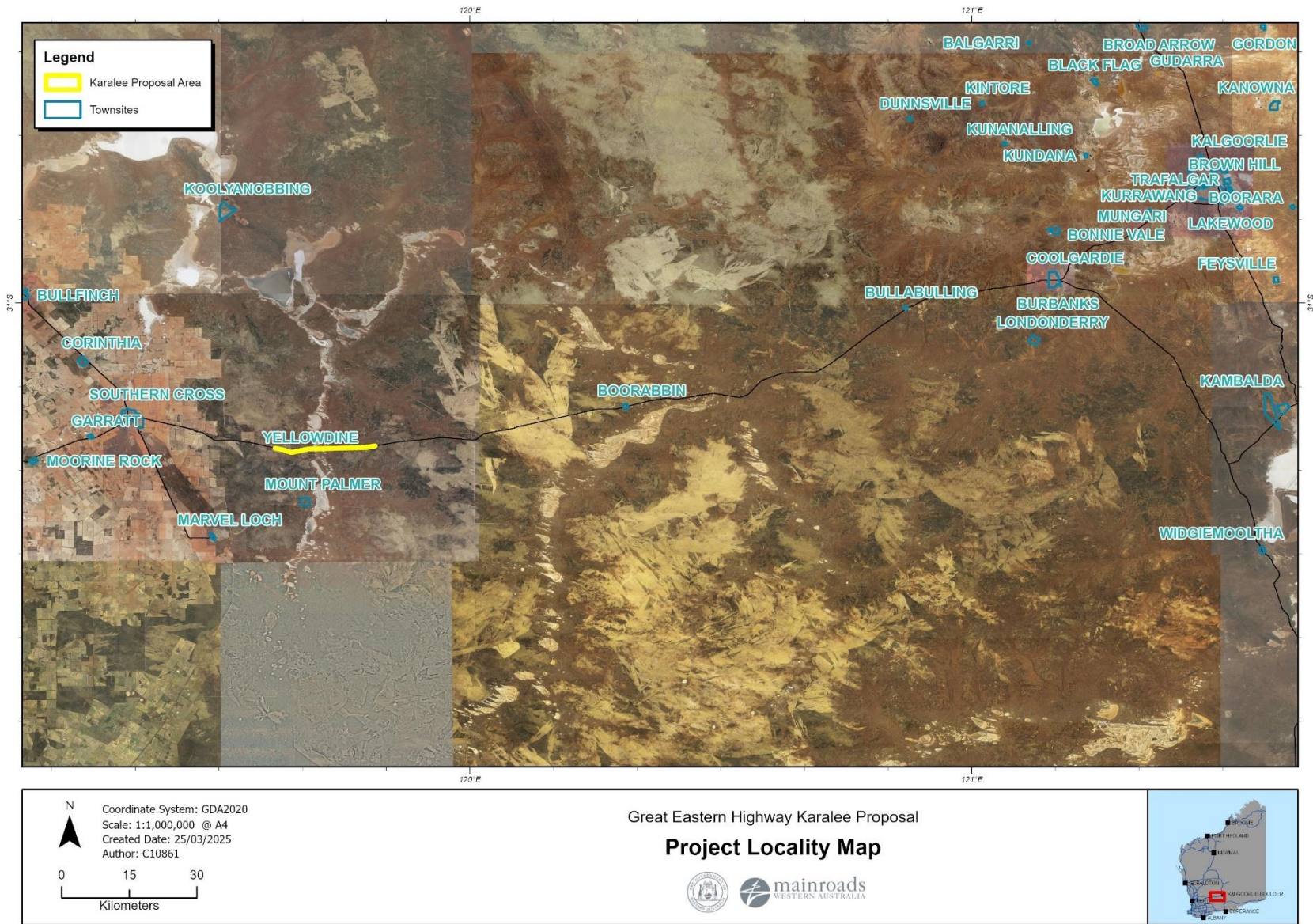


Figure 1: Proposal Locality

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

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

- Do not upgrade the road, however this will potentially result in a poorer safety outcome and may result in future fatalities or serious injuries and further degradation of the State road asset.
- Main Roads retains frangible vegetation where a clear zone is to be established for road projects. For this project, however, clearing will only be required to accommodate the road formation, with no clear zone being established. Accordingly, the retention of frangible vegetation does not apply to this proposal.
- Reducing the speed limit to minimise clearing requirements, while still balancing safety (driver fatigue) and freight efficiency. Speed Limits are an essential mechanism to ensure the safe and efficient operation of road networks. The application of appropriate speed limits and other traffic management measures is a key mechanism in managing vehicle speeds to achieve desired safety, mobility, traffic management, local amenity, and road user expectations. There are several factors involved in road safety, including road conditions, driver behaviour and overall road design. Except in special situations, reducing speed limits below national standards on state and national roads is not typically supported as it has the potential to contribute to driver frustration, impatience, tiredness and recklessness. The environmental values protected by reducing the speed limit, do not justify the impacts on freight efficiencies nor road user safety. Accordingly, the reduction of the speed limits to avoid clearing of native vegetation for this proposal is not proposed.
- Minimisation of clearing buffers to reduce the impact to specific vegetation units of the project area and working within a tighter footprint.

1.6 Measures to Avoid, Minimise, Reduce and Manage Proposal Clearing Impacts

The design and management measures implemented to avoid and minimise the potential clearing impacts of the Proposal are provided in Table 1.

Table 1. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Proposal Clearing Impacts

Design or Management Measure	Discussion and Justification
Alignment to one side of existing road	The proposal has been strategically designed to encompass an already cleared major highway, with maximum usage of cleared areas alongside the existing route. The adjacent Yellowdine National Park boundary constrains the proposal boundary to the north and south, limiting the extent of the proposal area. Deviation from the existing centreline will significantly increase the impacts to clearing and require extensive land access negotiations with stakeholders.
Alternative alignment located within pasture or degraded areas	The design has been developed to utilise the existing road alignment. An alternate route would significantly add to the quantity of clearing.
Simplification of design to reduce number of lanes and/or complexity of intersections	The widening scope of works cannot be further simplified whilst retaining the necessary safety benefits. The upgrade of the highway to include a passing lane has been selected as a result of traffic investigations conducted by the region. A passing lane is required to support the safe passing of heavy vehicles that consistently utilise this transport route. If the widening was not undertaken, this would likely result in no improvements in safety, which is unacceptable to Main Roads on this dangerous stretch of road network.
Steepen batter slopes	Batter slope angles to reduce clearing whilst remaining effective have been considered in the design and implemented where possible and appropriate.
Installation of barriers	The installation of safety barriers would not reduce the clearing footprint due to the requirements of roadside drainage. Thus, this is not a suitable measure to avoid.
Use of existing cleared areas for access tracks, construction storage and stockpiling	The location of water bores, water standpipes, laydown and camp infrastructure have all been located in existing cleared areas.
Drainage modification	Along the alignment, culverts are being installed to maintain the existing hydrological regime.

1.7 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, Main Roads has also had regard to the below instruments where relevant.

Other Legislation potentially relevant 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 and D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914* (WA) (RIWI Act)
- *Aboriginal Heritage Act 1972* (WA).

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 (DER, 2014)
- Procedure: Native vegetation clearing permits (DWER, 2021)
- Environmental Offsets Guidelines (Government of Western Australia, 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.
- National Recovery Plan for Malleefowl (*Leipoa ocellata*). (Department of Climate Change, Energy, the Environment and Water, 2024)
- Chuditch (*Dasyurus geoffroii*) Recovery Plan. (Department of Environment and Conservation, 2012)

2 SCOPE AND METHODOLOGY ASSESSMENT OF CLEARING

Native vegetation will be cleared to accommodate this proposal. This clearing will be undertaken using the Main Roads Statewide Clearing Permit CPS 818.

To comply with CPS 818, Main Roads must prepare a Clearing Assessment Report (CAR).

The CAR outlines the key activities associated with the proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the proposal using the ten Clearing Principles listed under s51 of the *Environmental Protection Act 1986* (EP Act) and strategies used to manage vegetation clearing.

2.1 Report Terminology and Sources

The following terms are used in this Clearing Report:

- **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. The Clearing Area for this proposal is 38.56 ha.
- **Extrapolated Area** – An area of extrapolated GIS vegetation condition and fauna habitat mapping to ensure complete coverage of the Clearing Area. The Extrapolated Area for this proposal is 0.23 ha. Further details are provided in Section 3.1.
- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the proposal is confined to a local area of a 40 km radius.
- **Survey Area** – Area covered by the GHD (2016) and Botanica (2021) Biological Surveys. The Survey Area is 189.07 ha.

2.2 Desktop Assessment

A desktop assessment of the proposal area was undertaken by viewing internal datasets and other government agency managed databases, and consulting with relevant stakeholders where necessary.

GIS layer viewing and mapping is done using ArcMap and/or Main Roads corporate mapping system known as iMaps. Referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. Government managed databases were searched to locate additional information, which are found under References in Section 10.

2.3 Surveys and Assessments

The following surveys/assessments were undertaken to inform this CAR:

- GHD (2016). Great Eastern Highway Karalee SLK 394.5 – 414 Biological Assessment
- Botanica Consulting (2021). Memorandum: Great Eastern Hwy Ghooli, Karalee & Quardanoologin Flora/ Fauna Assessment
- Main Roads (2025).

Biological and targeted surveys conducted for the proposal are outlined in Table 2 and a summary of the findings in these reports are presented in Sections 3.1 to 3.5.

Table 2. Summary of Surveys and Assessments Relevant to the Proposal

Consultant and Survey Name	Survey Details
<p>GHD (March 2016) Great Eastern Highway Karalee SLK 394.5 – 414.0 Biological Assessment</p>	<p>Survey Area: The Survey Area is 189.07 hectares (ha) and comprises the following:</p> <ul style="list-style-type: none"> • The area extending 20 m north and 50 m south of the Great Eastern Highway centreline from SLK 394.5 and SLK 396.5 • The area extending 50 m north and 50 m south of the Great Eastern Highway centreline from SLK 396.5 to SLK 414. <p>Type: The scope of the works comprised a flora, vegetation and fauna desktop assessment of the study area, and to undertake a biological survey of the Survey Area to provide:</p> <ul style="list-style-type: none"> • Description and mapping of vegetation units and vegetation condition • Assessment of plant species diversity, density, composition, structure and weed cover in quadrats • Location and extents of any Threatened or Priority Flora • Inventory of flora and fauna species • Description and mapping of fauna habitat <p>Timing: The field survey was conducted during spring, from 28 September to 1 October 2015.</p> <p>Survey Results Shapefile TRIM Ref: D16#199568 Document TRIM Ref: D16#199530</p>
<p>Botanica (2021) Memorandum: Great Eastern Hwy Ghooli, Karalee & Quardanoolagin Flora/ Fauna Assessment</p>	<p>Survey Area: The assessment area extends over an area of approximately 65 km from Ghooli (SLK 367.3-395) located directly east of Southern Cross to Karalee (SLK 394.5 to 414) and Quardanoolagin (Mt Palmer) (SLK 414.5 to 432). The Karalee survey area covered 189.07 ha.</p> <p>Type: The assessment for the proposal areas comprised:</p> <ul style="list-style-type: none"> • Review previous biological surveys and updated flora likelihood of occurrence table provided for Ghooli, Karalee and Quardanoolagin. • Undertake desktop likelihood of occurrence for Threatened and Priority flora, and Threatened fauna to inform field survey effort. • Undertake a targeted field survey for Threatened and Priority flora, survey and map extent of populations. • Undertake opportunistic sampling for Threatened and Priority fauna which may occur in the survey area. • Update vegetation condition mapping from the three previous surveys. • Provide a short report with updated data on Threatened and Priority flora, Threatened fauna, and vegetation condition. <p>Timing: The assessment area was systematically searched on foot by four Botanica staff members from the 5th to 8th October 2020.</p> <p>Survey Results Shapefile TRIM Ref: D21#873133 Document TRIM Ref: D21#717575</p>
<p>Main Roads (2025)</p>	<p>Survey Area: A 40 km radius from the Clearing Area (and in relation to the adjacent Quardanoolagin (Mt Palmer) Proposal Area).</p>

Consultant and Survey Name	Survey Details
Great Eastern Highway Karalee & Quardanoolagin (Mt Palmer) Widening Reconstruction and Overlay SLK 395 – 435 Desktop Assessment	<p>Type: A Desktop Assessment using DBCA and Western Australian Herbarium restricted flora, fauna and Ecological community databases and the Commonwealth Department of Climate Change, Energy, the Environment and Water’s Protected Matters Search Tool (PMST) (DCCEEW, 2025a) to identify conservation significant species and ecological communities previously recorded and potentially present within a 40 km radius of the Clearing Area.</p> <p>Timing: March 2025.</p> <p>Document TRIM Ref: D25#51298</p>

3 SURVEY RESULTS

3.1 Summary and Analysis of Flora and Vegetation Surveys

A field survey was conducted by GHD 28 September to 1 October 2015. The survey timing was considered optimal for the flora and fauna field survey, having received approximately 56% higher rainfall than the long term average for the July to September period prior to the survey.

A corridor of 20 m and 50 m south of the Great Eastern Highway centre line from SLK 394.5 to SLK 396.5, and 50 m north and south of the highway centreline was surveyed from SLK 396.5 to SLK 414.0.

GHD (2016) surveyed 121.89 ha of native vegetation within 189.07 ha of survey area, identifying five vegetation associations, not including highly degraded areas, comprising:

- *Eucalyptus* woodland (W1)
- *Eucalyptus* mallee woodland (LW1)
- *Allocasuarina* and *Acacia* shrubland (TS1)
- *Acacia acuminata* tall open shrubland (TS2)
- *Tecticornia* low shrubland (LS1)

The vegetation present within the Karalee Survey Area does not align with any Threatened Ecological Community (TEC), Priority Ecological Community (PEC) or other significant vegetation.

In 2020, Botanica Consulting was commissioned to review previous biological surveys of Great Eastern Highway, including the Karalee Clearing Area. Botanica conducted an updated likelihood of occurrence assessment for Threatened and Priority flora, and Threatened fauna to inform field survey effort, a targeted field survey for Threatened and Priority flora, surveying and mapping the extent of populations, opportunistic sampling for Threatened and Priority fauna, and updated vegetation condition mapping. Field work occurred 5 to 8 October 2020. The data presented in this report combines both GHD’s and Botanica’s findings, utilising the most current information.

Reviewed and rated by Botanica (2021), the condition of each vegetation unit varied from Excellent to Very Good- Good. These areas are presented in Table 6.

Slight changes to the proposal design occurred late 2024, and as a result small slithers of the proposed Clearing Area lay outside the Survey Area. Therefore, up to 0.23 ha of vegetation was not

surveyed by GHD (2016) or Botanica (2021) and these small areas were extrapolated by Main Roads (2025), based on aerial imagery and surrounding vegetation type mapping (Appendix 1).

GHD's likelihood of occurrence assessment for Threatened and Priority flora identified two Priority Flora taxa as 'likely' to occur and nine Priority flora taxa as 'possible' to occur within the Karalee Survey Area (GHD, 2016). Reviewed and refined by Botanica, six of the Priority flora are considered 'possible' to occur and six Priority Flora are considered 'unlikely' to occur. Those considered 'possible' to occur include:

- *Acacia lobulata* (EN – BC Act)
- *Mirbelia taxifolia* (Priority 1)
- *Goodenia heatheriana* (Priority 1)
- *Lissanthe scabra* (Priority 2)
- *Acacia desertorum* var. *nudipes* (Priority 3)
- *Phebalium brachycalyx* (Priority 3)

During the field surveys, GHD (2016) recorded 182 flora taxa (including subspecies and varieties) representing 47 families and 107 genera from the survey area. This total comprised 172 native species and 6 introduced (exotic) species.

No Threatened and three Priority-listed flora taxa were recorded within the GHD (2016) Survey Area. These species included:

- *Verticordia dasystylis* subsp. *dasystylis* (P2)
- *Stylidium choreanthum* (P3)
- *Gompholobium cinereum* (P3)

Botanica's targeted search for Threatened and Priority flora, re-visiting locations of existing GHD and DBCA records of Priority flora within the Survey Area, confirmed the presence of the GHD records only; no re-counts of the existing GHD records were undertaken, however Botanica recorded additional plants within the vicinity of GHDs previous records.

Table 3 summarises these findings.

Table 3: Priority flora recorded within the Karalee Survey Area

Taxon	Conservations Status	GHD Records (2016)	Botanica Records (2021)	Percentage within Clearing Area
<i>Verticordia dasystylis</i> subsp. <i>dasystylis</i>	P2	23 plants	11 plants	0%
<i>Stylidium choreanthum</i>	P3	1000 plants	-	12.2%
<i>Gompholobium cinereum</i>	P3	2 plants	-	0%

Only *S. choreanthum* occurs within the Clearing Area. In addition to the 1,000 plants recorded by GHD in 2015, greater than 1,050 individuals are known to occur regionally totalling to approximately 12.2% impact the known occurrences of this taxon. This is discussed further in section 5 (Principle (a)).

No other impacts to significant flora are likely to occur, as a result of native vegetation clearing, for the proposal.

3.2 Summary and Analysis of Fauna Surveys

GHD ecologists undertook a single season Level 1 fauna survey (reconnaissance survey) of the Survey Area from 28 September to 1 October 2015.

The GHD (2016) assessment, utilising the EPBC Act PMST Report, NatureMap Fauna Report (10 km buffer) identified the likely presence of five species of conservation significance, including:

- Malleefowl (*Leipoa ocellata*) – Vulnerable EPBC Act and BC Act
- Woma (*Aspidites ramsayi (southwest subpop)*) – Priority 1 BC Act
- Chuditch, Western Quoll, (*Dasyurus geoffroii*) - Vulnerable EPBC Act and BC Act
- Central Long-eared Bat (*Nyctophilus major tor*) – Priority 3 BC Act
- Rainbow Bee-eater (*Merops ornatus*) – now delisted under the BC Act, and listed as a protected marine species (in Commonwealth areas) only.

GHD surmised that all of the above-listed species had the potential to utilise habitat in the proposal area as outlined in Table 4.

Table 4: Conservation Significant Fauna and Fauna Habitat of the Survey and Clearing Area

Fauna Habitat	Habitat and Information	Associated with Significant Species	Fauna Habitat within the Survey Area (ha)	Fauna Habitat within the Clearing Area (ha)
<i>Allocasuarina</i> and <i>Acacia</i> shrubland	Vegetation association: TS1 and TS2. Occupies approximately 19% of the survey area.	<p>Potential hunting and breeding habitat for:</p> <ul style="list-style-type: none"> • Woma <p>Potential foraging and refuge opportunities for:</p> <ul style="list-style-type: none"> • Central Long-eared Bat. <p>Occasional foraging, dispersal and refuge habitat for:</p> <ul style="list-style-type: none"> • Malleefowl • Rainbow Bee-eater 	36.08	12.00
Mixed <i>Eucalypt</i> woodland	Vegetation association: W1 and LW1. When combined this habitat occupies approximately 46% of the survey area.	<p>Potential hunting/foraging and breeding opportunities for:</p> <ul style="list-style-type: none"> • Woma • Central Long-eared Bat. <p>Occasional foraging, dispersal and refuge habitat for:</p> <ul style="list-style-type: none"> • Malleefowl • Rainbow Bee-eater 	84.19	26.14

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Fauna Habitat	Habitat and Information	Associated with Significant Species	Fauna Habitat within the Survey Area (ha)	Fauna Habitat within the Clearing Area (ha)
Chenopod shrubland	Vegetation association: LS1 This habitat type consists of one vegetation association, is restricted to the salt lakes present and occupies less than 1 % of the survey area.	Potential foraging and dispersal opportunities for: <ul style="list-style-type: none"> Rainbow Bee-eater 	1.62	0.42
Highly degraded	N/A	N/A	67.18	N/A
Total			189.07	38.56

In addition to the GHD fauna surveys, Botanica conducted opportunistic sampling for evidence of conservation significant fauna (i.e., direct species observation, tracks, mounds/ nests or scats) in the survey area in October 2020. No conservation significant fauna species were recorded during this survey, and Botanica made no changes to the Likelihood of Occurrence for the significant species mentioned by GHD (2016).

No primary or secondary evidence of significant species was identified in either the GHD (2016) or Botanica (2021) field surveys.

3.3 Summary and Analysis of Desktop Assessment

Flora

As both GHD and Botanica biological assessments considered a 10 km desktop area only, Main Roads undertook an additional desktop assessment identifying conservation significant flora that may occur in proximity to the Karalee Clearing Area. With a 40 km desktop Study Area applied, Main Roads (2025) identified a total of 74 conservation significant taxa that have been previously recorded within the 40 km radius desktop Study Area. State listed flora comprised twenty Priority one (P1) species, nine Priority two (P2) species, thirty-three Priority three (P3) species and six Priority four (P4) species, plus six Threatened Flora listed under State legislation, including:

- *Daviesia macrocarpa*
- *Eucalyptus crucis subsp. crucis*
- *Frankenia parvula*
- *Gastrolobium graniticum*
- *Isopogon robustus*
- *Philothea falcata*

Within the 40 km desktop Study Area, Main Roads identified 55 conservation significant flora taxa that had not been assessed by GHD (2016) or Botanica (2021), for a 'Likelihood of Occurrence' within the Clearing Area. This assessment identified one additional priority flora species to those listed above, *Thryptomene interzonensis*, that may possibly occur within the Clearing Area. This assessment

was undertaken based on Florabase information, restricted ArcGIS DBCA and WA Herbarium data identifying dated documented locations, habitat descriptions and population data, then comparing this information with the presence of suitable habitat in the Clearing Area.

Fauna

Main Roads (2025) conducted a desktop review of the DBCA restricted ArcGIS data, increasing the desktop search area to a 40 km radius from the Clearing Area, identifying 193 records. These records comprised only of 11 species, including four birds, two invertebrates, four mammals and one reptile. The desktop review identified seven fauna species that had not been assessed by GHD (2016) or Botanica (2021), for a 'Likelihood of Occurrence' within the Clearing Area, including:

- Peregrine Falcon (*Falco peregrinus*) - Specially Protected - Other Specially Protected
- Western Rosella (*Platycercus icterotis xanthogenys*) – Priority 4
- Common Greenshank (*Tringa nebularia*) – Migratory EPBC Act and BC Act
- Western Brush Wallaby (*Notamacropus Irma*) – Priority 4
- Red-tailed phascogale (*Phascogale calura*) – Vulnerable EPBC Act and Conservation Dependant BC Act
- Tree-Stem Trapdoor Spider (*Idiosoma castellum*) – Priority 4
- Water Flea (inland south west) (*Daphnia jollyi*) – Priority 1

An assessment of likelihood of occurrence for the above-listed species determined only the Peregrine Falcon and Western Brush Wallaby were 'likely to occur' within the Clearing Area.

4 DESKTOP ASSESSMENT OF VEGETATION

4.1 Desktop Vegetation Description

According to the broad scale mapping undertaken by Beard (Shepherd et al 2002), the Native Vegetation Clearing Area is mapped as occurring within Coolgardie Bioregion and Southern Cross sub-region.

Table 5 provides details of the pre-European vegetation associations within the Clearing Area and the remaining extent of these associations. As evident in Table 5, the vegetation associations have significantly greater than 30% of their pre-European extent remaining at all levels.

Table 5. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
Veg Assoc No. 141	Statewide	1,158,760.28	960,755.59	82.91	35.24
	IBRA Bioregion Coolgardie	883,085.75	858,525.09	97.22	46.08
	IBRA Sub-region Southern Cross	883,085.75	858,525.09	97.22	46.08
	Local Government Authority Shire of Yilgarn	711,450.38	690,599.07	97.07	39.76
Veg Assoc No. 1413	Statewide	1,679,916.32	1,286,855.48	76.60	13.22

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Pre-European Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
	IBRA Bioregion Coolgardie	1,061,212.28	1,042,553.77	98.24	18.18
	IBRA Sub-region Southern Cross	953,237.73	934,825.95	98.07	19.38
	Local Government Authority Shire of Yilgarn	538,791.10	395,458.48	73.40	19.26
Veg Assoc No. 128	Statewide	329,836.19	288,813.54	87.56	20.94
	IBRA Bioregion Coolgardie	184,549.90	183,891.19	99.64	18.79
	IBRA Sub-region Southern Cross	156,192.80	155,552.26	99.59	21.01
	Local Government Authority Shire of Yilgarn	45,797.43	41,452.12	90.51	27.40

Five native vegetation types were mapped within the native vegetation clearing area (GHD, 2016) with the areas summarised in Table 6. Vegetation condition has been mapped as Excellent to Very Good – Good (Botanica, 2021).

Table 6: Summary of Vegetation Types within Clearing Area

Vegetation Code	Vegetation Type	Vegetation Description (GHD2016)	Karalee Survey Area (ha)	Karalee Clearing Area (ha)	Vegetation Condition (ha) (Botanica 2021)
W1	<i>Eucalyptus</i> woodland	Sparse canopy of <i>Eucalyptus salmonophloia</i> (16 - 18 m) over a sparse sub-canopy of <i>E. salubris</i> , <i>E. oleosa</i> , <i>E.yilgarnensis</i> , <i>E.calycogona</i> , and <i>E.melanoxylon</i> over a tall open shrubland of <i>Acacia acuminata</i> , <i>Senna artemisioides</i> subsp. <i>filifolia</i> , <i>Eremophila oppositifolia</i> (2-3 m) over a shrubland of <i>Senna artemisioides</i> subsp. <i>filifolia</i> , <i>E. ionantha</i> , <i>E. scoparia</i> , <i>A. colletioides</i> , <i>Exocarpos aphyllus</i> , <i>Alyxia buxifolia</i> , <i>Olearia pimeleoides</i> , <i>Atriplex vesicaria</i> and <i>Scaevola spinescens</i> . Common ground layer species included <i>Austrostipa elegantissima</i> , <i>Sclerolaena diacantha</i> , <i>S.patenticuspis</i> , <i>Maireana georgei</i> and <i>M.trichoptera</i> .	72.52	22.03 0.21* Total 22.24	Excellent 8.45
					Excellent- Very Good 11.88
					Very Good 0.21
					Very Good – Good 1.70
LW1	<i>Eucalyptus</i> mallee woodland	Mid-dense canopy of <i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i> , <i>E.oleosa</i> , <i>E. yilgarnensis</i> and <i>E. horistes</i> (5 - 8 m) over a tall shrub layer of <i>Acacia acuminata</i> , <i>A. resinimarginea</i> , <i>A. verrucula</i> and <i>Grevillea paradoxa</i> (2 – 4 m) over a sparse shrubland of <i>Alyxia buxifolia</i> , <i>Senna artemisioides</i> subsp. <i>filifolia</i> , <i>Scaevola spinescens</i> , <i>A. colletioides</i> , <i>A. erinacea</i> and <i>E. ionantha</i> . Common ground layer species included <i>Aristida contorta</i> , <i>Calandrinia eremaea</i> , <i>Waitzia acuminata</i> var. <i>acuminate</i> , <i>Podolepis lessonii</i> and <i>Lomandra effusa</i> .	11.67	3.90	Excellent 0.36
					Excellent - Very Good 0.47
					Very Good – Good 3.07
TS1	<i>Allocasuarina</i> and <i>Acacia</i> shrubland	Mid-dense shrubland of <i>Allocasuarina corniculata</i> , <i>A. spinosissima</i> , <i>Acacia beauverdiana</i> , <i>A. resinimarginea</i> , <i>A.assimilis</i> subsp. <i>assimilis</i> , <i>Leptospermum fastigiatum</i> , <i>Grevillea didymobotrya</i> subsp. <i>didymobotrya</i> , and <i>G.paradoxa</i> with occasional <i>Callitris preissii</i> and <i>Eucalyptus ?rigidula</i> (2-5 m) over a low mid-dense shrubland of <i>Euryomyrtus maidenii</i> , <i>Thryptomene kochii</i> ,	31.73	10.52	Excellent 7.17
					Very Good 1.88

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Vegetation Code	Vegetation Type	Vegetation Description (GHD2016)	Karalee Survey Area (ha)	Karalee Clearing Area (ha)	Vegetation Condition (ha) (Botanica 2021)
		<i>Euryomyrtus leptospermoides</i> , <i>Phebalium tuberosum</i> , <i>Platysace trachymenioides</i> and <i>Melaleuca cordata</i> . The ground layer was very sparse and included <i>Schoenus</i> sp. (insufficient material) and ± <i>Triodia scariosa</i> isolated hummock grasses.			Very Good – Good 0.84
					Excellent 0.63
TS2	<i>Acacia acuminata</i> tall open shrubland	<i>Acacia acuminata</i> tall open shrubland over <i>Borya constricta</i> <i>Acacia acuminata</i> tall open shrubland with <i>Brachychiton gregorii</i> low isolated trees over <i>Thryptomene kochii</i> , <i>Calytrix sapphirina</i> mid-open shrubland over <i>Borya constricta</i> , <i>Rhodanthe citrina</i> , <i>Lawrencella rosea</i> open herbland.	4.35	1.46 0.02* Total 1.48	Excellent - Very Good 0.83
					Excellent 0.65
LS1	<i>Tecticornia</i> low shrubland	Mid-dense low shrubland of <i>Tecticornia halocnemoides</i> (complex), <i>T. ?indica</i> subsp. <i>bidens</i> , <i>Frankenia cinerea</i> , <i>F. pauciflora</i> , <i>Rhagodia drummondii</i> , <i>Roycea divaricata</i> , <i>Angianthus tomentosus</i> , <i>Disphyma crassifolium</i> subsp. <i>clavellatum</i> , <i>Sclerolaena eurotioides</i> , <i>Eragrostis dielsii</i> , <i>Austrostipa elegantissima</i> and <i>Crassula exserta</i> (0.2 – 1.2 m) with scattered <i>Hakea preissii</i> on fringes (1-2 m).	1.62	0.42	Excellent - Very Good 0.42
	Highly Degraded	Areas within the survey area that have been completely cleared (e.g. roads and tracks) and are largely devoid of vegetation.	67.18		
	TOTAL		189.07	38.56 (excl cleared)	

* Indicates extrapolated vegetation mapping

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

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

Each principle has been assessed in accordance with the former Department of Environment Regulation (now Department of Water and Environmental Regulation (DWER) '*A Guide to the Assessment of Applications to Clear Native Vegetation*' (Department of Environment Regulation, 2014) and other relevant clearing permit application decision reports prepared by DWER.

The proposed clearing is at variance to Principle (f) and is not at variance, or not likely to be at variance, to the remaining 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.

The Clearing Area is located within the Coolgardie Bioregions and Southern Cross sub region (Government of Western Australia 2019). The following pre-European Beard vegetation associations are mapped as occurring within the Clearing Area:

- Vegetation Association 141: Medium woodland; York gum, salmon gum & gimlet
- Vegetation Association 1413: Shrublands; acacia, casuarina & melaleuca thicket
- Vegetation Association 128: Bare areas; rock outcrops

The vegetation associations within the Clearing Area have more than 73% of their pre-European extent remaining intact at all levels.

The Clearing Area is a long linear area adjacent and alongside the existing road corridor. This area comprises five vegetation types mapped by GHD in 2015. Vegetation mapping and condition was reviewed by Botanica in 2020.

Vegetation types that intersect the Clearing Area comprise:

- *Eucalyptus* woodland (W1)
- *Eucalyptus* mallee woodland (LW1)
- *Allocasuarina* and *Acacia* shrubland (TS1)
- *Acacia acuminata* tall open shrubland (TS2)
- *Tecticornia* low shrubland (LS1)

All vegetation types are widely available beyond the Clearing Area, with 17.27 ha vegetation mapped rated as Excellent, 13.59 ha vegetation mapped as Excellent - Very Good, 2.11 ha vegetation mapped as Very Good and 5.59 ha mapped as Very Good- Good (Table 6).

Ecological communities

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) (as listed by DBCA) were identified within the Clearing Area, or within proximity of the Survey Area (DCCEEW, 2025a).

Significant Flora

GHD (2016) conducted a search of Nature Map database identifying 422 plant taxa representing 61 families and 185 genera within the Study Area, including 11 non-native flora taxa.

In a likelihood of occurrence assessment, GHD (2016) identified two Priority Flora taxa as 'likely' to occur and nine Priority flora taxa as 'possible' to occur within the Survey Area. Botanica (2021) reviewed and refined the species list to six significant flora taxa considered 'possible' to occur and six Priority Flora taxa considered 'unlikely' to occur. Those considered 'possible' to occur include:

- *Acacia lobulata* (Threatened) - discussed further in Principle (c)
- *Mirbelia taxifolia* (Priority 1)
- *Goodenia heatheriana* (Priority 1)
- *Lissanthe scabra* (Priority 2)
- *Acacia desertorum* var. *nudipes* (Priority 3)
- *Phebalium brachycalyx* (Priority 3)

As both GHD and Botanica biological assessments considered a 10 km desktop area only, Main Roads (2025) undertook an additional desktop assessment of the restricted DBCA and WA Herbarium ArcGIS databases, identifying 74 conservation significant flora taxa in a 40 km radius from the Clearing Area. State listed flora comprised twenty Priority one (P1) species, nine Priority two (P2) species, thirty-three Priority three (P3) species and six Priority four (P4) species, plus six Threatened Flora listed under State legislation (discussed further in Principle (c)).

Within the 40 km desktop Study Area, Main Roads identified 55 significant flora that had not been assessed by GHD (2016) or Botanica (2021), for a 'Likelihood of Occurrence' within the Clearing Area. An assessment of likelihood of occurrence for these 55 significant flora species was undertaken based on Florabase information, restricted ArcGIS DBCA and WA Herbarium data identifying dated documented locations, habitat descriptions and population data, then comparing this information with the presence of suitable habitat in the Clearing Area. The Likelihood of Occurrence assessment identified one additional priority flora taxa to those listed above, *Thryptomene interzonensis* (Priority 1), that may possibly occur within the Clearing Area (Main Roads 2025).

During the field surveys, GHD (2016) and Botanica (2021) identified three Priority Flora taxa within the Survey Area:

- *Gompholobium cinereum* (Priority 3)
- *Stylidium choreanthum* (Priority 3)
- *Verticordia dasystylis* subsp. *dasystylis* (Priority 2)

A discussion of each conservation significant flora species 'likely' or 'possible' to occur in the Survey Area has been provided below, including context of potential impact as a result of the proposed native vegetation clearing.

Mirbelia taxifolia (Priority 1)

This taxon has been documented on 10 occasions within the restricted WA Herbarium ArcGIS database and one occurrence within the restricted DBCA ArcGIS database, although six of the ten

records appear to be duplicates of two historic entries. These records are observed as four populations spanning 200 km north (Mt Walton Access Road) to south (Hyden-Norseman Track).

The closest occurrences to the Clearing Area are located approximately 3.7 km east, and 6.9 km northeast from the eastern extent of the Clearing Area; however, both records were historically documented in September 1924 and 1934 respectively. Only two other populations occur, dated 2018 and 1999, and are located over 90 km north northeast and 120 km south of the proposal area respectively.

Western Australian Herbarium (1998-) and the restricted ArcGIS data identifies that this species grows on yellow sand and sandy loams. Botanica (2021) suggests suitable habitat for this species is available in the Survey Area, most likely in vegetation type TS1, *Allocasuarina* and *Acacia* shrubland on deep yellow sands. Up to 10.52 ha of this habitat is available in the Clearing Area.

Both Western Australian Herbarium (1998-) and the restricted ArcGIS data suggests this species flowers in September, displaying orange to red inflorescences. The GHD and Botanica surveys were both undertaken during the optimal flowering period for this species. Botanica (2021) surmised that the field survey efficacy was considered high for this taxon and that this species is not cryptic to identify.

Given that this species is not cryptic, and noting that the historic documented records of *Mirbelia taxifolia* were not located during the multiple field surveys which were undertaken during the optimal flowering period, it is considered unlikely that this taxon occurs in the Clearing Area.

Goodenia heatheriana (Priority 1)

Goodenia heatheriana is an annual herb that grows to 0.15 m high. It is known to be spreading with flowers that are predominantly yellow (Western Australian Herbarium 1998-).

The taxon has been documented on nine occasions within the restricted WA Herbarium ArcGIS database and on one occurrence within the restricted DBCA ArcGIS database (a duplicate). The data shows that this species distribution spans from Great Eastern Highway at its northern occurrence, to almost 40 km south at Parker Range. The western extent occurs 15 km south southeast of Southern Cross while the eastern extent is located 25 km west of Parker Range.

The closest known record to the Clearing Area occurs 7.55 km west, along Great Eastern Highway (on soils mapped as AC1 Atlas System) (CSIRO,2015), however this record is considered historic having been recorded in 1931. The remainder of records occur at least 22 km from the Clearing Area. Western Australian Herbarium (1998-) and the restricted ArcGIS databases suggest that the taxon has flowered during the months of September and October, and it grows on red crumbly clay loam, greenstone gravel and cobbles, sometimes associated with a creek bed, colluvial flats and the roadside on undulating plains.

Botanica (2021) reported that some suitable habitat may occur in the Survey Area. Soils mapped by Department of Primary Industries and Regional Development (DPIRD), identify the AC1 Atlas System in which the closest record of this taxon occurs, this coincides with GHD's vegetation type TS1, *Allocasuarina* and *Acacia* shrubland, of which 10.52 ha of this habitat is mapped within the Clearing Area.

Botanica reported that this species can be cryptic and that the presence of annual taxa was limited during the survey, however both GHD (2016) and Botanica (2021) surveyed during the optimal flowering period and the taxon was not recorded. It is therefore unlikely that *Goodenia heatheriana* occurs in the Clearing Area.

Thryptomene interzonensis (Priority 1)

This is a newly termed *Thryptomene*, having been described recently by Barbara Rye in *Nuytsia The Journal of the Western Australia Herbarium*, August 2024, previously known as *Thryptomene* sp. *Mt Clara* (R.J. Cranfield 11702).

Thryptomene interzonensis Rye. sp. *nov* is a shrub that grows 0.3–0.8 high and 0.3–1 m diameter. This species occurs in the Coolgardie and Avon Wheatbelt bioregions, from three known localities extending over 112 km from Jaurdi Station south to Parker Range, Western Australia (Rye, 2024).

The restricted DBCA and WA Herbarium ArcGIS databases identify four records (one duplicate), from open scrub on a yellow clayey sandplain, the edge of a salt pan over exposed granite, and sandplain. The WA Herbarium records, and Rye (2024), indicates that white flowers are recorded from November to February, and mature fruits in January and February. Only records between November to February have been documented in the restricted ArcGIS databases.

The closest known record occurs approximately 13 km north (recorded 1997) from the eastern end of the Clearing Area and the next closest is over 50 km south southwest. The Clearing Area is within the taxon's distribution.

Within the Clearing Area, suitable habitat may possibly occur within vegetation type W1, *Eucalyptus* Woodland, on yellow clay sandplains (22.24 ha in the Clearing Area), vegetation type TS2, *Acacia acuminata* tall open shrubland, with exposed granite (1.48 ha in the Clearing Area).

Although the surveys did not occur during the known flowering period for this species, *Thryptomene interzonensis* is not a cryptic species and has different leaves to the other *Thryptomene* sp. identified during the survey. It is therefore unlikely that *Thryptomene interzonensis* Rye. sp. *nov* has been misidentified or occurs in the Clearing Area.

Verticordia dasystylis subsp. *dasystylis* (Priority 2)

Verticordia dasystylis subsp. *dasystylis* is small shrub ranging in height from 0.2-0.4 m. The restricted DBCA and WA Herbarium ArcGIS databases identify 5 records and 19 records respectively (four duplicates), that indicate its distribution extends from Duladgin Nature Reserve in the north to approximately 20 km south to Condarnin Rock Nature Reserve (2 km south of the Clearing Area). The species' distribution east to west spans only 4 km near Yellowdine. The restricted ArcGIS data identifies that the species occurs on granitic sands or clay loams in association with granite exposures. The known flowering period is from September to November and flowers are green and yellow (Western Australian Herbarium 1998-).

V. dasystylis subsp. *dasystylis* was observed growing within the mallee woodland vegetation association (LW1) occurring within the western portion of the Survey Area (with a survey efficacy rated as high during both surveys). The taxon was restricted to a closed shallow depression situated within granitic soils of the outer apron of the granite outcrop to the north of the Survey Area in an area likely to retain moisture for extended periods following rainfall. GHD (2016) reported that the local occurrence comprised 23 individuals and approximately 20% of those were flowering at the time of the survey, occupying an area approximately 5 m x 10 m (0.005 ha). Botanica recorded another 11 plants in 2021. Although these occurrences are within the Survey Area, none are within the Clearing Area or will be impacted by native vegetation clearing.

Lissanthe scabra (Priority 2)

Lissanthe scabra is a rigid, erect, fairly densely branched shrub, that grows up to 1 m high (Western Australian Herbarium 1998-).

It is known from 18 records within the restricted WA Herbarium ArcGIS database and from ten occurrences within the restricted DBCA ArcGIS database (almost all duplicates). The data shows that this species distribution ranges 90 km east west, from Jaurdi Homestead to both north and south of Garratt (near Southern Cross); and approximately 85 km north to south, from Jaurdi Station in the north to Frog Rock Nature Reserve (22 km west of Marvel Loch).

The restricted ArcGIS data indicate that white flowers have been observed July to September, and November, but has also been recorded May, and July to November suggesting that it has been located during non-flowering periods. The taxon grows on white to orange-brown clay, sandy gravel loams, and granite breakaways, and uplands (Western Australian Herbarium 1998-).

The species has been recorded twice in 1989, almost 500 m and 600 m south from the Clearing Area at SLK 395.3. Vegetation types LW1, *Eucalyptus* mallee woodland (3.90 ha within the Clearing Area) and TS2, *Acacia acuminata* tall open shrubland (1.48 ha within the Clearing Area), both comprise an apron of granitic soils, and sandy gravel/ outcrops suitable for this taxon to occur. However, restricted ArcGIS data indicates that the taxon is known to occur in association with *Melaleuca pauperiflora* subsp. *fastigiata*, *Eremophila decipiens*, scattered *Borya constricta*, *Alyxia buxifolia*, *Micromyrtus racemosa*, *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Callitris columellaris*, *Eremophila latrobei* subsp. *Filiformis*, most of which were not representative of any vegetation unit mapped within the Clearing Area.

GHD (2016) reported that a high level of field survey efficacy was applied regarding this taxon, and although the surveys were conducted outside the known flowering period, it has been identified during non-flowering periods. Therefore, it is suggested that if the taxon occurred within the Survey Area it would have been located during the field surveys.

Acacia desertorum var. *nudipes* (Priority 3)

Acacia desertorum var. *nudipes* is a shrub to approximately 2 m or rarely a tree to approximately 4 m. The taxon grows on yellow sandplains and lateritic gravel, in heath and tall open shrubland (Western Herbarium, 1998-).

The restricted WA Herbarium and DBCA ArcGIS databases record 35 records within 40 km, approximating greater than 665 plants. Furthermore, Botanica (2021) recorded 690 individuals and GHD identified 303 individuals in the Mt Palmer Survey Area only 9.5 km east of the Clearing Area. In a botanical survey conducted for the Ghooli survey area of 2016, GHD identified 650 individuals, and Botanica identified a further 242 individuals, located 7.9 km east of the Clearing Area.

The restricted ArcGIS data suggests that this species has been recorded April and May, July to October, December and January. The records suggest that the frequency within the recorded populations are numerous, however individual numbers cannot be estimated.

Botanica reports that this taxon is a non-cryptic species and that the surveys were undertaken during the optimal flowering period. The taxon was not identified within the Clearing Area. Given the high level of survey efficacy in the optimal flowering period, and that hundreds of individuals were identified in other areas of the local setting within a similar period, it is considered highly unlikely that this taxon occurs in the Clearing Area.

Phebalium brachycalyx (Priority 3)

Phebalium brachycalyx is a shrub that grows 0.4-1.5 m high. This taxon has a large distribution, occurring in the Eremaean and South-West Botanical Province, in the Coolgardie, Mallee and Swan Coastal Plain IBRA regions (Western Herbarium, 1998-).

The restricted WA Herbarium and DBCA ArcGIS databases identify 16 and seven records respectively, indicating that this species ranges from near Wongan Hills in the west, to the town of Siberia (north of Kalgoorlie) in the east, some 430 km. Its northern extent occurs near Jibberding (near Wubin) spanning almost 400 km southeast to Varley in the southwest of Western Australia. The restricted ArcGIS data identifies that *Phebalium brachycalyx* has been recorded during the months of August, September to October and January, with white to cream flowers reported in August and September. The records indicate that it is known to occur on sand, gravelly soils on lateritic uplands and hills.

One record occurs 9.4 km east of the Clearing Area, 1.3 km north of SLK 423.2. This entry was documented in 1966. The next closest record occurs almost 110 km west southwest of the Clearing Area, recorded in 1970. The record located near Siberia is much more current and is located at the eastern extent of its range.

Botanica (2021) reports that this species is not cryptic and GHD (2016) surveyed during the optimal flowering period. The Botanica survey (2021) was conducted after the optimal flowering and known identification period. However, given that this taxon is not cryptic and has previously been identified in its non-flowering period, it is suggested that if the taxon occurred within the Survey Area it would have been located.

Gompholobium cinereum (Priority 3)

Gompholobium cinereum is a decumbent, densely branching shrub to 0.45 m high. It occurs in shrubland or woodland on yellow sands, yellow-brown clayey sands or brown loams over laterite. The taxon's recorded distribution is large, extending from Jaurdi Hill north of Coolgardie, west approximately 460 km to Croton Creek north of Geraldton (Atlas of Living Australia 2016, Chappill et al 2008). The southern most extent occurs 50 km south of Southern Cross, and the northern most extent occurs 42 km north of Northampton.

GHD (2016) observed two *Gompholobium cinereum* individuals growing within the *Acacia* and *Allocasuarina* shrubland vegetation association occurring at the western extent of the Survey Area. The vegetation at this location was regenerating following a previous fire event (3-5 years earlier). The individuals were growing in loose yellow sands on the mid-slope of a gently undulating sand plain and were flowering and fruiting at the time of the survey. GHD reported a high level of survey efficacy for this species.

The recordings of *Gompholobium cinereum* are not within the Clearing Area and will not be impacted. Given the high level of survey efficacy for this species, it is highly unlikely to be found elsewhere within the Clearing Area.

Stylidium choreanthum (Priority 3)

Stylidium choreanthum is a creeping perennial herb up to 3 cm high and 30 cm wide. It occurs on white or yellow sandplain or on red sandy soils. Flowers are pink and white and the known flowering period is from September to November (Western Herbarium, 1998-). The restricted WA Herbarium and DBCA ArcGIS databases identify 30 documented records and seven records respectively, identifying its distribution to extend 240 km east west, from Kambalda to Bullfinch

(40 km north northwest). Its northern extent lies near the town of Jackson, spanning 200 km south to its southern extent, 54 km west of the Norseman-Esperance Road turnoff, on a track to Hyden.

During the biological field surveys, GHD (2016) observed *S. choreanthum* growing within the *Acacia* and *Allocasuarina* shrubland vegetation association occurring at the eastern extent of the Karalee Survey Area. The local occurrence was restricted to areas of *Acacia* shrubland with a substrate characterised by loose yellow/orange sands with occasional laterite surface gravels. GHD (2016) recorded approximately 1,000 individuals, mapped as a 4 ha polygon. Upon identifying potential impact to this taxon caused by this proposal, Main Roads has amended the road design between SLK 411.75 to SLK412.18, reducing the area of potential impact to 0.73 ha; equating to approximately 18.25% of the local population.

The restricted WA Herbarium and DBCA ArcGIS databases provide only vague population estimates, however, one documented occurrence located at Mount Manning Range Conservation Park (110 km north of the Clearing Area) recorded over 1,000 individuals. Therefore regionally, conservative records indicate a total greater than 2,050 plants. This equates to 8.9% of the recorded regional population that occurs within the Clearing Area.

Fauna Habitats

GHD (2016) identified three key fauna habitat types in the Survey Area, as seen in Table 7. These habitats are widespread and representative of surrounding habitats within the conservation areas of Yellowdine, Condarnin Rock, Biljahnies Rock and Jilbadji Nature Reserves.

Table 7: Fauna Habitat of the Survey and Clearing Area (GHD 2016)

Fauna Habitat	Habitat and Information	Fauna Habitat within the Survey Area (ha)	Fauna Habitat within the Clearing Area (ha)
<i>Allocasuarina</i> and <i>Acacia</i> shrubland	Vegetation association: TS1 and TS2. Occupies approximately 19% of the survey area.	36.08	12.00
Mixed <i>Eucalypt</i> woodland	Vegetation association: W1 and LW1. When combined this habitat occupies approximately 46% of the survey area.	84.19	26.14
Chenopod shrubland	Vegetation association: LS1 This habitat type consists of one vegetation association, is restricted to the salt lakes present and occupies less than 1 % of the survey area.	1.62	0.42
Total		121.89	38.56

Although the vegetation may be used for faunal dispersal, the vegetation does not form an ecological linkage and the proposed clearing is unlikely to significantly fragment fauna habitats noting the existing fragmentation from the Great Eastern Highway and nearby powerline, Goldfields water pipeline, railway line and other disturbances such as old tracks associated with the historic Karalee townsite.

Significant Fauna

Biological surveys by GHD (2016) and Botanica (2021) did not record any primary or secondary evidence of conservation significant fauna within the Clearing Area or broader Survey Area. As discussed further in Clearing Principle (b), a number of conservation significant fauna species may utilise habitats within the Clearing Area, mostly as irregular visitors utilising foraging and dispersal habitat as opposed to breeding habitat. However, given the linear and fragmented nature of habitats in the Clearing Area, and noting habitats are well represented beyond the Clearing Area in large tracts of intact conservation estate, no fauna species is expected to rely on the Clearing Area as critical habitat. Similarly, fauna diversity in the Clearing Area is not likely to be high in comparison to the adjoining and nearby Nature Reserves and National Parks.

Summary

GHD (2016) reported that the clearing of native vegetation for the Karalee proposal is considered unlikely to significantly impact on regional populations of fauna, with no fauna that only utilises the habitat of the Clearing Area. One flora species, *Stylidium choreanthum*, will be impacted by the proposed clearing, with impact to *S. choreanthum* reduced to an estimated 18.25% locally, and 8.9% of the known regional population. This Priority 3 species has broad habitat preferences, with current records spanning 240 km east-west and 200 km north-south. It is unlikely that the proposed clearing will impact the conservation status of this species.

The Clearing Area does not comprise a large number or diverse suite of flora or fauna. None of the flora or fauna are considered to have a range restricted to the Clearing Area. Although most vegetation is rated as 'Excellent to Very Good – Good', the Clearing Area does not comprise a TEC or PEC and is not considered to be in better condition than the adjoining vegetation within surrounding conservation areas.

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

Methodology

- Atlas of Living Australia (2016)
- Botanica (2021)
- DCCEEW (2025a)
- GHD (2016)
- Government of Western Australia (2019)
- Government GIS Shapefiles:
 - DBCA Threatened and Priority Ecological Community database search (Accessed 24 March 2025)
 - DBCA Threatened and Priority flora database search (Accessed 24 March 2025)
 - Ecological Linkages (Accessed 24 March 2025)
- Main Roads (2025)
- Natural Resource Management SLIP Soil Systems (Accessed 20 March 2025)
- Rye (2024)
- Western Australian Herbarium (1998-)

(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.

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

Based on a desktop assessment (10 km radius) in 2016, GHD (2016) identified the potential presence of five significant fauna species to occur within the Karalee Clearing Area, including:

- Malleefowl (*Leipoa ocellata*) – Vulnerable EPBC Act and BC Act
- Chuditch, Western Quoll, (*Dasyurus geoffroii*) - Vulnerable EPBC Act and BC Act
- Woma (*Aspidites ramsayi* (southwest subpop)) – Priority 1
- Central Long-eared Bat (*Nyctophilus major tor*) – Priority 4 at the time of reporting, now Priority 3
- Rainbow Bee-eater (*Merops ornatus*) – now delisted under the BC Act. Not discussed further.

Main Roads (2025) conducted a desktop assessment of the DBCA restricted ArcGIS data, utilising a 40 km radius from the Clearing Area, identifying 193 fauna records. These records comprised only of 11 species, including four birds, two invertebrates, four mammals and one reptile. The desktop review identified seven fauna species that had not been assessed by GHD (2016) or Botanica (2021), for a 'Likelihood of Occurrence' within the Clearing Area. Only two are considered 'likely' to occur in the Clearing Area, including the Peregrine Falcon and Western Brush Wallaby.

No primary or secondary evidence of significant species was identified in either the GHD (2016) or Botanica (2021) field surveys.

The Clearing Area lies in an already fragmented landscape, with rail, pipeline and powerline infrastructure running parallel to the Great Eastern Highway alignment at various distances. In the Clearing Area, SLK 394.69 to SLK 396.7, the rail and pipeline infrastructure are located between 6 m to 10 m from the proposal boundary. The distance from the road then increases to 40 m from the proposal boundary at SLK 397.9, and just over 100 m near the old Karalee townsite (Yellowdine -SLK 398.8 to SLK399.2). At the old townsite, vegetation is highly fragmented, impacted by vehicle tracks and unofficial parking areas. From SLK 399.2 to SLK 401.3, a 60 m wide revegetation and power line corridor on the southern side of the alignment occurs only 10 m south of the Clearing Area. Therefore, when assessing impact to significant fauna, it is noted that fauna dispersal may be impeded by the existing rail and water pipeline corridors on the northern side of the highway, and revegetation and powerline corridor on the southern side of the alignment. Beyond this disturbance, fauna habitats are part of a larger intact area of vegetation extending throughout the greater locality.

GHD mapped three key fauna habitats in the Survey Area, including:

- *Allocasuarina* and *Acacia* shrubland - Vegetation association: TS1 and TS2. Occupies approximately 19% of the Survey Area (12.00 ha in the Clearing Area).
- Mixed Eucalypt woodland - Vegetation association: W1 and LW1. When combined this habitat occupies approximately 46% of the Survey Area (26.14 ha in the Clearing Area).
- Chenopod shrubland - Vegetation association: LS1. This habitat type consists of one vegetation association, is restricted to the salt lakes present and occupies less than 1 % of the Survey Area (0.42 ha in the Clearing Area).

A summary of each identified significant fauna rated 'likely' or 'possible' to occur in the Survey Area and the habitat it prefers, has been provided below.

Malleefowl (*Leipoa ocellata*) - Vulnerable

Malleefowl generally occur in semi-arid areas of Western Australia, and are associated with long unburnt thick vegetation, occupying shrublands and low woodlands that are dominated by mallee vegetation, as well as native pine *Callitris* woodlands, *Acacia* shrublands, Broombush (*Melaleuca uncinata*) vegetation or coastal heathlands (DCCEEW, 2024, DCCEEW, 2025b).

DBCA restricted database identified numerous records of Malleefowl within 40 km of the Survey Area, from 1964 to 2024. The closest record of Malleefowl to the Clearing Area was recorded in 1995, 100 m west of the old Karalee townsite.

Up to 12.00 ha of suitable habitat is present in the Clearing Area, in the form of dense *Allocasuarina* and *Acacia* shrubland (TS1 and TS2) and 26.14 ha Mixed Eucalypt Woodland (W1 and LW1). However, the leaf litter layer was generally poor to moderate coverage (GHD 2016), making this less preferable habitat than the large tracts of intact, nearby native vegetation within Yellowdine, Condarnin Rock, Biljahnje Rock and Jilbadji Nature Reserves.

Despite the presence of potentially suitable habitat, no signs of Malleefowl breeding (e.g. mounds) or other evidence of Malleefowl presence (tracks, scats or feathers) were recorded during either the GHD (2016) or Botanica (2021) field surveys.

GHD (2016) reported that the habitats of the broader Survey Area are part of an area of contiguous vegetation, and it may be used as a part of the Malleefowl's larger home range for foraging, refuge and/or for dispersal. GHD concluded that it is unlikely that a Malleefowl population would rely on the habitats present within the Survey Area and the clearing of habitat for the Karalee proposal is unlikely to significantly impact on the regional population.

Given the Clearing Area is close to a major highway, contains a poor to moderate leaf litter coverage, contains no evidence of Malleefowl usage and is fragmented in comparison to large, intact tracts of better condition vegetation in adjoining nature reserves, it is unlikely to constitute significant habitat for the species.

Chuditch, (*Dasyurus geoffroii*) – Vulnerable

The Chuditch is now known only from Western Australia where it predominantly occurs in Jarrah (*Eucalyptus marginata*) forest and the great Western Woodland, and mallee shrubland, of the Goldfields, Midwest, South Coast, SouthWest, Swan, Warren and Wheatbelt IBRA Regions. The survey areas are part of the area of occupancy for the species (DEC, 2012, DCCEEW, 2025b).

The DBCA restricted database identified numerous records of Chuditch within 40 km of the Clearing Area, with records ranging from 1989 to February 2022. The closest record to the Clearing Area was recorded in 1994 at the former Karalee Tavern site, while the remainder of records are at least 15 km or more from the Clearing Area. A grey literature search identified several recent records of Chuditch in the broader Goldfields region, recorded by industry, indicating that the presence of Chuditch within suitable habitat in the local setting is likely.

GHD (2016) considers some habitat may be present within the Survey Area, primarily comprising dry woodland and mallee shrublands, including 12.00 ha of *Allocasuarina* and *Acacia* shrubland

(TS1 and TS2) and 26.14 ha Mixed Eucalypt Woodland (W1 and LW1). The Chuditch may use this vegetation for limited foraging and transit through broad corridors of contiguous vegetation. Vegetation in the Survey Area lacks trees and logs with hollows suitable for breeding, however the habitat may potentially form part of an individual's home range which can span up to 1,500 ha for males and approximately 300 ha for females (Serena and Soderquist 1989; in DEC 2012).

GHD reported that it is unlikely that a population of Chuditch would rely on the habitats present within the Survey Area and the clearing associated is considered unlikely to significantly impact the regional population.

Conservation areas in the Study Area such as Yellowdine Nature Reserve (32,870 ha), Jilbadji Nature Reserve (208,866 ha), Boorabin National Park and adjoining Goldfields Woodlands Conservation Park (>100,000 ha) are far more likely to provide critical Chuditch habitat than the linear, narrow and fragmented Clearing Area, particularly given the lack of suitable breeding habitat in the Clearing Area, as noted by GHD.

Woma, (*Aspidites ramsayi* (southwest subpop.)) – Priority 1

Populations of the Woma Python extend from central Australia into the south-western edge of Queensland, and into northern South Australia. Other populations are known from the Pilbara coast, north to the Eighty-mile Beach area and south-west Western Australia from Cape Peron south and east to the eastern Goldfields. There are very few recent records of the Woma within the southern parts of its range.

Woma Pythons are found in desert dunefields and on sandy plains, usually with hummock grasses but also other natural vegetation. The species is known to breed and hunt in areas with good ground cover and animal burrows, preferring to hunt lizards, snakes, birds and small mammals. The Woma is quiet and shy, mostly seen at dusk or during warmer nights (Government of South Australia, 2011).

The restricted DBCA ArcGIS database identified 30 documented records of Woma Python in Western Australia, and only one record was identified within the 40 km desktop search area, approximately 30 km west of the Clearing Area, in Southern Cross. This record and those documented east of Merredin (six records) are recorded prior to 1966.

GHD (2016) specified that this species may occasionally breed and hunt within the Survey Area, in almost all habitats (38.56 ha of *Allocasuarina* and *Acacia* shrubland and Mixed Eucalypt Woodland) in which animal burrows were commonly observed during the field survey.

No primary or secondary signs of the Woma were noted in either GHD (2016) or Botanica (2021) surveys. Given the Clearing Area is most likely beyond the eastern extent of its range, it is unlikely that the Woma inhabits the Clearing Area.

Central Long-eared Bat, (*Nyctophilus major tor*) - Priority 4

The Central Long-eared Bat is found south of the Hamersley Range and across South Australia as far east as the Eyre Peninsula. It is a bat that prefers mixed eucalypt woodlands with prominent shrub layers, and around the fringes of she-oak and wattle thickets. The species roosts in tree crevices, foliage or under loose bark (Parnaby, 2009).

GHD (2016) reported that the species may potentially utilise habitat within the Survey Area for foraging, breeding and roosting habitat within eucalypt woodlands (with hollow-bearing trees and crevices). Hollows were very rare and mostly absent from *Allocasuarina* and *Acacia* shrubland but may occur in the mixed *Eucalypt* woodland within *Eucalyptus salmonophloia* and *E. melanoxylon* although most trees present were not hollow bearing due to age or growth habit (i.e. mallees).

Only two known occurrences of the Central Long-eared Bat are recorded within 40 km of the Clearing Area, one located almost 30 km west at Southern Cross, and the other 40 km south. Both records were documented in 1981. Given the surrounding conservation areas of Yellowdine, Condarnin Rock, Biljahnje Rock and Jilbadji Nature Reserves, more suitable habitat beyond the Clearing Area is widely available and is likely to be preferable than the long linear habitat alongside a major highway. It is unlikely that the Clearing Area constitutes significant habitat for the Central Long-eared bat, given the abundance of better quality habitat in adjacent areas and the level of disturbance within the Clearing Area from the adjacent highway and other nearby infrastructure.

Western Brush Wallaby (*Notamacropus irma*) – Priority 4

The Western Brush Wallaby is now distributed across the south-west of Western Australia from north of Kalbarri to Cape Arid. The western brush wallaby's optimum habitat is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heath-land, and is uncommon in karri forest (DBCA, n.d).

The species is highly mobile, often moving around during the day, resting in thicket, and is adapted to movement through open landscapes (DBCA, n.d).

The restricted DBCA ArcGIS database identifies over 2,000 records of Western Brush Wallaby in Western Australia. Only four records occur within 40 km of the Clearing Area, and these seem to be the northern extent for inland records. The closest occurrence to the Clearing Area occurs 17 km southwest.

Whilst the Western Brush Wallaby may potentially utilise habitats in the Clearing Area, it is more likely to prefer intact vegetation and hunting opportunities found within the nearby conservation areas of Yellowdine, Condarnin Rock, Biljahnje Rock and Jilbadji Nature Reserves. Given the extent of uncleared, better quality habitat in the local and regional area, the Clearing Area is unlikely to constitute significant habitat for this species.

Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected Species

The Peregrine Falcon is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water and may even be found nesting on high city buildings (Birdlife Australia, 2018). Open air space over all areas represents possible foraging areas for this species.

Some areas of the Survey Area could be used by this species as part of a broader home range, with all fauna habitats, *Allocasuarina* and *Acacia* shrubland, Mixed Eucalypt Woodland and Chenopod Shrubland possible habitats utilised by this species.

The Peregrine Falcon is a highly mobile species and is likely to prefer the more intact vegetation and hunting opportunities found within the nearby conservation areas of Yellowdine, Condarnin Rock, Biljahnies Rock and Jilbadji Nature Reserves.

Summary

The fauna habitat types identified by GHD (2016) in the Clearing Area do not represent significant habitat for fauna, noting they are adjacent to a major highway are not confined to the Clearing Area and are well represented in the local and regional area, including within large, intact tracts of conservation lands.

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

Methodology

- Avon Catchment Council (ACC) (2007)
- Birdlife Australia (2018)
- Botanica (2021)
- Department of Biodiversity Conservation and Attractions (n.d.)
- DCCEEW (2024)
- DCCEEW (2025a)
- DCCEEW (2025b)
- Department of Environment and Conservation (2012)
- GHD (2016)
- Government GIS Shapefiles:
 - DBCA Threatened and Priority fauna database search (Accessed 24 March 2025)
 - Ecological Linkages (Accessed 10 March 2025)
- Government of South Australia (2011)
- Parnaby (2009)

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

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

As both GHD (2016) and Botanica (2021) biological assessments considered a 10 km desktop search area for conservation significant flora, Main Roads (2025) undertook an additional desktop assessment of the restricted DBCA and WA Herbarium ArcGIS databases, identifying conservation significant flora taxa in a 40 km radius from the Clearing Area. This data comprised six Threatened flora listed under State legislation, including:

- *Daviesia microcarpa*
- *Eucalyptus crucis subsp. crucis*
- *Frankenia parvula*
- *Gastrolobium graniticum*
- *Isopogon robustus*
- *Philothea falcata*

Each of the state listed Threatened flora, is described in more detail below.

***Daviesia microcarpa* (Norseman Pea)**

As described within the Interim Recovery Plan for Norseman Pea, *Daviesia microcarpa* is a sprawling shrub to 40 cm high and 1 m wide, with 8-20 mm long needle-like phyllodes spirally arranged on tangled stems. The taxon occurs in discrete areas of disturbed low mallee heath over spinifex scrub, in loamy red-brown soil with calcrete nodules. The taxon has been found in both dry and moist soil conditions (DAWE, 2021, DBCA 2024).

A review of the restricted DBCA and WA Herbarium Flora ArcGIS Databases identified five records located almost 30 km northwest, near Southern Cross mine site. A. Brown (pers. comm. 2003; in DEC 2004) suggests that these plants are not thought to be naturally occurring. The records indicate that it may be a disturbance species, in that it has been found in Southern Cross Minesite rehabilitation and rehabilitated gravel pits on Eyre Highway, 5 km east north-east of Norseman. The taxon has been found in several road reserves associated with tracks or water pipeline routes.

The Norseman population records are in the DD14 Atlas Soil System of flat to undulating land with small valleys occasionally broken by low narrow rocky hills and ridges, or tors and bosses and the BB5 Atlas Soil System characterised by rocky ranges and hills of greenstones-basic igneous rocks (Natural Resource Management, 2025).

Daviesia microcarpa is considered unlikely to occur in the Clearing Area, based on the distance to the nearest populations and the different soil characteristics that are present in the Clearing Area.

***Eucalyptus crucis subsp. crucis* (Silver Mallee)**

The Silver Mallee grows 2-8 m high and is characterised with rough bark, growing on shallow, granitic, sandy loam soil on granite rocks associated with Sheoak (*Allocasuarina*), Wattle (*Acacia*) and One-sided Bottlebrush (*Calothamnus*) (DEC, 2008a).

The restricted DBCA and WA Herbarium ArcGIS databases identify 14 and 44 documented records respectively, indicating that the eastern extent of its occurrence is located at Southern Cross, spanning 100 km west to Maughan Nature Reserve. The records occur in two IBRA

regions, the Avon Wheatbelt and Coolgardie, in the Eastern Goldfields, Merredin and Southern Cross subregions (Government of Western Australia 2019).

Records specify that the taxon displays white flowers in July, October, December, or January to March, and has been documented in almost every month of the year, indicating that this taxon is not cryptic.

The closest record to the proposal area occurs 27 km west at Southern Cross, (undated). Mallee woodland on granitic soils is known to occur in vegetation types *Eucalyptus* mallee woodland (LW1) and *Acacia acuminata* tall open shrubland (TS2), however, given that this species is non-cryptic, the closest documented record is almost 30 km from the Clearing Area, and that the GHD (2016) and Botanica (2021) surveys were conducted during optimal identification seasons, it is surmised that the species would have been identified if it was present within the Survey Area.

***Frankenia parvula* (Short-leaved Frankenia, Drummonds Frankenia)**

The Short-leaved Frankenia is a procumbent to ascending small shrub (Western Australian Herbarium, 1998-). It is currently known from several populations, approximating 1,750 individuals. These numbers are sourced from twelve records lodged with the WA Herbarium and seven records from the restricted DBCA ArcGIS database. The taxon has been located near Tammin within the Kwolyin Nature Reserve and Glenluce Nature Reserve, both just over 200 km west of the Clearing Area.

The populations of *Frankenia parvula* are known to occur on white to brown sand over sandy clay in sandy rises near saline drainage lines, and along the high water mark of salt lakes. It is also sometimes found across the pan of seasonal lakes. These small rises act as islands and would be subject to periodic inundation of relatively fresh water after rains when fresher water flows along the drainage lines (DEC, 2008c).

The closest record of the Short-leaved Frankenia occurs approximately 15 km north of the Clearing Area, where five records occur in proximity to each other. Four of the five records to the north are located on the broadly mapped SV2 Atlas Soil System, which intersects the proposal between SLK 401.9 to SLK 403.55. This soil system, mapped by DPIRD, covers 61,608 ha, extending 42 km north and approximately 47 km south of the Clearing Area. The SV2 Atlas Soil System within the Clearing Area equates to 2.99 ha, and 0.0048% of the total SV2 Atlas Soil System.

On a finer scale, vegetation of the Survey Area was described and mapped by GHD (2016). The vegetation unit, *Tecticornia* low shrubland (LS1) approximately coincides with the SV2 Atlas Soil System, equating to 0.42 ha of potential habitat within the Clearing Area. GHD (2016) rated the taxon as an 'unlikely occurrence' as it was not found within 10 km of the Survey Area. Two quadrats measuring 20 m x 20 m were situated in the LS1 vegetation unit, with two *Frankenia* species, *F. cinerea* and *F. pauciflora* representative of this vegetation type. *F. parvula* is known to be difficult to identify in the field, however the taxon was assessed by a representative of the WA Herbarium, reducing the likelihood of misidentification.

Given the small area of potentially suitable habitat available in the Clearing Area, it is unlikely that the Clearing Area includes, or is necessary for the continued existence of, the Short-leaved Frankenia.

***Gastrolobium graniticum* (Granite Poison)**

Granite Poison is an erect open shrub, growing to 2.5 m tall. Flowering occurs from August to September. The taxon is known from several populations confined to a small Goldfields/ Wheatbelt area ranging as far east as Coolgardie (DEC, 2008b). At the western extent are two populations located 40 km east of Narambeen; at the southern extent lies four populations 70 km south of Coolgardie and the northern extent are two populations north of the proposal area (eastern end), discussed below. With over 18 records within the restricted DBCA ArcGIS database and another 43 records reviewed from WA Herbarium ArcGIS database, excluding potential overlaps, the total population size is estimated to be greater than 2,000 plants.

The closest records are located 2.4 km and 3.3 km north of the Clearing Area at SLK 415.3 and SLK 417.2 respectively. Both records occur on the AC1 Atlas Soil System, the same as that mapped for a very small portion of the Clearing Area. The next closest record is approximately 80 km east of the Clearing Area in Mx41 Atlas Soil System, described as flat to undulating pediments marginal to unit AC1; granitic rock outcrop and some low escarpments. This soil type does not occur in the Clearing Area.

DBCAs Florabase, restricted DBCA and WA Herbarium ArcGIS databases suggest that Granite Poison is associated with the margins of granite outcrops, especially along drainage lines; and on sandy soils in open woodland in association with *Allocasuarina huegeliana*, *Acacia acuminata*, *Acacia laroicalyx*, and *Alyxia buxifolia*.

GHD (2016) conducted an EPBC Act Protected Matters Report and a 10 km Nature Map Flora Species Report in August 2015. Both reports identified Granite Poison as potentially occurring within the Survey Area, however, a likelihood of occurrence assessment for this species determined that the species was unlikely to occur within the Survey Area as no suitable habitat occurs. The flora surveys conducted by GHD (2016) and Botanica (2021) did not identify the taxon within the Survey Area. It is also noted that GHD surveyed during the flowering period for *G. graniticum*, therefore if it was present in the Survey Area, it would most likely have been identified.

Based on the above, it is unlikely that the taxon would be found within the Clearing Area.

***Isopogon robustus* (Robust Coneflower)**

This taxon is a Protea, known from six records, restricted to the Parker Range, just over 40 km southwest of the Clearing Area (DEC, 2009).

The species grows on skeletal grey sandy loam on deeply weathered laterite ridges (Western Australian Herbarium, 1998-, restricted DBCA ArcGIS data, DEC 2009). The taxon is known to occur in four populations with several sub populations, almost exclusively within the Parker Range. The restricted DBCA ArcGIS data suggests that there are approximately 1,100 mature plants. The flowering period is from September to October.

Given the taxon's restricted range, being confined almost exclusively to the Parker Range, some 40 km south, it is unlikely that this taxon would occur in the Clearing Area.

***Philotheca falcata* (Sickle-leaved Waxflower)**

The Sickle-leaved Waxflower is a small shrub growing from 0.15 m to 0.25 m tall. The taxon flowers white in October. The waxflower is known from the Avon Wheatbelt and Coolgardie IBRA regions, within the Merredin and Southern Cross IBRA subregions.

The Sickle-leaved Waxflower was first collected in 1931 from Yellowdine in Western Australia, 30 km east of Southern Cross (Wilson, 1998; in DEC 2015), and 350 m south of SLK 398.4. There are seven records of this species in the restricted WA Herbarium ArcGIS database. Five of these records are clustered at one location (Yellowdine, recorded 1931) and are clearly historic. The taxon has not been recollected from this site since 1931, and it is now considered locally extinct at this location (Brown et al., 1998; Leigh et al., 1984; Western Botanical, pers. comm., 2014; in DEC, 2015). Three additional records are noted within the restricted DBCA ArcGIS database (recorded 2008), located over 90 km southwest from the Clearing Area.

The WA Herbarium reports that records collected in 2007 and 2008, are the only confirmed records of this species since 1931 (Western Australian Herbarium 2013; in DEC 2015). The species is currently known from an area south of Southern Cross in Western Australia, near Sloss Nature Reserve and Welsh Nature Reserve (Western Australian Herbarium, 2013). These records occur on dry orange laterite and clay loam on flat landscape.

Given *Philotheca falcata* is considered locally extinct from the Yellowdine locality, the species is easily identifiable, and the GHD (2016) and Botanica (2021) surveys were conducted in the optimal flowering season, it is surmised that the species would have been identified if it was present within the Survey Area.

Summary

Six Threatened flora taxa were identified from the 40 km desktop search. Based on the lack of or limited suitable habitat, or that the above listed threatened flora is restricted to specific locations, it is unlikely that the Clearing Area includes, or is necessary for the continued existence of, Threatened flora.

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

Methodology

- Botanica (2021)
- Department of Agriculture, Water and the Environment (2021)
- Department of Biodiversity Conservation and Attractions (2004)
- DCCEEW, (2025a)
- GHD (2016)
- Government GIS shapefiles:
 - DBCA Threatened flora database search (Accessed 24 March 2025)
- Department of Environment and Conservation (2008a)
- Department of Environment and Conservation (2008b)
- Department of Environment and Conservation (2008c)
- Department of Environment and Conservation (2009)
- Department of Environment and Conservation (2015)-
- Western Australian Herbarium (1998-)
- Wilson (1998)

(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.**

A search of DBCA databases did not identify any Threatened Ecological Communities (TECs) within the Clearing Area. A search of the Protected Matters Search Tool (DCCEEW, 2025a) identified one TEC within 40 km of the Clearing Area: the *Eucalypt* Woodlands of the Western Australian Wheatbelt.

The *Eucalypt* Woodlands of the Western Australian Wheatbelt occurs in the wheatbelt region between the Darling Range and the Great Western Woodlands. This recognised woodland is listed as a TEC under the EPBC Act and lies within the 40 km desktop search buffer area of the Karalee Clearing Area only, occurring approximately 35 km west. No impact will occur to this TEC due to the proposed clearing.

The vegetation types described in the Clearing Area by GHD (2016) are not representative of communities that correspond to any State (BC Act), or Commonwealth (EPBC Act) listed TEC.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- DCCEEW (2025a)
- GHD (2016)
- Government GIS shapefiles:
 - DBCA Threatened Ecological Community database search (Accessed 6 March 2025)

(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.

The Clearing Area is located within the Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) region and Southern Cross sub-region (Government of Western Australia, 2019).

According to the broad scale mapping undertaken by Beard (Shepherd et al 2002), the Clearing Area is mapped as occurring within the following pre-European vegetation associations:

- 141 – Medium woodland; York gum, salmon gum & gimlet
- 1413 - Shrublands; acacia, casuarina & melaleuca thicket
- 128 - Bare areas; rock outcrops

The National Objectives and Targets for Biodiversity Conservation recognise that the retention of 30% or more of the pre-clearing extent of each ecological community is necessary if Australia's biological diversity is to be protected (Commonwealth of Australia, 2001) except in constrained areas (Perth and Peel) where 10% representation should be maintained.

The Clearing Area is not located within a constrained area, with the vegetation associations having greater than 30% of pre-European vegetation extent remaining at all levels, as summarised in Table 8 below.

Table 8. Pre-European Vegetation Remaining

Pre-European Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in Managed Land (prop of pre-European Extent)
Veg Assoc No. 141	Statewide	1,158,760.28	960,755.59	82.91	35.24
	IBRA Bioregion Coolgardie	883,085.75	858,525.09	97.22	46.08
	IBRA Sub-region Southern Cross	883,085.75	858,525.09	97.22	46.08
	Local Government Authority Shire of Yilgarn	711,450.38	690,599.07	97.07	39.76
Veg Assoc No. 1413	Statewide	1,679,916.32	1,286,855.48	76.60	13.22
	IBRA Bioregion Coolgardie	1,061,212.28	1,042,553.77	98.24	18.18
	IBRA Sub-region Southern Cross	953,237.73	934,825.95	98.07	19.38
	Local Government Authority Shire of Yilgarn	538,791.10	395,458.48	73.40	19.26
Veg Assoc No. 128	Statewide	329,836.19	288,813.54	87.56	20.94
	IBRA Bioregion Coolgardie	184,549.90	183,891.19	99.64	18.79
	IBRA Sub-region Southern Cross	156,192.80	155,552.26	99.59	21.01
	Local Government Authority Shire of Yilgarn	45,797.43	41,452.12	90.51	27.40

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The vegetation within the Clearing Area is well represented locally and regionally, with clearing being undertaken within a narrow linear corridor either side of the existing roadway. As such the vegetation is not considered significant as a remnant of native vegetation.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Commonwealth of Australia (2001)
- Government GIS shapefiles:
 - Pre-European vegetation (Accessed 6 March 2025)
 - IBRA Regions (Accessed 6 March 2025)
 - IBRA Sub-Regions (Accessed 6 March 2025)
- 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.**Proposed clearing is at variance to this Principle.**

Based on GIS databases and biological surveys by GHD (2016) and Botanica (2021), the Clearing Area does not intersect any Internationally Important Wetlands (i.e RAMSAR) or Nationally Important Wetlands.

Although not considered a major or minor tributary, the Clearing Area intersects the non-perennial Mt Palmer Salt Lake System at SLK 402.4 - 402.7. Up to 0.42 ha of salt lake vegetation, LS1 - *Tecticornia* low shrubland has been mapped growing in association with this salt lake area (GHD, 2016).

Given the proposed clearing includes up to 0.42 ha of vegetation growing in, or in association with, an environment associated with a wetland (being a salt lake in this instance), the proposed clearing is at variance to this Principle. However, based on aerial imagery analysis and Australian Soil Resource Information System (ASRIS) analysis, the salt lake system coincides with the SV2 Atlas Soil System soil system, extending approximately 50 kilometres north and over 30 km south equating to 61,608 ha (CSIRO, 2015). The small amount of LS1 vegetation proposed to be cleared, within an existing road reserve, equates to 0.0048% of the total SV2 Atlas Soil System habitat, and is not likely to significantly impact the ecological functions of this extensive wetland system.

The proposed clearing is at variance to this Principle.

Methodology

- Botanica (2021)
- CSIRO (2015)
- GHD (2016)
- Government GIS shapefiles:
 - Geomorphic Wetlands (Accessed 6 March 2025)
 - Ramsar Wetlands (Accessed 6 March 2025)
 - Important Wetlands (Accessed 6 March 2025)
 - Watercourses (Accessed 6 March 2025)

(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 Australian Soil Resource Information System (ASRIS) mapping indicates that three soil landscape types occur within the Clearing Area (CSIRO, 2015). These areas are characterised as:

- AC1 Atlas System; Gently sloping to gently undulating plateau areas, or uplands, on granites, gneisses, and allied rocks, with long gentle slopes and, in places, abrupt erosional scarps
- DD15 Atlas System; Undulating plains with some low dunes, seasonal lakes, and clay pans
- SV2 Atlas System; Saline valleys with some dunes including barchan forms-salt lake channels, mostly devoid of true soils, and their fringing areas

The topography of the Clearing Area falls from east to west, from 420 m Australian Height Datum (AHD) to 360 m AHD at the low point, and coinciding with the Mt Palmer Salt Lake System. It then rises approximately 20 m over 7 km to the western end of the proposal, reaching 380 m AHD.

DPIRD mapping indicates that the Clearing Area has 1 % mapped high to extreme risk of water and wind erosion, and a 1 % moderate salinity hazard. The proposal is mapped as 0 % high susceptibility of subsurface acidification, only a 1 % moderate to very high risk of waterlogging and inundation, and 1% moderate to high risk of flooding.

The DPIRD mapping indicates that the Clearing Area has a low risk of flooding, water and wind erosion. The clearing of native vegetation is not likely to exacerbate salinity or acidification in the area, flooding or water logging, causing appreciable land degradation.

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

Methodology

- CSIRO (2015)
- Government GIS Shapefiles:
 - Acid Sulfate Soil Risk Map (Accessed 24 March 2025)
 - Soil landscape land quality – Water Erosion Risk (Accessed 24 March 2025)
 - Soil landscape land quality – Wind Erosion Risk (Accessed 24 March 2025)
 - Soil landscape land quality – Salinity Risk (Accessed 24 March 2025)
 - Soil landscape land quality – Surface Acidity (Accessed 24 March 2025)
 - Soil landscape land quality – Waterlogging Risk (Accessed 24 March 2025)
 - Soil landscape land quality – Flood Risk (DPIRD-007) (Accessed 24 March 2025)

(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 likely to be at variance to this Principle.

A desktop assessment identified that the Clearing Area is largely surrounded by lands reserved for conservation of flora and fauna. Most of the Clearing Area (SLK 398.8 to 413.2) falls within an area mapped as an Environmentally Sensitive Area (ESA), associated with the now defunct 'Register of the National Estate'. The ESA in this area reflects the 'Yellowdine Proposed Reserve', as recommended by the Conservation Through Reserves Committee (CTRC) to the Environmental Protection Authority (EPA) in the 1970's (EPA Red Book Recommendation 11.7.1). The area was nominated for reservation in the conservation estate based on its biogeographical significance as a transition zone between the eremeaen and south-west botanical provinces, landform diversity and associated floristic and faunal diversity (DCCEEW, 2025c).

In relation to this proposal, the Great Eastern Highway road reserve is approximately 60 m wide and abuts the Yellowdine Nature Reserve (R 41936, Class C) to the north and south, between approximate SLK 399.1 and SLK 413. The Clearing Area does not intersect the boundary of the Yellowdine Nature Reserve or any other conservation area.

Other nearby conservation areas to the Clearing Area include: Condarnin Rock Nature Reserve (2 km south), Biljannie Rocks Nature Reserve (4.5 km southeast), Duladgin Nature Reserve (11 km north), Boorabin National Park (19 km east) and Jilbadji Nature Reserve (21 km south).

The proposed clearing will be confined to the Great Eastern Highway road reserve and utilises existing disturbed areas where practicable to avoid and minimise impacts associated with native vegetation clearing. In most sections along the length of the Clearing Area, a buffer of at least 10 m exists between the Yellowdine Nature Reserve boundary and the Clearing Area boundary. Standard construction environmental management controls will minimise the potential for indirect impact on the environmental values of adjacent conservation areas.

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

Methodology

- DCCEEW (2025c)
- Government GIS Shapefiles:
 - DBCA Legislated Lands and Waters & Lands of Interest (Accessed 6 March 2025)
 - DBCA Lands of Interest (Accessed 6 March 2025)
 - Geomorphic Wetlands (conservation category wetlands only) (Accessed 6 March 2025)
 - Ramsar Wetlands (Accessed 6 March 2025)
 - Important Wetlands (Accessed 6 March 2025)

(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 at variance to this Principle.

The Clearing Area is not located within a Surface Water Area as proclaimed under the *Rights in Water Irrigation Act 1914* (RIWI Act), nor is it located within a Public Drinking Water Source Area or within any of the controlled catchment areas under the *Country Areas Water Supply Act 1947* (CAWS Act). There are no RAMSAR or Nationally Important Wetlands within or adjacent to the Clearing Area.

The Mt Palmer Salt Lake System intersects the Clearing Area at SLK 402.4 - 402.7, however this is a non-perennial system and not considered a major or minor tributary.

With low rainfall and no permanent bodies of surface water within the Clearing Area, clearing activities are unlikely to result in sedimentation, erosion or turbidity of a watercourse or wetland.

The Clearing Area is located within the Goldfields Groundwater Area as proclaimed under the RIWI Act. Clearing of native vegetation adjacent to the existing road is unlikely to alter salinity, pH of water tables or existing water regimes.

Based on the above, the proposed clearing is not likely to cause deterioration in the quality of surface or groundwater.

The proposed clearing is not at variance to this Principle.

Methodology

- Government GIS Shapefiles:
 - RIWI Act, Surface Water Areas and Irrigation Districts (Accessed 6 March 2025)
 - CAWSA Part 2A Clearing Control Catchments (Accessed 6 March 2025)
 - RIWI Act, Groundwater Areas (Accessed 6 March 2025)
 - Public Drinking Water Source Areas (Accessed 6 March 2025)
 - Acid Sulfate Soil risk mapping (Accessed 6 March 2025)

(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 at variance to this Principle.

The Shire of Yilgarn experiences low annual rainfall, with Southern Cross receiving an average annual rainfall of 294.5 mm. Majority of rainfall occurs between the months of March and August (BoM, 2025).

The Australian Soil Resource Information System (ASRIS) mapping indicates that three soil landscape types occur within the Clearing Area (CSIRO, 2015). These areas are characterised as:

- AC1 Atlas System; Gently sloping to gently undulating plateau areas, or uplands, on granites, gneisses, and allied rocks, with long gentle slopes and, in places, abrupt erosional scarps
- DD15 Atlas System; Undulating plains with some low dunes, seasonal lakes, and clay pans
- SV2 Atlas System; Saline valleys with some dunes including barchan forms-salt lake channels, mostly devoid of true soils, and their fringing areas

The Clearing Area is mapped as having a low risk of flood hazard and waterlogging (1% of map unit has a moderate to very high flood hazard and waterlogging risk). Only 1 % of the site drainage map unit has a 'very poor to poor' potential.

The topography of the Clearing Area has a fall from east to west, from 420 m AHD at the eastern end, to 360 m AHD at the lowest point coinciding with the Mt Palmer salt lake system, then increases elevation to approximately 20 m over 7 km to the western end of the proposal, reaching 380 m AHD.

The proposed clearing is a narrow and linear corridor alongside the existing highway, with no intersection or proximity to perennial watercourses or wetlands. With a low risk of waterlogging and flooding in the area, the proposed clearing is unlikely to cause or exacerbate the incidence or intensity of flooding.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- BoM (2025)
- CSIRO (2015)
- Government GIS Shapefiles:
 - Soil Mapping (Accessed 6 March 2025)
 - Contours (Accessed 6 March 2025)
 - Soil landscape land quality - Waterlogging Risk (Accessed 6 March 2025)
 - Soil landscape land quality - Flood Risk (Accessed 6 March 2025)

6 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum.

7 REHABILITATION, REVEGETATION AND OFFSETS

7.1 Revegetation and Rehabilitation

No temporary clearing will be undertaken as part of the Proposal activities and therefore no revegetation or rehabilitation will be conducted under CPS 818.

7.2 Offset Proposal

No offset proposal is required as the proposed clearing will not result in significant residual impacts to native vegetation within the region.

8 STAKEHOLDER CONSULTATION

Main Roads will undertake stakeholder consultation in accordance with CPS 818 Condition 8.

9 COMPLIANCE WITH CPS 818

Table 9 summarises what further pre-clearing impact assessment is required in accordance with CPS 818.

Table 9. Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	Further Action Required
<p>1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.</p>	Yes	<p>In accordance with Conditions of CPS 818/17, 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:</p> <ul style="list-style-type: none"> (i) a minor non-perennial watercourse(s); and/or (ii) a wetland that is not a defined wetland <p>further action is not required.</p>
<p>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.</p>	No	No further action required.
<p>3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality and (j) the incidence of flooding.</p>	No	No further action required.
<p>4. The Proposal involves clearing for temporary works (as defined by CPS 818).</p>	No	No further action required.
<p>5a. Proposal is within a Region that:</p> <ul style="list-style-type: none"> • has rainfall greater than 400mm; and, • is South of the 26th parallel; and, • works are necessary in 'Other than dry conditions'; and, • works have potential for uninfested areas to be impacted. 	No	Standard Vehicle and Plant management actions from Annexure 204B (TABLE 204B.9.1), <u>Hygiene Checklists</u> and <u>Vehicle, Plant and Machinery Hygiene Register Template</u> will be applied.

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Impact of Clearing	Yes/No or NA	Further Action Required
5b. Do the proposed works require clearing within or adjacent to DBCA managed lands in non-dry conditions?	No	No further action required.
6. 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.
7. Weeds are 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.
8. Did an environmental specialist conduct the survey or field assessment?	Yes	The Environmental Specialist undertaking the biological assessments was suitably qualified and had more than three years' experience.
9. Did an environmental specialist prepare the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal?	Yes	The Environmental Specialist preparing the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal was suitably qualified and had more than three years' experience.

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11 APPENDICES

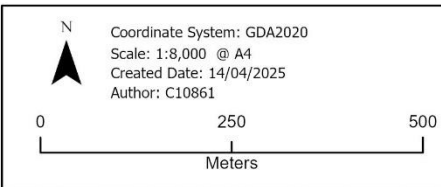
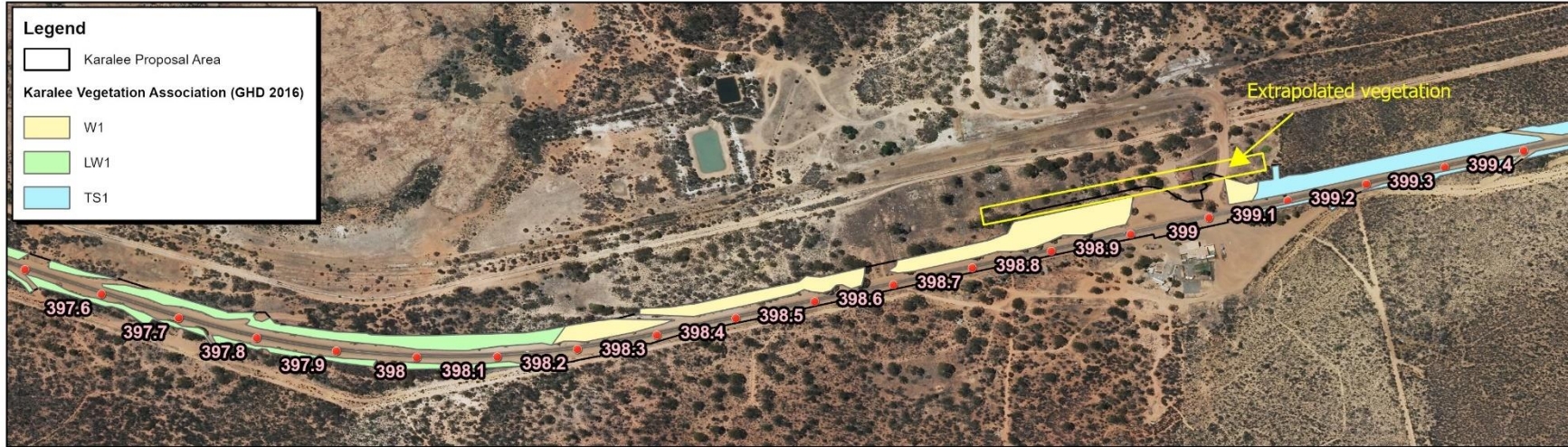
Appendix 1: Vegetation of the Karalee Clearing Area



Coordinate System: GDA2020
Scale: 1:8,000 @ A4
Created Date: 14/04/2025
Author: C10861

0 250 500
Meters

Great Eastern Highway Karalee Proposal
Vegetation of the Clearing Area SLK 394.69 - SLK 397.6



Great Eastern Highway Karalee Proposal
Vegetation of the Clearing Area SLK 397.6 - SLK401.2





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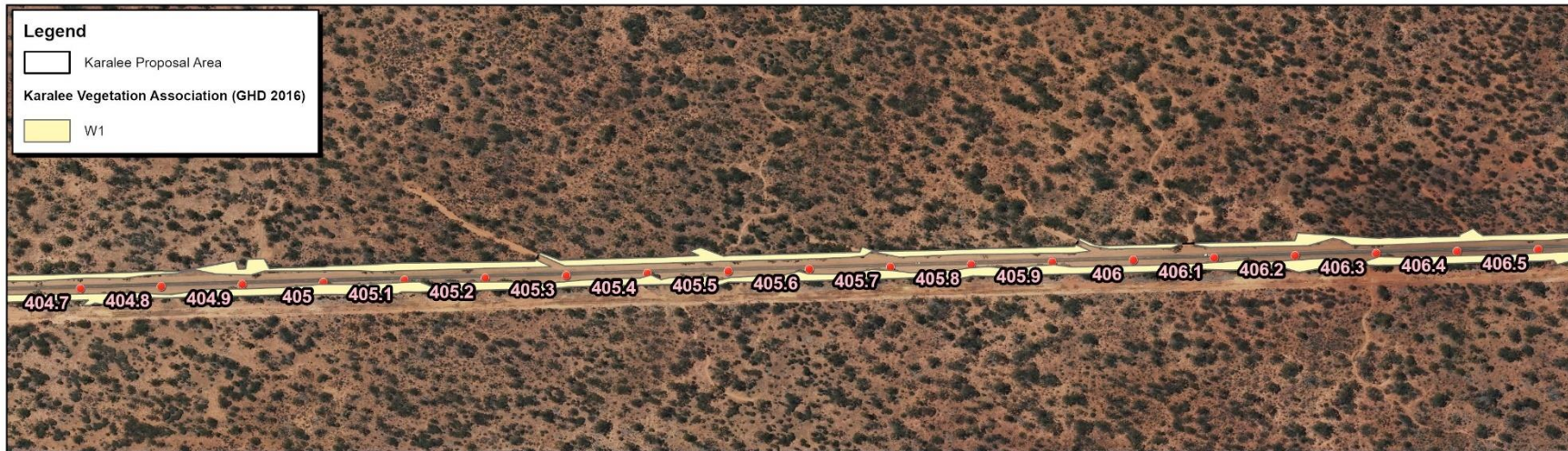
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Great Eastern Highway Karalee Proposal

Vegetation of the Clearing Area SLK 401.2 - SLK 404.8

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Coordinate System: GDA2020
Scale: 1:8,000 @ A4
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Author: C10861

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Great Eastern Highway Karalee Proposal

Vegetation of the Clearing Area SLK 404.8 - SLK408.3



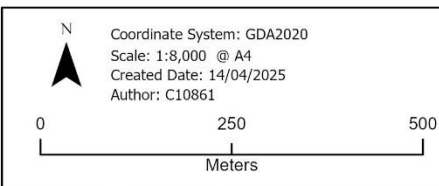
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Author: C10861

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Meters

Great Eastern Highway Karalee Proposal

Vegetation of the Clearing Area SLK 408.3 - SLK 411.9



Great Eastern Highway Karalee Proposal
Vegetation of the Clearing Area SLK 411.9 - SLK 414.02

