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Clearing Assessment Report – CPS 818

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Western Australia.*

Thomas Road Duplication (Tonkin Highway
to South Western Highway): SLK 0.4 – 3.0
EOS 2907

D24#39034
April 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 the native vegetation clearing that is proposed to be undertaken using the Statewide Clearing Permit (CPS 818) issued to Main Roads Western Australia (Main Roads).

Main Roads proposes to duplicate Thomas Road between Tonkin Highway and South Western Highway (SLK 0.4 to 3.0). The proposal will greatly improve the efficiency of road traffic flow by widening the current extent of the road. 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.

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 and enhancing 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 1.6.

1.2 Proposal Scope

Proposal Name: Thomas Road Duplication (Tonkin Highway to South Western Highway)

Proposal purpose / Components: Main Roads is proposing to duplicate of Thomas Road between Tonkin Highway (SLK 3.0) and South Western Highway (SLK 0.4), for improved efficiency of traffic.

The required Clearing Area for these works is shown in Figure 1.

The proposed clearing undertaking using CPS 818 is: 0.96 ha of remnant native vegetation

The proposed temporary clearing undertaking using CPS 818 is: Nil

This 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 project using the ten clearing principles and strategies used to manage vegetation clearing. Key items associated with the clearing impact assessment are listed below.

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

1.3 Proposal Location

The Clearing Area is located 31 km south-east of the Perth CBD along Thomas Road between Tonkin Highway (SLK 3.0) and South Western Highway (SLK 0.4) within the Shire of Serpentine-Jarrahdale as shown in Figure 1.

Start: -32.20486919, 116.00688476

End: -32.20713802, 115.98035237

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818:

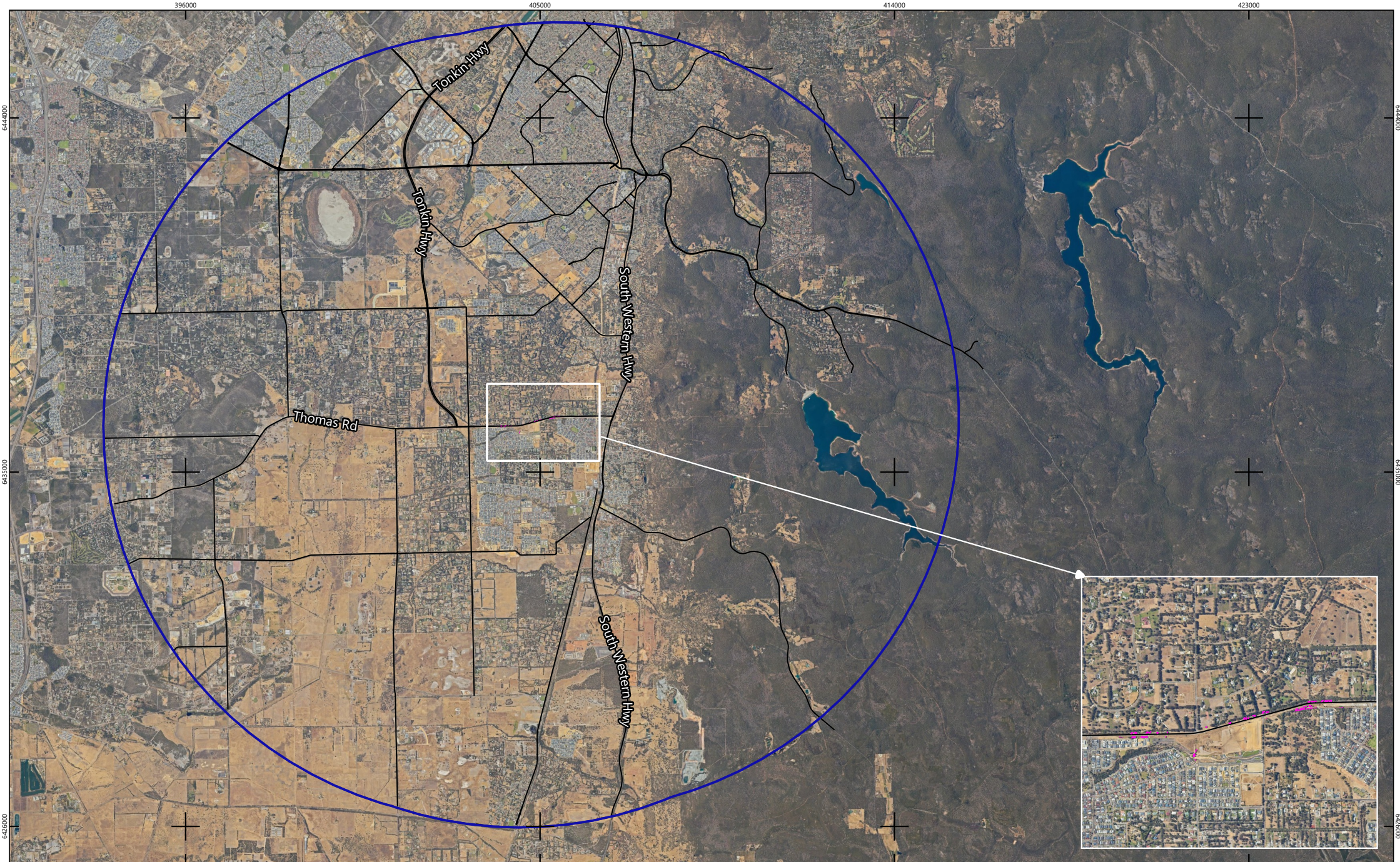
0.96 ha of remnant native vegetation within the Clearing Area. No temporary clearing will be required for the Proposal.

Areas of Native Vegetation Clearing:

The areas of native vegetation to be cleared (Clearing Area) are shown in Figure 2.

Type of Native Vegetation:

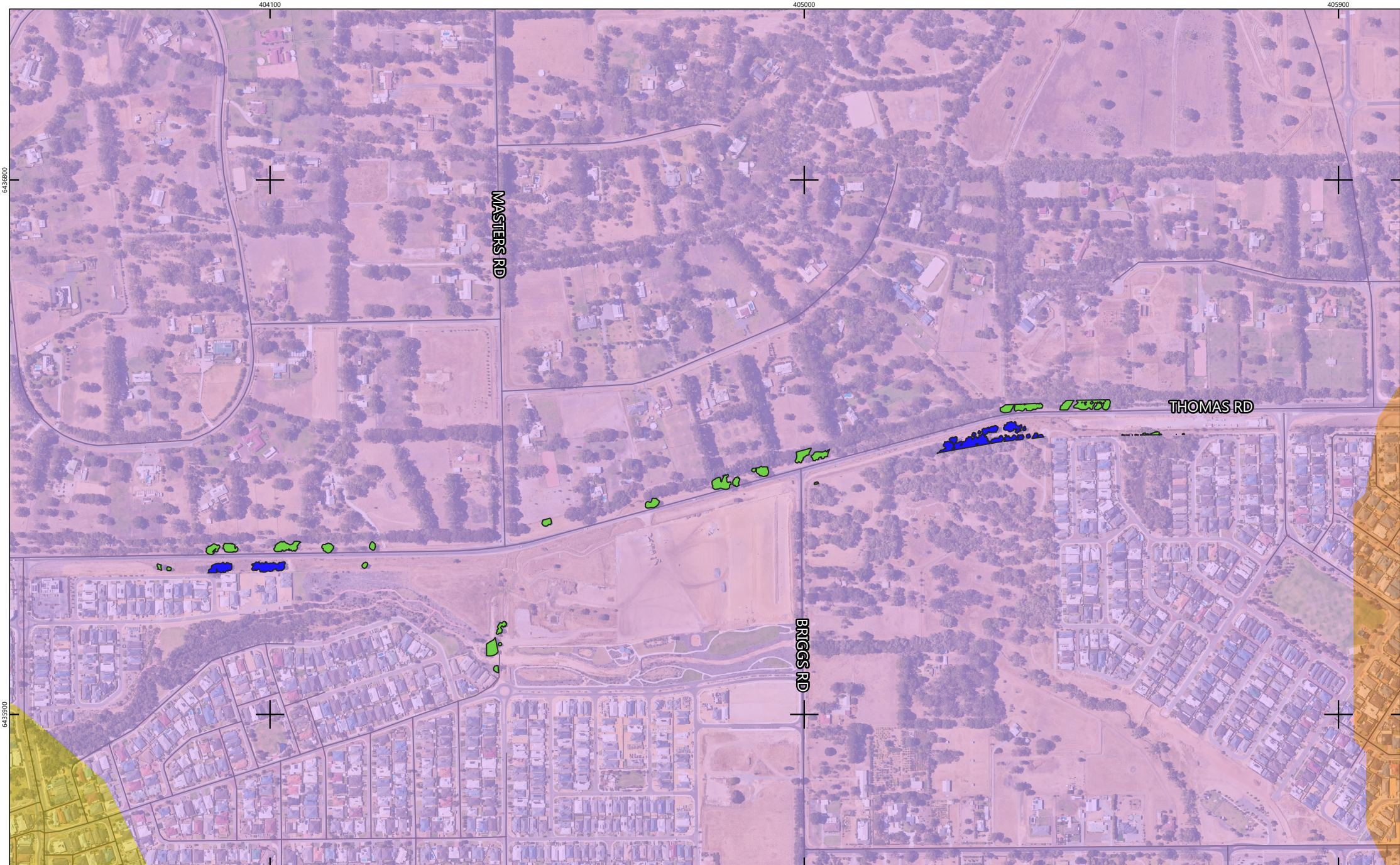
The Clearing Area has 0.96 ha of native vegetation in 'Degraded' condition and mapped in two vegetation units. This includes 0.40 ha of *Corymbia calophylla* tall open woodland and 0.56 ha of Sparse native trees over weeds. All native vegetation within the Clearing Area is representative of the under-represented Guildford complex (5.09% of pre-European extent remaining) and is vegetation growing in association with a wetland (Multiple-Use Palusplain wetlands).



0 1 2 3 4 km
GDA 2020 MGA Zone 50

Figure 1 - Study Area

- Legend**
- Study Area
 - Clearing Area
 - Roads



0 100 200 300 400 m
GDA 2020 MGA Zone 50

**Figure 2 - Vegetation within
Clearing Area**

Legend

Clearing Area:

- Corymbia calophylla tall open woodland over mixed weeds
- Sparse native trees over weeds
- Roads

Vegetation Complexes:

- Beermullah Complex
- Forrestfield Complex
- Guildford Complex

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

The Clearing Area represents the maximum extent of disturbance for the proposal. Where possible, vegetation and fauna habitat will be retained during detailed design and construction. The road corridor is constrained by private property and the requirement to tie into Tonkin Highway and Southwestern Highway. In order to duplicate Thomas Road, there are no alternatives to clearing native vegetation.

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

- Realigning Thomas Road. However, this is not possible due to the constraints of adjacent residential and rural properties and the requirement to tie in Thomas Road to the new bridge over the railway and existing intersections at Tonkin Highway and South Western Highway.
- Upgrading other alternative routes that are less vegetated and environmentally constrained, however these are not suitable due to longer travel times, sensitive local receptors (such as residences) or other planning issues.
- Do not upgrade the road, however this will result in increased congestion, a poorer safety outcome and may result in future fatalities or serious injuries.
- Reducing the speed limit to minimise clearing requirements, while still balancing safety (driver fatigue) and freight efficiency. Speed limits are an essential mechanism to ensure the safe and efficient operation of road networks. The application of appropriate speed limits and other traffic management measures is a key mechanism in managing vehicle speeds to achieve desired safety, mobility, traffic management, local amenity, and road user expectations. There are several factors involved in road safety, including road conditions, driver behaviour and overall road design. Except in special situations, reducing speed limits below national standards on state and national roads is not typically supported as it has the potential to contribute to driver frustration, impatience, tiredness and recklessness. The environmental values protected by reducing the speed limit do not justify the impacts on freight efficiencies nor road user safety. Accordingly, the reduction of the speed limits to avoid clearing of native vegetation for this proposal is not proposed.

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

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

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

Design or Management Measure	Discussion and Justification
Alignment to one side of existing road	Existing road alignment for Thomas Road has been retained and a second carriageway constructed to the south. The existing road needs to be upgraded to meet modern road safety requirements for the predicted traffic volumes.
Alternative alignment located within pasture or degraded areas	Main Roads has avoided the clearing of native vegetation for the Thomas Road Duplication as far as practicable. The majority of the road construction works will not impact native vegetation and will be constructed in existing disturbed and cleared areas. Only 0.96 ha of native vegetation will be impacted within a 17.5 ha construction footprint.
Simplification of design to reduce number of lanes and/or complexity of intersections	The median has been reduced to the minimum safe width in order to reduce the clearing area. This has reduced the incursion into the native vegetation on the southern side of Thomas Road. It is not possible to reduce the number of lanes without compromising the objectives of the road construction project – which is to duplicate Thomas Road.
Steepen batter slopes	The road will be just above existing ground surface, in order to prevent flooding and capillary rise from groundwater from impacting the road pavement. Steepening batter slopes will provide minimal if any reduction in the amount of clearing required, however, road shoulders will use a 3:1 slope rather than 6:1 slope.
Installation of barriers	Safety barriers will be installed to ensure that no further clearing impacts are necessary beyond the current Clearing Area. Detailed design will determine the extent and location of barriers required.
Installation of kerbing	Kerbing has been designed where possible, but open drainage structures will be required to manage the flow of road runoff and storage of stormwater.
Use of existing cleared areas for access tracks, construction storage and stockpiling	Much of the road duplication area has been previously cleared and will be used for construction storage and stockpiling. No temporary clearing will be undertaken for the construction works.

1.7 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under the *Environmental Protection Act 1986* (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&D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914* (WA) (RIWI Act)
- *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 (DER 2014)
- Procedure: Native vegetation clearing permits (DWER 2021)
- Environmental Offsets Guidelines (Government of Western Australia 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities.
- Approved Recovery Plans for threatened species
- EPBC Act Referral Guidelines for Three Threatened Black-Cockatoo Species (DSEWPac 2012)
- Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan (DPAW 2013)
- Referral guideline for 3 WA Threatened Black-Cockatoo species (DAWE 2022).

2 SCOPE AND METHODOLOGY OF ASSESSMENT OF CLEARING

Clearing of 0.96 ha native vegetation will be undertaken using the Main Roads Statewide Clearing Permit CPS 818.

To comply with CPS 818, Main Roads must prepare a CAR (this document).

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 CAR:

- **Native Vegetation Clearing Area (Clearing Area)** – The maximum amount of native vegetation to be cleared for the Proposal that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe movement of machinery during construction. The Clearing Area for this Proposal is 0.96 ha.
- **Desktop Area** – Area covered by the Desktop Assessment. The Desktop Area for the Proposal is confined to a local area of a 10 km radius.
- **Survey Area** – Area covered by the Biological Survey. The survey covered an area of 30.95 ha (ELA 2023).

2.2 Desktop Assessment

A desktop assessment of the Clearing Area was undertaken as part of the survey undertaken by ELA (2023).

2.3 Surveys and Assessments

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

- Eco Logical Australia (ELA) (2023). *Thomas Road Duplication Biological Survey*.
- Focused Vision Consulting (2024a). *Ballawara Ave – Indigo Parkway roundabout, Byford, Site Inspection – Memo Report*.
- Focused Vision Consulting (2024b). *Thomas Road Duplication – Tonkin Hwy to South Western Highway – Ground truthing of existing vegetation mapping. Memo Report*.

A summary of the results of the above surveys/assessments and methodology are provided in Section 3.

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

Consultant & Survey Name	Survey Details
ELA (2023) Thomas Road Duplication Biological Survey	Survey Area: The total area surveyed was approximately 30.95 ha, of which, 4.28 ha was native vegetation. Type: Detailed flora and vegetation survey, Basic fauna, and Black-Cockatoo (BC) habitat assessment Timing: The flora, vegetation, and the fauna survey were undertaken in 2020 and updated in 2023. Survey Results Shapefile TRIM Ref: D23#1357554 Document TRIM Ref: D23#846260
Focused Vision Consulting (2024a) Ballawara Ave – Indigo Parkway roundabout, Byford, Site Inspection – Memo Report	Survey Area: 0.22 ha within the Clearing Area just north of Malarkey Road roundabout that had not been surveyed by ELA (2023) due to changes to the proposal's design. Type: Extrapolation of flora, vegetation and fauna habitat survey results, with on-site inspection of potential Black-Cockatoo habitat trees. Vegetation unit and condition mapping was extrapolated at a desktop level in reference to aerial imagery, using GIS software, and a site inspection was undertaken to assess Diameter at Breast Height (DBH) trees, record observable native flora and to confirm vegetation units, vegetation condition and fauna habitats. Timing: Site inspection occurred on 7 March 2024. Survey Results Shapefile TRIM Ref: D24#540563 Document TRIM Ref: D24#540554
Focused Vision Consulting (2024b) Thomas Road Duplication - Tonkin Highway to South Western Highway - Ground truthing of existing vegetation mapping.	Survey Area: 1.76 ha within the road duplication proposal area. Type: Ground truth whether vegetation mapped in ELA (2023) was planted or native and inspection of habitat to determine Black-Cockatoo habitat quality. Timing: Site inspection occurred on 6 November 2024. Survey Results Shapefile TRIM Ref: D24#341419 Document TRIM Ref: D24#1471290

3 SURVEY RESULTS

In accordance with CPS 818/17 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. Figure 3 shows the extent of the ELA (2023) survey areas compared to the Clearing Area and the area of extrapolation by FVC (2024a).

3.1 Summary of Flora and Vegetation Surveys

Eco Logical Australia (2020, 2023)

A Detailed and Targeted flora and vegetation survey was undertaken by Eco Logical Australia (ELA) in 2020. In July 2023, ELA undertook a supplementary field survey to ground-truth and refine mapping boundaries following the modifications to the survey area boundary, and additionally update the vegetation mapping to reflect cleared areas since 2020 survey.

Results from ELA (2023) includes the updated survey area boundaries along with desktop area, totalling to 30.95 ha.

The survey mapped four vegetation communities totalling an area of 7.97 ha across the 30.95 ha survey area, including tracks and cleared areas. Of this, only 4.28 ha was remnant native vegetation. Two native vegetation units were mapped in the ELA (2023) survey: *Corymbia calophylla* tall open woodland, and Sparse native trees over weeds. The vegetation condition ranged from 'Degraded' to 'Completely Degraded'. No significant ecological communities, Threatened Ecological Communities (TEC) or Priority Ecological Community (PEC) were inferred to occur within the survey area.

A total of 49 flora taxa representing 18 families and 47 genera were recorded from 11 quadrats and four relevés. This total comprised of 11 native and 38 introduced species. No Threatened or Priority flora species were identified in the ELA (2023) survey.

Focused Vision Consulting (2024a)

A site inspection was undertaken by Focused Vision Consulting (FVC) on 7 March 2024, in order to extrapolate the ELA (2023) results into a small (0.22 ha) area that was not part of ELA's flora, vegetation, and fauna habitat assessment area.

Flora, and vegetation units and condition were evaluated during the survey (FVC 2024a) to match ELA's results.

Two native flora species, *Corymbia calophylla* and *Kingia australis*, were recorded during the site inspection. The understorey was found to be dominated by grassy weeds with no other native species observed. No significant flora species were recorded.

Two vegetation classifications (mapped in accordance with ELA (2023) descriptions) were observed in the survey area: Sparse native trees over weeds (0.049 ha) and Cleared (0.177 ha). The vegetation condition within the site inspection area was found to range from 'Completely Degraded' (0.007 ha) to 'Degraded' (0.042 ha) condition. Most of the 0.22 ha inspected has been previously cleared (0.177 ha, 77.8%) and is devoid of remnant vegetation.

Focused Vision Consulting (2024b)

A site inspection was undertaken by FVC on 6 November 2024 to refine vegetation mapping in ELA (2023) by ground-truthing to determine whether vegetation was planted or native vegetation. The

assessment determined that only 0.96 ha of native vegetation occurs within the footprint of the Thomas Road Duplication project (FVC 2024b).

3.2 Summary of Fauna Surveys

Eco Logical Australia (2020, 2023)

A basic fauna and targeted Black-Cockatoo habitat assessment was undertaken by ELA in 2020, with a supplementary survey in July 2023 to refine mapping boundaries.

The fauna survey identified three fauna habitats within the survey area; Fauna habitat 1: Marri tall open woodland over mixed weeds, Fauna habitat 2: Sparse native and planted trees over weeds and Fauna habitat 3: Revegetation. The survey area contains minor patches of roadside remnant vegetation, which is interspersed with cleared areas and surrounded by residential housing. Fauna habitat within the survey area is unlikely to provide high quality connectivity for fauna species (ELA 2023).

A total of 16 fauna species were recorded within the survey area (15 birds, one mammal). Three significant fauna species were observed through direct and indirect sightings within the survey area. These are:

- Carnaby's Black-Cockatoo (*Zanda latirostris*) – Endangered under BC and EPBC Act
- Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable under BC and EPBC Acts
- Quenda (*Isodon fusciventer*) – Priority 4 (DBCA listing).

The survey area occurs within the known range of all three Black-Cockatoos species (Carnaby's Black-Cockatoo, Forest Red-tailed Black-Cockatoo and Baudin's Black-Cockatoo (*Zanda baudinii*)). Whilst only two Black-Cockatoo species were recorded in the survey area, Baudin's Black-Cockatoo also has the potential to occur, due to the presence of moderate quality foraging habitat for the species and known records in close proximity (ELA 2023).

One introduced fauna species was directly observed in the survey area – Rainbow Lorikeet (**Trichoglossus moluccanus*).

A total of 2.59 ha (8.4%) within the survey area is considered to provide 'Moderate' quality foraging habitat for all three Black-Cockatoo species, with tall Marri woodland. Other fauna habitats were identified to provide Poor (5.33 ha) or Very Poor (0.05 ha) quality foraging habitat, with scattered *Eucalyptus* spp. occurring in low cover areas. Much of the survey area (22.97 ha) provides no foraging habitat for Black-Cockatoos.

The Black-Cockatoo breeding habitat assessment identified 131 potentially suitable Diameter at Breast Height (DBH) trees within the survey area. All potentially suitable DBH trees were Marri (*Corymbia calophylla*), with no hollows recorded (ELA 2023).

Focused Vision Consulting (2024a)

A site inspection was undertaken by FVC on 7 March 2024 in order to extrapolate the ELA (2023) results into a small (0.22 ha) area that was not included in ELA's flora, vegetation, and fauna habitat assessment area. Fauna habitat was evaluated during the survey to match ELA's results.

The DBH for all potential Black-Cockatoo breeding and roosting trees was measured and inspected for potential hollows.

One Marri with a potentially suitable DBH (DBH>500 mm) was recorded. No suitable hollows for Black-Cockatoo breeding were observed.

The fauna habitat within the site inspection area consisted of 'Fauna habitat 2: Sparse native and planted trees over weeds' in 'Poor' condition, as per the description of fauna habitats in ELA (2023).

Focused Vision Consulting (2024b)

A site inspection was undertaken by FVC on 6 November 2024 to assess the Habitat Quality Score (HQS) of native vegetation for Black-Cockatoo foraging habitat within the Thomas Road Duplication clearing area. HQS were determined using the Bamford Consulting Ecologists (BCE) methodology (BCE 2024), which calculates a score out of 10 for Black-Cockatoo habitat as follows:

- a score out of six for vegetation composition, condition and structure
- a score out of three for site context
- a score out of one for stocking rate (Black-Cockatoo species density).

The resulting total score (out of ten) reflects the quality of Black-Cockatoo foraging habitat.

Of the 0.96 ha, 0.01 ha (1.04%) has a foraging HQS of '0', 0.16 ha (16.67%) has a foraging HQS of '4' and 0.79 ha (82.29%) has a foraging HQS of '5'. These scores were determined largely by the presence and projected foliage cover of suitable foraging species, particularly *Corymbia calophylla* at each location.

3.3 Summary of Dieback Survey (ELA 2023)

A *Phytophthora* Dieback survey was undertaken on 27 August 2020 by a registered and suitably qualified Dieback Interpreter with over 23 years of experience (ELA 2023). Due to the degraded vegetation condition of the Clearing Area, the entire survey area was classified as 'Excluded' (unprotectable) due to absence of observable factors (indicator species, vegetation) to detect the Dieback pathogen's impact on native vegetation.

No disease expression was observed due to the site being severely altered. Sporadic deaths of *Xanthorrhoea preissii* were observed but they showed no chronology or pattern of deaths that could suggest Dieback was the cause. Dieback resistant species including Marri and *Kingia* spp. were also seen to be dead or in decline. These deaths may be due to a range of other factors.

Two samples were collected from the survey area to check for *Phytophthora* infestation. Laboratory results from the two *X. preissii* samples gave a negative outcome for presence of *Phytophthora* spp. Sampling was limited as there was no recently dead or dying indicator plants. Both samples were from plants that had died a long time ago, which can limit the viability of inoculum to detect the pathogen through laboratory techniques.

4 VEGETATION DETAILS

4.1 Proposal Site Vegetation Description

The Clearing Area has 0.96 ha of native vegetation in Degraded condition (Table 3).

Table 3. Summary of Vegetation Units representing native vegetation (ELA 2023, FVC 2024a, FVC 2024b)

Vegetation Unit(s)	Extent of native vegetation within Clearing Area	Vegetation condition
<i>Corymbia calophylla</i> tall open woodland over mixed weeds	0.40	Degraded
Sparse native trees over weeds	0.56	Degraded

The Clearing Area is located within the Swan Coastal Plain IBRA region and the Perth subregion (SWA02). The Perth subregion is composed of colluvial and aeolian sands, alluvial river flats and coastal limestone and the vegetation is described by Mitchell *et al.* (2002) as Heath and/or Tuart woodlands on limestone, Banksia, and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages and Marri on colluvial and alluvial. The Perth subregion also comprises a complex series of seasonal wetlands, and areas of relatively high ecosystem/species diversity (Mitchell *et al.* 2002).

There is one Vegetation Association within the Clearing Area – 968, which is described as – Medium woodland: *Eucalyptus marginata*, *Corymbia calophylla*, and *Eucalyptus wandoo*.

Table 4 provides details of the vegetation association within the Clearing Area, and its remaining extent in comparison to its pre-European extent.

Table 4. 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. 968	Statewide	296,877.84	95,048.82	32.02	18.45
	IBRA Bioregion Swan Coastal Plain	136,188.20	9,017.32	6.62	1.43
	IBRA Sub-region Perth	136,188.20	9,017.32	6.62	1.43
	Local Government Authority Shire of Serpentine-Jarrahdale	24,351.49	1,121.13	4.60	0.57

4.2 Vegetation Complexes and Representation

Vegetation Complexes within the Clearing Area have been defined by Heddle *et al.* (1980) and are based on vegetation in association with landforms and underlying geology. Only one native vegetation complex as described by Heddle *et al.* (1980) occurs within the Clearing Area, as follows:

- Guildford Complex – A mixture of open forest to tall open forest of *Corymbia calophylla* - *Eucalyptus wandoo*– *Eucalyptus marginata* and woodland of *Eucalyptus wandoo* (with rare occurrences of *Eucalyptus lane-poolei*). Minor components include *Eucalyptus rudis* - *Melaleuca raphiophylla*.

The remaining extent of the Guildford complex is below the minimum threshold of 10% that is the target for retention in constrained areas (DER 2014). The current remaining extent of this vegetation complex is detailed in Table 5.

Table 5. Vegetation Complexes (Heddle/Mattiske) within the Clearing Area

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
Guildford Complex	90,513.13	4,607.91	5.09

4.3 Black-Cockatoo Habitat Assessment

Black-Cockatoo foraging habitat within the Clearing Area have been assigned a foraging HQS in accordance with the BCE (2024) methodology for each of the three species of Black-Cockatoo (Table 6).

Of the 0.96 ha of native vegetation within the Clearing Area, 0.01 ha (1.04%) has a foraging HQS of '0', 0.16 ha (16.67%) has a foraging HQS of '4' and 0.79 ha (82.29%) has a foraging HQS of '5'. These scores were determined in accordance with BCE (2024) by the presence and projected foliage cover of suitable foraging species, particularly *Corymbia calophylla* within the Clearing Area.

BCE (2024) defines the 'local area' as a 15 km radius of the centre point of the project area. A total of 28,169 ha of remnant vegetation occurs within the 'local area', and therefore, the remnant vegetation in the survey areas is a significantly small proportion of the remnant vegetation of the local area. Therefore, in accordance with BCE (2024) a site context score of '0' has been applied to the project area.

Evidence (chewed Marri nuts) of Black-Cockatoo foraging was observed within the clearing area and therefore, where applicable (for vegetation characteristic scores of 3 or greater), a stocking rate of 1 was applied.

Vegetation characteristic scores of ≤ 2 are not further analysed for context and stocking rate (species presence), as such habitat is considered to have negligible foraging value (BCE 2024).

Table 6. Black-Cockatoo Foraging HQS (out of 10) for Native Vegetation within the Clearing Area (BCE 2024)

Foraging Habitat Score	Black-Cockatoo Habitat	
	Area (ha)	Area (%)
0	0.01	1.04
4	0.16	16.67
5	0.79	82.29

Foraging Habitat Score	Black-Cockatoo Habitat	
	Area (ha)	Area (%)
Total	0.96	100

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the 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 DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation' (DER 2014).

The proposed clearing is at variance to Clearing Principles (b), (e), (f) and (h) and is not at variance, or not likely to be at variance, to the remaining Clearing Principles.

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

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

Vegetation:

The Clearing Area comprises of 0.96 ha of native remnant vegetation in Degraded condition (ELA 2023) comprising two vegetation units/communities:

- *Corymbia calophylla* tall open woodland over mixed weeds
- Sparse native trees over weeds: Marri, Allocasuarina, Flooded gum, over *Kunzea glabrescens*, *Melaleuca preissiana*, *Xanthorrhoea preissii* sparse shrubland over weeds.

Neither of the vegetation units/communities present represent a Threatened or Priority Ecological Community (TEC/PEC). No TECs or PECs are expected to occur within the Clearing Area.

Flora:

A total of 49 flora species representing 18 families and 47 genera were recorded in seven quadrats and three relevés (ELA 2023) from the survey area. From the 49 flora species, 11 are native, and 38 are introduced.

No State or Federally listed Threatened or Priority flora species were recorded within the Clearing Area (ELA 2023). Of the 25 significant flora species identified from the pre-survey likelihood of occurrence assessment, none were likely to occur within the Clearing Area, due to highly degraded nature of vegetation and lack of suitable habitat.

Fauna and fauna habitat:

The Clearing Area supports 0.96 ha that could provide habitat for native fauna. All such habitat is in poor condition as a result of historical clearing, surrounding infrastructure and high levels of weed invasion. It is not considered likely that this habitat supports a high diversity of native fauna.

As the Clearing Area contains no Threatened or Priority flora, contains 0.96 ha of remnant native vegetation in Degraded to Completely Degraded condition, and a limited amount of poor quality foraging habitat for conservation significant fauna species, the proposed Clearing Area is not considered to comprise a high level of biodiversity and is not likely to be at variance to this Principle.

Methodology

- ELA (2023)
- FVC (2024b)
- EPA (2016)
- DBCA Shapefiles
- MRWA shapefiles
- NatureMap (2023)

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

Proposed clearing is at variance to this Principle.

ELA's desktop assessment identified known records of 32 significant fauna species occurring within 10 km of the Clearing Area.

The biological survey (ELA 2023) identified three conservation species present within the survey area. These were:

- Carnaby's Cockatoo (*Zanda latirostris*) – EPBC Act and BC Act Endangered
- Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) – EPBC Act and BC Act Vulnerable
- Quenda (*Isodon fusciventer*) – Priority 4.

Within the Clearing Area, Carnaby's Black-Cockatoo and Quenda were observed directly, while the Forest Red-tailed Black-Cockatoo was recorded from secondary signs, specifically tail feathers, and foraging evidence (ELA 2023).

Black-Cockatoos

The Clearing Area is within the known distribution and range of the Carnaby's Cockatoo and Forest Red-tailed Black-Cockatoo, with foraging evidence for both species present within the Clearing Area. Baudin's Black-Cockatoo (*Zanda baudinii*) was not directly observed in the Clearing Area but is considered to have the potential to occur, as the Clearing Area is within its known range and provides potentially suitable foraging, breeding, and roosting habitat.

Within the Clearing Area, 0.95 ha of potentially suitable foraging habitat for all three Threatened Black-Cockatoo species was recorded (Figure 4). The quality of the foraging habitat was assessed using the Bamford Consulting Ecologists methodology (BCE 2024) and varied from a HQS of '4' (0.16 ha) to '5' (0.79 ha) (FVC 2024b).

There are 35 potentially suitable DBH (Marri) trees within the Clearing Area (ELA 2023, FVC 2024a). No suitable hollows for breeding have been confirmed within any of these trees. Another two DBH trees (identified as trees 51 and 104 in Figure 4) are outside the Clearing Area but may be impacted by clearing due to their canopy hanging over the Clearing Area and are therefore considered as part of this assessment.

No roosting of Black-Cockatoos was observed during surveys within the Clearing Area (ELA 2023). The Clearing Area does not occur within the buffer of a known Black-Cockatoo roosting site. However, all potential DBH trees within the Clearing Area provide potentially suitable roosting habitat (ELA 2023).

The loss of up to 0.95 ha of Black-Cockatoo foraging habitat, potential breeding habitat and potential roosting habitat is considered to be at variance to this clearing principle.

Other Conservation Significant Species

The Quenda occurs in wet or dry sclerophyll forest through to open woodland and scrubby, dense vegetation on sandy soils but also inhabits urban backyards, parklands and bush fragments. The species was recorded within the fauna surveys that included the Clearing Area (ELA 2023). This species was directly observed within the survey area. Quenda are widespread and is an adaptable species, and the vegetation within the Clearing Area is not considered to be critical to the species.

It is unlikely that the small area of vegetation to be cleared constitutes significant habitat for the species, which is more likely to occur in larger pockets of native vegetation associated with local bushland reserves.

The proposed clearing is at variance to this Principle due to:

- Loss of up to 0.95 ha of Black-Cockatoo foraging habitat
- Loss of up to 37 potentially suitable DBH trees for Black-Cockatoos (none with hollows). This number includes two DBH trees outside the Clearing Area that may be impacted due to their canopy overhanging the Clearing Area.

Methodology

Aerial Photography

DBCA Shapefiles

DAWE (2022)

ELA (2023)

EPA (2016)

FVC (2024a)

FVC (2024b)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.**Proposed clearing is not at variance to this Principle.**

No State or Federally listed Threatened flora species were recorded within the Survey Area (ELA 2023).

ELA (2023) identified 17 Threatened flora species as possibly occurring within the Survey Area based on the database searches. A pre-survey likelihood of occurrence assessment identified one Threatened species as having the potential to occur within the Survey Area:

- *Synaphea* sp. Serpentine (Critically Endangered under the EPBC Act and BC Act).

A post-survey likelihood of occurrence assessment following the flora survey indicated that none of the 17 Threatened flora species were likely to occur. This is due to the lack of suitable habitat within the Survey Area for any of the Threatened flora species and the highly degraded nature of vegetation within the Survey Area. The level of search effort within the survey area was considered adequate to have identified any individuals of a Threatened species (ELA 2023).

As no Threatened species are known or likely to occur in the Clearing Area, the proposed clearing is not at variance to this Principle.

Methodology

ELA (2023)

DBCA Shapefiles

(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.

No State or Federally listed Threatened Ecological Community (TEC) occurs within the Clearing Area (ELA 2023).

Based on desktop assessment, buffers of two State and Federally listed TECs occur in close proximity to the Clearing Area. Both of these TECs are listed as Endangered under EPBC Act and Critically Endangered under BC Act. These are:

- SCP3a *Corymbia calophylla* – *Kingia australis* woodlands on heavy soils, Swan Coastal Plain
- SCP3c *Corymbia calophylla* – *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain.

The buffer of the TECs intersects the eastern end of the Survey Area, but the actual location and extent of both TECs is outside the Survey Area and within the adjacent rail reserve. No vegetation within the Survey Area or the Clearing Area is representative of either TEC.

There are no known TECs within the Clearing Area and therefore, the proposed clearing is not at variance to this Principle.

Methodology

ELA (2023)

DBCA Shapefiles

EPA (2016)

(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 at variance to this Principle.**

The Clearing Area is located within the Swan Coastal Plain IBRA region and Perth subregion (SWA02). One Beard (1990) vegetation association (968) occurs within the Clearing Area and is described as: Medium woodland; *Eucalyptus marginata*, *Corymbia calophylla*, and *Eucalyptus wandoo*. Within the Swan Coastal Plain IBRA region and the Perth IBRA subregion, this Beard vegetation association is underrepresented, with less than 10% of its pre-European extent remaining.

Vegetation Association (Beard 1990) within the Clearing Area

Pre-European Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 968	Statewide	296,877.84	95,048.82	32.02	18.45
	IBRA Bioregion Swan Coastal Plain	136,188.20	9,017.32	6.62	1.43
	IBRA Sub-region Perth	136,188.20	9,017.32	6.62	1.43
	Local Government Authority Shire of Serpentine-Jarrahdale	24,351.49	1,121.13	4.60	0.57

One Heddle *et al.* (1980) complex, the Guildford Complex, occurs within the Clearing Area, and is summarised as: a mixture of open forest to tall open forests of Marri, Wandoo, Jarrah, and woodland of wandoo with rare occurrences of Flooded Gum and paperbark. The Guildford Complex is considered to be under-represented as there is 5.09 % of its pre-European extent remaining.

Vegetation Complex (Heddle *et al* 1980) within the Clearing Area

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
Guildford Complex	90,513.13	4,607.91	5.09

The national objectives and targets for biodiversity conservation in Australia have a target to prevent clearance of ecological communities with an extent below 30% of that present pre-1750, below which, species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). The Clearing Area is within a constrained area, and as such, a retention target of at least 10% applies (DER 2014).

The current extent of Vegetation Association 968 is below the 10% threshold (IBRA Bioregion, IBRA sub-region, and LGA) and therefore, is considered significant as a remnant of native vegetation. In addition to this, the current extent of Guildford complex is below 10% threshold for the Swan Coastal Plain, and therefore representations are considered significant vegetation.

The proposed clearing is at variance to this Principle, as the vegetation within the Clearing Area is in an area that has been extensively cleared.

Methodology

- Aerial photography
- Commonwealth of Australia (2001)
- DER (2014)
- EPA (2016)
- ELA (2023)
- Government of Western Australia (2019)

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**Proposed clearing is at variance to this Principle.**

According to DBCA's Geomorphic Wetlands of the SCP Dataset (1:25,000 scale mapping), three multiple use wetlands (UFI 15797, 7868, and 15013) are mapped as occurring occur within the Clearing Area (Figure 5). However, by definition, these wetlands are degraded to the extent that they are not a priority for conservation and have few remaining important attributes and functions. The small extent of the proposed clearing will not have a significant impact on these already highly modified palusplains.

The entire 0.96 ha of native vegetation within the Clearing Area occurs on an area mapped as palusplain wetlands. Therefore, the proposed clearing is at variance to this Principle. However, the proposed clearing is not likely to impact on the greater extent of riparian vegetation in the local area considering it comprises a small area within an extensive palusplain; noting the Armadale Palusplain covers over 7,200 ha.

Methodology

ELA (2023)

DWER and DBCA shapefiles

- Government GIS shapefiles:
 - Geomorphic Wetlands (Accessed March 5, 2024)

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

Proposed clearing is not at variance to this Principle.

The Department of Primary Industries and Regional Development (DPIRD) provides a series of soil degradation risk mapping at sub-system level. The Clearing Area is located within the Pinjarra soil system which is described as: ‘poorly drained coastal plain with variable alluvial and aeolian soils. Vegetation includes Jarrah, Marri, wandoo, paperback, forest, and woodland’.

The table below summarises the soil degradation risk within the Clearing Area:

Aspect	Degradation risk (Pinjarra soil system)
Wind erosion	65%
Waterlogging	45 – 100%
Water Erosion	0%
Salinity	0%
Flood risk	1%

Wind erosion and waterlogging are the two potential soil degradation aspects relevant to the Clearing Area. However, due to the poorly drained and heavy soils associated with the Clearing Area, it is unlikely that wind erosion will be a significant issue. The Clearing Area is located within an extensive Palusplain wetland, which is known to be affected by waterlogging even without clearing. Given the small amount of clearing proposed, it is unlikely that the clearing will cause any increase in waterlogging.

It is unlikely that the small amount of proposed clearing will cause appreciable land degradation, especially given the implementation of standard construction environmental management measures to mitigate and manage potential wind driven erosion during construction.

Methodology

GIS shapefiles

Natural Resource Management SLIP Soil Systems (Accessed March 2024)

(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 at variance to this Principle.**

No DBCA managed conservation areas occur within the Clearing Area.

The Clearing Area will impact on native vegetation within reserve 37332 (also known as Lot 151 on Plan 1367, Byford) which covers 0.2 ha of the Clearing Area. Reserve 37332 is managed by the Shire of Serpentine Jarrahdale under a management order for the dual purpose of 'Public Recreation and Conservation'. Reserve 37332 was an offset condition for the Shire of Serpentine Jarrahdale for Clearing Permit CPS 6498/1 (Figure 6).

Clearing Permit CPS 6498/1 requires the Shire to conserve 5.6 ha of Black Cockatoo habitat in perpetuity within Reserve 37332. Given R 37332 is approximately 7.3ha in size, the Shire's offset won't be impacted by the proposed clearing associated with the Thomas Road duplication Project. There will still be ample area within R 37332 for the Shire to deliver the 5.6 ha offset requirement.

As the Clearing Area is partly within a reserve managed for conservation, the proposed clearing is at variance to this Principle.

Methodology

ELA (2023)

DBCA shapefiles

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

The proposed clearing of 0.96 ha of native vegetation adjacent to an existing road and other disturbance is unlikely to cause deterioration in the quality of surface or ground water. Whilst groundwater levels are naturally high within the Clearing Area, the transmissivity of the soil is low due to the heavy soils.

Given the small area of clearing proposed, there will be no change to the surface or groundwater hydrology of the Clearing Area.

The proposed road duplication will construct drainage structures within the Clearing Area, to ensure that rainfall with a 1% annual exceedance probability (AEP) is managed within the drainage system.

Deterioration in the quality of surface water or underground water is unlikely to occur as a result of native vegetation clearing.

The proposed clearing is not likely to be at variance to this Principle.

Methodology

ELA (2023)

DWER and DBCA shapefiles

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

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

Given that the wetland areas within and adjacent to the Clearing Area have been significantly altered due to urban, infrastructure and agricultural development and the proposed clearing is relatively small in relation to the size of the palusplain wetlands, the proposed clearing is unlikely to cause or exacerbate the incidence or intensity of flooding.

The proposed road duplication will construct drainage structures within the Clearing Area, to ensure that rainfall with a 1% AEP is managed within the drainage system.

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

Methodology

ELA (2023)

Natural Resource Management SLIP Soil Systems (Accessed March 2024)

GIS Shapefiles

6 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided, then clearing will be kept to a minimum. A Vegetation Management Plan (VMP) has been developed to manage and minimise vegetation clearing for the Proposal (refer to Appendix 3).

7 REHABILITATION, REVEGETATION & OFFSETS

7.1 Revegetation and Rehabilitation

No temporary clearing will be undertaken as part of the Proposal activities.

7.2 Offset Proposal

In accordance with CPS 818 condition 11(a), to offset the residual impacts from clearing 0.96 ha of Black Cockatoo Foraging Habitat (also representing the Guildford Complex), Main Roads has developed an offset proposal in accordance the current WA environmental offsets Policy.

Main Roads will work with DWER to finalise the offset proposal.

8 STAKEHOLDER CONSULTATION

Main Roads has undertaken stakeholder consultation in accordance with Condition 8 of CPS 818. Main Roads received submissions from the following stakeholders:

- 2 x Individual Landowners

The following table details the key issues raised and Main Roads response to these issues.

Name of Stakeholder	Key Issue/Comment	Main Roads Response/Comment
Individual Landowner 27/05/2024	The landowner raised concerns about the proposed clearing of native vegetation. In addition, the landowner raised concerns regarding the following potential impacts. - Removal of the trees will remove the vegetation 'screen' between their property and Thomas Road resulting in increased noise impacts. - Potential for the alteration of the drain along Thomas Road to exacerbate flooding on their property - Safety concerns regarding the current horse crossing - Objections regarding the removal of the bridal trail in the area and concerns as to how horses will access trails from Thomas Road.	Main Roads is committed to minimising vegetation clearing to maintain trees and natural screening. Sections 1.5 and 1.6 of this Clearing Assessment Report outline the alternatives to native vegetation clearing considered during the development of the proposal and measures to avoid, minimise, reduce and manage clearing impacts of this proposal. Noise monitoring and modelling has been undertaken to determine current and future traffic noise levels and inform appropriate noise mitigation measures. At this stage, noise mitigation proposed near the property includes road surfacing treatments to reduce noise for residential properties, however, noise walls are not required. Further noise modelling and community consultation will also be undertaken. In relation to drainage, significant hydrological modelling has been undertaken to understand current surface water flow regimes and how this may change after the roadworks are constructed. The modelling has identified critical flow paths that will need to be maintained after construction through the provision of culverts below the road. The road is being built up to accommodate the high water table and drainage requirements through the area. The drainage design will be progressed further during the detailed design process. The equine path north of Thomas Road will be maintained. Additional north-south connectivity is being provided to link the existing southern path, to the northern Darling Downs network, via a signalised crossing located east of Briggs Road. An unsignalised crossing will also be provided on Wungong South Road to connect to an underpass constructed as part of the Thomas Road over Rail project. A shared path for pedestrians and cyclists will be constructed on the southern side of Thomas Road.
Individual Landowner 12/05/2025	The landowner raised concerns about the proposed clearing and the provision of a suitable offset. In addition, the landowner raised concerns about the selection of an alignment that involves the clearing	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, and that it has a responsibility to conserve the environmental values that occur within the State's road network, and minimise the impact its projects have on the environment. 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

Name of Stakeholder	Key Issue/Comment	Main Roads Response/Comment
	of native vegetation instead of utilising already cleared land.	environmental, economic and community benefits and impacts. It operates on a hierarchy of avoiding, minimising, reducing and then offsetting our environmental impacts. Sections 1.5 and 1.6 of this Clearing Assessment Report outline the alternatives to native vegetation clearing considered during the development of the proposal and measures to avoid, minimise, reduce and manage clearing impacts of this proposal. Main Roads has proposed an appropriate offset to ensure the proposed clearing impacts are counter balanced.

9 COMPLIANCE WITH CPS 818

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

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 3. 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 assessment was conducted in the Clearing Area (ELA 2023). Results show that the Clearing Area has been classified as 'Excluded' (unprotectable) because the site vegetation structure is severely altered. Standard Vehicle and Plant management actions from Principal Environmental Management Requirements (PEMRs) and Hygiene Checklists will be applied. This will be adequate to minimise the risk of spreading dieback and weeds within and outside the Clearing Area (ELA 2023).
5b. Do the proposed works require clearing within or adjacent to DBCA managed lands in non-dry conditions?	No	No further action required.

Impact of Clearing	Yes/No or NA	Further Action Required
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback.	No	No further action required.
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	No	There is no adjacent native vegetation in good or better condition.
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.

10 REFERENCES

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11 APPENDICES

Appendix	Title
Appendix 1	CPS 818/17 condition 8 (e) (iii) Biological Surveys and Field Assessment Executive Summary and Report Conclusions
Appendix 2	Figures
Appendix 3	Vegetation Management Plan

Appendix 1: CPS 818/17 condition 8 (e) (iii) Biological Surveys and Field Assessment Executive Summary and Report Conclusions

Thomas Road Duplication Biological Survey (ELA 2023)

Executive Summary

Main Roads Western Australia (Main Roads) is proposing to duplicate Thomas Road between Tonkin Highway (SLK 18.5) and South Western Highway, to improve the safety and efficiency on Thomas Road. The survey area is located approximately 40 kilometres south of Perth, Western Australia, and consists of an approximately 60-metre-wide by 3.5-kilometre-long section of road reserve to the north and south of Thomas Road in Byford, Western Australia.

Eco Logical Australia was engaged by Main Roads in 2020 to undertake a Detailed and Targeted flora and vegetation survey and a Basic fauna survey and Targeted black cockatoo habitat assessment of the survey area in order to identify biological values present. In July 2023, ELA undertook a supplementary field survey to ground-truth and refine mapping boundaries following an amendment to the survey area boundary, and to update vegetation mapping to reflect cleared areas since the 2020 survey. Results presented in the following report, inclusive of the desktop assessment, reflect the updated survey area, totalling approximately 30.95 ha.

A desktop assessment was undertaken, including a review of relevant government database searches within 5 kilometres of the survey area, to assess for the potential presence of conservation listed flora and fauna species and ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the State *Biodiversity Conservation Act 2016* or Priority species by the Department of Biodiversity, Conservation and Attractions.

A single, out of season Detailed and Targeted flora and vegetation survey and a Basic fauna survey and Targeted black cockatoo habitat assessment was undertaken within the survey area on 4 August 2020. The 2020 field survey was undertaken in accordance with the Environmental Protection Authority *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (2016), the Environmental Protection Authority *Technical guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (2020) and the Department of Sustainability, Environment, Water, Populations and Communities *EPBC Act referral guidelines for three threatened black cockatoo species* (2012). An out-of-season supplementary field survey was conducted on 24 July 2023.

A total of 49 flora species (11 native and 38 introduced) representing 18 families and 47 genera were recorded from the eleven quadrats and four relevés established within the survey area and from opportunistic collections. No Threatened (Declared Rare) flora species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or the State *Biodiversity Conservation Act 2016*, or Priority flora species listed by the Department of Biodiversity, Conservation and Attractions were recorded within the survey area. A post-survey flora likelihood of occurrence assessment was undertaken following the field survey. Following this assessment, all of the 25 significant flora species identified from the desktop assessment as possibly occurring within the survey area were considered as being unlikely to occur within the survey area. This assessment was based on the lack of suitable habitat present within the survey area, the highly degraded nature of vegetation present and from adequate search effort having been undertaken within the survey area. Two introduced (weed) species listed as Declared Pests under the State *Biosecurity and Agriculture Management Act 2007* were recorded within the survey area, namely **Gomphocarpus fruticosus* (Narrow Leaf Cotton Bush) and **Zantedeschia aethiopica* (Arum Lily). Each of these species is categorised as s. 22(2) (c3), required to be managed.

Vegetation communities were described through the establishment of eleven 10 x 10 metre quadrats and four relevés. Four vegetation communities were mapped across the survey area, covering a total area of 7.98 hectares. Of this 4.28ha was remnant native vegetation, 3.64ha was planted and 0.05 was revegetation. Tracks and cleared areas with weeds accounted for the remaining 22.97 hectares. No significant ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the State *Biodiversity Conservation Act 2016* or by the Department of Biodiversity, Conservation and Attractions were inferred to occur within the survey area.

Condition of remnant vegetation in the survey area ranged from Completely Degraded to Degraded, with majority of remnant vegetation within the survey area being recorded in Degraded condition (13.8%; 4.28 hectares). All vegetation has been subject to historical disturbances including weed invasion, historical clearing and minor rubbish dumping.

A total of three fauna habitats were recorded within the survey area; Fauna habitat 1: Marri tall open woodland over mixed weeds, Fauna habitat 2: Sparse native and planted trees over weeds and Fauna habitat 3: Revegetation. The survey area contains minor patches of roadside remnant vegetation, which is interspersed with cleared areas and surrounded by residential housing. Fauna habitat within the survey area is unlikely to provide high quality connectivity for fauna species.

A total of 16 fauna species were recorded within the survey area, comprising 15 birds and one mammal. Of these species, Carnaby's Cockatoo (*Calyptorhynchus latirostris*) is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the State *Biodiversity Conservation Act 2016*, the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii* subsp. *naso*) is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the State *Biodiversity Conservation Act 2016*, and Quenda (*Isodon fusciventer*) is listed as Priority 4 by the Department of Biodiversity, Conservation and Attractions. These species were observed from direct observation (Carnaby's Cockatoo calls heard and birds observed flying overhead, Quenda directly observed) and from secondary signs (e.g., Forest Red-tailed Black Cockatoo tail feathers and foraging evidence observed within Fauna habitat 1: Marri tall open woodland over mixed weeds and Fauna habitat 2: Sparse native and planted trees over weeds). One introduced fauna species was recorded within the survey area, namely **Trichoglossus moluccanus* (Rainbow Lorikeet), which was directly observed within the survey area.

The Targeted black cockatoo habitat assessment was undertaken in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* referral guidelines (Department of Sustainability, Environment, Water, Populations and Communities 2012). The survey area occurs within the known distribution of Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo (Department of Sustainability, Environment, Water, Populations and Communities 2012).

A total of 2.59 hectares (8.4%) within the survey area is considered as providing 'Moderate' quality foraging habitat for all three black cockatoo species, with tall open Marri (*Corymbia calophylla*) woodland providing potentially suitable foraging habitat for all three species of black cockatoo species. A further 5.33 hectares and 0.05 hectares is considered as providing Poor and Very Poor foraging quality, respectively, with Scattered *Eucalyptus* spp. occurring at a low cover within these areas. A total of 22.97 hectares is considered as providing 'Nil' foraging quality for black cockatoo species.

The black cockatoo breeding habitat assessment identified 131 potentially suitable Diameter at Breast Height trees within the survey area, comprising *Corymbia calophylla* (Marri), none of which contained hollows or suitable hollows for breeding. All potentially suitable Diameter at Breast Height trees recorded from the survey area provide potential roosting habitat for three black cockatoo species. An additional 127 potentially suitable roosting trees were recorded, bringing the total to 258 potentially suitable roosting trees recorded within the survey area.

Although not directly observed during the field survey, Baudin's Black Cockatoo (*Calyptrorhynchus baudinii*) is also considered as having the potential to occur within the survey area, as the survey area provides moderate quality foraging habitat, and occurs within this species' known foraging range.

A Phytophthora dieback assessment, conducted in accordance with the requirements of Main Roads Statewide Purpose Clearing Permit, CPS818/14, was completed within the survey area on 27 August 2020 by Bruno Rikli from Bark Environmental, a DBCA registered dieback interpreter, former Forester and former Biosecurity Officer for Department of Agriculture and Food Western Australia. The survey was undertaken with consideration of any naturally vegetated areas of influence up to 150 metres outside of the survey area and involved the collection of up to 2 plant/soil samples for laboratory testing, as required.

Due to the degraded condition of vegetation and the absence of available observable factors to detect the Dieback pathogen's impact, the entire survey area was classified as Excluded (unprotectable). There was no disease expression to report, due to site vegetation structure being severely altered. Sporadic deaths of the widely scattered susceptible indicator plant *Xanthorrhoea preissii* were observed, however they showed no chronology or pattern of deaths within the landscape that could suggest *Phytophthora spp.* as the cause. Two samples were collected from within the survey area, with the sampling strategy being to detect any possible *Phytophthora spp.* in the survey by targeting known susceptible plants and to sample areas where *Phytophthora spp.* commonly occurs e.g., alongside roads and drainage lines. Both sampled plants, both of which returned a negative sample.

5. DISCUSSION AND RECOMMENDATIONS

This Dieback assessment has mapped the entire study area of 27.55 ha as the “Excluded” occurrence category because site vegetation structure is severely altered and Phytophthora occurrence assessment is not possible. The small vegetated areas were also Excluded considering the total environmental context. If Phytophthora Dieback was present within this site, with the current native vegetation paucity and overall absence of susceptible plant species, it would not be observable or cause a significant impact. The remnant stand of Marri trees was also Excluded because its understorey is no longer intact and it is Degraded. In addition, it has open-access for off-road vehicles and recent evidence of this was observed along the sand/mud tracks surrounds it.

Given the entire assessment study area has been classed as “Excluded” and it does not adjoin any current Phytophthora susceptible native vegetation, it can be considered as “Unprotectable” from Dieback. It also has ongoing potential to have pathogens introduced as it has open roads and roadside drainage vectors.

Ballawara Ave – Indigo Parkway Roundabout, Byford, Site Inspection Report (FVC 2024a)

FVC (2024a) was a memo-style report with no clear Executive Summary or Conclusions. Therefore, a summary of the report and its conclusions is provided below:

A biological survey of the Thomas Road Duplication Project area was conducted by Eco Logical Australia (ELA) in 2020 and revised in 2023 (ELA 2023). A site inspection was conducted by Focused Vision Consulting (FVC) in March 2024 (FVC 2024) to supplement ELA (2023) for a patch of vegetation within the project area but outside the ELA (2023) survey area.

The purpose of the survey was to ground truth aerial imagery in order to extrapolate the ELA (2023) survey data for vegetation units and condition and fauna habitat. The Diameter at Breast Height (DBH) for all potential Black-Cockatoo breeding and roosting trees was measured and inspected for potential hollows.

The site inspection of a 0.22 ha area within the proposed Thomas Road Duplication proposal area that had not been previously surveyed, found that the site was largely degraded and had been impacted by recent urban development. One Marri with a DBH >500 mm was identified within the site inspection area. No hollows were observed. A total of 0.049 ha of native vegetation was confirmed to occur, in 'Completely Degraded – Degraded' to 'Degraded' condition.

Thomas Road Duplication – Tonkin Hwy to South Western Highway – Ground truthing of existing vegetation mapping (FVC 2024b)

FVC (2024b) was a memo-style report with no Executive Summary or Conclusions. Therefore, a summary of the report and its conclusions is provided below:

FVC was engaged to ground-truth vegetation proposed to be cleared as part of the Thomas Road Duplication project in order to determine whether the vegetation is planted or remnant.

Areas were initially assessed using historical aerial imagery to determine the age of the vegetation and whether it was likely to be remnant or potentially planted. Areas were then traversed on foot to determine if the vegetation was planted or native.

Vegetation was assessed as being planted by visually assessing species composition (presence of exotic landscaping species, endemic species out of context), structure (planted in rows as opposed to naturally dispersed) and landform (growing in roadside batters, drains or signs of earthworks).

Areas, that contain remnant vegetation, or contained self-sown rejuvenating vegetation, were considered 'Native'. Areas that, distinctly show evidence of being planted, such as occurring in a single row along a batter or as rows along the bridal trail, were considered 'Planted'

Areas of vegetation were categorised into two broad categories; native or planted, as summarised in Table 1.

Table 1 – Summary of Vegetation within the Clearing Area

Category	Area (ha)	% of Clearing Area (ha)
Native	0.96	54.54
Planted	0.80	45.45
Total	1.76	100

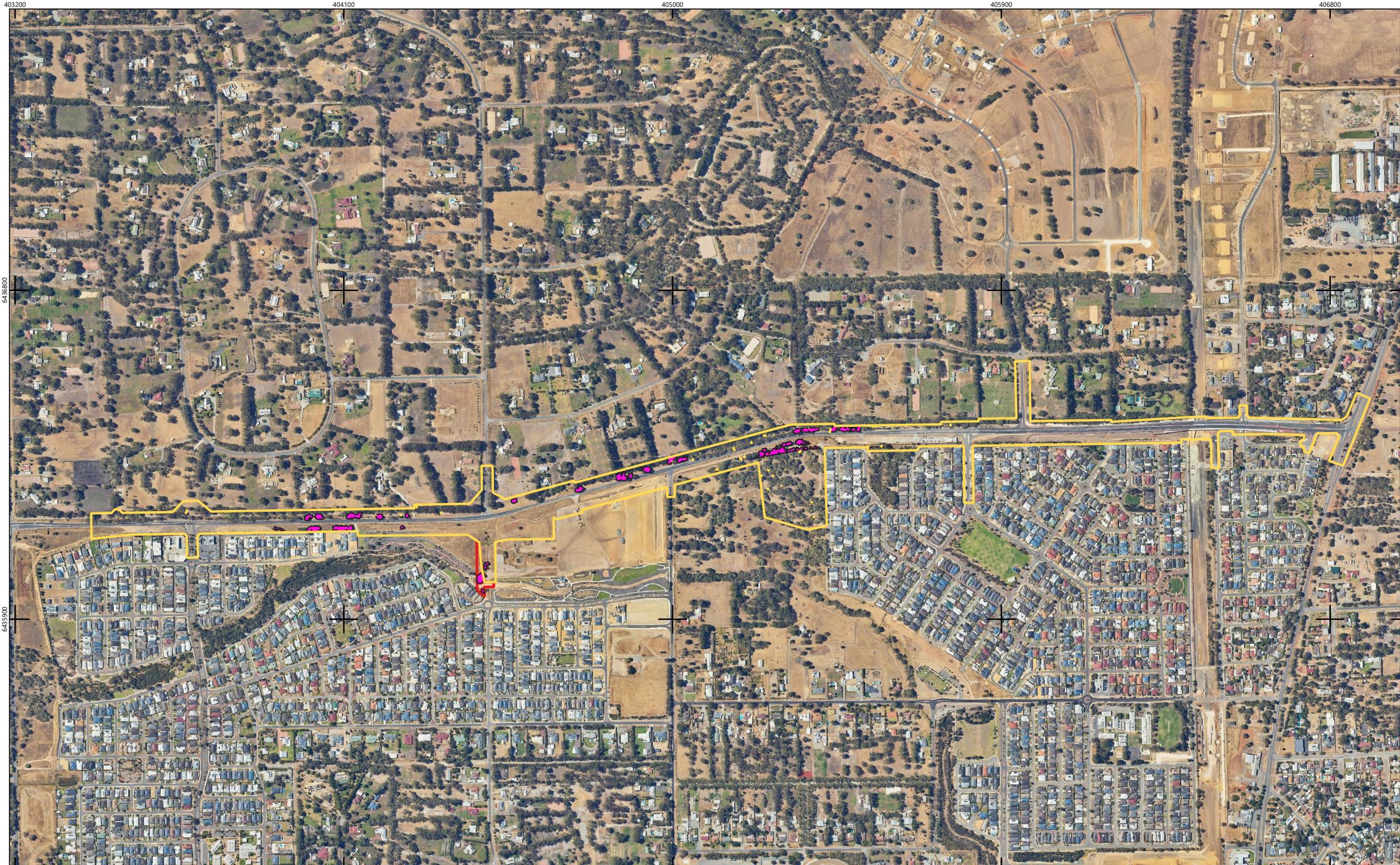
A foraging habitat quality score for Black-Cockatoos was applied to all areas containing native vegetation. The scoring system applied the Bamford Consulting Ecologists (BCE) methodology (BCE 2024), which calculates a score out of 10 for Black-Cockatoo habitat as follows:

- a score out of six for vegetation composition, condition and structure
- a score out of three for site context
- a score out of one for stocking rate (Black-Cockatoo species density).

The resulting total score (out of ten) reflects the quality of Black-Cockatoo foraging habitat.

Of the 0.96 ha, 0.01 ha (1.04%) has a foraging HQS of '0', 0.16 ha (16.67%) has a foraging HQS of '4' and 0.79 ha (82.29%) has a foraging HQS of '5'. These primary driver for these scores was the presence and projected foliage cover of suitable foraging species, particularly *Corymbia calophylla* at each location.

Appendix 2: Figures



0 100 200 300 400 m
GDA 2020 MGA Zone 50

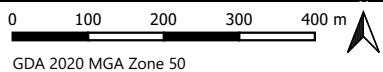
Figure 3 - Extent of biological surveys/assessments

Legend

- Clearing Area
- FVC Survey Area
- Ecological Survey (2023)



Figure 4 - Black-Cockatoo Habitat



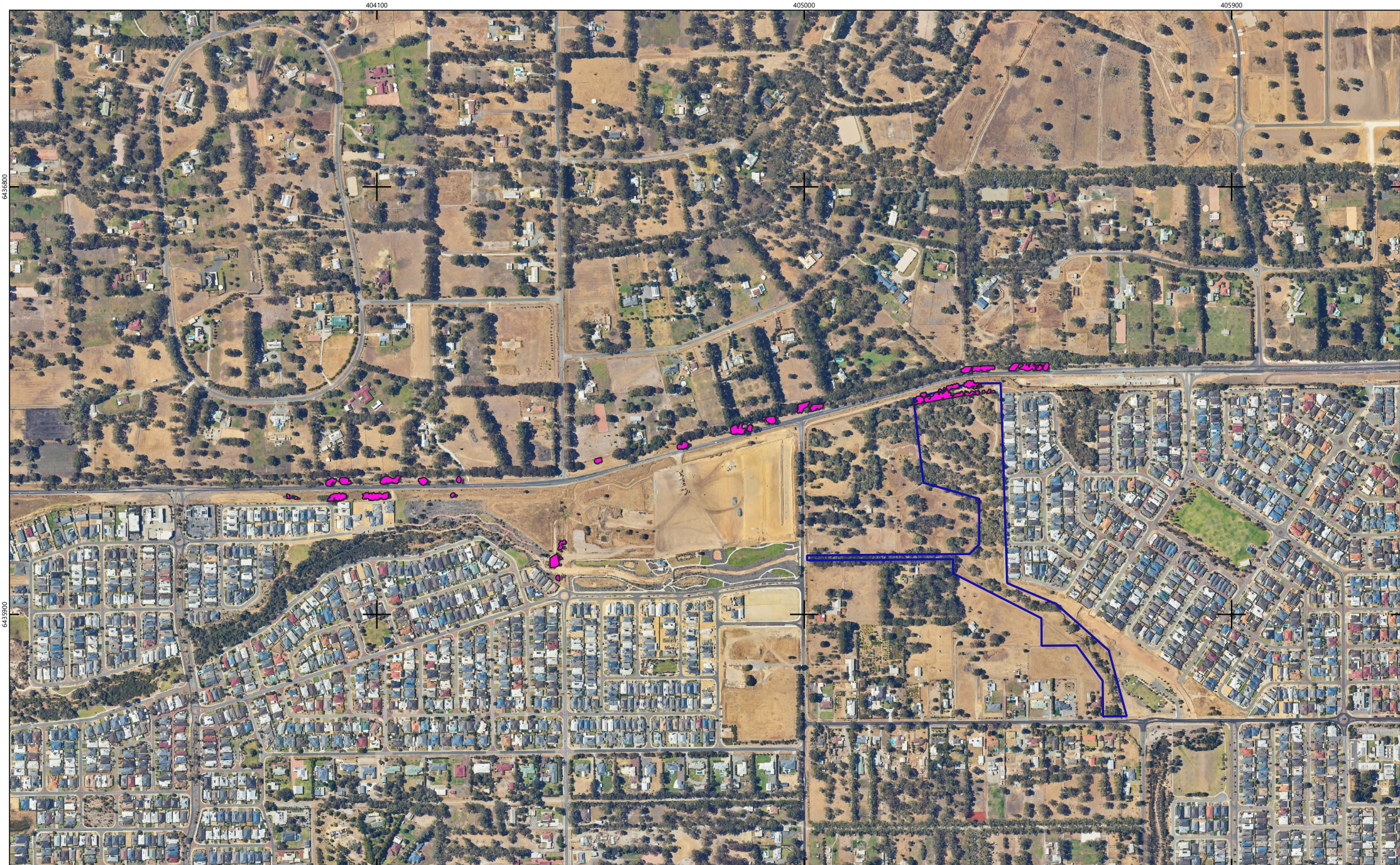
Legend

Wetlands Category:

- Multiple Use
- Resource Enhancement

Clearing Area

Figure 5 - Geomorphic Wetlands



0 100 200 300 400 m
 GDA 2020 MGA Zone 50

Legend

- Clearing Area
- Lot 151

**Figure 6 - Reserve 37332 (Lot 151
 on Plan 1367, Byford)**

Appendix 3: Vegetation Management Plan

THOMAS ROAD DUPLICATION (TONKIN HIGHWAY TO SOUTH WESTERN HIGHWAY)

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 Thomas Road Duplication.

Main Roads Western Australia (Main Roads) proposes to duplicate Thomas Road between Tonkin Highway and South Western 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 4.1: General Vegetation Management Actions for Clearing.

Appendix 3.1: 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

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 (zoology) to identify the areas to demarcate for all significant fauna habitat to be avoided within the development envelope.
- Engage an environmental specialist (fauna) to undertake a preclearance check of conservation significant fauna residences.

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.