Clearing Assessment Report – CPS 818

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Albany Highway Passing Lane SLK 41 – 45
Albany Highway (H001)
Metro Region
EOS: 1897

D21#85200
May 2025

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1 PROPOSAL

1.1 Purpose and Justification

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

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

Main Roads Western Australia (Main Roads) proposes to develop a 2.6 km long southbound passing land on Albany Highway (H001), including line marking upgrades to account for the modified road layout (the Proposal). The proposal will reduce vehicle congestion and increase safe natural passing opportunities along Albany Highway.

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.

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1.2 Proposal Scope

Main Roads proposes to develop a southbound passing lane between 42.01 and 44.65 SLK on Albany Highway (H001). The Proposal will comprise the following components:

- Develop a 2.6 km long, 3.5 m wide southbound passing lane between 42.01 and 44.65 SLK on Albany Highway (H001),
- Line marking between 41.6 to 42.0 SLK and 44.6 to 44.85 SLK.

1.3 Proposal Location

The Development Envelope and Clearing Area is located on Albany Highway (H001) between 41 and 45 Straight Line Kilometre (SLK), located 12 kilometres (km) south-east of Armadale, Western Australia as shown in Figure 1 and Figure 2.

Latitude: 32°14'0" S
Longitude: 116°8'30" E

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818:
The proposal will require up to 4.29 ha clearing of remnant native vegetation within a 11.60 ha Development Envelope.

Areas of Native Vegetation Clearing:
The areas of native vegetation to be cleared are shown in Figure 2.

Type of Native Vegetation:

The native vegetation community to be cleared under this Proposal is described predominantly by ELA (2023) and has been refined via site inspection as follows:

- **EmAfBg** (3.61 ha) (Veg Community 1)– *Eucalyptus marginata, Allocasuarina fraseriana* mid open forest and *Banksia grandis* low open woodland over *Xanthorrhoea preissii*, *Macrozamia riedlei*, *Xanthorrhoea gracilis* mid sparse shrubland over *Adenanthos barbiger*, *Trymalium ledifolium* and *Lomandra sonderi* low sparse forbland.

  The site inspection report in October 2024, focused on the clearing area, observed a limited occurrence of *Banksia grandis*. When they occurred, they comprised only scattered trees within dominant vegetation of *Allocasuarina fraseriana*. Most areas of this vegetation community are disturbed and previously impacted by logging activities.

- **EmCcAf** (0.68 ha) (Veg community 2) - *Eucalyptus marginata, Corymbia calophylla, Allocasuarina fraseriana* mid open forest over *Xanthorrhoea preissii, Hakea lissocarpha, Xanthorrhoea gracilis* mid open shrubland over *Hibbertia hypericoides, Banksia dallanneyi* subsp. *dallanneyi* low sparse shrubland and *Lomandra sonderi* low sparse forbland.
  Most areas of this vegetation community are disturbed and previously impacted by logging activities.

All vegetation communities are further described in Table 3 and shown Figure 3.

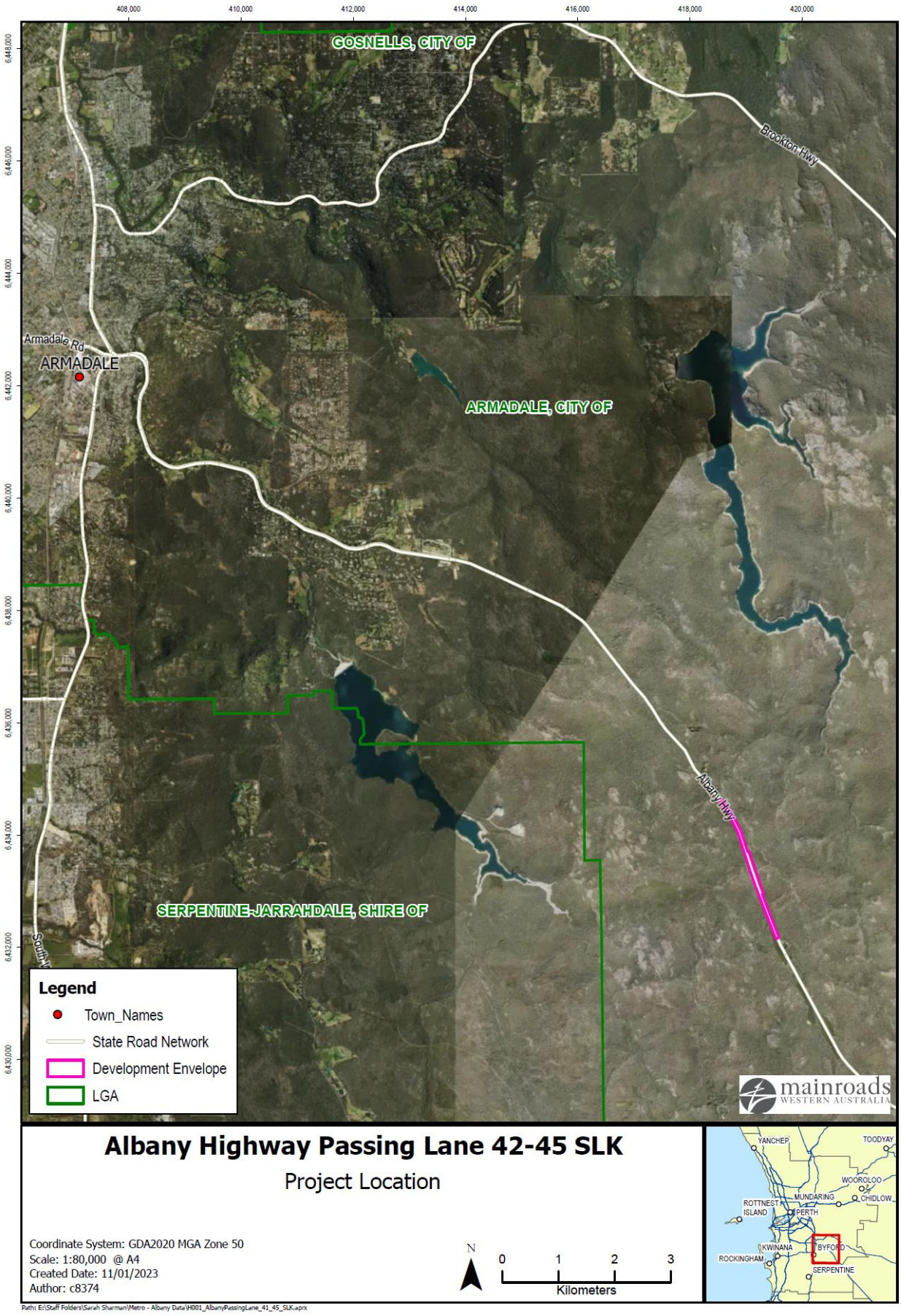

Figure 1. Project Location

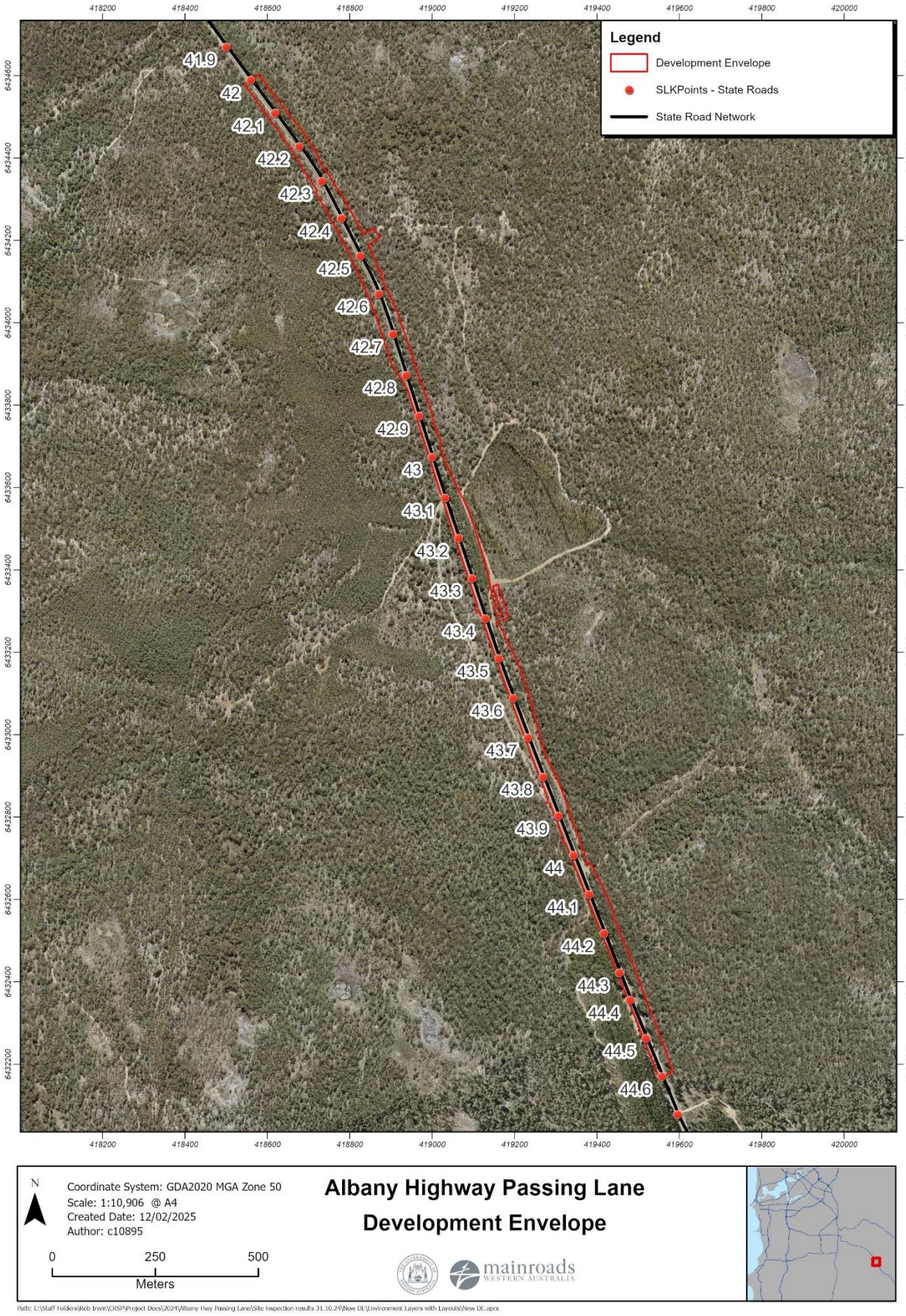

Figure 2. Clearing Area/Development Envelope

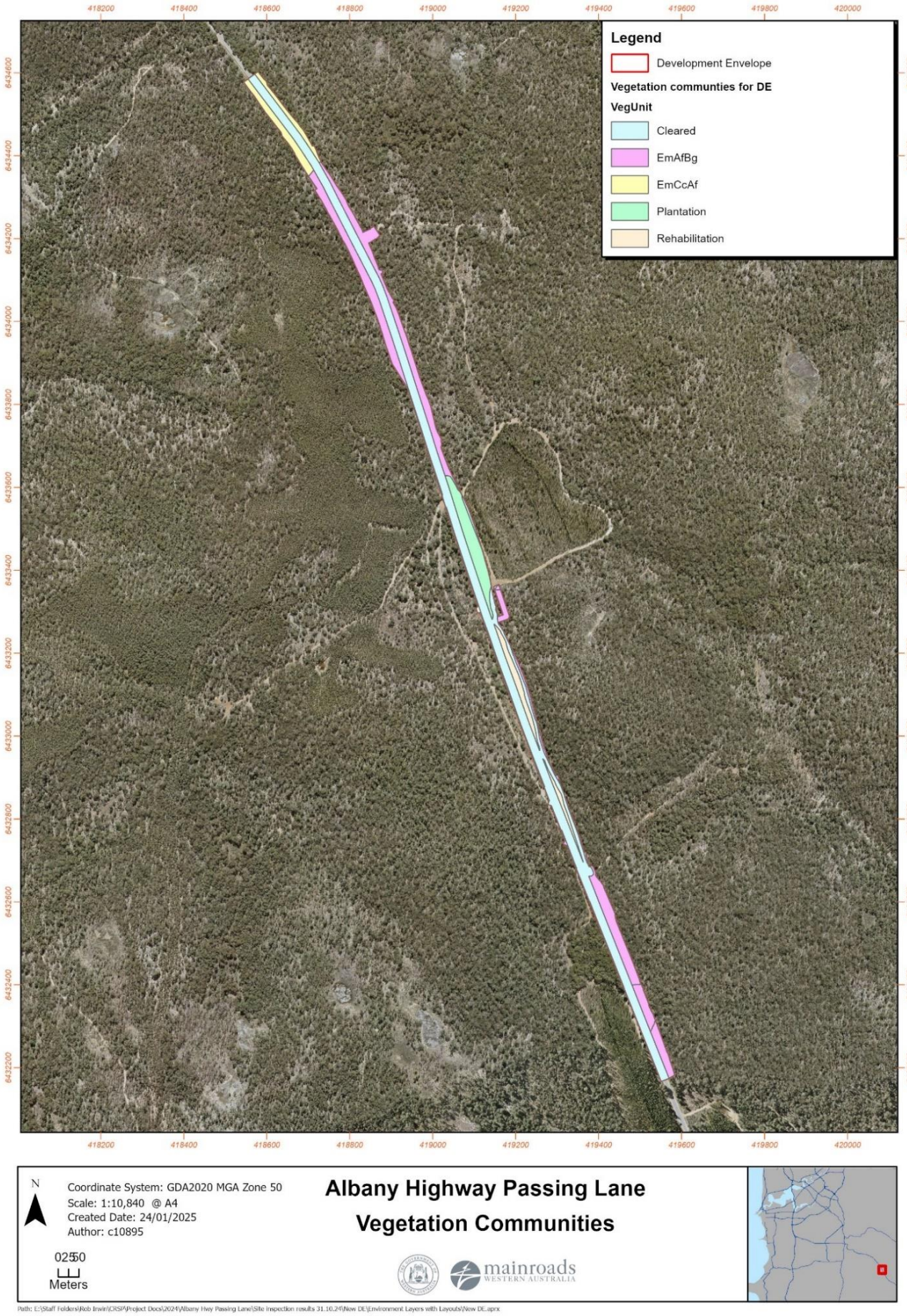

Figure 3. Vegetation within Development Envelope

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

Alternatives considered during design to clearing include utilising existing tracks, roads and previously cleared areas where possible.

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.

Further details on how the clearing impacts have been avoided and minimised include:

- Reduction in the Development Envelope from to 18.33 ha to the current 11.60 ha to reduce impacts to environmental values.
- Environmental and heritage requirements included in the site induction and pre-starts
- Demarcate clearing boundaries prior to clearing
- Clearing activities to ensure machinery stays within the approved clearing area
- Pre-Starts to detail the approved clearing areas and what they represent
- Infrastructure used to maintain surface drainage patterns, if required (e.g. culverts, diversions)
- Construction during rainfall avoided where practicable
- Main Roads hygiene management plan detailed under clearing permit CPS 818 will be implemented at all times during construction activities
- A fauna specialist must be present when trees containing suitable black cockatoo breeding hollows are felled, if clearing is conducted during black cockatoo breeding season to check for breeding activity prior to felling
- Felled trees will be left overnight to allow any unobserved fauna to relocate
- Clearing will occur such that there is a corridor available for fauna to move through and relocate to other locations.
- Topsoil to be retained for rehabilitation by nearby stockpiles with dieback infested and non-infested soil stored separately.
- Hygiene inspections conducted for all vehicles and machinery, prior to entry to site and clean on entry (CoE) points.
- A hygiene inspection checklist will be used to record the results of hygiene inspections
- Weekly inspections will be conducted to assess compliance with CPS 818 and the CEMP during operations
- A practical completion inspection will be conducted to assess compliance with CPS 818 at the completion of clearing
- Results of inspections will be recorded using an inspection checklist.

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 upgrade and widening of Albany Highway will require works on both sides of the existing road. Due to the variable site topography alignment on one-side only is not possible.

Design or Management Measure	Discussion and Justification
Alternative alignment to follow existing road (or) to preferentially locate within pasture or degraded areas	The placement of the passing lane within the Development Envelope will aim to minimise, as much as practicable, the clearing of native vegetation through placement of the passing lane footprint within previously cleared areas and Pine plantation.
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 design includes slip lanes, an overtaking lane and a truck acceleration lane extending to the east. This design is based on a Transport Impact Assessment to maintain road safety.
Installation of safety barriers	Safety barriers will be installed to meet design safety requirements where required. Impacts to environmental values are not likely to be changed as a result of safety barrier installation.
Installation of kerbing	The pre-existing highway does not have kerbing installed, the resulting changes to the highway associated with the Project will not require kerbing to be installed.
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	Existing cleared areas such as vehicle tracks will be utilised where possible to avoid additional clearing of native vegetation. Areas previously cleared containing planted vegetation will be cleared in preference to locations containing primarily native vegetation.
Drainage modification	The Project is not expected to alter the natural drainage profile of the surrounding environment. Minor drainage modifications have been included in the design to ensure road safety.
Steeping of Barriers	Steeping batters has been employed in some sections of the Project, assisting in the initial design reduction from 18.33 ha to the current 11.60 ha.
Possibility to avoid the 2 DBH trees within the DBCA access route	During a site inspection, a strong possibility to retain two native trees has been explored. These trees are located on a proposed DBCA access track within an envelope with indicative width of 13m. These trees may be able to be avoided dependant on final site topography and

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*
- *Aboriginal Heritage Act 1972* (WA).

Environmental Protection Policies:

- Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992
- Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011.

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 (Government of WA, December 2014)
- Procedure: Native vegetation clearing permits (Government of WA, October 2019)
- 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.
- Referral guideline for 3 WA threatened black cockatoo species (DCCEEW, 2022).

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:

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

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

- **Proposal Area** – The total footprint of the Proposal including both cleared and uncleared areas. This is based on the current design and is less than the development envelope. It usually includes a buffer to allow for constructability and the movement of machinery during construction.

- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the Proposal is confined to a local area of a 20 km radius.

- **Survey Area** – Area covered by the Biological Survey, which is typically larger that the Development Envelope.

2.2 Desktop Assessment

A desktop assessment of the Development Envelope 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:

- *Albany Highway Passing Lane 41-45 SLK Biological Survey* (ELA, 2023).
- *Albany Highway Passing Lane 41-45 SLK Targeted Flora Survey (ELA, 2022).*
- *Albany Highway Passing Lane Phytophthora Dieback Occurrence Assessment (Glevan, 2020).*
- *Albany Highway Passing Lane Site Inspection Report 41-45 (2024)*

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 Section 3.

Table 2. Summary of Biological and Targeted Surveys Relevant to the Proposal

Consultant & Survey Name	Survey Details
Eco Logical Australia (ELA) (2023) Albany Highway Passing Lane 41-45 SLK Biological Survey	**Survey Area:** Survey area comprised approximately 82.8 ha, between SLK 41 and 45 either side of Albany Highway. **Type:** Detailed flora and vegetation survey and basic fauna survey and targeted black cockatoo habitat assessment. The survey identified and mapped the dominant vegetation units, assessed vegetation condition and completed opportunistic searches for conservation significant fauna taxa. A targeted assessment of black cockatoo habitat was also undertaken. **Timing:** Fieldwork conducted from 6th to 7th October 2020 and **Survey Results Shapefile TRIM Ref:** D20#1134235 **Document TRIM Ref:** D20#1134222
Eco Logical Australia (ELA) (2022) Albany Highway Passing Lane 41-45 SLK Targeted Flora Survey	**Survey Area:** Survey area comprised approximately 18.6 ha spanning approximately 2.6 km along Albany Highway, 35 m either side of the highway centreline. **Type:** Targeted Flora Searches for *Thysanotus anceps* (P3), *Boronia tenuis* (P4) and *Pimelea rara* (P4) were conducted in suitable habitat. **Timing:** Fieldwork conducted on 30th November 2021. **Survey Results Shapefile TRIM Ref:** - D25#489291 **Document TRIM Ref:** D23#36629
Glevan Consulting (2020) 20-1115 Albany Highway Passing Lane Phytophthora Dieback Occurrence Assessment	**Survey Area:** Survey area comprised approximately 95 ha between SLK 41 and 45 on Albany Highway. **Type:** Phytophthora Dieback Occurrence Assessment of vegetation within the development envelope to identify areas of protectable vegetation. **Timing:** Fieldwork conducted 24 September 2020. **Survey Results Shapefile TRIM Ref:** D20#1025114 **Document TRIM Ref:** D20#1025116
Main Road **Site Inspection Report (2024)**	**Survey Area:** Survey area comprised the Development Envelope (approximately 11.60 ha) spanning approximately 2.6 km along Albany Highway, 35 m either side of the highway centreline. **Type:** Assessing number of DBH trees in the landscape, assessment of foraging habitat value provided by Eucalypt/ Corymbia species based on maturity, and occurrence of banksia species providing additional foraging habitat **Timing:** Site Inspection conducted on 31st October 2024 **Document TRIM Ref:** D24#1465968

3 SURVEY RESULTS

In accordance with CPS 818 condition 8 (e) (iii), a copy of the relevant sections of the executive summary and report conclusions from the biological survey and/or field assessments are provided in Appendix 1.

3.1 Summary and Analysis of Flora and Vegetation Survey (ELA 2023)

Main Roads engaged Eco Logical Australia (ELA) to undertake a vegetation, community, opportunistic Threatened and Priority flora, basic fauna and targeted black cockatoo biological survey and Targeted Priority Flora Survey for the Project. Surveys were conducted on 6 and 7 October 2020 by ELA and aligned with State and Commonwealth requirements for the bioregion, species and communities present. Survey methodology was consistent with State guidelines, technical guides and Commonwealth survey guidelines for the relevant threatened and significant species.

A total of 205 flora species representing 45 families and 126 genera were recorded within the Survey area from both quadrats and opportunistic collections. No Threatened flora species listed under the EPBC Act or the BC Act, or Priority flora species listed by DBCA were recorded within the Survey Area which encompassed the entirety of the Development Envelope (ELA, 2023). A Desktop assessment comprising a search of ArcGIS shapefiles and DWER restricted databases within a 20km study area identified 101 significant flora species. None of the species were listed under the EPBC or BC Acts. Following a likelihood of occurrence assessment three Priority flora species were considered to have some potential to occur in the Project based on the availability of suitable habitat and proximity to previous records.

A total of four vegetation communities (remnant vegetation) in Very Good to Excellent condition were delineated and recorded within a mapped area of 519.20 ha (Survey Area and Extrapolation Area). Within the Development Envelope the following vegetation communities were recorded:

- **EmAfBg** (Veg Community 1) –*Eucalyptus marginata, Allocasuarina fraseriana* mid open forest and *Banksia grandis* low open woodland over *Xanthorrhoea preissii*, *Macrozamia riedlei*, *Xanthorrhoea gracilis* mid sparse shrubland over *Adenanthos barbiger*, *Trymalium ledifolium* and *Lomandra sonderi* low sparse forbland.
- **EmCcAf** (Veg Community 2) - *Eucalyptus marginata*, *Allocasuarina fraseriana* mid open forest and *Banksia grandis* low open woodland over *Xanthorrhoea preissii*, *Macrozamia reidlei*, *Xanthorrhoea gracilis* mid sparse shrubland.
- Pine plantation; and
- Rehabilitated areas.

No Threatened Ecological Communities listed under either the EPBC Act or the BC Act, or Priority Ecological Communities listed by DBCA occur, or were inferred to occur, within the total mapped area.
The Basic fauna survey and targeted black cockatoo habitat assessment was undertaken in accordance with the EPA Technical Guidance: Terrestrial Fauna Surveys (2020) and the EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (DSEWPaC 2012).

A total of 21 fauna species (20 native and one introduced Pig (*Sus scrofa*) were recorded within the Survey Area, comprising 19 birds and two mammals. Of these species, the following significant fauna species were recorded:

- Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Endangered under the EPBC Act and BC Act; indirect observation – foraging evidence

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii* subsp. *naso*), Vulnerable under the EPBC Act and BC Act; Direct and indirect (tail feathers, foraging evidence) observations
- Quenda (Southern Brown Bandicoot; *Isoodon obesulus*) listed as P4 by DBCA; direct observation.

A desktop assessment identified 34 significant species with some possibility of occurrence. In addition to the species listed above which were recorded; *Phascogale tapoatafa* subsp. wambenger (South-western Brush-tailed Phascogale), *Tyto novaehollandiae novae-hollandiae (*Masked owl) and *Ctenotus delli* (Dell's Skink) have been considered to have the Potential to occur.

Four fauna habitats were mapped within the Biological Survey Area (82.80 ha) covering 71.50 ha (86.35%), with the remaining 11.30 ha (13.64%) being cleared area. Similarly, within the Development Envelope, which spans 11.60 ha, four fauna habitats were identified, covering 5.67 ha (48.87%). The remaining 5.93 ha (51.1%) consists of cleared areas.

A total of 43.7 ha (52.8%) of the Biological Survey Area was considered by ELA (2023) as providing 'Good' quality foraging habitat for all three black cockatoo species, with the presence of foraging species such as Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*) and Banksia spp. present at several strata, correlated to *Fauna Habitat 1: Jarrah/Marri and Allocasuarina open forest over shrubland*. A total of 22.9 ha (27.6%) of the Biological Survey Area was assessed as providing 'Moderate' foraging quality for black cockatoo species. The remainder of the Biological Survey Area provides either 'Very Poor' foraging habitat (4.9 ha, 5.9%) or 'Nil' foraging habitat (11.3 ha, 13.7%; cleared areas) for Black Cockatoo species.

The Black cockatoo breeding habitat assessment identified 512 potentially suitable DBH trees within the Survey Area comprising; Jarrah, Marri, *Eucalyptus patens*, *Eucalyptus* sp. (planted) and stags (unidentifiable). Of these, two trees contained potentially suitable nesting hollows over 100 mm in diameter.

Of the 16 DBH trees recorded within the Development Envelope, none contain suitable hollows; however, all provide suitable roosting habitat for Black cockatoos, as defined by the referral guidelines (DSEWPaC 2012). Pine plantation occurs across 12 ha of the Survey Area and also may provide potential roosting habitat for Carnaby's Cockatoo (ELA 2023).

3.2 Summary of Targeted Flora Survey (ELA 2022)

Main Roads engaged Eco Logical Australia (ELA) to undertake a targeted flora survey for Priority flora species identified during the desktop assessment of the 2020 survey. The survey area comprised approximately 18.6 ha spanning approximately 2.6 km along Albany Highway, 35 m either side of the highway centreline.

None of the three targeted species were recorded in the survey area during the field assessment. Following the survey, it is considered unlikely that *Thysanotus anceps, Cyanothamnus tenuis,* or *Pimelea rara* occur within the Survey Area. This conclusion is based on the fact that none of targeted species were observed during the field assessment despite significant survey effort, favourable timing, and conducive weather conditions for flowering.

Although the project may harbour suitable habitat to the above three flora species, they were not recorded within the Development Envelope during the Biological Survey, nor were there any Priority or Threatened Flora recorded. The Project is not anticipated to impact any significant flora

3.3 Summary and Analysis of Dieback Survey (Glenvan Consulting 2020)

Glevan Consulting was commissioned by Main Roads to undertake a *Phytophthora* Dieback assessment for the proposal within an area comprising 95.00 ha based on the proximity of the proposed works to DBCA managed land. This assessment aimed to provide information on the *Phytophthora cinnamomi* occurrence for input into the hygiene management planning process for the identification and subsequent management of protectable areas.

All Phytophthora Dieback detection, diagnosis and mapping was performed to DBCA defined standards and procedures, with fieldwork completed by a qualified Dieback Interpreter in September 2020. The assessment type was a linear assessment, observing all vegetation within (at least) twenty-five metres from the non-cleared edge of Albany Highway with a total Assessment area of approximately 95.00 hectares.

Phytophthora Dieback is distributed through the vegetation on the highway margins for the entire length of the Development Envelope.

Historical mapping and previous samples that have been taken along the margins of Albany Highway provided adequate proof of the existence of *Phytophthora* Dieback in the Development Envelope (Glevan Consulting, 2020). Areas within the Dieback assessment mapped as 'excluded' have historical records that indicates that they were previously 'Infested',and therefore will need to be treated as 'Infested' (Glevan Consulting, 2020).

A 0.02 ha area inside the Development Envelope is classified as 'Uninfested'. This vegetation is contiguous with larger areas of 'Uninfested' vegetation outside of the Development Envelope. Clearing within the 'Uninfested' area will be managed during construction in accordance with a Dieback Management Plan. DBCA will be consulted to validate and advise on the efficiency of the Dieback Management Plan.

3.4 Summary of Site Inspection (Main Roads 2024)

As part of Main Roads avoidance and mitigation measures, the Development Envelope has been refined and reduced to 11.60 ha to minimise the environmental footprint. Following this refinement a desktop assessment and site inspection was conducted in October 2024 to determine if the broadscale habitat mapping provided by the biological survey was applicable across the entirety of the vegetation present within the Development Envelope.

The inspection was led by a Main Roads Environment and Heritage Branch staff member with over 15 years' experience in the assessment of Vegetation and Fauna Habitat, and Environmental Impact Assessment.

The site inspection concluded that within this broad habitat type several sub-types existed providing varying levels of Black Cockatoo habitat quality. Factors used to determine habitat quality included:

- previous disturbance and logging activity;
- the number of Remnant DBH trees in the landscape (high value foraging resource);
- assessment of foraging habitat value provided by Eucalypt/ Corymbia species based on maturity, and
- occurrence of banksia species providing high value foraging habitat for Black Cockatoo.

Black Cockatoo expert Rick Dawson, Mawson outlined that the largest 2% of marri trees in Jarrah-Marri forest accounted for an estimated 85% of fruit and seed production. Small marri trees (<6 m tall) flower sparingly and set few seed. Therefore, the assessment of foraging value for black cockatoo is not only dependant on species, but also reliant on the maturity of the tree. Marri is the primary foraging species; however, Jarrah is utilised when Marri seed is unavailable (DoE 2024). Large, mature remnant trees were identified within the Development Envelope and delineated from the newer growth which has established post historic logging in the area. The total large Jarrah/Marri tree canopy comprising high-quality black cockatoo forage within the Development Envelope equated to 0.08 ha.

The fauna habitat sub-types within the Development Envelope can be summarised as follows:

- Remnant DBH trees
- *Banksia sessilis* Shrubland
- Marri/Jarrah/Sheoak regrowth in previously logged areas
- Cleared and natural regrowth

Assessment of Significance of Black Cockatoo Habitat

The Bamford Scoring System has been applied to areas of native vegetation within the Development Envelope which may comprise Black Cockatoo foraging habitat which have been delineated based on each of the three black cockatoo and the three-fauna habitat sub-types as identified above.

The score from each of the three habitat sub- types was determined in consideration of the three aspects of the Bamford Scoring System:

- site condition (specific criteria related to foraging vegetation suitable for each species);
- site context (impact as a percentage of available foraging habitat within a 15 km radius); and
- species stocking rate.

The assessment has been summarised as follows:

Remnant DBH Trees (0.08 ha): The Remnant DBH trees habitat sub-type was assessed for all three Black Cockatoo species and resulted in final scores of:

- Carnaby's Cockatoo – 5
- Baudins Cockatoo – 7
- Forest Red Tail Black Cockatoo – 7

The remnant DBH trees provide moderately suitable habitat conditions for Carnaby's Cockatoo, returning a moderate site condition as the habitat sub-type does not contain preferred proteaceous species. Baudin's and Forest Red Tail Black Cockatoo returned the highest possible score due to the excellent foraging value of the mature trees.

Site context scored low for all three species. Although the nearest breeding location is over 6km distant, it is assumed that breeding would occur within the Jarrah Forest. However, the availability of suitable habitat within a 15km radius resulted in low impact to available foraging resources. Species stocking rate was scored highly for all three species due to foraging evidence being located within the Development Envelope and the assumption that all three species would be present within the Jarrah Forest.

***Banksia sessilis* Shrubland (0.42ha):** The *Banksia sessilis* shrubland was assessed for all three Black Cockatoo species and resulted in final scores of:

- Carnaby's Cockatoo – 5
- Baudins Cockatoo – 3
- Forest Red Tail Black Cockatoo – 3

This habitat sub-type scored moderately for Carnaby's cockatoo due to the shrubby banksias; however, due to a lack of tree banksias was unable to be scored higher. Baudin's and Forest Red Tail Black Cockatoo scored lower due to the lack of Marri and Jarrah preferred foraging species in this habitat type.

Site context scored low for all three species. Although the nearest breeding location is over 6km distant, it is assumed that breeding would occur within the Jarrah Forest. However, the availability of suitable habitat within a 15km radius resulted in low impact to available foraging resources. Species stocking rate was scored highly for all three species due to foraging evidence being located within the Development Envelope and the assumption that all three species would be present within the Jarrah Forest.

Marri/Jarrah/Sheoak Regrowth in Previously Logged Areas (3.59 ha): The Marri/Jarrah/Sheoak Regrowth in Previously Logged Areas habitat type was assessed for all three Black Cockatoo species and resulted in final scores of:

- Carnaby's Cockatoo – 5
- Baudins Cockatoo – 6
- Forest Red Tail Black Cockatoo – 6

This habitat sub-type provides moderately suitable habitat conditions for Carnaby's Cockatoo, as the habitat type contains limited numbers of the preferred proteaceous species. Baudin's and Forest Red Tail Black Cockatoo scored higher due to availability of Marri and Jarrah preferred foraging species in this habitat sub-type. However, as no remnant trees providing large canopy cover and therefore comparatively limited numbers of nuts for foraging are available in this habitat sub-type, it was not able to be given the maximum score.

Site context scored low for all three species. Although the nearest breeding location is over 6km distant, it is assumed that breeding would occur within the Jarrah Forest. However, the availability of suitable habitat within a 15km radius resulted in low impact to available foraging resources. Species stocking rate was scored highly for all three species due to foraging evidence being located within the Development Envelope and the assumption that all three species would be present within the Jarrah Forest.

Cleared and natural regrowth (0.2ha)

The natural regrowth also present within the Development Envelope has been considered as low-quality foraging habitat for all three species of Black Cockatoos as it consists of scattered native trees and shrubs with minimal groundcover and dense understory of grasses and weeds.

The detailed application of the Bamford Scoring System resulted in the assignment of foraging values from "High' quality to "Low quality for each of the sub habitat types as described below.

Remnant DBH trees (High quality)	0.08 ha
Banksia sessilis Shrubland (Moderate quality)	0.42 ha
Marri/Jarrah/Sheoak regrowth in previously logged areas (Moderate Quality)	3.59 ha
Cleared and natural regrowth (Low Quality)	0.20 ha
Total	**4.29 ha**

The remainder of this document utilises the above scores when referencing Black Cockatoo foraging values.

In addition to the foraging habitat assessment, the Development Envelope was surveyed to identify DBH trees which were measured with a DBH measuring tape. It was confirmed that 16 DBH trees are contained within the Development Envelope, none contain hollows.

4 VEGETATION DETAILS

4.1 Proposal Site Vegetation Description

The proposal is located within the Jarrah Forest bioregion within the Shire of Armadale, surrounded by the Jarrahdale State Forest.

A total of 56.6 ha of native vegetation was mapped within the Biological Survey area (ELA, 2023). Four vegetation communities were identified within the Survey area (ELA, 2023), of which two occur in the Development Envelope, described below in Table 3.

The Project will impact up to 4.29 ha of native vegetation (Figure 3). The remainder of the Development is comprised of planted, non-native vegetation and cleared land.

Table 3. Summary of Vegetation Types within Development Envelope

Vegetation Type	Extent Development Envelope (ha)	Total Extent Mapped (ha) within Survey Area	Vegetation Condition	Site inspection report
VC1 (EmAfBg): *Eucalyptus marginata*, *Allocasuarina fraseriana* mid open forest and *Banksia grandis* low open woodland over Xanthorrhoea *preissii*, *Macrozamia riedlei*, *Xanthorrhoea gracilis* mid sparse shrubland over *Adenanthos barbiger*, *Trymalium ledifolium* and *Lomandra sonderi* low sparse forbland.	3.61	32.4	Good to Very Good – Excellent	Only scattered trees of *Banksia grandis* were observed within areas of dominant *Allocasuarina fraseriana* within the Development Envelope. Few remnant Corymbia/ Eucalypt remain, with the majority of individuals of these species representing regrowth.
VC2 (EmCcAf): *Eucalyptus marginata, Corymbia calophylla, Allocasuarina fraseriana mid open forest over Xanthorrhoea preissii, Hakea lissocarpha, Xanthorrhoea gracilis* mid open shrubland	0.68	11.30	Excellent	Few remnant Corymbia/ Eucalypt remain, with the majority of individuals of these species representing regrowth.
Total Native Vegetation	**4.29**			

Table 4 and Table 5 below provide details of the Pre-European Vegetation Associations within the Development Envelope and the remaining extents of these associations. Vegetation Association (3) retains >80% of its pre-European extent within the Armadale local government area and just under 80% within the Northern Jarrah Forest IBRA region.

Table 4. Pre-European Vegetation Representation

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 3	Medium forest; jarrah-marri.	*Excellent* (EPA 2016)	*Eucalyptus marginata*, *Allocasuarina fraseriana* mid open forest and *Banksia grandis* low open woodland over *Xanthorrhoea preissii*, *Macrozamia riedlei*, *Xanthorrhoea gracilis* mid sparse shrubland

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. 3	**Statewide**	2,661,404.62	1,803,437.48	67.76	81.50
	IBRA Bioregion *Jarrah Forest*	2,390,591.54	1,604,101.56	67.10	81.00
	IBRA Sub-region Northern Jarrah Forest	908,099.69	723,445.91	79.67	84.03
	Local Government Authority City of Armadale	42,944.33	38,717.59	90.16	82.36

4.2 Vegetation Complexes and Representation

For Proposals on the Swan Coastal Plain and Southwest (Perth, Peel and Warren), vegetation has been mapped at a finer scale than Beard's map series of the State. The combined vegetation complex mapping of the southwest and SCP by Havel & Mattiske (2000) and Webb et. al (2016): Vegetation Mapping of the South West Forest Regions of Western Australia and Heddle, Loneragan & Havel (1980): Vegetation of the Darling System In: Atlas of Natural Resources, Darling System, Western Australia (Joined by the Perth Biodiversity Project, 2011) was combined by WALGA's Perth Biodiversity Project in 2013.

The vegetation complexes mapped within the Development Envelope are presented in Table 6. Both vegetation complexes occurring within the Development Envelope retain >80% of their pre-European extent.

Table 6. Vegetation Complexes (Heddle/Mattiske) within the Development Envelope

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
2 - Dwellingup complex in medium to high rainfall	86,128.33	71,055.96	82.50
11 - Yarragil complex (maximum development swamps) in medium to high rainfall	80,202.95	64,927.06	80.95

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 a variance to Principle b) and not at or unlikely to be at variance with the ten 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.

Assessment of Vegetation and Flora

The Biological survey (ELA, 2023) identified 205 native flora species representing 45 families and 126 genera within the broader survey area. Families with the highest number of species included Fabaceae (25 species), Proteaceae (16 species) and Asparagaceae (13 species). Acacia (9), Drosera (9) and Stylidium (7) taxa were the most species-rich genera throughout the Survey Area. Of the 205 native taxa identified, none were significant flora species.

No Threatened or Priority flora species were identified during the initial Biological Survey or subsequent Targeted Priority flora surveys within the Survey Area (ELA 2023 and 2022). The targeted survey was undertaken to conduct targeted searches for *Thysanotus anceps* (P3), *Cyanothamnus tenuis* (P4) and *Pimelea rara* (P4), all of which were identified as potentially occurring (but not recorded) in the initial survey. None of the three species were recorded in the targeted survey which covered the Development Envelope.

The proposed clearing of up to 4.29 ha of native vegetation within the Development Envelope is unlikely to impact any significant flora species as none were recorded in two seasons of surveys within the Survey Area.

Twenty-two introduced flora species were recorded within the Survey Area. No species are listed as Weeds of National Significance (WoNS) or Declared Pests listed under the BAM Act.

Four native vegetation communities were mapped within the ELA (2023) Survey Area, two vegetation communities (as described above) are within the Development Envelope, these include:

- EmAfBg (3.61 ha)
- EmCcAf (0.68 ha)

The flora taxa and native vegetation within the Development Envelope are characteristic of the broader region.

No PECs or TECs occur within or adjacent to the Development Envelope.

Assessment of fauna

The Biological Survey and targeted Black Cockatoo habitat assessment (ELA, 2023) identified 21 fauna species (20 native and 1 introduced), comprising 19 birds and two mammals within the Survey Area.

Of these species the following three significant fauna species were recorded directly or indirectly within the Survey Area:

- *Calyptorhynchus latirostris* - Carnaby's Cockatoo - Endangered (EPBC Act and BC Act)
- *Calyptorhynchus banksii* subsp. *Naso*- Forest Red-tailed Black Cockatoo - Vulnerable (EPBC Act and BC Act)
- *Isoodon obesulus* - Quenda, Southern Brown Bandicoot- Priority 4 *(*DBCA)

Carnaby's Cockatoo was indirectly observed (foraging evidence), whilst the Forest Red-tailed Black Cockatoo and Quenda were directly observed within the Survey Area.

The Forest Red-tailed Black Cockatoo was observed indirectly (tail feathers, foraging evidence) at 65 tree locations within the Survey Area. Indirect observations (chewed nuts) were recorded at six DBH trees (x4 Jarrah, x2 Marri) within the Development Envelope. No other Black cockatoo species were observed within the Development Envelope.

In addition to the above recorded species, following the field survey, of the 34 significant fauna species identified from the desktop assessment, Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) is considered as Likely to occur within the Survey Area, and three (3) species listed below are considered as having the Potential to occur within the Survey Area, based on the availability of suitable habitat and proximity to nearby recent records:

- *Phascogale tapoatafa* subsp. *wambenger* – South Western Brush-tailed Phascogale Critically Endangered (BC Act).
- *Tyto novae-hollandiae* subsp. *novae-hollandiae* -Masked Owl (southwest)- Priority 4 by DBCA.
- *Ctenotus delli*-Dell's Skink, Darling Range Ctenotus - Priority 4 by DBCA.

Further analysis of the likelihood of occurrence of the above three species within the Development Envelope and potential for impact is presented in Principle B below. In summary, although there may be some potential for the species to occur, impacts to the species are unlikely to be significant

Black Cockatoos

As outlined in Section 3.5, sixteen DBH trees, none of which contain hollows are located in the Development Envelope.

Black Cockatoo Foraging Habitat comprises the below:

Remnant DBH trees (High quality)	0.08 ha
Banksia sessilis Shrubland (Moderate quality)	0.42 ha
Marri/Jarrah/Sheoak regrowth in previously logged areas (Moderate Quality)	3.59 ha
Cleared and natural regrowth (Low Quality)	0.20 ha
Total	**4.29 ha**

The proposed clearing of up to 4.29 ha of Native Vegetation comprising Black Cockatoo foraging habitat ranging from 'Low' to 'High' quality constitutes a small fraction of the available foraging habitat locally and within the broader Darling Escarpment region. Over 40,000 ha of State Forest

directly surrounds the Development Envelope and over 700,000 ha of Medium-Jarrah forest exists regionally (ELA, 2023).

Clearing will remove vegetation in a linear corridor adjacent to the road in comparable or worse condition than the surrounding vegetation. No additional native vegetation will be cleared within the Development Envelope. For the above reasons, impacts of clearing of the foraging habitat of varying value to the three black cockatoo species within the Development Envelope is unlikely to result in a significant residual impact.

Due to the widespread occurrence and persistence of the native vegetation associations, communities and flora taxa identified within the Development Envelope, the vegetation located within the Development Envelope is not considered to comprise a high level of biodiversity. Therefore, the clearing of up to 4.29 ha of native vegetation within the Development Envelope is not likely to be at variance with this principle.

Methodology

- ELA Biological Survey (2023)
- ELA Targeted Priority Flora Survey (2022)
- DBCA shapefiles
- Main Roads GIS Shapefiles
- Department of Natural Resources and Environment (2002)
- NatureMap (Accessed Oct 2020)
- EPA (2016)
- Government of WA (2013)
- DPLH Website (Accessed 05/03/2021)
- BOM Website (Accessed 05/03/2021
- Bamford Scoring System
- Site Inspection Report (October 2024)

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

Proposed clearing is at variance to this Principle.

Assessment

The Biological Survey and targeted Black Cockatoo habitat assessment (ELA, 2023) identified 21 fauna species (20 native and 1 introduced), comprising 19 birds and two mammals within the Survey Area.

Of these species the following three significant fauna species were recorded directly or indirectly within the Survey Area:

- *Calyptorhynchus latirostris* - Carnaby's Cockatoo - Endangered (EPBC Act and BC Act)
- *Calyptorhynchus banksii* subsp. *Naso*- Forest Red-tailed Black Cockatoo - Vulnerable (EPBC Act and BC Act)
- *Isoodon obesulus* - Quenda, Southern Brown Bandicoot- Priority 4 *(*DBCA)

Carnaby's Cockatoo was indirectly observed (foraging evidence), whilst the Forest Red-tailed Black Cockatoo and Quenda were directly observed within the Survey Area.

The Forest Red-tailed Black Cockatoo was observed indirectly (tail feathers, foraging evidence) at 65 tree locations within the Survey Area. Indirect observations (chewed nuts) were recorded at six DBH trees (x4 Jarrah, x2 Marri) within the Development Envelope. No other Black cockatoo species were observed within the Development Envelope.

One introduced (pest) fauna species, Pig (*Sus scrofa*), was recorded in the within the Development Envelope identified via diggings.

In addition to the above recorded species, following the field survey, of the 34 significant fauna species identified from the desktop assessment, Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) is considered as Likely to occur within the Survey Area, and three (3) species listed below are considered as having the Potential to occur within the Survey Area, based on the availability of suitable habitat and proximity to nearby recent records:

- *Phascogale tapoatafa* subsp. *wambenger* – South-Western Brush-tailed Phascogale Critically Endangered (BC Act).
- *Tyto novae-hollandiae* subsp. *novae-hollandiae* -Masked Owl (southwest)- Priority 4 by DBCA.
- *Ctenotus delli*-Dell's Skink, Darling Range Ctenotus - Priority 4 by DBCA.

Further analysis of the likelihood of occurrence of the above three species within the Development Envelope and potential for impact is presented below:

South-western Brush-tailed Phascogale

The South-western Brush-tailed Phascogale inhabits dry sclerophyll forests and open woodlands with trees that have hollows and sparse ground cover. This habitat is available within Development Envelope (ELA, 2023). However, the species has not been recorded within the Development Envelope, with the nearest record being 6.5 km away, documented in 1968, nearly 57 years ago. Additionally, DBCA (2012) states that in Western Australia, the species occurs at low densities in the northern Jarrah forest, with the highest densities in the Perup/Kingston area, Collie River valley, and near Margaret River and Busselton.

The species was not recorded in lack of recent sightings within the Development Envelope, combined with historical data indicating low densities in the northern Jarrah forest, reinforces the conclusion that the species' presence in the Development Area is minimal. Additionally, conservation efforts and habitat management in areas with higher densities may contribute to the species' limited distribution in other regions. This suggests that their presence within the Development Envelope is likely very low and minimal impact from the project is anticipated.

Masked Owl

The Australian masked owl is Priority 4 listed bird by DBCA that inhabits timbered areas, often with a shrub understorey, and is seldom found more than 300 km inland. Within the Development Envelope, the Marri and Jarrah woodland habitat provides suitable potential habitat for this species. However, the bird has not been found with the Development Envelope, the nearest being recorded 12.50 km away. This widespread and highly mobile species is unlikely to be impacted by the narrow strip of clearing adjacent to the existing Albany Hwy.

Dells Skink

Dell's Skink (*Ctenotus delli*), is typically found in Jarrah and Marri woodlands with a shrub understorey over laterite, sand, or clay substrates. The Development Envelope provides a potential suitable habitat for this skink (ELA, 2023). However, the species has not been found within the Development Envelope and the nearest record is about 2km away, which was found 15 years ago in 2010. In addition, DBCA dataset records indicate the species occurs over a 270 km range in Western Australia (Figure 6) ranging from Yarragil, Jarrah Forest block southeast of Dwellingup from South to Julimar State Forest to the North. The species is unlikely to be impacted by the narrow strip of clearing adjacent to the existing Albany Hwy.

Black Cockatoos

As outlined in Section 3.5, sixteen DBH trees, none of which contain hollows are located in the Development Envelope.

Black Cockatoo Foraging Habitat comprises the below:

Remnant DBH trees (High quality)	0.08 ha
Banksia sessilis Shrubland (Moderate quality)	0.42 ha
Marri/Jarrah/Sheoak regrowth in previously logged areas (Moderate Quality)	3.59 ha
Cleared and natural regrowth (Low Quality)	0.20 ha
Total	**4.29 ha**

The proposed clearing of up to 4.29 ha of Native Vegetation comprising Black Cockatoo foraging habitat ranging from 'Low' to 'High' quality constitutes a small fraction of the available foraging habitat locally and within the broader Darling Escarpment region. Over 40,000 ha of State Forest directly surrounds the Development Envelope and over 700,000 ha of Medium-Jarrah forest exists regionally (ELA, 2023).

Native vegetation of the Darling Range remains mostly extant, continuous and is predominantly Jarrah and Marri forest. This provides equivalent or better quality habitat for Black cockatoos than the Jarrah/Marri forest located within the Development Envelope. The proposed clearing associated with Project activities (4.29 ha) is adjacent to an existing cleared area associated with the Albany Highway and is unlikely to fragment existing Black cockatoo populations. The clearing area is also small relative to the available habitat in the local area and is unlikely to disrupt the breeding cycles

or modify, destroy, isolate or decrease the availability of quality of habitat to the extent that the species are likely to decline.

Clearing will remove vegetation in a linear corridor adjacent to the road in comparable or worse condition than the surrounding vegetation. No additional native vegetation will be cleared within the Development Envelope. For the above reasons, impacts of clearing of the foraging habitat of varying value to the three black cockatoo species within the Development Envelope is unlikely to result in a significant residual impact.

Similarly, given the small and linear nature of clearing adjacent to an existing highway and presence of large areas of suitable alternative habitat in the local area, significant impacts to the Quenda, are not anticipated. Other significant species that were considered to have potential to occur within the Survey Area (South-western Brush-tailed Phascogale, Masked Owl (southwest) and Dell's Skinks) are unlikely to be impacted by clearing associated with the Proposal given the availability of habitat in adjacent area and the clearing proposed is adjacent to an existing highway.

It is considered that the proposed clearing is at variance to this principle.

Methodology

- DBCA Shapefiles
- DBCA website
- EPA (2016)
- ELA Biological Survey (2023)
- Bamford Scoring System
- Site Inspection Report (October 2024)

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

Proposal is not at variance to this Principle.

Assessment

The biological surveys undertaken (ELA 2023 and 2022) of the Development Envelope identified no State or Commonwealth Threatened flora and the post survey likelihood assessment confirmed none were likely to occur within the Development Envelope.

Therefore, clearing associated with the Project is not at variance with this principle.

Methodology

- DBCA shapefiles
- Florabase (Accessed March 2021)
- ELA Biological Survey (2023)
- ELA Targeted Priority Flora Survey (2022)

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

Proposed clearing is not at variance to this Principle.

Assessment

The ELA (2023) biological survey report did not identify any Threatened Ecological Communities within the Development Envelope or adjoining parts of the Survey Area.

The project will not be at variance with this principle.

Methodology

- DBCA shapefiles
- ELA Biological Survey (2023)

(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.

Assessment

The National Objectives and Targets for Biodiversity Conservation 2001-2005 (Commonwealth of Australia, 2001) recognises that the retention of 30% or more of the pre-clearing extent of each ecological community is necessary if Australia's biodiversity is to be protected.

The Development Envelope is located within the Jarrah Forest Bioregion that has not been extensively cleared. Within the Development Envelope, one vegetation association (Vegetation Association No. 3) has been identified.

The 2018 Statewide Vegetation Statistics (Government of Western Australia, 2019) reports that Vegetation Association No. 3 has 67.10% of the pre-European extent remaining across the State (Table 5).

Two Heddle/Mattiske (1998) complexes occur within the Development Envelope, the Dwellingup complex and Yarragil complex. Both these vegetation complexes have more than 80% of their pre-European extents remaining (Table 6).

The current extent of these vegetation associations and complexes are above the 30% threshold for pre-European extent for Statewide, IBRA Bioregion, and LGA. The proposed clearing of up to 11.60 of remnant vegetation that is representative of Vegetation Association no. 3 represents <0.0001 of the extent remaining within the Armadale Local Government Area.

Therefore, clearing associated with the Project is not at variance with this principle.

Methodology

- EPA (2016)
- ELA Biological Survey (2023)
- ELA Targeted Priority Flora Survey (2022)
- Commonwealth of Australia,(2001)
- Government of Western Australia (2019)
- Perth Biodiversity Project (2013)
- Shepherd (2009)
- Aerial photography

(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 not at variance to this Principle.

Assessment

Within the 20 km Study Area surrounding the Development Envelope, there are eleven wetlands (mapped as part of the Geomorphic Wetlands of the Swan Coastal Plain dataset) which includes four Conservation Category wetlands, and five Resource Enhancement wetlands.

No wetlands are located within the Development Envelope. The closest wetland to the Development Envelope is located approximately 2.2 km north and is classified as Resource Enhancement (UFI 12379 Unknown).

The closest wetland is located at least 2.2 km from the Development Envelope and is unlikely to be impacted by Project activities due to their distance from the Development Envelope. The project will not be at variance with this principle.

Methodology

- DWER and DBCA shapefiles
- ELA Biological Survey (2023)
- ELA Targeted Priority Flora Survey (2022)

(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.

Assessment

The Development Envelope is located in the Soil-landscape Zone 58 - Western Darling Range Zone. This zone is characterised by Moderately dissected lateritic plateau on granite with deeply incised valleys, includes the Darling Scarp on the western margin. Soils are formed in laterite, lateritic colluvium and weathered in-situ granite and gneiss (Natural Resource Management in WA, 2020).

There is potential for local soil erosion to occur, although topography is not steep and gullying would not be expected. It is not expected that clearing of up to 4.29 ha of native vegetation surrounding Albany Highway will impact or cause salinity, eutrophication or flooding. The construction of the existing Albany Highway has not resulted in appreciable land degradation. Furthermore, the intact Jarrah and Marri forest within and adjacent to the Development Envelope will provide soil structure and stability, significantly reducing the likelihood of gullying and erosion of landforms occurring.

With the minimisation of vegetation clearing and implementation of management measures, the proposed clearing would not likely be at variance with this principle.

Methodology

- ELA Biological Survey (2023)
- ELA Targeted Priority Flora Survey (2022)
- Natural Resource Management SLIP Soil Systems (Accessed 1 April 2021)

(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.

Assessment

The vegetation surrounding the Development Envelope constitutes part of the Jarrahdale State Forest. However, proceedings are underway to excise this area form the Sate Forest and include in the road reserve. This process will require approval of the Conservation Commission and to be tabled in Parliament. No works will occur until the process has been completed.

The clearing of a narrow, elongate strip of native vegetation (4.29 ha) adjacent to Albany Highway within the Development Envelope will not impact the interconnectivity, ecosystem function, diversity of vegetation or the overall environmental value of the surrounding Marri and Jarrah State Forest that has a large continuous extent surrounding the highway. The construction of the overtaking lane is not expected to cause greater impediment to fauna movement than that of the existing Albany Highway.

A dieback management plan is in preparation and will be provided for DBCA for endorsement.

The closest conservation areas are the Monadnocks Conservation Park, located 1.82 km to the east, and the Midgegooroo National Park located 4.51km to the northwest.

Given the area under application is comparatively small compared to the extensive areas of intact vegetation adjacent in equivalent or better condition the proposed clearing is unlikely to have a significant impact on the environmental values of the conservation areas nearby.

The vegetation clearing proposed for the project will have no impact on the environmental value of the surrounding Jarrahdale State Forest and can be considered not at variance within this principle.

Methodology

- DBCA shapefiles
- ELA Biological Survey (Oct 2020)
- ELA Targeted Priority Flora Survey (Nov 2021)

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

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

Assessment

There are no permanent watercourses or wetlands within the proposed clearing area and the construction of Albany Highway passing lane will not intercept the groundwater table. No drainage channels intersect the Development Envelope.

The risk of clearing of native vegetation causing surface water quality issues is considered minimal due to erosion control measures being implemented. Ephemeral surface water flows will be maintained through construction of appropriate drainage infrastructure.

The proposed native vegetation clearing is not expected to have an appreciable impact upon surface water and groundwater quality and therefore is not likely to be at variance with this principle.

Methodology

- DWER and DBCA shapefiles
- EPA (2016)

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

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

Assessment

The climate of the region is Mediterranean, characterised by hot, dry summers and cool, wet winters. The area has an annual long-term average rainfall of approximately 826 millimetres per year (BoM, 2021). There are no permanent watercourses or wetlands within or adjacent to the Development Envelope.

Only high intensity, prolonged rainfall events are considered as being likely to cause temporary and localised major surface flows and potential flood events. Ephemeral surface water flows will be controlled through maintenance of existing drainage lines and culverts. With the minimisation of vegetation clearing and implementation of management measures, the proposed clearing would not likely be at variance with this principle.

Methodology

- BOM (2021)
- ELA Biological Survey (2023)
- Natural Resource Management SLIP Soil Systems (Accessed 01/04/2021)

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. A Vegetation Management Plan (VMP) has been developed to manage and minimise vegetation clearing for the Proposal (refer to Appendix 2).

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

In accordance with CPS 818/17 condition 11(a), as the proposal is at variance to Principle b) an offset proposal is required to be provided to the CEO for approval, unless advised in writing by the CEO that an offset proposal is not required.

In accordance with CPS 818 condition 11(a), Main Roads is seeking an exemption from submitting an offset proposal.

8 STAKEHOLDER CONSULTATION

Main Roads will undertake stakeholder consultation in accordance with CPS 818/17 Condition 8.

9 COMPLIANCE WITH CPS 818

Table 7 summarises what further pre-clearing impact assessment is required in accordance with CPS 818/17.

Table 7. Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	Further Action Required
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.	**Yes**	**1.** Clearing Report to be published on website and submissions sought for 21 days. **2.** Submissions invited from relevant parties, including the LGA, the owner or occupier of the land and other stakeholders in accordance with Condition 8 of CPS 818. **3.** VMP has been completed, refer to Appendix 2. **4.** An offset proposal for approval by DWER has been prepared. **5.** Summary of submissions and a statement addressing each of those submissions to be published on website.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **or** (j) the incidence of flooding.	**No**	No further action required.
3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **and** (j) the incidence of flooding.	**No**	No further action required.
4. The Proposal involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.
5a. Proposal is within a Region that: • 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.	**Yes**	A dieback survey has been undertaken and works will be undertaken in accordance with standard Vehicle and Plant management actions from Principal Environmental Management Requirements (PEMRs). A Dieback Management Plan is in preparation and will be provided to DBCA for endorsement (TRIM D23#415097).
5b. Do the proposed works require clearing within or adjacent to DBCA	**No**	No further action required. The Development Envelope intersects with the DBCA- legislated land

Impact of Clearing	Yes/No or NA	Further Action Required
managed lands in non-dry conditions?		Jarrahdale State Forest (DBCA-011) which require clearing. Following the submission of the Issued for Construction (IFC) detailed design package, the Development Envelope has been received by Transport Portfolio Land and Property Services (TPLPS) for the creation of updated Land Dealing Plans (LDP) that are used to facilitate approvals with DBCA / DPLH. These approvals are currently in progress. Once approvals have been received, a Deposited Plan will be lodged into Landgate and then tabled in Parliament. As a significant portion of State Forest requested for excision is required to rationalise boundaries of the pre-existing Albany Hwy corridor and to improve safety conditions by constructing the passing lane, efforts to expedite any stage of the land acquisition process will be explored.
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. CEMP will require that all vehicles and machinery arrive on site clean therefore there is a low risk of weed spread.
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: CPS 818 condition 8 (e) (iii) Biological Surveys and Field Assessment Executive Summary and Report Conclusions

Eco Logical Australia (ELA). (2023). *Albany Highway Passing Lane 41-45 SLK Biological Survey*. Unpublished report prepared for Main Roads Western Australia.

Executive Summary

Main Roads Western Australia (Main Roads) is proposing to improve vehicle congestion and natural passing opportunities by developing a 3.5 metre (m) southbound passing lane between 41 and 45 Straight Line Kilometre (SLK) on Albany Highway (H001) (the proposal). Designs for the proposal have not yet been finalised, as such, the proposal will be located in an area comprising 82.8 hectares (ha; Biological Survey Area), located approximately 12 km south-east of Armadale, Western Australia. Eco Logical Australia (ELA) was engaged by Main Roads to undertake a desktop assessment and biological survey in the Biological Survey Area. Extrapolation of vegetation units present within the Biological Survey Area was undertaken for a 500 m buffer surrounding the Biological Survey Area (Extrapolation Area; 508.8 ha). The total mapped extent for the proposal comprises both the Extrapolation Area and the Biological Survey Area (591.6 ha).

A comprehensive desktop assessment was undertaken to review relevant government database searches within 20 km of the Biological Survey Area to assess for the potential presence of significant flora and fauna species and ecological communities listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), the State Biodiversity Conservation Act 2016 (BC Act) and by Department of Biodiversity, Conservation and Attractions (DBCA).

A Detailed flora and vegetation survey, including targeted flora searches, was conducted on 6th and 7th October 2020, in accordance with the Environmental Protection Authority (EPA) Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a). Vegetation communities were described from 12 established 10 x 10 metre quadrats.

A total of 205 flora species representing 45 families and 126 genera were recorded within the Biological Survey Area from both quadrats and opportunistic collections. No Threatened flora species listed under the EPBC Act or the BC Act, or priority flora species listed by DBCA were recorded within the Biological Survey Area from the field survey. Of the initial 101 significant flora species identified from the desktop assessment as possibly occurring within the Biological Survey Area, following the field survey three flora species have the Potential to occur based on availability of suitable habitat within the Biological Survey Area, proximity to previous records and seasonal conditions:

- *Thysanotus anceps*, listed as Priority 3 by DBCA;
- *Boronia tenuis*, listed as Priority 4 by DBCA; and
- *Pimelea rara*, listed as Priority 4 by DBCA.

A total of four vegetation communities (remnant vegetation) were delineated and mapped within the total mapped area (Biological Survey Area and Extrapolation Area), covering an area of 519.2 ha (87.8%), with plantation (51.5 ha, 8.7%), rehabilitation (2.9 ha, 0.5%) and cleared areas (18.1 ha, 3.1%) accounting for the remaining area. No significant ecological communities listed under the EPBC Act, the BC Act or by DBCA occur or were inferred to occur within the total mapped area.

Condition of remnant vegetation within the Biological Survey Area is predominately in Excellent condition (48.1 ha, 58.0%). The remaining remnant vegetation is in Very Good condition (8.1 ha, 9.8%) or Good condition (0.4 ha, 0.5%), with plantation (12.0 ha, 14.5%), rehabilitation (2.9 ha, 3.5%) and cleared areas (11.3 ha, 13.7%) accounting for the remaining area.

A Basic fauna survey and Targeted black cockatoo habitat assessment was undertaken within the Biological Survey Area in accordance with the EPA Technical Guidance: Terrestrial Fauna Surveys (2020) and the EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (SEWPaC 2012).

A total of 21 fauna species (20 native and one introduced) were recorded within the Biological Survey Area, comprising 19 birds and two mammals. Of these species, the following significant fauna species were recorded:

- Carnaby's Cockatoo (Calyptorhynchus latirostris) listed as Endangered under the EPBC Act and BC Act;
- Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii subsp. naso) listed as Vulnerable under the EPBC Act and BC Act; and
- Quenda (Southern Brown Bandicoot; Isoodon obesulus) listed as P4 by DBCA.

Carnaby's Cockatoo was indirectly observed only (foraging evidence), whilst the Forest Red-tailed Black Cockatoo and Quenda were directly observed, and the Forest Red-tailed Black Cockatoo was also observed indirectly (tail feathers, foraging evidence at 62 tree locations). One introduced (pest) fauna species, Pig (Sus scrofa), was recorded in the Biological Survey Area identified via diggings. Following the field survey, of the 34 significant fauna species identified from the desktop assessment, Baudin's Black Cockatoo (Calyptorhynchus baudinii; EN under EPBC Act and BC Act) are considered as Likely to occur within the Biological Survey Area, and three (3) species are considered as Potential to occur within the Biological Survey Area, based on the availability of suitable habitat and proximity to nearby recent records:

- South-western Brush-tailed Phascogale (Phascogale tapoatafa subsp. wambenger; listed as CD under the BC Act);
- Masked owl (southwest) (Tyto novaehollandiae novae-hollandiae; listed as P3 by DBCA); and
- Dell's Skink, Darling Range Ctenotus (Ctenotus delli; listed as P4 by DBCA).

A total of three fauna habitats were identified and mapped within the Biological Survey Area covering a total of 56.6 ha (68.4%). Plantation (12.0 ha, 14.5%), rehabilitation (2.9 ha, 3.5%) and cleared areas (11.3 ha, 13.7%) accounted for the remaining area. A total of 43.7 ha (52.8%) of the Biological Survey Area is considered as providing 'Good' quality foraging habitat for all three black cockatoo species, with the presence of foraging species such as Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*) and Banksia spp. present at several strata, correlated to fauna habitat 1: Jarrah/Marri and Allocasuarina open forest over shrubland. A total of 22.9 ha (27.6%) of the Biological Survey Area provides 'Moderate' foraging quality for black cockatoo species. The remainder of the Biological Survey Area provides either Very Poor foraging habitat (4.9 ha, 5.9%) or 'Nil' foraging habitat (11.3 ha, 13.7%; cleared areas) for black cockatoo species.

The black cockatoo breeding habitat assessment identified 503 potentially suitable breeding trees within the Biological Survey Area comprising; Jarrah, Marri, Eucalyptus patens, Eucalyptus sp. (planted) and stags (unidentifiable). Of these, two trees contained potentially suitable hollows over 100 mm in diameter. All potential breeding trees recorded from the Biological Survey Area also

provide potential suitable roosting habitat for black cockatoos as defined by the referral guidelines (SEWPaC 2012). Pine plantations also provide potential roosting habitat for Carnaby's Cockatoo.

Discussion

Flora and vegetation

Flora

A total of 205 flora species representing 45 families and 126 genera were recorded within the Biological Survey Area from quadrat data and opportunistic collections. It is noted that due to lower than average rainfall conditions proceeding the survey, annual flora may have been underrepresented. No recorded species are listed as a Declared Pest under the State BAM Act or WoNS.

No significant flora species listed under the EPBC Act or the BC Act, nor any priority species listed by DBCA, were recorded within the Biological Survey Area from the field survey. Following the field survey, of the 101 significant flora species identified from the desktop assessment as possibly occurring within the Biological Survey Area, three species are considered to have the Potential to occur based on availability of suitable habitat within the Biological Survey Area, seasonal conditions, and close proximity to previous records.

Vegetation

A total of four vegetation communities (remnant vegetation) were delineated and mapped across the total mapped area (Biological Survey Area and Extrapolation Area). Plantation, rehabilitation and cleared areas accounted for the remaining area. The most widespread vegetation community throughout the total mapped area was vegetation community 1 (EmAfBg). Vegetation communities within the total mapped area are not inferred to represent any known TECs or PECs listed under the EPBC Act, the BC Act or by DBCA, nor any other significant vegetation as defined under the EPA Environmental Factor Guidelines (EPA 2016b, c).

At a regional scale, the percentage impact to Beard (1979) vegetation association (West Darling 3), system 6 vegetation complexes (2, 11, 20) and land systems (Darling Plateau and Murray Valleys) as a result of the proposal is low (DPIRD 2020). All of these are well represented across the broader landscape, with the total mapped area in the Biological Survey Area representing a small percentage (<0.1%). At a local scale, impacts to individual communities as a result of the proposal is also low. All four vegetation communities are found both in the Biological Survey Area and the Extrapolation Area, with majority of extent (>70%) of each community represented in the Extrapolation Area. Therefore, it is unlikely that the proposal would appreciably reduce the representativeness of vegetation associations in the local area or at a regional scale.

Vegetation condition and the intact nature of vegetation communities present largely reflected disturbance impacts, with higher condition ratings generally being recorded from the road reserves or areas adjacent to the sealed roads. In these areas there has been only brief disturbances historically from activities associated with roadworks. Condition of remnant vegetation within the Biological Survey Area is predominately in Excellent condition. This included most areas of vegetation community 1 (EmAfBg) and 2 (EmCcAf) and a partial extent of vegetation community 3 (EpCcBl) and 4 (PeXpHt). A small portion of vegetation community 1 (EmAfBg) in the south of the Biological Survey

Area was considered to be in Good condition due to historical disturbance and the presence of introduced species. Some of the extent of vegetation community 3 (EpCcBl) in the south of the Biological Survey Area was
reduced to Very Good condition, due to the community fringing the pine plantation and therefore associated with slight disturbance. A section of vegetation community 4 (PeXpHt) in the centre of the Biological Survey Area has been previously cleared, so regrowth is Very Good condition.

Fauna

A total of 21 fauna species (20 native and one introduced) were recorded within the Biological Survey Area, comprising 19 birds and two mammals. Of these species, following significant fauna species were recorded; the Carnaby's Cockatoo (EN under the EPBC and BC Act), the Forest Red-tailed Black Cockatoo (VU under the EPBC Act and BC Act) and Quenda (P4 by DBCA). Carnaby's Cockatoo was indirectly observed only (foraging evidence), whilst the Forest Red-tailed Black Cockatoo and Quenda were directly observed, and the Forest Red-tailed Black Cockatoo was also observed indirectly (tail feathers, foraging evidence). One introduced (pest) fauna species, Pig (*Sus scrofa*), was recorded in the Biological Survey Area identified via diggings.

Following the field survey, of the 34 significant fauna species identified from the desktop assessment as possibly occurring within the Biological Survey Area, Baudin's Black Cockatoo (EN under EPBC Act and BC Act) are considered as Likely to occur within the Biological Survey Area, and three species are considered as Potential to occur within the Biological Survey Area, based on the availability of suitable habitat and proximity to nearby recent records.

A total of three intact fauna habitats were identified and mapped within the Biological Survey Area, with cleared areas accounting for the remaining area. The most commonly occurring habitat is Jarrah/Marri and Allocasuarina open forest over shrubland. Fauna habitats within the Biological Survey Area are not locally restricted. The Biological Survey Area contains remnant vegetation, which is interspersed with cleared or previously cleared areas, a mosaic which extends throughout the Jarrah Forest region. Along with providing habitat to resident fauna species, it also forms habitat connectivity enabling a dispersal network for fauna on a variety of landscape scales.
The majority of the Biological Survey Area is considered as providing 'Good' quality foraging habitat for all three black cockatoo species. Jarrah and Marri forests within the Biological Survey Area provide foraging habitat for both the Baudin's and Forest Red-tailed Black Cockatoo, while native shrubland (particularly *Banksia* and *Hakea* spp.), as well as eucalypt woodland and forest, provides foraging for the Carnaby's Cockatoo (SEWPaC 2012). The 'Moderate' quality foraging habitat also provides a food source for all three species of black cockatoo, namely pine plantations for Carnaby's Cockatoo.

The black cockatoo breeding habitat assessment identified 503 potentially suitable breeding trees within the Biological Survey Area, comprising Jarrah, Marri, *Eucalyptus patens*, *Eucalyptus* sp. (planted) and stags (unidentifiable). Of these, Jarrah and Marri made up majority of trees recorded, and two trees contained hollows potentially suitable for breeding (>100 mm in diameter). All breeding trees recorded from the Biological Survey Area also provided suitable roosting habitat for black cockatoos as defined by the referral guidelines (SEWPaC 2012). Pine plantations also provide potential roosting habitat for Carnaby's Cockatoo.

Eco Logical Australia (ELA). (2022). *Albany Highway Passing Lane 41-45 SLK Targeted Flora Survey*. Unpublished report prepared for Main Roads Western Australia.

Results and Discussion

Desktop Assessment

The desktop assessment prior to this field survey found that the vegetation within the Survey Area includes habitat favourable to all three species, consisting of predominantly Jarrah-Marri forest in Very Good to Excellent condition on lateritic gravels or laterite soils. Historical records from Atlas of Living Australia for all three targeted species (Thysanotus anceps, Cyanothamnus tenuis, and Pimelea rara) is mostly concentrated in the Jarrah Forest region to the east of the Perth metropolitan area, however only data points for C. tenuis and P. rara are present within the Desktop Study Area. The lack of data for *T. anceps* within the Desktop Study Area may be due to a paucity of survey effort within the region rather than the absence of the species. Due to the favourable habitat and presence of nearby historical records to the Survey Area, the desktop assessment undertaken prior to this Targeted survey concluded that all three species could potentially be present within the Survey Area.

Field survey

None of the three targeted species were recorded in the Survey Area during the field assessment. This outcome is consistent with results presented in the biological surveys conducted by ELA in 2020 (ELA 2023).

Given the favourable weather conditions in the months prior to the survey, including warm temperatures and significant rainfall over winter and in the preceding 'Kambarang' season (October-November), it is likely that the three targeted species would have been displaying flowering material. Many other similar species within the same genera as those targeted were observed with flowering material during the field survey, including *T. multiflorus, T. thyrsoideus, T. dichotoma, Boronia fastigiata, P. ciliata,* and *P. suaveolens,* suggesting that conditions were conducive for flowering to occur in the targeted species. Given the favourable conditions and timing of the targeted survey, it is likely that the three targeted species would have been in flower and therefore recorded if they were present within the Survey Area.

Following the survey, it is considered unlikely that *Thysanotus anceps, Cyanothamnus tenuis, or Pimelea rara* occur within the Survey Area. This conclusion is based on the fact that none of targeted species were observed during the field assessment despite significant survey effort, favourable timing, and conducive weather conditions for flowering.

Glevan Consulting. (2020). *Albany Highway Passing Lane Phytophthora Dieback Occurrence Assessment*. Unpublished report prepared for Main Roads Western Australia.

Executive Summary

Main Roads Western Australia (Main Roads) intends to undertake the construction of a passing lane southbound on Albany Highway between 41-45 straight-line kilometres (SLK) to ease congestion and provide an additional passing lane. This section on Albany Highway is adjacent to Jarrahdale State Forest, within the City of Armadale and required a Dieback Survey to identify areas of protectable vegetation.

Glevan Consulting was commissioned by Main Roads to undertake a Phytophthora Dieback assessment for the proposal within an area comprising 95 ha based on the proximity of the proposed

works to Department of Biodiversity, Conservation and Attractions (DBCA) managed land. This assessment aims to provide information on the Phytophthora cinnamomi occurrence for input into the hygiene management planning process for the identification and subsequent management of protectable areas.

All Phytophthora Dieback detection, diagnosis and mapping were performed to DBCA defined standards and procedures, with fieldwork completed by a qualified Dieback Interpreter in September 2020. The assessment type was a linear assessment, observing all vegetation within (at least) twenty-five metres from the non-cleared edge of Albany Highway with a total project area of approximately 95 hectares.

During the assessment process, the collection of evidence to support the field diagnosis was recorded using a tablet running the ESRI Collector application. Waypoints were recorded at locations to show evidence of Phytophthora Dieback presence or absence. The Phytophthora Dieback occurrence categories were demarcated in the field using 25mm wide day-glow pink flagging tape tied to the vegetation at an appropriate buffer width.

Phytophthora Dieback is distributed through the vegetation on the highway margins for the majority of the Project Area. Some sections of the roadside vegetation were classified as Excluded. The vegetation was generally disturbed and adjacent to Pine Plantations and not contiguous with larger areas of native vegetation.

Two small sections of the Project Area (1.7%) classified as Uninfested Protectable, will need to be managed according to Main Roads Phytophthora Dieback hygiene management procedures

Discussion

Most of the project area is Infested; the Excluded areas have historical data indicating they were previously infested and should be treated as Infested (Project Dieback, n.d.). The infested areas have been demarcated with day-glow pink flagging tape tied to the vegetation at a suitable buffer width with tails facing the infestation and the back of the band denoting Uninfested. As most of the area is infested, only the tape surrounding the small areas of uninfested sites have field demarcation indicating that the area is Infested. The existing road has not been excluded from the assessment, or calculations of area. Historical mapping and previous samples that have been taken along the margins of Albany Highway provided adequate proof of the existence of Phytophthora Dieback in the Project Area.

The two areas of uninfested vegetation (1.58ha) are Protectable and adjoin a greater area of uninfested protectable vegetation. The excluded areas (13.87ha) are pine plantations with areas of surrounding vegetation that have been heavily impacted with wildlings and pine encroachment.

Multiple access tracks run adjacent to Albany Highway, and there is a history of plantations and harvesting in the area. There is historical DBCA data that indicates most of the site is Infested along and surrounding the project area and within the project boundary. Access alongside Albany highway has not been uncontrolled, and there is significant disturbance and refuse dumps through a few places.

No samples were required or taken during this assessment. Current Main Roads Phytophthora Dieback hygiene management procedures should be adopted for the Project Area with appropriate Clean on Entry, or Clean on Exit procedures followed.

Appendix 2: Vegetation Management Plan

ALBANY HIGHWAY PASSING LANE SLK 41-45

Purpose and Scope

This Vegetation Management Plan (VMP) has been prepared by Main Roads for the purpose of managing native vegetation clearing impacts associated with the Albany Highway Passing Lane SLK 41-45 Project.

The Proposal involves the construction of a 3.5 metre (m) wide southbound passing lane between 41 and 45 Straight Line Kilometre (SLK) on Albany Highway (H001), located approximately 12 km south-east of Armadale, Western Australia. The passing lane will be 3.5 kilometres in length. and is required to reduce vehicle congestion and increase the natural passing opportunities along Albany Highway.

In specified circumstances, Main Roads VMP is required to be approved by Department of Water and Environmental Regulation (DWER) as a condition of the Main Roads Statewide Clearing Permit CPS 818.

Actions, and their relevant timeframes, from this VMP will be documented within the relevant Tender Documentation (Specifications), such as:

- Specification 204 Environmental Management
- Specification 301 Vegetation Clearing and Demolition
- Specification 303 Materials and Water
- Specification 304 Revegetation
- Specification 304 Rehabilitation of Disturbed Areas.

Once the Contract has been awarded, the Superintendent's Contract Management Team (or equivalent roles) are to ensure that the requirements are implemented by the Contractor.

Avoiding, Mitigating and Managing the Impacts of Clearing

A number of measures were undertaken to during the development and design of the proposal to reduce its impact the environment.

For further information on the alternatives that were considered during the proposal development, please go to Section 1.5 of the Clearing Assessment Report for the proposal.

For further information on the measures undertaken to avoid, minimise, reduce and manage the proposal's clearing impacts, please go to Section 1.6 of the Clearing Assessment Report for the proposal.

VMP Actions

General vegetation management actions to be undertaken is shown in Appendix 2.1: General Vegetation Management Actions for Clearing.

Appendix 2.1: General vegetation management actions for clearing

Management Action	Responsibility	Timing
The Contractor must ensure plant, machinery and equipment, is cleaned down prior to arrival to the site.	Superintendent	During construction
Vehicle hygiene inspection checklists will be utilised to manage potential weed/dieback spread on earth-moving machinery.	Superintendent	During construction
No known dieback infested soil, mulch, fill or other material will be permitted into the works area.	Superintendent	During construction
All Clearing must be undertaken in such a way to allow fauna to move out of the Clearing area.	Superintendent	During construction
The Limits of Vegetation Clearing will be demarcated on site prior to the commencement of clearing to prevent entry into areas of native vegetation.	Superintendent	During construction
Natural drainage pathways will not be obstructed from stockpile gravel, crushed rock and excavated material.	Superintendent	During construction
All recently cleared, exposed and loose surface areas shall be protected from wind, water and soil erosion.	Superintendent	During construction
The Contractor will ensure that clearing of native vegetation is only undertaken in dry conditions, unless otherwise approved and / or directed by the Superintendent.	Superintendent	During construction
All Special Environmental Areas will be pegged in accordance with Main Roads' Drawing 201928-0001-1 Construction Peg Colour Code (https://www.mainroads.wa.gov.au/globalassets/technical-commercial/technical-library/standard-contract-drawings/vegetation/construction-environmental-management/201928-0001-construction-peg-colour-code-drawing.pdf?v=49bd3b).	Superintendent	During construction
The Contractor must develop and detail a Site induction training program as part of the CEMP that includes as a minimum, the significant environmental impacts, actual or potential, of work activities associated with the Contract	Superintendent	During construction

VMP Requirement	Standard Management Actions	Specific Environmental Management Actions
Clearing	Refer to Table 9: Clearing PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan • Specification 301 Vegetation Clearing and Demolition • Environment Measurement and Evaluation Checklist (for release of HOLD POINTS) Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	• Clearing boundary will be demarcated prior to commencement of works.
Pegging and Flagging	Refer to Table 10: Pegging and Flagging PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan • Specification 301 Vegetation Clearing and Demolition Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	• Not Applicable
Dieback Management	Refer to Table 11: Dieback Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	• Not Applicable

VMP Requirement	Standard Management Actions	Specific Environmental Management Actions
Erosion and Sedimentation Control	Refer to Table 12: Erosion and Sedimentation Control PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	• Not Applicable
Fauna Management	Refer to Table 13: Fauna Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	• Not Applicable
Machinery and Vehicle Management	Refer to Table 14: Machinery and Vehicle Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	• Use Hygiene Checklist to ensure ensures that all vehicles and plant do not arrive or leave Main Roads sites with contaminating material

The following specific actions shall also be implemented and will be the responsibility of the Superintendent to ensure they are completed prior to clearing commencing, unless otherwise specified:

- Engage an environmental specialist (fauna) to undertake a preclearance check of potential conservation significant fauna residences (where applicable).

The above actions will be documented within Specifications 204 and 301.

Main Roads' preclearing **Hold Point** applies to all projects that require vegetation clearing, as documented within Specification 301 (301.12 PRE-CLEARING PROCESS). Accordingly, all Hold Point actions must be signed off prior to clearing commencing. This Hold Point comprises the following actions:

1. Prior to the commencement of any clearing operations, the Contractor must certify for the Superintendent's verification and approval that the following activities have been completed in accordance with the relevant specification:

a) The pegging of limits of vegetation clearing has been undertaken.

b) The pegged vegetation clearing area does not exceed the Limits of Vegetation Clearing.

c) Mature trees have been conserved as far as practicable.

d) The pegging of special environmental areas has been undertaken.

f) All pre-clearing weed control has been undertaken.

g) All pre-clearing fauna operational controls have been undertaken.

h) All pre-clearing dieback operational controls have been undertaken.

i) Suitable and unsuitable topsoil zones have been identified.

j) Vegetation and topsoil stockpile locations have been identified.

o) All clearing machinery is compliant with controls.

Monitoring and Maintenance Program

The Superintendent's Contract Management Team shall monitor the implementation of management actions that are a **Hold Point**. **Hold Point** actions must be signed off by the Superintendent's Representative to confirm it has occurred and recorded within the Superintendent's Contract Management Plan.

Non-Compliance

Non-compliance with management actions will trigger corrective actions, preventative actions and/or an incident investigation. Non-compliances will be recorded with Main Roads incident management system and reviewed by Main Roads Manager Environment.

The need for reporting non-compliances with VMP management actions to DWER will be determined as part of an incident investigation.

Revegetation

Revegetation will be undertaken in accordance with Condition 9 of CPS 818. Relevant requirements from Condition 9 have been incorporated into Project Revegetation Plan Template. The elements to be implemented by the Contractor will be incorporated into the relevant Specification 304.