



mainroads  
WESTERN AUSTRALIA

# Clearing Impact Assessment and Vegetation Management Plan

*We're working for  
Western Australia.*

Mitchell Freeway Southbound –  
Hodges Drive on-ramp (H659)

July 2020

EOS No.1969

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# Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	E Associate / Consultant	Rev A	15 May 2020
Reviewer:	Principal Environmental Officer	Rev A	
Author:	Senior Environmental Officer / Consultant	Rev B	22 May 2020
Reviewer:	Principal Environmental Officer	Rev B	
Author:	Associate	Rev 0	May 2020
Reviewer:	Senior Environment Officer	Rev 0	13 July 2020

# 1 SUMMARY

## 1.1 Project Information

**Project Name:** Mitchell Freeway Southbound – Hodges Drive on-ramp

**Project Location(s):** The project area is located on the Hodges Drive on-ramp (H659) SLK 0.12 to SLK 0.40 and Mitchell Freeway (H016) between SLK 25.67 to SLK 25.38 within the local government authority boundary of the City of Joondalup (Figure 1).

**Project Purpose / Components:** Main Roads Western Australia (Main Roads) proposes to upgrade the Hodges Drive on-ramp to allow for future ramp signals.

Note that this assessment is ONLY for the clearing of native vegetation for above project activities.

**Area Proposed to be Cleared:** The project will require clearing of up to 0.035 hectares (ha) of remnant vegetation

**Temporary Clearing Required:** None

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

- Flora and Vegetation
  - Clearing of 0.035 ha of remnant native vegetation, of which 0.031 ha is in a 'Degraded' condition and 0.004 ha in 'Good' condition.
  - Clearing of 0.025 ha of Banksia Woodlands of the Swan Coastal Plain TEC.
  - Clearing of 0.034 ha of Banksia woodlands of the Swan Coastal Plain PEC.
- Terrestrial Fauna
  - The project has the potential to impact Black Cockatoo species, specifically Carnaby's and Forest Red-tailed Black Cockatoo through the removal of 0.035 ha of foraging habitat; due to the altered state of vegetation and the sporadic and isolated distribution of known foraging species, it is not considered quality foraging habitat as defined in the referral guidelines (Department of Sustainability Environment Water Population and Communities 2012).
  - No potential breeding trees (those of a suitable species with greater than the 500 mm DBH) will be impacted as a result of clearing.
- The project is not likely to be at variance with any of the ten clearing principles.
- A Vegetation Management Plan has been prepared for this work and is appended to this document (Appendix B).

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



## 2 ASSESSMENT SCOPE

This clearing impact assessment involved a desktop analysis of environmental aspects and impacts, a site investigation, a biological assessment and an assessment of native vegetation clearing impacts. The study area is confined to a local area of a 10 km radius. This assessment determined the need to develop and obtain approvals from the Department of Water and Environmental Regulation (DWER) for a Revegetation Plan, a Vegetation Management Plan (VMP), a Dieback Management Plan or an Offset Proposal.

### 3 PROJECT DESCRIPTION

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

**Table 1. Project Description**

Project Components	Clearing Required (Y/N)	Estimated Clearing Area (ha) <i>TBC if unknown</i>
Road Widening(H659) SLK 0.12 to SLK 0.40 and (H016) between SLK 25.67 to SLK 25.38	Y	0.035 ha
Pre-construction works/service Relocations	Y	Within the 0.035 ha

#### 3.1 Project Location

The project area is located on the Hodges Drive on-ramp (H659) SLK 0.12 to SLK 0.40 and Mitchell Freeway (H016) between SLK 25.67 to SLK 38 within the local government authority boundary of the City of Joondalup (Figure 1).

##### *Start*

Latitude: -31.755797°

Longitude: 115.765562°

##### *End*

Latitude: -31.758930°

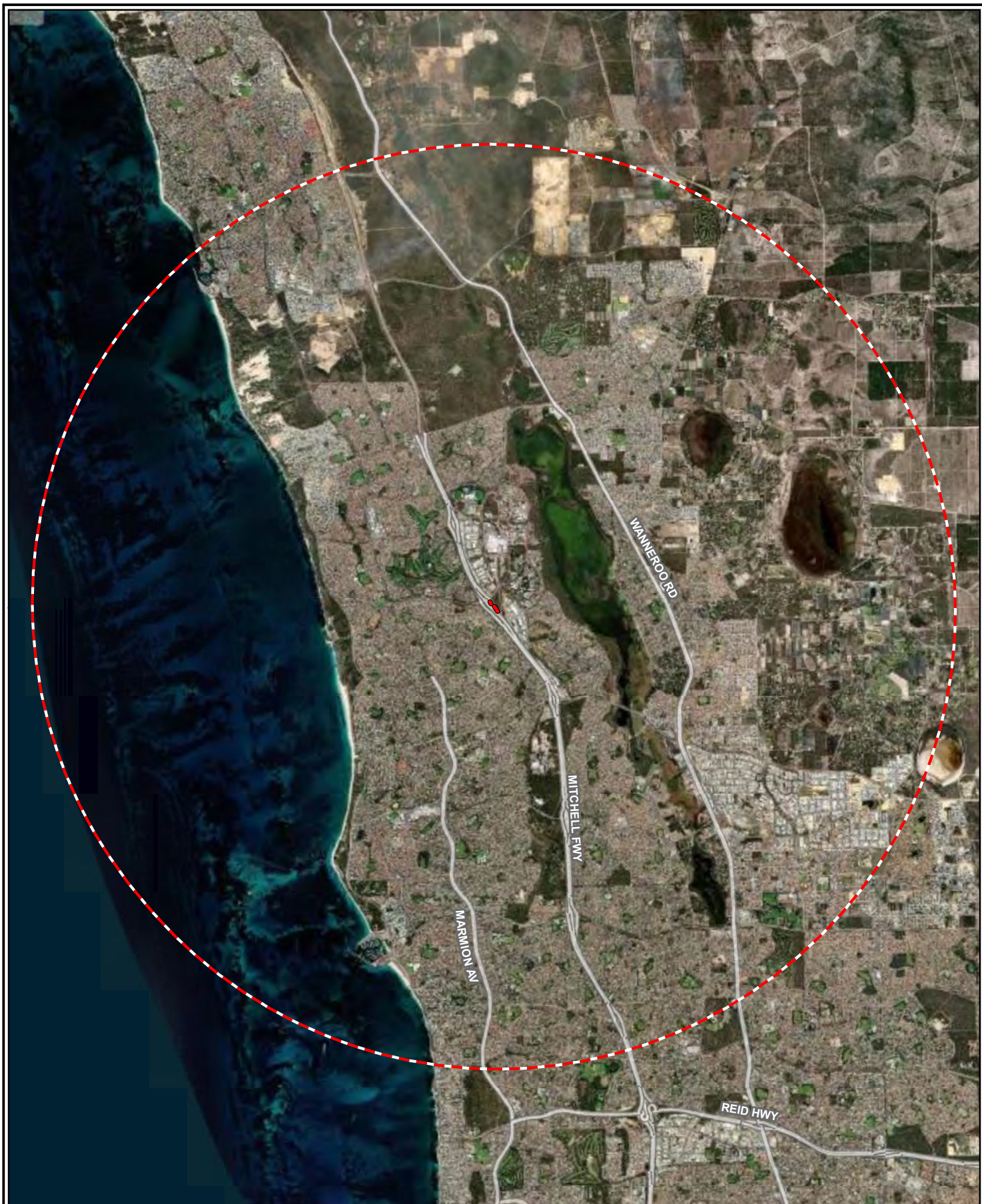
Longitude: 115.768143 °

The location and boundaries of the study area (10 km radius) for the project are shown in Figure 2.



<b>Legend:</b> <div><div></div> Project area</div> <div><div></div> Roads (MRWA)</div>	<div>050100metres</div> <div>Scale 1:2,500 at A4</div>		Hodges Drive and Mitchell Freeway Perth,WA
	Coord. Sys. GDA 1994 MGA Zone 50		<div><div></div></div> <b>PROJECT AREA</b>
	Job No: 58540		
	Client: Main Roads		<b>FIGURE 1</b>
	Version: A	Date: 12-May-2020	
	Drawn By: esutherland	Checked By: AH	<div><div></div><div>strategen JBS&amp;G</div></div>





<div>Legend:</div> <div><div><div></div></div>Project area</div> <div><div><div></div></div>10km buffer</div> <div><div><div></div></div>State roads (MRWA)</div>	Scale 1:110,000 at A4		<div><div>012</div><div>Kilometres</div></div>	Hodges Drive and Mitchell Freeway Perth,WA	
	Coord. Sys. GDA 1994 MGA Zone 50			<div><div></div></div>	PROJECT AREA AND STUDY AREA
	Job No: 58540				
	Client: Main Roads				
	Version: A				Date: 12-May-2020
	Drawn By: cthatcher				Checked By: AH
<div><div><div></div></div><div>strategen</div><div>JBS&amp;G</div></div>					

## 4 Methodology

### 4.1 Preliminary Desktop Study

A preliminary desktop study was undertaken as part of the CIA, to assess the proposed native vegetation clearing and potential constraints associated with the project. The desktop assessment included viewing GIS shapefiles, reviewing government agency managed databases (where necessary) and consulting with relevant stakeholders.

The methodology used when completing an assessment of the clearing principles is provided in Section 5.3. Mapping was completed using ArcMap or Main Roads Integrated Mapping System (IMS).

### 4.2 Detailed Clearing Impact Assessment

Further environmental assessment of the impacts of native vegetation clearing was undertaken and a CIA report completed. The CIA included a site visit to verify desktop information and a biological survey to delineate key environmental elements of the project area. A summary of the outcome of the survey is provided in Section 6.

The methodology used for the biological survey is provided in the *Mitchell Freeway Widening Southbound and PSP Mitchell Freeway Gaps Hodges Drive to Reid Highway Biological Survey September/October 2019*, Astron (2020) report in Appendix A.

## 5 Clearing of Native Vegetation

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

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

### 5.1 Measures to Avoid, Minimise, Mitigate and Manage Project Clearing Impacts

The design and management measures implemented to avoid and minimise the project clearing impacts are provided in Table 2.



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

Design or Management Measure	Applied to Current Design	Discussion and Justification
<b>Steepen batter slopes</b>	Yes	Batters will be steepened beyond standard practice to ensure that clearing doesn't extend outside the proposed footprint.
<b>Installation of safety barriers</b>	Yes	Installation of safety barriers is required in order to comply with road safety requirements.
<b>Alignment to one side of existing road</b>	Yes	All widening is to the verge, which has already been heavily disturbed
<b>Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded area</b>	No	Widening of the on-ramp must go into the verge and disturb native and planted vegetation.
<b>Installation of kerbing</b>	No	Kerbing will not reduce the area of impact.
<b>Simplification of design to reduce number of lanes and/or complexity of intersections</b>	No	Road design must allow for ramp metering and sufficient capacity on the ramp to allow for the metering. This is unfortunately complicated and is being simplified as far as possible.
<b>Preferential use of existing cleared areas for access tracks, construction storage and stockpiling</b>	Yes	No vegetation to be cleared for temporary works.
<b>Drainage modification</b>	Yes	The project will utilise the existing drainage in place for this section of Hodges Drive and Mitchell Freeway.
<b>Other design treatment</b>	No	No other design treatment is appropriate for the required work. The project involves the widening and upgrade of an existing on-ramp. No design alternatives exist to achieve the same outcome while reducing clearing requirements.

In addition to the elements discussed in Table 1, the following avoidance and minimisation action have been applied to this project:

- The clearing area will be demarcated prior to the commencement of native vegetation clearing.
- The project design was refined to avoid clearing any potential cockatoo roosting trees.
- Where possible vegetation will be pruned as opposed to removed.
- Further project clearing will be avoided as the site office, materials storage areas, construction vehicles/machinery and access tracks will be located on previously disturbed or cleared areas.



## 5.2 Vegetation Details

### 5.2.1 Project Site Vegetation Description

The project area is predominately in a Good to Completely Degraded condition with two native vegetation units present, described by Astron (2020) as:

- **Banksia Woodland:** *Allocasuarina fraseriana* and *Banksia attenuata* low open woodland over *Banksia sessilis* and *Jacksonia sternbergiana* tall open shrubland over *Xanthorrhoea preissii* and *Olearia axillaris* sparse mid shrubland over *Hibbertia hypericoides*, *Synaphea spinulosa* and *Tricoryne elatior* low shrubland over *Mesomelaena pseudostygia*, *Conostylis aculeata* subsp. *aculeata* and *Alexgeorgea nitens* sparse sedgeland over *Ehrharta calycina* and *Avena fatua* sparse tussock grassland.
- **Jarrah Woodland 1:** *Eucalyptus marginata*, *Allocasuarina fraseriana* and *Banksia attenuata* mid open forest to low woodland over *Xanthorrhoea preissii* (+/- *Jacksonia sternbergiana*/*Allocasuarina humilis*) mid open shrubland over *Hibbertia hypericoides* low open shrubland over *Mesomelaena pseudostygia* and/or *Lepidosperma calcicola* and/or *Desmocladius flexuosus* sparse sedgeland over a tussock grassland of introduced grasses.

Tables 3 and 4 provide details of the Pre-European Vegetation Associations with the project area and the remaining extents of these associations.

For a full description of the existing vegetation, refer to the Biological Assessment Report (Astron, 2020) in Appendix A.

**Table 3. Summary of Project Area's Mapped Pre-European Vegetation Associations**

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 1007 described as a Mosaic: Shrublands; <i>Acacia lasiocarpa</i> & <i>Melaleuca acerosa</i> heath / Shrublands; <i>Acacia rostellifera</i> & <i>Acacia cyclops</i> thicket (Government of Western Australia, 2019).	Clearing of up to 0.031 ha for road widening, Hodges Drive on-ramp.	Degraded (0.031 ha) condition (Astron, 2020)	Vegetation description and condition determined from biological survey (Astron, 2020).
Vegetation Association 998 described as a Medium woodland: tuart (Government of Western Australia, 2019).	Clearing of up to 0.004 ha for road widening, Hodges Drive on-ramp.	Good condition (0.004 ha) (Astron, 2020)	Vegetation description and condition determined from biological survey (Astron, 2020).

**Table 4. Pre-European Vegetation Representation**

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 1007</b>	<b>Statewide</b>	30,407.75	20,691.11	68.05	10.04
	<b>IBRA Bioregion</b> Swan Coastal Plain	30,109.89	20,679.62	68.68	10.13
	<b>IBRA Sub-region</b> Perth	30,109.89	20,679.62	68.68	10.13
	<b>Local Government Authority</b> City of Joondalup	2,760.85	221.65	8.03	0.00
<b>Veg Assoc No. 998</b>	<b>Statewide</b>	51,015.33	18,492.63	36.25	17.65
	<b>IBRA Bioregion</b> Swan Coastal Plain	50,867.50	18,492.32	36.35	17.70
	<b>IBRA Sub-region</b> Perth	50,867.50	18,492.32	36.35	17.70
	<b>Local Government Authority</b> City of Joondalup	2,841.13	273.43	9.62	0.60

### 5.2.2 Vegetation Complexes and Representation

Vegetation Complexes within the project area have been defined by Heddle et al. (1980) and are based on vegetation in association with landforms and underlying geology. Native vegetation complexes as described by Heddle et al. (1980) within the Project area comprise:

- **Cottesloe Complex** – Central and South: mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri); closed heath on the Limestone outcrops.

This complex is above the minimum threshold of 10% target for the retention of vegetation complexes in constrained areas on the Swan Coastal Plain (EPA, 2000). The current remaining extent of this vegetation complex (GoWA, 2019) is detailed in Table 5.

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

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2013 Vegetation Extent	% Remaining
Cottesloe Complex – Central and South	45,299.6	14,567.9	32.2

### 5.3 Assessment against the Ten Clearing Principles

In assessing whether the project's proposed clearing is likely to have a significant impact on the environment, the project was assessed against the ten clearing principles (EP Act 1986, Schedule 5).

Each principle has been assessed in accordance with DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation'.

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

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

Comments	Proposed clearing is not likely to be at variance to this Principle
	<p>Clearing as a result of the project is not likely to be at variance with this Principle. The project requires the clearing of up to 0.035 ha of native vegetation (Figure 3). Astron (2020) delineated two vegetation units within the project area as:</p> <ul style="list-style-type: none"> <li>• <b>Banksia Woodland:</b> <i>Allocasuarina fraseriana</i> and <i>Banksia attenuata</i> low open woodland over <i>Banksia sessilis</i> and <i>Jacksonia sternbergiana</i> tall open shrubland over <i>Xanthorrhoea preissii</i> and <i>Olearia axillaris</i> sparse mid shrubland over <i>Hibbertia hypericoides</i>, <i>Synaphea spinulosa</i> and <i>Tricoryne elatior</i> low shrubland over <i>Mesomelaena pseudostygia</i>, <i>Conostylis aculeata</i> subsp. <i>aculeata</i> and <i>Alexgeorgea nitens</i> sparse sedgeland over <i>Ehrharta calycina</i> and <i>Avena fatua</i> sparse tussock grassland; and</li> <li>• <b>Jarrah Woodland 1:</b> <i>Eucalyptus marginata</i>, <i>Allocasuarina fraseriana</i> and <i>Banksia attenuata</i> mid open forest to low woodland over <i>Xanthorrhoea preissii</i> (+/- <i>Jacksonia sternbergiana</i>/<i>Allocasuarina humilis</i>) mid open shrubland over <i>Hibbertia hypericoides</i> low open shrubland over <i>Mesomelaena pseudostygia</i> and/or <i>Lepidosperma calcicola</i> and/or <i>Desmocladius flexuosus</i> sparse sedgeland over a tussock grassland of introduced grasses.</li> </ul> <p>The vegetation was assessed to be in a 'Degraded' to 'Good' condition with the majority of the vegetation in a 'Degraded' condition (Figure 4). Two vegetation units were mapped during the detailed field survey, as shown above in section 5.2.1 (Astron 2020).</p> <p>No State or Federally listed Threatened or Priority flora species were recorded within the Project area.</p> <p>The project will impact on approximately 0.025 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC) from a contiguous patch of 6.19 ha. Within the project area, the majority of vegetation been assessed as a 'Degraded' to 'Completely Degraded' (0.031 ha) condition.</p> <p>Noting this, it is considered that the vegetation within the project area is representative of a diverse native vegetation remnant that comprises the whole, or a part of, a significant occurrence of an ecological community; or native vegetation that has a higher diversity than other examples of an ecological community in the region. This is not considered to result in a significant impact as clearing represents a reduction of less than 1% of the TEC within the survey area (Figure 5).</p> <p>One state listed Priority Ecological Community (PEC), Banksia dominated Woodlands of the Swan Coastal Plain IBRA Region PEC was recorded within the project area. Clearing for the project will impact 0.035 ha of the PEC from a contiguous patch of 6.19 ha. This is not</p>

	<p>considered to result in a significant impact as clearing represents a reduction of less than 1% of the PEC within the survey area (Figure 5).</p> <p>Within the project area, approximately 0.035 ha of potentially suitable black cockatoo foraging habitat was recorded (Figure 6). The black cockatoo assessment undertaken by Astron (2020) determined that no quality foraging habitat as defined referral guidelines (Department of Sustainability Environment Water Population and Communities 2012) is present, due to the altered state of vegetation and the sporadic and isolated distribution of known foraging flora species.</p> <p>No potential breeding trees (those of a suitable species with greater than the 500 mm DBH) were observed within the project area. No suitable hollows were observed during the survey and no evidence of breeding was recorded at the time of the survey.</p> <p>Furthermore, the project is outside of the known breeding range of Carnaby's Cockatoo and considered unlikely to support breeding for the Forest Red-tailed Black Cockatoo due to the absence of intact woodland or forest habitat.</p> <p>Based on the findings of the survey and that clearing area is small; is not in better condition or representative of an area of higher biodiversity value than the area surrounding, it is considered that the clearing is unlikely to result in any significant impact to the environment and is not likely to be at variance to this clearing principle.</p> <p><b>Assessed Outcome:</b></p> <p><b>Clearing for this project is not likely to be at variance to this principle.</b></p>
<b>Methodology</b>	<p>MRWA Shapefiles</p> <p>DBCA shapefiles</p> <p>DSEWPac (2012)</p> <p>NatureMap (February, 2020)</p> <p>EPA (2016)</p> <p>Biological Survey (October, 2019)</p>

**(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.**

<b>Comments</b>	<b>Proposed clearing is not likely to be at variance to this Principle</b>
	<p>Clearing as a result of the project is not likely to be at variance with this Principle. Within the study area there are known records of 61 protected fauna species. The biological survey identified that there were three conservation species present within the wider survey area. These are:</p> <ul style="list-style-type: none"> <li>• <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo) -Threatened</li> <li>• <i>Calyptorhynchus banksii naso</i> (Forest Red-tailed Black Cockatoo) -Threatened</li> <li>• <i>Isodon obesulus</i> subsp. <i>fusciventer</i> (Southern Brown Bandicoot) - Priority 4</li> </ul> <p>Within the project area, Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo are considered to potentially utilise the area. No evidence of Quenda presence within the project area was recorded (Astron, 2020).</p> <p><b><u>Black Cockatoo</u></b></p>

	<p>The project area is within the known distribution range of the Carnaby's Cockatoo, but outside its known breeding range. The project area is outside of the modelled distribution of the Forest Red-tailed Black Cockatoo (Department of Sustainability, Environment, Water, Population and Communities 2012). Given the small area of potential habitat and its poor condition, it is considered unlikely to be significant habitat for foraging or breeding for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo.</p> <p>Within the project area, approximately 0.035 ha of potentially suitable foraging habitat was recorded (Figure 5). The black cockatoo assessment undertaken by Astron (2020) determined that no quality foraging habitat as defined in referral guidelines (Department of Sustainability Environment Water Population and Communities 2012) is present, due to the altered state of vegetation and the sporadic and isolated distribution of known foraging flora species.</p> <p>No potential breeding trees (those greater than the 500 mm DBH) were observed within the project area. No suitable hollows were observed during the survey and no evidence of breeding was recorded at the time of the survey. Furthermore, no evidence of roosting was recorded within the project area.</p> <p>Within 4 km of the project area there is approximately 657 ha of suitable habitat within Local or State Government reserves which would provide significantly higher quality habitat for this black cockatoos (Figure 7). These reserves consist of:</p> <ul style="list-style-type: none"> <li>• Woodvale Nature Reserve (Bush Forever Site 407) (35 ha);</li> <li>• Yellagonga Regional Park (Bush Forever Site 299) (380 ha);</li> <li>• Whitfords Avenue Bushland, Craigie/Padbury (Bush Forever Site 303) (215 ha); and</li> <li>• Conti Road Bushland, Wanneroo (Bush Forever Site 164) (27 ha).</li> </ul> <p>Additionally, Neerabup National Park (944 ha) is located 4 km to the north of the project area consisting of potential habitat for this species. Clearing as a result of the project represents less than 0.01% of potentially available habitat for Black Cockatoos within 4 km of the project area.</p> <p><b><u>Other Conservation Significant Species</u></b></p> <p>The Southern Brown Bandicoot (Quenda) occurs in wet or dry sclerophyll forest through to open woodland and scrubby, dense vegetation on sandy soils. This species was identified within the wider survey area in close proximity to the Woodvale Nature Reserve, approximately 2.7 km south-east of the project area.</p> <p>It is considered unlikely that the small area of vegetation to be cleared as a result of the project constitutes significant habitat for the species, which is more likely to be in larger pockets of native vegetation associated with the reserves listed above.</p> <p><b>Assessed Outcome:</b></p> <p><b>Clearing for this project is not likely to be at variance to this principle.</b></p>
<b>Methodology</b>	<p>DBCA Shapefiles  DBCA website  DSEWPac (2012)  EPA (2016)  Biological Survey (October, 2019)  Aerial Photography</p>

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

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>Clearing as a result of the project is not at variance with this Principle. A total of 207 vascular flora species, from 47 families and 127 genera, were recorded in the wider survey area, between Hodges Drive and Reid Highway (Astron 2020). No State or Federally listed threatened flora species were recorded within the project area.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	<p>DBCA shapefiles</p> <p>Florabase (February, 2020)</p> <p>Biological Survey (October, 2019)</p>

**(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.**

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>Clearing as a result of the project is not at variance with this Principle. Astron (2020) did not record any State listed Threatened Ecological Communities (TEC) in the Project area.</p> <p>The likely State listed TEC present in the regional area would be <i>Banksia attenuata</i> woodland over species rich dense shrublands (SCP 20a) and <i>Melaleuca huegelii</i> — <i>Melaleuca systema</i> shrublands on limestone ridges (SCP26a). The nearest known locations of SCP20a are located at Neerabup and Koondoola within the City of Wanneroo, approximately 10km and 11 km, respectively from the project area (DEC, 2012). For SCP26a, this community occurs on significant limestone ridges, predominately located in Yanchep within the City of Wanneroo, approximately 20 km from the project area (CALM, 2009).</p> <p><b>Assessed Outcome:</b></p> <p><b>Clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	<p>DBCA shapefiles</p> <p>Biological Survey (October, 2019)</p>

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

Comments	Proposed clearing is not likely to be at variance to this Principle												
	<p>Clearing as a result of the project is not likely to be at variance with this Principle. The project area is mapped as Vegetation Association 998 described as a Medium woodland: tuart and Vegetation Association 1007 described as a Mosaic: Shrublands; <i>Acacia lasiocarpa</i> &amp; <i>Melaleuca acerosa</i> heath / Shrublands; <i>Acacia rostellifera</i> &amp; <i>Acacia cyclops</i> thicket. The project proposes to clear up to 0.035 ha of native vegetation, of this, 0.031 ha (89%) has been assessed as 'Degraded' (Astron, 2020).</p> <p><b>Table 5.1. Pre-European Vegetation Representation</b></p> <table><tr><th>Pre-European</th><th>Scale</th><th>Pre-European (ha)</th><th>Current Extent (ha)</th><th>% Remaining</th><th>% Remaining in DBCA reserves</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Pre-European	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves						
Pre-European	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves								

	<table><tr><th>Vegetation Association</th><th></th><th></th><th></th><th></th><th></th></tr><tr><td rowspan="4">Veg Assoc No. 1007</td><td>Statewide</td><td>30,407.75</td><td>20,691.11</td><td>68.05</td><td>10.04</td></tr><tr><td>IBRA Bioregion Swan Coastal Plain</td><td>30,109.89</td><td>20,679.62</td><td>68.68</td><td>10.13</td></tr><tr><td>IBRA Sub-region Perth</td><td>30,109.89</td><td>20,679.62</td><td>68.68</td><td>10.13</td></tr><tr><td>Local Government Authority City of Joondalup</td><td>2,760.85</td><td>221.65</td><td>8.03</td><td>0.00</td></tr><tr><td rowspan="4">Veg Assoc No. 998</td><td>Statewide</td><td>51,015.33</td><td>18,492.63</td><td>36.25</td><td>17.65</td></tr><tr><td>IBRA Bioregion Swan Coastal Plain</td><td>50,867.50</td><td>18,492.32</td><td>36.35</td><td>17.70</td></tr><tr><td>IBRA Sub-region Perth</td><td>50,867.50</td><td>18,492.32</td><td>36.35</td><td>17.70</td></tr><tr><td>Local Government Authority City of Joondalup</td><td>2,841.13</td><td>273.43</td><td>9.62</td><td>0.60</td></tr></table>	Vegetation Association						Veg Assoc No. 1007	Statewide	30,407.75	20,691.11	68.05	10.04	IBRA Bioregion Swan Coastal Plain	30,109.89	20,679.62	68.68	10.13	IBRA Sub-region Perth	30,109.89	20,679.62	68.68	10.13	Local Government Authority City of Joondalup	2,760.85	221.65	8.03	0.00	Veg Assoc No. 998	Statewide	51,015.33	18,492.63	36.25	17.65	IBRA Bioregion Swan Coastal Plain	50,867.50	18,492.32	36.35	17.70	IBRA Sub-region Perth	50,867.50	18,492.32	36.35	17.70	Local Government Authority City of Joondalup	2,841.13	273.43	9.62	0.60
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<p><b>Table 5.2. Vegetation Complexes (Heddle/Mattiske) within the Project Area</b></p> <table><tr><th>Heddle/Mattiske Veg Complex</th><th>Pre-European Extent (ha)</th><th>2013 Vegetation Extent</th><th>% Remaining</th></tr><tr><td>Cottesloe Complex – Central and South</td><td>45,299.6</td><td>14,567.9</td><td>32.2</td></tr></table> <p>The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The project area is within a constrained area of the Swan Coastal Plain and as such retention objectives of at least 10 per cent apply (EPA, 2016).</p> <p>As shown in Table 5.1 and 5.2, vegetation association 1007 and 998 and the vegetation complex Cottesloe (Central and South) are above the 10 per cent threshold in a constrained area (Government of Western Australia, 2019). Vegetation associations 1007 and 998 are below the 10% threshold within City of Joondalup, however retention at the scale of local government authority has not been taken into consideration in recent assessments by DWER that have rather focussed on the IBRA region scale (e.g. CPS 8796).</p> <p>Furthermore, given the condition of the vegetation, it is not considered to be representative of native vegetation that is significant as a remnant in an area that has been extensively cleared.</p> <p><b>Assessed Outcome:</b></p> <p><b>Clearing for this project is not likely to be at variance to this principle.</b></p>						Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2013 Vegetation Extent	% Remaining	Cottesloe Complex – Central and South	45,299.6	14,567.9	32.2																																				
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Methodology	EPA (2016) Biological Survey (October, 2019) 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.**

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>Clearing as a result of the project is not at variance with this Principle. Interrogation of DBCA and DWER hydrological and wetland datasets determined that no wetlands or watercourses are mapped within the project area. The nearest mapped wetland is Lake Joondalup, located approximately 1.7 km from the project area.</p> <p>In addition, the Astron (2020) biological survey concluded that no remnant vegetation considered to represent riparian vegetation was recorded from the project area.</p> <p><b>Assessed Outcome:</b></p> <p><b>Clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	<p>DWER and DBCA shapefiles</p> <p>Biological Survey (October, 2019)</p>

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

Comments	Proposed clearing is not at variance to this Principle																				
	<p>Clearing as a result of the project is not at variance with this Principle. The Department of Primary Industries and Regional Development (DPIRD), provides a series of soil degradation risk mapping at the sub-system level. The project area is located within two subsystems of the Spearwood Dunes soil systems as follows:</p> <ul style="list-style-type: none"><li>• Karrakatta Sand Yellow Phase subsystem of the Spearwood Dunes soil system. It is described as low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. Banksia spp. woodland with scattered emergent <i>E. gomphocephala</i> and <i>E. marginata</i> and a dense shrub layer; and</li><li>• Karrakatta Shallow Soils Phase subsystem. It is described as low hills and ridges. Bare limestone or shallow siliceous or calcareous sand over limestone. Dense low shrub dominated by <i>Banksia sessilis</i>, <i>Melaleuca huegelii</i> and species of <i>Grevillea</i> (DPIRD, 2018).</li></ul> <p>The table below summaries the soil degradation risk within the project area.</p> <table><tr><th rowspan="2">Aspect</th><th colspan="2">Degradation risk</th></tr><tr><th>Karrakatta Sand Yellow Phase</th><th>Karrakatta Shallow Soils Phase</th></tr><tr><td>Wind Erosion</td><td>98%</td><td>60%</td></tr><tr><td>Waterlogging</td><td>0%</td><td>0%</td></tr><tr><td>Water Erosion</td><td>0%</td><td>0%</td></tr><tr><td>Salinity</td><td>0%</td><td>0%</td></tr><tr><td>Flood Risk</td><td>0%</td><td>0%</td></tr></table> <p>Wind erosion is the only potential soil degradation aspect relevant to the project area, due to the deep yellow sands associated with the area. It is unlikely that the project will cause appreciable land degradation given the relatively small amount of clearing and the implementation of appropriate measures to mitigate and manage potential wind driven erosion during construction.</p> <p><b>Assessed Outcome:</b></p>	Aspect	Degradation risk		Karrakatta Sand Yellow Phase	Karrakatta Shallow Soils Phase	Wind Erosion	98%	60%	Waterlogging	0%	0%	Water Erosion	0%	0%	Salinity	0%	0%	Flood Risk	0%	0%
Aspect	Degradation risk																				
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Water Erosion	0%	0%																			
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Flood Risk	0%	0%																			



	<b>Clearing for this project is not at variance to this principle.</b>
<b>Methodology</b>	GIS shapefiles Biological Survey (October, 2019) Natural Resource Management SLIP Soil Systems (Accessed May 2020)

**(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.**

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>Clearing as a result of the project is not at variance with this Principle. The nearest conservation area to the project is the Yellagonga Regional Park which occurs approximately 1.25 km to the east of the project area and has no direct links to the project area.</p> <p>It is not considered that the project area contains vegetation which represents a significant ecological linkage for fauna to move between conservation reserves. Noting the above and that the project area is contained to the road reserve, the proposed clearing will not result in impacts to any adjacent or nearby conservation area.</p> <p><b>Assessed Outcome:</b></p> <p><b>Clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	DBCA shapefiles EPA (2016)

**(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.**

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>Clearing as a result of the project is not at variance with this Principle. There are no major or minor watercourses mapped within the project area.</p> <p>The project will not change the hydrology of the area. Given the small scale of clearing and that no dewatering or drainage modifications are required; it is considered that there will be very little to no deterioration of underground water quality.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	DWER and DBCA shapefiles Biological Survey (October, 2019)

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

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>Clearing as a result of the project is not at variance with this Principle. This project proposes to clear up to 0.035 ha of vegetation over an approximately 0.45 km stretch of road. The removal of such a small area of vegetation makes it unlikely that the incidence or intensity of flooding will increase. NRM SLIP identifies that the area has 0% risk of flooding in the area, largely attributed to presence of sandy soil and fast infiltration rates.</p>

	<p>Given the small amount of clearing, that vegetation will remain in the surrounding area and that the project area will be sealed it is unlikely that this project will cause or exacerbate the incidence or intensity of flooding.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	Natural Resource Management SLIP Soil Systems (Accessed June 2020)

## 6 SUMMARY OF BIOLOGICAL SURVEYS

A Detailed biological survey of the area of the Mitchell Freeway median and eastern verge from Hodges Drive in the north to Warwick Train Station was undertaken in 2019 and 2020 (Astron, 2020). The project area subject to this CIA is a small fraction of this survey area. A summary of the findings from the survey are presented below.

### Vegetation:

- Five remnant native vegetation types were defined and included:
  - One Banksia Woodland;
  - Two *Eucalyptus marginata* (jarrah) woodlands; and
  - two *Eucalyptus gomphocephala* (tuart) forests.
- Remnant vegetation types were mapped across 6.4 ha (19 %) of the survey area. The remaining 27.6 ha of the survey area was either cleared (3.0 ha, 9 %) or planted vegetation (24.6 ha, 72 %).
- Remnant vegetation in the survey area was in Good to Completely Degraded condition, with the majority considered Completely Degraded as it consisted of scattered remnant species only. It is expected that quality of these remnants has been declining over time due to significant edge effects.
- Vegetation inferred to represent the EPBC Act listed 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' TEC was recorded within the survey area, but not within the project area.
- Vegetation inferred to represent the EPBC Act listed 'Banksia Woodlands of the Swan Coastal Plain' TEC was recorded within the survey area.
- Vegetation considered to represent the State listed PEC 'Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain' was not recorded within the project area; 'Banksia dominated woodlands of the Swan Coastal Plain IBRA Region' PEC was recorded within the survey area and within the project area across 0.035 ha.

### Flora:

- A total of 207 vascular flora species, from 47 families and 127 genera, were recorded in the survey area. No EPBC Act listed flora were recorded, one priority flora species of significance was recorded: *Jacksonia sericea* P4 (outside current project area).
- The survey area has considerable disturbance and limited floristic diversity which further limits the potential for any threatened or priority flora species to occur.
- Sixty-three weed species were recorded within the survey area, accounting for 30% of the species recorded. Three are listed as WoNS (Australian Weeds Committee 2012) (*\*Asparagus asparagoides*, *\*Lantana camara* and *\*Genista linifolia*) and three are declared pest plants in Western Australia under the BAM Act (Department of Agriculture and Food Western Australia 2016).

### Fauna:

- Twenty-four conservation significant vertebrate species were identified in the desktop assessment, and three species (quenda, Carnaby's cockatoo and forest red-tailed black cockatoo) were recorded within the survey area, one species were considered to have a 'moderate' likelihood and 20 species were considered to have a 'low' likelihood of occurrence.
- Based upon the current distributions for the three threatened species of black cockatoo, only the Carnaby's cockatoo (*Calyptorhynchus latirostris*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) are likely to occur within the vicinity of the survey area.
- Three hundred and twenty-nine black cockatoo potential breeding trees (259 Tuarts, 42 jarrah, 16 dead stags and 12 marri) with a diameter at breast height of over 50 cm were recorded within the survey area (none within current project area) including 15 trees (nine Tuarts and six dead stags) considered to have suitable hollows for Carnaby's cockatoos to breed in.
- Twenty-seven known foraging resource species for the Carnaby's cockatoo and three known foraging resource species for the forest red-tailed black cockatoo were recorded within the survey area; however, only the marri, jarrah and Banksia species are considered key species for foraging Carnaby's cockatoos. Two individual Carnaby's cockatoos were observed foraging on *Banksia prionotes* and jarrah within the survey area.

One individual quenda roadkill and multiple diggings in the same area were recorded within the survey area (outside current project area). The sighting was recorded 228 m south of the Woodvale Open Space, and it is likely that this individual was from of a larger quenda population within Woodvale Open Space.

## 7 ADDITIONAL ACTIONS REQUIRED

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

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

Impact of Clearing	Yes/No or NA	Further Action Required
<b>1.</b> The PCIA indicates that the clearing is 'Seriously at Variance', 'At Variance' or 'May be at Variance' with one or more of the clearing principles.	<b>No</b>	No further action required
<b>2.</b> The PCIA indicates that the clearing is at variance or may be at variance with clearing principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.	<b>No</b>	No further action required
<b>3.</b> The project involves clearing for temporary works (as defined by the permit under Condition 11 of CPS 818).	<b>No</b>	No further action required
<b>4a.</b> The project is in part of a region that has annual rainfall greater than 400mm and is south of the 26 <sup>th</sup> parallel of latitude.	<b>Yes</b>	<b>4a.</b> Yes
<b>4b.</b> The project will require movement of soil in conditions other than dry conditions.	<b>No</b>	<b>4b.</b> No further action required.
<b>5.</b> 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	<b>No</b>	No further action required.
<b>6.</b> The proposal requires referral to either the WA EPA or the Commonwealth DAWE.	<b>No</b>	No further action required.
<b>7a.</b> The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition	<b>No</b>	<b>7a.</b> Yes. Some of the surrounding vegetation is expected to be in good or better condition and some good condition vegetation will be cleared.
<b>7b.</b> Are weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition		<b>7b.</b> No. Weed management will be addressed in the VMP/CEMP to avoid weed spread.

## **8 STATEMENT ADDRESSING STAKEHOLDER SUBMISSIONS**

Condition 7 of CPS 818/14 requires Main Roads WA to invite submissions from a number of parties when the proposed clearing is considered likely to be seriously at variance, at variance or may be at variance with one or more of the clearing principles.

As the assessment has determined that the proposed clearing is not at variance with any of the clearing principles, no stakeholder submission is required.

## 9 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 VMP has been developed to manage and minimise vegetation clearing for the project (refer to Appendix B).

## 10 REFERENCES

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Western Australian Herbarium. *FloraBase* - The Western Australian Flora. Department of Biodiversity, Conservation and Attractions. Available online from: <https://florabase.dpaw.wa.gov.au/> Accessed April 2020



## 11 APPENDICES

Appendix	Title
<b>Appendix A</b>	Biological Assessment
<b>Appendix B</b>	Vegetation Management Plan
<b>Appendix C</b>	Constraints Mapping

**Appendix A: Biological Survey Report**

## **Appendix B: Vegetation Management Plan**

### **HODGES DRIVE ON-RAMP**

#### **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 Mitchell Freeway Southbound Widening – Hodges Drive On-ramp project (the project).

The project will involve the upgrade a portion of the Hodges Drive on-ramp to accommodate an additional lane as part of the wider Mitchell Freeway Southbound Widening project.

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

#### **Action**

Appendix B1 contains the standard Principal Environmental Management Requirements (PEMRs) that will be utilised for all projects that involve clearing to avoid, mitigate and manage the environmental impacts of the project.

#### **Timeframes**

Actions shall be undertaken in accordance with those described in the relevant PEMR and the Project Specific Environmental Management Requirements.

#### **Responsibilities**

It is the responsibility of the Superintendent's Contract Management Team that the requirements are implemented by the Contractor. This shall be done by adhering to the Environmental Measurement and Evaluation Checklist.

## Appendix B1 – Principal Environmental Management Requirements (PEMR's)

### B1.1 Clearing

<b>STANDARD MANAGEMENT REQUIREMENTS</b>
<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must prepare, implement and maintain processes to ensure that the movement of all vehicles, plant and machinery does not occur outside of the Limits of Vegetation Clearing. This must include all turnaround areas.</li> <li>2. The Contractor must minimise vegetation clearing and the area of disturbance on ground by utilising existing cleared area where possible.</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must report any damage to vegetation beyond the Limits of Vegetation Clearing as an Environment Incident.</li> <li>2. The Contractor must ensure Movements are confined to the Limits of Vegetation Clearing during the works</li> <li>3. The Contractor must undertake the clearing in accordance with the Fauna PEMR.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. NIL</li> </ol>

### B1.2 Dieback Management

<b>STANDARD MANAGEMENT REQUIREMENTS</b>
<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. Contractor's Pre-starts must detail the requirements from the DMP/HMP, where relevant, dieback management areas and the requirements of each area, maps of infested and uninfested locations, and hygiene requirements</li> <li>2. Where relevant a copy of the DMP/HMP must be onsite. This plan will include maps of management areas and obligatory control actions</li> <li>3. Prescribe where vehicles, machinery and plant are going to be stored/parked during the works.</li> <li>4. Use the Plant, Vehicle and Equipment Hygiene Checklist or equivalent Hygiene form to check that all machinery and vehicles are clean on entry (i.e. free of soil and vegetation).</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. If required, locations of dieback infested or dieback free areas and hygiene control locations marked on site in accordance with contract HMP or DMP.</li> <li>2. Hygiene works to be undertaken as per the HMP or DMP, where required.</li> <li>3. Restrict movement of machines and other vehicles to the Limits of Vegetation Clearing.</li> </ol>

<ol style="list-style-type: none"> <li>4. Ensure no known weed affected soil, mulch, fill or other material is brought into the Limits of Vegetation Clearing.</li> <li>5. Ensure cleared materials are stockpiled or disposed at waste at the locations approved by the Superintendent.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. Record that the project was undertaken in dry soil conditions (unless an approved DMP authorises otherwise).</li> <li>2. Use the Plant, Vehicle and Equipment Hygiene Checklist to check that all machinery and vehicles are clean on exit (i.e. free of soil and vegetation).</li> </ol>

### B1.3 Erosion and Sedimentation Control

<b>STANDARD MANAGEMENT REQUIREMENTS</b>
<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must develop, implement and maintain processes and procedures to ensure that: <ul style="list-style-type: none"> <li>• The Contractor is responsive to and addresses incidents of erosion and sedimentation within and adjacent to the work areas.</li> <li>• Prevent water and wind soil erosion within and adjacent to the works areas.</li> <li>• Prevent the sedimentation and siltation of watercourses located within and adjacent to the works area.</li> <li>• Ensure that sedimentation and siltation of drainage lines due to the removal of riparian vegetation is avoided, minimised and mitigated.</li> <li>• Ensure that loose surfaces and recently cleared areas are protected from wind and soil erosion.</li> <li>• Minimise exposed soil working surfaces or protect them from stormwater erosion.</li> <li>• Ensure material such as gravel, crushed rock and excavated material is stockpiled away from drainage paths and covered to prevent erosion.</li> <li>• Ensure that water quality monitoring is undertaken when turbidity and sedimentation is an issue.</li> </ul> </li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. Implement, monitor and adhere to the sedimentation and erosion processes developed to address the requirements in the pre-works.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. If required, the Contractor must continue to monitor water quality until the turbidity/sedimentation dissipates.</li> <li>2. The Contractor must ensure that disturbed areas are stabilised as soon as is practicable after construction activities are completed.</li> </ol>

## B1.4 Fauna

<b>STANDARD MANAGEMENT REQUIREMENTS</b>
<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must ensure that fauna management requirements are communicated to the crew undertaking the clearing works during the induction and pre-start meeting.</li> <li>2. Where active nests, burrows or dens are identified, works must not proceed until the Contractor obtains the Superintendents approval of the management of active nests, burrows or dens adheres to the Superintendents advice.</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must undertake the clearing in the following manner to allow fauna to move out of the clearing area;               <ol style="list-style-type: none"> <li>i. Prior to the clearing activities commencing, use machinery to tap large trees with habitat hollows to encourage any animals evacuate.</li> <li>ii. Undertake the clearing in one direction and towards areas of native vegetation to allow the animals to escape to adjacent habitat.</li> </ol> </li> <li>2. The Contractor must ensure that all onsite personnel undertake visual monitoring and are vigilant to the presence of fauna. Any sightings of fauna, including injury or fatality, must be reported as an Environmental Incident.</li> <li>3. The Contractor must ensure that;               <ol style="list-style-type: none"> <li>i. No pets, traps or firearms are brought into the project area.</li> <li>ii. Fauna are not fed</li> <li>iii. Fauna are not intentionally harmed or killed</li> <li>iv. Fauna that venture into the work area are encouraged to leave in a manner that does not harm the animal or operator (loud noise, slowly approaching in a vehicle etc.)</li> </ol> </li> <li>4. The Contractor must ensure that in the event that sick, injured or orphaned native wildlife are located on the project site, the WILDCARE Helpline ((08) 9474 9055) will be contacted for assistance. The Contractor must maintain records of any animal taken to a wildlife carer.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must provide any records of fauna impact to the Superintendent.</li> </ol>

## B1.5 Machinery and Vehicle Management

<b>STANDARD MANAGEMENT REQUIREMENTS</b>
<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must ensure that all areas associated with the storage, parking, servicing, wash down and refuelling of all vehicles, plant and machinery is located within the Limits of Clearing and approved by the Superintendent.</li> <li>2. The Contractor must ensure that all vehicles, machinery and plant are clean on entry (i.e. free of all soil and vegetation material) and comply with the requirements of 204.B.32.</li> </ol>

<ol style="list-style-type: none"> <li>3. The Contractor must ensure that vehicle servicing and refuelling will be undertaken at designated areas approved by the Superintendent.</li> <li>4. The Contractor must ensure that all staff suitably qualified and competent to undertake works, especially refuelling activities.</li> </ol>
<b>DURING WORKS</b> <ol style="list-style-type: none"> <li>1. The Contractor must maintain records of checking all vehicles, machinery and plant are clean on entry.</li> </ol>
<b>POST WORKS</b>

## B1.6 Mulch and Topsoil Management

<b>STANDARD MANAGEMENT REQUIREMENTS</b>
<b>PRE WORKS</b> <ol style="list-style-type: none"> <li>1. The Contractor must ensure that the movement of soil and vegetation is only undertaken in dry conditions unless otherwise approved and / or directed by the Superintendent.</li> <li>2. The Contractor must ensure that poor quality topsoil and mulched vegetation does not contaminate the good quality topsoil and vegetation.</li> </ol>
<b>DURING WORKS</b> <ol style="list-style-type: none"> <li>1. The Contractor must ensure that all machinery used in the removal of weed-infested topsoil must be cleaned down before and between operations to prevent the introduction and spread of weeds.</li> <li>2. The Contractor must ensure the movement of large equipment over topsoil materials is avoided to minimise compaction.</li> <li>3. The Contractor must ensure that Dieback and weed infected topsoil and mulch vegetation must be handled separately to minimise the risk of spreading dieback and weed species across the site and stockpiles.</li> <li>4. The Contractor must ensure that stockpiling operations must occur in a manner to ensure that the properties of the topsoil are not degraded and the topsoil made unsuitable for use in revegetation.</li> </ol>
<b>POST WORKS</b>

## B1.7 Pegging and Flagging

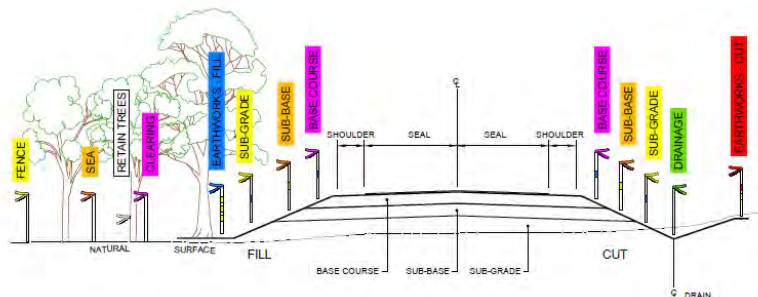
<b>STANDARD MANAGEMENT REQUIREMENTS</b> <ol style="list-style-type: none"> <li>1. Pegging must be done in accordance with the requirements detailed in Specification 301.</li> <li>2. The Contractor must clearly communicate, either at the pre-start meeting or equivalent, to the crew undertaking the clearing works, through clear maps and other additional means, what the Pegging represents.</li> </ol>
--

**DURING WORKS**

1. The Contractor must peg the Limits of Clearing by PINK flagging tape.
2. The Contractor peg/demarcate vegetation proposed to be retained is demarcated by WHITE flagging tape.
3. The Contractor must ensure that the vegetation demarcated with PINK and WHITE flagging tape is consistent with the approved clearing areas.

**POST WORKS**

1. The Contractor remove and dispose of appropriately any demarcation, pegging or flagging once project works are completed.

**TAPES ON PEGS**

There are two types of tapes on survey pegs. Flappers and Wraps.

**Flappers** are the long tapes that blow in the breeze. They are usually at the top of the pegs. They are used to show you what type of peg it is as per below.

YELLOW (outside earthworks)	Fence
ORANGE (outside earthworks)	SEA - Special Environment Area
PINK (in bush)	Clearing peg
PINK (on trees)	Remove tree
WHITE (on tree)	Retain tree
WHITE (on tree) and PINK (on tree limb)	Retain tree Remove limb
RED	Earthworks CUT peg
BLUE	Earthworks FILL peg
GREEN	Drainage peg
YELLOW	Sub-grade peg
ORANGE	Sub-base peg
PINK (on pavement)	Basecourse peg

**Wraps** are the short tied tapes on the pegs and they are used to show the required level to trim to or to reference the level that is needed to be achieved. The different colours are explained below.

BLUE	Finished level of basecourse
YELLOW	Finished level of sub base
PINK	Sub-grade level (can be on earthworks and on sub-grade pegs)
RED	500mm CUT of FILL depending on whether the Flapper is Red or Blue
YELLOW	1 metre CUT or FILL depending on whether the Flapper is Red or Blue

Example 1 - The earthworks peg which has a Red Flapper with a Red & Yellow Wrap means 1.5m CUT and it refers to the next point in from the top of batter, i.e. the drain.

Example 2 - The earthworks peg which has a Blue Flapper with 3 Yellow Wraps means 3m FILL and it refers to the next point in from the toe of batter, i.e. the sub-grade hinge point.

						STANDARD DRAWING	
						CONSTRUCTION PEG COLOUR CODE	
						201928-0001	

**B1.8 Water Drainage Management****STANDARD MANAGEMENT REQUIREMENTS****PRE WORKS**

1. Use pollution control and containment strategies for project activities in Public Drinking Water Source Areas (PDWSAs) / Underground Water Pollution Control Areas (UWPCAs) and liaise with the DWER where necessary

**DURING WORKS**

1. Existing natural drainage paths and channels along the road or the vicinity of the project area will not be unnecessarily blocked or restricted.



2. Temporary drainage systems may be installed to carry surface water away from the areas where excavation and foundation construction work is taking place or from any other area where the accumulation of water could cause delay or damage to the work.
3. Maintain these drainage systems in proper working order at all times.
4. Runoff from disturbed areas must be managed to minimise adverse impacts on surrounding vegetation, watercourses and properties.
5. Booms and silt fences must be used when working over or adjacent to areas of surface water in order to protect the quality of surface water from construction impacts.

#### **POST WORKS**

1. Water quality monitoring to be undertaken (if turbidity/ sedimentation is an issue).
2. Prior to backfilling the completed pipe work certify that the entire system is flushed clean and tested
3. Disturbed areas will be stabilised soon after construction activities are completed.
4. Culvert and drainage structures will be free of all grass, weeds, silt and debris

### **B1.9 Weed Management**

#### **STANDARD MANAGEMENT REQUIREMENTS**

##### **PRE WORKS**

1. The Contractor must remove or kill any weeds growing in project area that are likely to spread and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.
2. The Contractor must develop, implement and maintain procedures to identify and control declared and invasive weed species within the Contract areas, to the satisfaction of the Superintendent.
3. The Contractor must prepare a weed control program, for nominated weed species for control and disposal, to the satisfaction of the Superintendent.
4. The Contractor must undertake weed management in Stockpiles as directed by the Superintendent.

##### **DURING WORKS**

1. The Contractor must implement the weed control procedures and management plan and record and manage records of its implementation.
2. The Contractor must treat nominated weed infestations as many times as necessary to control and eradicate the weed species in accordance with the approved weed control program
3. The contractor must ensure that no known weed, pest or diseased affected soil, mulch, fill or other material is brought into the Site.

##### **POST WORKS**

1. The relevant [Vegetation Maintenance Record Sheets](https://www.mainroads.wa.gov.au/BuildingRoads/Contracting/Pages/ReportingForms.aspx) available at: <https://www.mainroads.wa.gov.au/BuildingRoads/Contracting/Pages/ReportingForms.aspx> must be completed and sent to the Superintendent.

**Appendix C: Constraints Mapping**





Project area

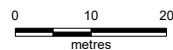
#### Vegetation association

Banksia Woodland: *Allocasuarina fraseriana* and *Banksia attenuata* low open woodland over *Banksia sessilis* and *Jacksonia sternbergiana* tall open shrubland over *Xanthorrhoea preissii* and *Olearia axillaris* sparse mid shrubland over *Hibbertia hypericoides*, *Synaphea spinulosa* and *Tricoryne elatior* low shrubland over *Mesomelaena pseudostylia*, *Conostylis aculeata* subsp. *aculeata* and *Alexgeorgea nitens* sparse sedgeland over *Ehrharta calycina* and *Avena fatua* sparse tussock grassland.

Jarrah Woodland 1: *Eucalyptus marginata*, *Allocasuarina fraseriana* and *Banksia attenuata* mid open forest to low woodland over *Xanthorrhoea preissii* (+/- *Jacksonia sternbergiana*/*Allocasuarina humilis*) mid open shrubland over *Hibbertia hypericoides* low open shrubland over *Mesomelaena pseudostylia* and/or *Lepidosperma calcicola* and/or *Desmodiadus flexuosus* sparse sedgeland over a tussock grassland of introduced grasses.

— Roads (MRWA)

Scale 1:1,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 58540

Client: Main Roads

Version: A

Drawn By: cthatcher

Date: 12-May-2020

Checked By: AH

Hodges Drive and Mitchell Freeway  
Perth, WA

VEGETATION ASSOCIATIONS

FIGURE 3



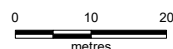




# Legend

- Project area
- Vegetation condition
  - Good
  - Degraded to completely degraded
  - Completely degraded
- Roads (MRWA)

Scale 1:1,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 58540

Client: Main Roads

Version: A

Drawn By: cthatcher

Date: 12-May-2020

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Hodges Drive and Mitchell Freeway  
Perth, WA

VEGETATION CONDITION

FIGURE 4



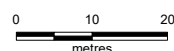




# Legend

- Project area
- Fauna habitat
- Banksia Woodland
- Jarrah Woodland 1
- Roads (MRWA)

Scale 1:1,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



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Date: 12-May-2020

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Hodges Drive and Mitchell Freeway  
Perth, WA

BLACK COCKATOO HABITAT

FIGURE 5



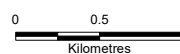




#### Legend

- Project area
- 4km buffer
- Carnaby's Black Cockatoo foraging habitat (DBCA)
- State roads (MRWA)

Scale 1:45,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 58540

Client: Main Roads

Version: A

Drawn By: cthatcher

Date: 12-May-2020

Checked By: AH

**Hodges Drive and Mitchell Freeway  
Perth, WA**

**BLACK COCKATOO HABITAT  
WITHIN 4 KM OF THE PROJECT AREA**

**FIGURE 6**







OVERVIEW MAP

Hodges Drive and Mitchell Freeway  
Perth, WA

# Legend

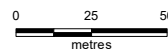
  Project Area

## Threatened/Priority Ecological Community

  EPBC TEC Banksia Woodlands of the Swan Coastal Plain ecological community

  WA PEC Banksia dominated woodlands of the Swan Coastal Plain

Scale 1:2,500 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No:

Client:

Version: A

Date: 13-Jul-2020

Drawn By: esutherland

Checked By:

Threatened and Priority  
Ecological Communities

FIGURE 6







**mainroads**  
WESTERN AUSTRALIA

# Clearing Impact Assessment and Vegetation Management Plan

*We're working for  
Western Australia.*

Mitchell Freeway Southbound –  
Hepburn Avenue on-ramp (H590)

April 2020

1969

Printed copies are uncontrolled unless marked  
otherwise. Refer to iRoads for current version.

D20#289851

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# Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	Associate, Strategen- JBS&G	Rev A	30 March 2020
Reviewer:	Principal Environmental Officer	Rev A	
Author:	Associate, Strategen- JBS&G	Rev B	13 April 2020
Reviewer:	Principal Environmental Officer	Rev B	
Author:	Associate, Strategen- JBS&G	Rev 0	26 April 2020
Reviewer:	Senior Environment Officer	Rev 0	22 May 2020

# 1 SUMMARY

## 1.1 Project Information

**Project Name:** Mitchell Freeway Southbound - Hepburn Avenue on-ramp

**Project Location(s):** The project area is located on the Hepburn Avenue on-ramp (H590) SLK 0.045 to SLK 0.629 and Mitchell Freeway (H016) between SLK 17.75 to SLK 17.18 within the local government authority boundary of the City of Joondalup (Figure 1).

**Project Purpose / Components:** Main Roads Western Australia (Main Roads) proposed to upgrade the Mitchell Freeway southbound on-ramp at Hepburn Avenue.

Note that this assessment is ONLY for the clearing of native vegetation for above project activities.

**Area Proposed to be Cleared:** The project will require clearing of up to 0.52 hectares (ha) of remnant vegetation

**Temporary Clearing Required:** None

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

- Flora and Vegetation
  - Clearing of 0.52 ha of remnant native vegetation, of which 0.41 ha is in a 'Completely Degraded' condition and 0.11 ha in 'Good' condition.
  - Clearing of 0.52 ha of 'Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain' Priority Ecological Community (Priority 3iii).
- Terrestrial Fauna
  - The project has the potential to impact Black Cockatoo species, specifically Carnaby's and Forest Red-tailed Black Cockatoo through the removal of up to 13 suitable diameter at breast height (DBH) trees, none containing suitable hollows, and up 0.52 ha of foraging habitat.
- The project is not likely to be at variance with any of the ten clearing principles.

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

## 2 ASSESSMENT SCOPE

This clearing impact assessment involved a desktop analysis of environmental aspects and impacts, a site investigation, and an assessment of native vegetation clearing impacts. The study area is confined to a local area of a 10 km radius. This assessment determined the need to develop and obtain approvals from the Department of Water and Environmental Regulation (DWER) for a Revegetation Plan, a Vegetation Management Plan (VMP), a Dieback Management Plan or an Offset Proposal.

### 3 PROJECT DESCRIPTION

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

**Table 1. Project Description**

Project Components	Clearing Required (Y/N)	Estimated Clearing Area (ha) <i>TBC if unknown</i>
Road Widening(H590) SLK 0.045 to SLK 0.629 and (H016) between SLK 17.75 to SLK 17.18	Y	0.52 ha
Pre-construction works/service Relocations	Y	Within the 0.52 ha

#### 3.1 Project Location

The project area is located on the Hepburn Avenue on-ramp (H590) SLK 0.045 to SLK 0.629 and Mitchell Freeway (H016) between SLK 17.75 to SLK 17.18 within the local government authority boundary of the City of Joondalup (Figure 1).

##### *Start*

Latitude: -31.817464°

Longitude: 115.782694°

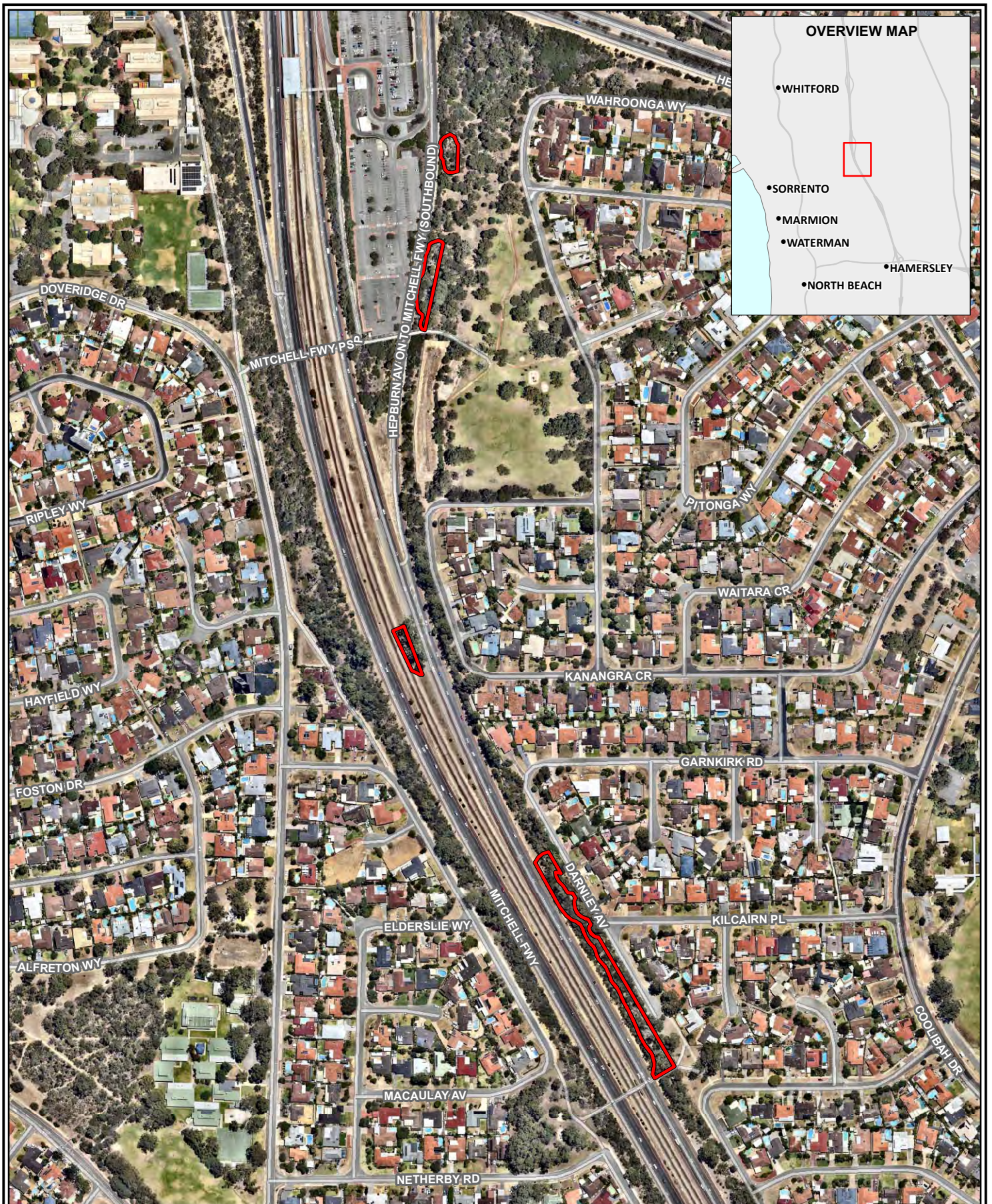
##### *End*

Latitude: -31.856397°

Longitude: 115.800251°

The location and boundaries of the study area (10 km radius) for the project are shown in Figure 2.

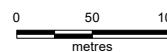




#### Legend:

- Project area
- Roads (MRWA)

Scale 1:5,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 58540

Client: Main Roads

Version: A

Drawn By: hsullivan

Date: 17-Apr-2020

Checked By: WS

**Mitchell Freeway  
Perth, WA**

**PROJECT AREA**

**FIGURE 1**







<b>Legend:</b> <div><div></div>Project area</div> <div><div></div>10km buffer</div> <div><div></div>Roads (MRWA)</div>	Scale 1:120,000 at A4 <div><div></div><div>012</div><div>Kilometers</div></div>		Mitchell Freeway Perth,WA
	Coord. Sys. GDA 1994 MGA Zone 50 <div><div></div></div>		PROJECT AREA AND STUDY AREA
	Job No: 58540		
	Client: Main Roads		
	Version: A	Date: 08-Apr-2020	<div><div></div><div>strategen</div><div>JBS&amp;G</div></div>
Drawn By: hsullivan	Checked By: WS		



## **3.2 Methodology**

### **3.3 Preliminary Desktop Study**

A preliminary desktop study was undertaken as part of the PCIA, to assess the proposed native vegetation clearing and potential constraints associated with the project. The desktop assessment included viewing GIS shapefiles, reviewing government agency managed databases (where necessary) and consulting with relevant stakeholders. The outcome of the desktop study identified that native vegetation clearing was not at variance with any of the ten clearing principles.

The methodology used when completing an assessment of the clearing principles is provided in Section 5.3. Mapping was completed using ArcMap or Main Roads Integrated Mapping System (IMS).

### **3.4 Detailed Clearing Impact Assessment**

Further environmental assessment of the impacts of native vegetation clearing was undertaken and a CIA report completed. The CIA included a site visit to verify desktop information and a biological survey to delineate key environmental elements of the project area. A summary of the outcome of the survey is provided in Section 6.

The methodology used for the biological survey is provided in the *Mitchell Freeway Widening Southbound and PSP Mitchell Freeway Gaps Hodges Drive to Reid Highway Biological Survey September/October 2019*, Astron (2020) report in Appendix A.

## **4 Clearing of Native Vegetation**

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

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

### **4.1 Measures to Avoid, Minimise, Mitigate and Manage Project Clearing Impacts**

The design and management measures implemented to avoid and minimise the project clearing impacts are provided in Table 2.

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

Design or Management Measure	Applied to Current Design	Discussion and Justification
<b>Steepen batter slopes</b>	Yes	Batters will be steepened beyond standard practice to ensure that clearing doesn't extend outside the proposed footprint.
<b>Installation of safety barriers</b>	Yes	Installation of safety barriers is required in order to comply with road safety requirements.
<b>Alignment to one side of existing road</b>	Yes	All widening is to the verge, which has already been heavily disturbed
<b>Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded area</b>	No	Widening of the on-ramp must go into the verge and disturb native and planted vegetation.
<b>Installation of kerbing</b>	No	Freeway surfacing with Open Graded Asphalt may prevent kerbing from being effective.
<b>Simplification of design to reduce number of lanes and/or complexity of intersections</b>	No	Road design must allow for ramp metering and sufficient capacity on the ramp to allow for the metering. This is unfortunately complicated and is being simplified as far as possible.
<b>Preferential use of existing cleared areas for access tracks, construction storage and stockpiling</b>	Yes	No vegetation to be cleared for temporary works.
<b>Drainage modification</b>	No	No, the project will utilise the existing drainage in place for this section of Hepburn Avenue and Mitchell Freeway.
<b>Other design treatment</b>	No	No other design treatment is appropriate for the required work. The project involves the widening and upgrade of an existing major road alignment. No design alternatives exist to achieve the same outcome while reducing clearing requirements.

In addition to the elements discussed in Table 1, the following avoidance and minimisation action have been applied to this project:

- The clearing area will be demarcated prior to the commencement of native vegetation clearing.
- The project design was refined to avoid clearing as many potential cockatoo habitat trees as practicable.
- Where possible vegetation will be pruned as opposed to removed.
- Further project clearing will be avoided as the site office, materials storage areas, construction vehicles/machinery and access tracks will be located on previously disturbed or cleared areas.

## 4.2 Vegetation Details

### 4.2.1 Project Site Vegetation Description

The project area is predominately in a degraded condition with one native vegetation unit present, described by Astron (2020) as:

- **Tuart Forest 2:** *Eucalyptus gomphocephala* mid open to closed forest over *Eucalyptus marginata* (+/- *Banksia attenuata*, *Allocasuarina fraseriana*, *Corymbia calophylla*) mid to low woodland to open woodland over *Xanthorrhoea preissii* (+/- *Acacia rostellifera*, *Jacksonia sternbergiana*, *Allocasuarina humilis*) mid shrubland to isolated shrubs over *Mesomelaena pseudostygia* and *Lepidosperma calcicola* sparse sedgeland over an introduced tussock grassland.

Tables 3 and 4 provide details of the Pre-European Vegetation Associations within the project area and the remaining extents of these associations.

For a full description of the existing vegetation, refer to the Biological Assessment Report (Astron, 2020) in Appendix A.

**Table 3. Summary of Project Area's Mapped Pre-European Vegetation Associations**

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 6 described as a Medium woodland: Tuart and jarrah (Government of Western Australia, 2019).	Clearing of up to 0.52 ha for road widening, Hepburn Avenue on-ramp.	Degraded (0.41 ha) to good condition (0.11 ha) (Astron, 2020)	Vegetation description and condition determined from biological survey (Astron, 2020)

**Table 4. Pre-European Vegetation Representation**

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 6</b>	<b>Statewide</b>	56,343	13,362.25	23.72	9.45
	<b>IBRA Bioregion</b> Swan Coastal Plain	56,343	13,362.25	23.72	9.45
	<b>IBRA Sub-region</b> Perth	56,343	13,362.25	23.72	9.45
	<b>Local Government Authority</b> City of Joondalup	2,294.47	326.68	14.24	1.32

#### 4.2.2 Vegetation Complexes and Representation

Vegetation Complexes within the project area have been defined by Heddle et al. (1980) and are based on vegetation in association with landforms and underlying geology. Native vegetation complexes as described by Heddle et al. (1980) within the Project area comprise:

- **Karrakatta Complex** – Central and South: Predominately open forest of *Eucalyptus gomphocephala* (Tuart), *E. marginata* (Jarrah), *Corymbia calophylla* (Marri) and woodland of *E. marginata* and *Banksia* species.
- **Cottesloe Complex** – Central and South: mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri); closed heath on the Limestone outcrops.

These complexes are above the minimum threshold of 10% target for the retention of vegetation complexes in constrained areas on the Swan Coastal Plain (EPA, 2000). The current remaining extent of these vegetation complexes (Government of WA, 2019) are detailed in Table 5.

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

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2019 Vegetation Extent	% Remaining
Karrakatta Complex - Central and South	53,081.0	12,467.2	23.5
Cottesloe Complex – Central and South	45,299.6	14,567.9	32.2



### 4.3 Assessment against the Ten Clearing Principles

In assessing whether the project's proposed clearing is likely to have a significant impact on the environment, the project was assessed against the ten clearing principles (EP Act 1986, Schedule 5).

Each principle has been assessed in accordance with DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation'.

The proposed clearing is considered not likely to be at variance to clearing principles (a), (b), (d) and (i) and not at variance to clearing principles (c), (e), (f), (g), (h) and (j).

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

Comments	Proposed clearing is not likely to be at variance to this Principle
	<p>This project involves the clearing of up to 0.52 ha of native vegetation (Appendix C: Figure 3). The vegetation unit within the project area has been assessed as:</p> <ul style="list-style-type: none"> <li>• <b>Tuart Forest 2:</b> <i>Eucalyptus gomphocephala</i> mid open to closed forest over <i>Eucalyptus marginata</i> (<i>Banksia attenuata</i>, <i>Allocasuarina fraseriana</i>, <i>Corymbia calophylla</i>) mid to low woodland to open woodland over <i>Xanthorrhoea preissii</i> (<i>Acacia rostellifera</i>, <i>Jacksonia sternbergiana</i>, <i>Allocasuarina humilis</i>) mid shrubland to isolated shrubs over <i>Mesomelaena pseudostygia</i> and <i>Lepidosperma calcicola</i> sparse sedgeland over an introduced tussock grassland.</li> </ul> <p>The vegetation is in 'Completely Degraded' to 'Good' condition with the majority (0.41 ha) of the vegetation in 'Completely Degraded' condition (Appendix C: Figure 4). One vegetation unit was mapped during the detailed field survey, as shown above in section 4.2.1 (Astron 2020).</p> <p>No State or Federally listed Threatened flora species were recorded within the Project area. One state listed Priority flora species was recorded within the project area, <i>Grevillia olivacea</i> (P4). However, Astron (2020) consider this to have been planted within the road reserve due to being well outside of its home range and it will not be considered further.</p> <p>Within the project area, no federally listed Threatened or Priority Ecological Communities are considered to occur. Vegetation consists mainly of planted vegetation and completely degraded patches of Tuart Woodland. There is a small section (0.1 ha) of Tuart Woodland vegetation that has been assessed as 'Good' condition (Figure 4).</p> <p>Astron (2020) determined that vegetation within the project area does not meet the criteria for classification as the Tuart Woodlands and Forests of the Swan Coastal Plain Threatened Ecological Community.</p> <p>The project will impact on approximately 0.52 ha of the State listed Tuart (<i>Eucalyptus gomphocephala</i>) woodlands of the Swan Coastal Plain' Priority Ecological Community (P3). Within the project area, the majority of vegetation been assessed as a 'Degraded' to 'Completely Degraded' (0.42 ha) condition. This is unlikely to result in a significant impact to the PEC as clearing represents approximately 0.3% of vegetation considered to represent the PEC within 5 km of the Project area. Noting this, it is considered that the vegetation within the project area is not representative of a diverse native vegetation remnant that comprises the whole, or a part of, a significant occurrence of an ecological community; or native vegetation that has a higher diversity than other examples of an ecological community in the region.</p>

	<p>The project area is within the known distribution range of the Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo, but outside of the known breeding range of Carnaby's Cockatoo and considered unlikely to support breeding for the Forest Red-tailed Black Cockatoo due to the absence of intact woodland or forest habitat.</p> <p>Within the project area, approximately 0.52 ha of potentially suitable foraging habitat was recorded (Appendix C: Figure 5). The black cockatoo assessment undertaken by Astron (2020) determined that no quality foraging habitat as defined referral guidelines (Department of Sustainability Environment Water Population and Communities 2012) is present, due to the altered state of vegetation and the sporadic and isolated distribution of known foraging flora species.</p> <p>The survey identified a total of 13 potential black cockatoo breeding trees (those of a suitable species with greater than the 500 mm DBH) within the project area. No suitable hollows were observed during the survey and no evidence of breeding was recorded at the time of the survey.</p> <p>Based on the mostly Completely Degraded condition of the clearing area, its small size and the occurrence similar remnant vegetation in similar of better condition in the local area, it is considered that the vegetation to be cleared does not comprise a high level of biological diversity.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not likely to be at variance to this principle.</b></p>
<b>Methodology</b>	<p>MRWA Shapefiles            DBCA shapefiles            DSEWPac (2012)            NatureMap (February, 2020)            EPA (2016)            Biological Survey (October, 2019)</p>

**(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.**

<b>Comments</b>	<b>Proposed clearing is not likely to be at variance to this Principle</b>
	<p>Within the survey area there are known records of 61 protected fauna species. The biological survey identified that there were three conservation species present within the wider survey area. These are:</p> <ul style="list-style-type: none"> <li>• <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo) -Threatened</li> <li>• <i>Calyptorhynchus banksii naso</i> (Forest Red-tailed Black Cockatoo) -Threatened</li> <li>• <i>Isodoon obesulus</i> subsp. <i>fusciventer</i> (Southern Brown Bandicoot) - Priority 4</li> </ul> <p>Within the project area, Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo are considered to potentially be present. No evidence of Quenda presence within the project area was recorded (Astron, 2020).</p> <p><b><u>Black Cockatoo</u></b></p>

	<p>The project area is within the known distribution range of the Carnaby's Cockatoo, but outside of the known breeding range of Carnaby's Cockatoo and is outside of the modelled distribution of the Forest Red-tailed Black Cockatoo (Department of Sustainability, Environment, Water, Population and Communities 2012). Given the small area of potential habitat and its poor condition, it is considered unlikely to be significant habitat for foraging or breeding for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo.</p> <p>Within the project area, approximately 0.52 ha of potentially suitable foraging habitat was recorded (Appendix C: Figure 5). The black cockatoo assessment undertaken by Astron (2020) determined that no quality foraging habitat as defined referral guidelines (Department of Sustainability Environment Water Population and Communities 2012) is present, due to the altered state of vegetation and the sporadic and isolated distribution of known foraging flora species.</p> <p>The survey identified a total of 13 potential black cockatoo breeding trees (those greater than the 500 mm DBH) within the project area. No suitable hollows were observed during the survey and no evidence of breeding was recorded at the time of the survey.</p> <p>No evidence of current or historic use of the project area for roosting was observed (Astron 2020). The closest confirmed roost site is located 2.3 km north-east to the project area.</p> <p>Within 4 km of the project area there is approximately 290 ha of suitable habitat within Local or State Government reserves which would provide significantly higher quality habitat for black cockatoos (Appendix C: Figure 6). These reserves consist of:</p> <ul style="list-style-type: none"> <li>• Hepburn Heights Conservation area (20 ha);</li> <li>• Shepherds Bushland Reserve (20 ha);</li> <li>• Craigie Open Space (Bushland) (215 ha); and</li> <li>• Woodvale Nature Reserve (35 ha).</li> </ul> <p>Clearing as a result of the project represents 0.17% of potentially available habitat within 4 km of the project area.</p> <p><b><u>Other Conservation Significant Species</u></b></p> <p>The Southern Brown Bandicoot (Quenda) occurs in wet or dry sclerophyll forest through to open woodland and scrubby, dense vegetation on sandy soils. This species was identified within the survey area in close proximity to the Woodvale Nature Reserve, approximately 3.5 km north of the project area.</p> <p>It is considered unlikely that the small area of vegetation to be cleared as a result of the project constitutes significant habitat for the species, which is more likely to be in larger pockets of native vegetation associated with the reserves listed above.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not likely to be at variance to this principle.</b></p>
<b>Methodology</b>	<p>DBCA Shapefiles  DBCA website  DSEWPaC (2012)  EPA (2016)  Biological Survey (October, 2019)  Aerial Photography</p>

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

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>A total of 207 vascular flora species, from 47 families and 127 genera, were recorded in the wider survey area, between Hodges Drive and Reid Highway (Astron 2020). No State or Federally listed threatened flora species were recorded within the project area.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	<p>DBCA shapefiles</p> <p>Florabase (February, 2020)</p> <p>Biological Survey (October, 2019)</p>

**(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.**

<b>Comments</b>	<b>Proposed clearing is not likely to be at variance to this Principle</b>
	<p>Astron (2020) did not record any State listed Threatened Ecological Communities in the Project area.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not likely to be at variance to this principle.</b></p>
<b>Methodology</b>	<p>DBCA shapefiles</p> <p>Biological Survey (October, 2019)</p>

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

Comments	Proposed clearing is not at variance to this Principle																																													
	<p>The project area is mapped as Vegetation Association 6 described as a Medium woodland: tuart and jarrah. The project proposes to clear up to 0.52 ha of native vegetation, of this, 0.41 ha (78%) has been assessed as 'Completely Degraded' and the remainder in good condition (Astron, 2020).</p> <p><b>Table 5.1. Pre-European Vegetation Representation</b></p> <table><tr><th>Pre-European Vegetation Association</th><th>Scale</th><th>Pre-European (ha)</th><th>Current Extent (ha)</th><th>% Remaining</th><th>% Remaining in DBCA reserves</th></tr><tr><td rowspan="4"><b>Veg Assoc No. 6</b></td><td><b>Statewide</b></td><td>56,343</td><td>13,362.25</td><td>23.72</td><td>9.45</td></tr><tr><td><b>IBRA Bioregion</b></td><td></td><td></td><td></td><td></td></tr><tr><td>Swan Coastal Plain</td><td>56,343</td><td>13,362.25</td><td>23.72</td><td>9.45</td></tr><tr><td><b>IBRA Sub-region</b></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>Perth</td><td>56,343</td><td>13,362.25</td><td>23.72</td><td>9.45</td></tr><tr><td></td><td><b>Local Government Authority</b></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>2,294.47</td><td>326.68</td><td>14.24</td><td>1.32</td></tr></table>	Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves	<b>Veg Assoc No. 6</b>	<b>Statewide</b>	56,343	13,362.25	23.72	9.45	<b>IBRA Bioregion</b>					Swan Coastal Plain	56,343	13,362.25	23.72	9.45	<b>IBRA Sub-region</b>						Perth	56,343	13,362.25	23.72	9.45		<b>Local Government Authority</b>							2,294.47	326.68	14.24	1.32
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Cottesloe Complex – Central and South	45,299.6	14,567.9	32.2														
<p>The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The project area is within a constrained area of the Swan Coastal Plain and as such retention objectives of at least 10 per cent apply (EPA, 2016).</p> <p>As shown in Table 5.1 and 5.2, vegetation association 6 and the vegetation complexes Karrakatta and Cottesloe (Central and South) are above the 10 per cent threshold in a constrained area (Government of Western Australia, 2019).</p> <p>Furthermore, given the condition of the vegetation, it is not considered to be representative of native vegetation that is significant as a remnant in an area that has been extensively cleared.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not at variance to this principle.</b></p>																	
Methodology	EPA (2016) Biological Survey (October, 2019) 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.**

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>Interrogation of DBCA and DWER hydrological and wetland datasets determined that no wetlands or watercourses are mapped within the project area. The nearest mapped wetland is Lake Goollelal, located approximately 2.85 km from the project area.</p> <p>In addition, the Astron (2020) biological survey concluded that no remnant vegetation considered to represent riparian vegetation was recorded from the project area.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	DWER and DBCA shapefiles Biological Survey (October, 2019)

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

Comments	Proposed clearing is not at variance to this Principle												
	<p>The Department of Primary Industries and Regional Development (DPIRD), provides a series of soil degradation risk mapping at the sub-system level. The project area is located within the Karrakatta Sand Yellow Phase subsystem of the Spearwood Dunes soil system. It is described as low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. Banksia spp. woodland with scattered emergent <i>E. gomphocephala</i> and <i>E. marginata</i> and a dense shrub layer. (DPIRD, 2018).</p> <p>The table below summaries the soil degradation risk within the project area,</p> <table border="1"> <thead> <tr> <th>Aspect</th><th>Degradation risk</th></tr> </thead> <tbody> <tr> <td>Wind Erosion</td><td>98%</td></tr> <tr> <td>Waterlogging</td><td>0%</td></tr> <tr> <td>Water Erosion</td><td>0%</td></tr> <tr> <td>Salinity</td><td>0%</td></tr> <tr> <td>Flood Risk</td><td>0%</td></tr> </tbody> </table> <p>Wind erosion is the only potential soil degradation aspect relevant to the project area, due to the deep yellow sands associated with the area. It is unlikely that the project will cause appreciable land degradation given the relatively small amount of clearing and the implementation of appropriate measures to mitigate and manage potential wind driven erosion during construction.</p> <p><b>Assessed Outcome:</b></p> <p><b>Noting the above, clearing for this project is not at variance to this principle.</b></p>	Aspect	Degradation risk	Wind Erosion	98%	Waterlogging	0%	Water Erosion	0%	Salinity	0%	Flood Risk	0%
Aspect	Degradation risk												
Wind Erosion	98%												
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Salinity	0%												
Flood Risk	0%												
<b>Methodology</b>	<p>GIS shapefiles</p> <p>Biological Survey (October, 2019)</p> <p>Natural Resource Management SLIP Soil Systems (Accessed April 2020)</p>												

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

Comments	Proposed clearing is not at variance to this Principle
	<p>Within 4 km of the project area there are 4 conservation areas/reserves are present:</p> <ul style="list-style-type: none"> <li>• Hepburn Heights Conservation area (20 ha);</li> <li>• Shepherds Bushland Reserve (20 ha);</li> <li>• Woodvale Nature Reserve (35 ha).</li> <li>• Craigie Bushland (215 ha)</li> </ul> <p>In addition to these areas, a number of small local government reserves are present. The nearest conservation area to the project area is the Craigie bushland area (Bush forever Site 303) which occurs approximately 450 m to the west of the project area, on the other side of the freeway and has no direct links to the project area.</p> <p>It is not considered that the project area contains vegetation which represents a significant ecological linkage for fauna to move between conservation reserves.</p> <p>Noting the above and that the project area is contained to the road reserve, the proposed clearing is will not result in impacts to an adjacent or nearby conservation area.</p>

	<b>Assessed Outcome:</b> <b>Noting the above, clearing for this project is not at variance to this principle.</b>
<b>Methodology</b>	DBCA shapefiles EPA (2016)

**(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.**

<b>Comments</b>	<b>Proposed clearing is not likely to be at variance to this Principle</b>
	<p>There are no major or minor watercourses mapped within the project area.</p> <p>The project will not change the hydrology of the area. Given the small scale of clearing and that no dewatering or drainage modifications are required; it is considered that there will be very little to no deterioration of underground water quality.</p> <p><b>Assessed Outcome:</b>  <b>Noting the above, clearing for this project is not likely to be at variance to this principle.</b></p>
<b>Methodology</b>	DWER and DBCA shapefiles Biological Survey (October, 2019)

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

<b>Comments</b>	<b>Proposed clearing is not at variance to this Principle</b>
	<p>This project proposes to clear up to 0.52 ha of vegetation over an approximately 6km stretch of road. The removal of such a small area of vegetation makes it unlikely that the incidence or intensity of flooding will increase. NRM SLIP identifies that the area has 0% risk of flooding, largely attributed to presence of sandy soil and fast infiltration rates.</p> <p>Given the small amount of clearing, that vegetation will remain in the surrounding area and that the project area will be sealed, it is unlikely that this project will cause or exacerbate the incidence or intensity of flooding.</p> <p><b>Assessed Outcome:</b>  <b>Noting the above, clearing for this project is not at variance to this principle.</b></p>
<b>Methodology</b>	Natural Resource Management SLIP Soil Systems (Accessed June 2020)



## 5 SUMMARY OF BIOLOGICAL SURVEYS

A Detailed biological survey of the area (survey area wider than the current project area) was undertaken in 2019 (Astron, 2020). A summary of the findings from the survey are presented below.

### Vegetation:

- Five remnant native vegetation types were defined and included:
  - One *Banksia* Woodland;
  - Two *Eucalyptus marginata* (jarrah) woodlands; and
  - two *Eucalyptus gomphocephala* (tuart) forests.
- Remnant vegetation types were mapped across 6.4 ha (19 %) of the survey area. The remaining 27.6 ha of the survey area was either cleared (3.0 ha, 9 %) or planted vegetation (24.6 ha, 72 %).
- Remnant vegetation in the survey area was in Good to Completely Degraded condition, with the majority considered Completely Degraded as it consisted of scattered remnant species only. It is expected that quality of these remnants has been declining over time due to significant edge effects.
- Vegetation inferred to represent the EPBC Act listed 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' TEC was recorded within the survey area, but not within the project area.
- Vegetation inferred to represent the EPBC Act listed 'Banksia Woodlands of the Swan Coastal Plain' TEC was recorded within the survey area, across 1.4 ha near Hodges Drive and adjacent to the Woodvale Nature Reserve, but not within the project area.
- Vegetation considered to represent the State listed PECs 'Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain' and 'Banksia dominated woodlands of the Swan Coastal Plain IBRA Region' PEC were recorded within the survey area across 4.7 ha and 1.3 ha respectively. Within the project area 0.52 ha exists.

### Flora:

- A total of 207 vascular flora species, from 47 families and 127 genera, were recorded in the survey area. No EPBC Act or State listed threatened flora were recorded, one priority flora species of significance was recorded: *Jacksonia sericea* P4.
- The survey area has considerable disturbance and limited floristic diversity which further limits the potential for any threatened or priority flora species to occur.
- Sixty-three weed species were recorded within the survey area, accounting for 30% of the species recorded. Three are listed as WoNS (Australian Weeds Committee 2012) (*\*Asparagus asparagoides*, *\*Lantana camara* and *\*Genista linifolia*) and three are declared pest plants in Western Australia under the BAM Act (Department of Agriculture and Food Western Australia 2016).

### Fauna:

- 24 conservation significant vertebrate species were identified in the desktop assessment, and three species (quenda, Carnaby's cockatoo and forest red-tailed black cockatoo) were recorded within the survey area, one species were considered to have a 'moderate' likelihood and 20 species were considered to have a 'low' likelihood of occurrence.
- Based upon the current distributions for the three threatened species of black cockatoo, only the Carnaby's cockatoo (*Calyptorhynchus latirostris*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) are likely to occur within the vicinity of the survey area.

- Three hundred and twenty-nine black cockatoo potential breeding trees (259 Tuarts, 42 jarrah, 16 dead stags and 12 marri) with a diameter at breast height of over 50 cm were recorded within the survey area including 15 trees (nine Tuarts and six dead stags) considered to have suitable hollows for Carnaby's cockatoos to breed in.
- Twenty-seven known foraging resource species for the Carnaby's cockatoo and three known foraging resource species for the forest red-tailed black cockatoo were recorded within the survey area; however, only the marri, jarrah and Banksia species are considered key species for foraging Carnaby's cockatoos. Two individual Carnaby's cockatoos were observed foraging on *Banksia prionotes* and jarrah within the survey area.

One individual quenda roadkill and multiple diggings in the same area were recorded within the survey area. The sighting was recorded 228 m south of the Woodvale Open Space, and it is likely that this individual was from of a larger quenda population within Woodvale Open Space.

## 6 ADDITIONAL ACTIONS REQUIRED

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

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

Impact of Clearing	Yes/No or NA	Further Action Required
<b>1.</b> The PCIA indicates that the clearing is 'Seriously at Variance', 'At Variance' or 'May be at Variance' with one or more of the clearing principles.	<b>No</b>	No further action required
<b>2.</b> The PCIA indicates that the clearing is at variance or may be at variance with clearing principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.	<b>No</b>	No further action required
<b>3.</b> The project involves clearing for temporary works (as defined by the permit under Condition 11 of CPS 818).	<b>No</b>	No further action required
<b>4a.</b> The project is in part of a region that has annual rainfall greater than 400mm and is south of the 26 <sup>th</sup> parallel of latitude.	<b>Yes</b>	<b>4a.</b> No further action required
<b>4b.</b> The project will require movement of soil in conditions other than dry conditions.	<b>No</b>	<b>4b.</b> No further action required.
<b>5.</b> 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	<b>No</b>	No further action required.
<b>6.</b> The proposal requires referral to either the WA EPA or the Commonwealth DAWE.	<b>No</b>	No further action required.
<b>7a.</b> The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition	<b>No</b>	<b>7a.</b> Yes. 0.11 ha within project area in good condition.
<b>7b.</b> Are weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition		<b>7b.</b> No. Weed management will be addressed in the VMP/CEMP to avoid weed spread.

## **7 STATEMENT ADDRESSING STAKEHOLDER SUBMISSIONS**

Condition 7 of CPS 818/14 requires Main Roads WA to invite submissions from a number of parties when the proposed clearing is considered likely to be seriously at variance, at variance or may be at variance with one or more of the clearing principles.

As the assessment has determined that the proposed clearing is not at variance with any of the clearing principles, no stakeholder submission is required.

## **8 VEGETATION MANAGEMENT**

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

## 9 REFERENCES

Astron (2020). Mitchell Freeway Widening Biological Survey [DRAFT]. Unpublished report by Astron Environmental Pty Ltd for Main Roads Western Australia

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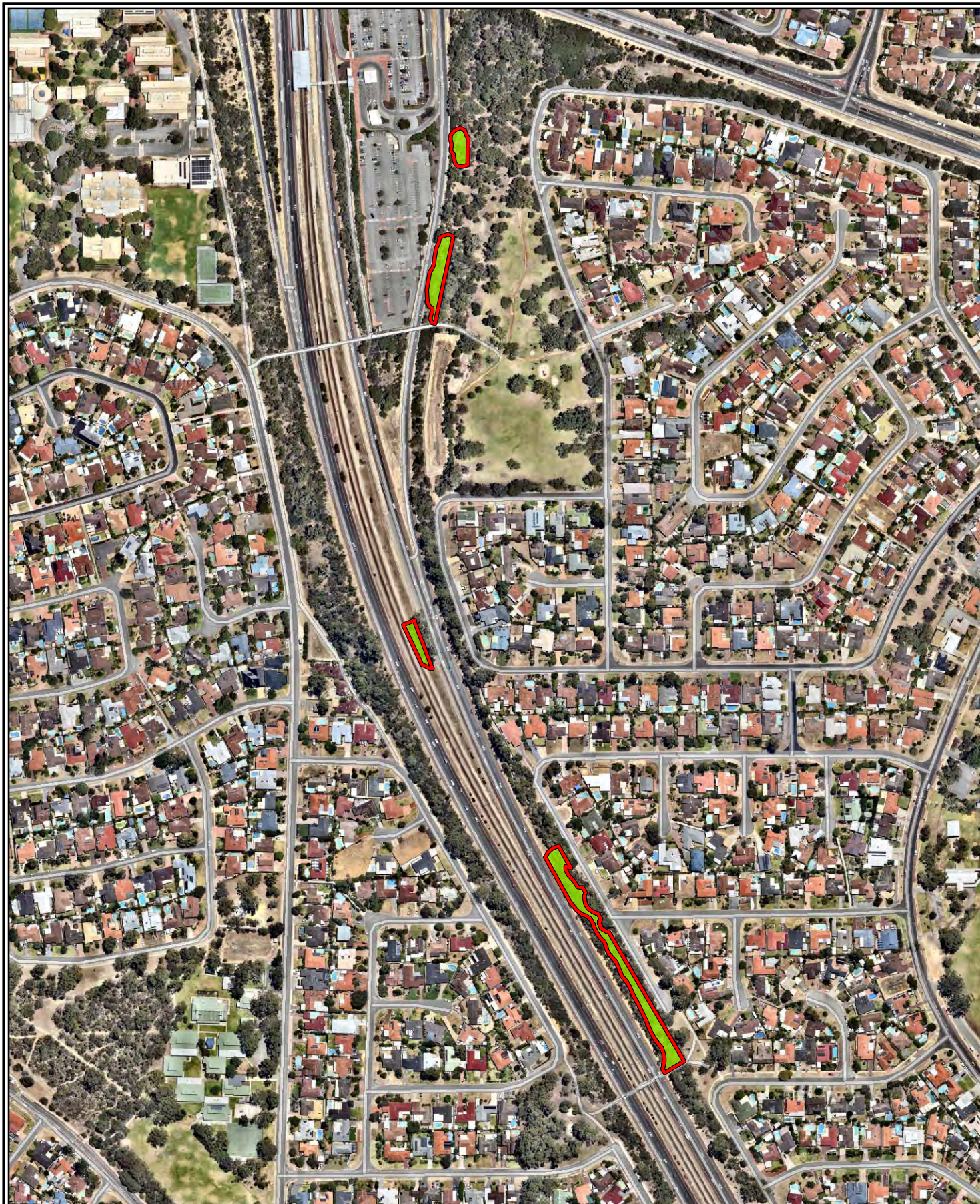
# 10 APPENDICES

Appendix	Title
Appendix A	Biological Assessment
Appendix B	Constraints Mapping

**Appendix A: Biological Survey Report (D20#289851)**

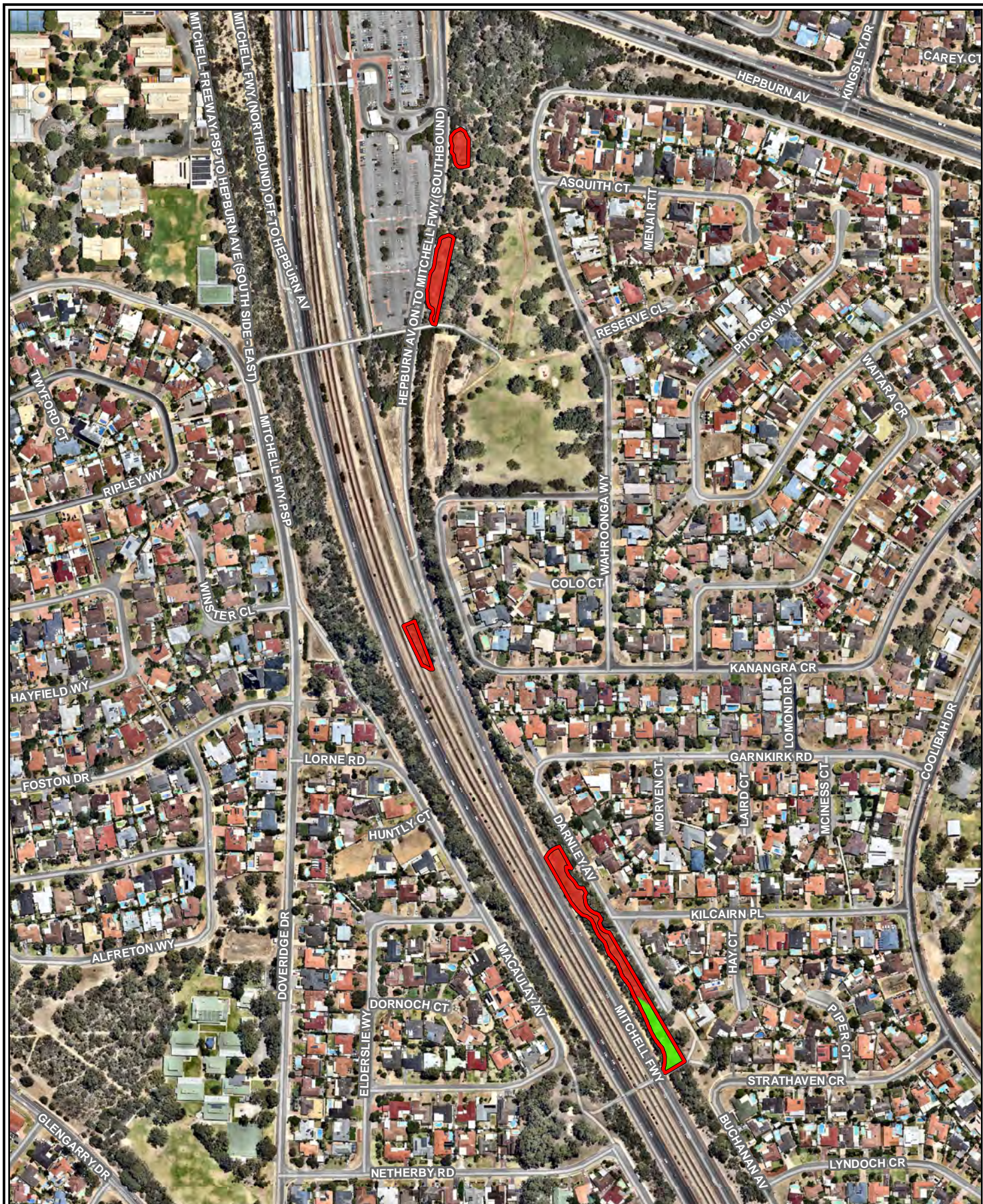
**Appendix B: Constraints Mapping**





<b>Legend:</b> <div><div></div> Project area</div> <div>Vegetation association</div> <div><div></div> Tuart Forest 2</div> <div><div></div> Roads (MRWA)</div>	Scale 1:5,000 at A4 <div><div>050100</div><div>metres</div></div>		<b>Mitchell Freeway</b> <b>Perth,WA</b>  <b>VEGETATION ASSOCIATIONS</b>
	Coord. Sys. GDA 1994 MGA Zone 50 <div><div></div></div>		
	Job No: 58540		
	Client: Main Roads		
	Version: A	Date: 17-Apr-2020	<b>FIGURE 3</b>  <div><div><div></div></div><div><b>strategen</b> <b>JBS&amp;G</b></div></div>
	Drawn By: hsullivan	Checked By: CT	

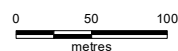




#### Legend:

- Project area
- Vegetation condition
- Good
- Completely Degraded
- Roads (MRWA)

Scale 1:5,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 58540

Client: Main Roads

Version: A

Drawn By: esutherland

Date: 08-Jun-2020

Checked By: CT

**Mitchell Freeway  
Perth, WA**

**VEGETATION CONDITION**

**FIGURE 4**



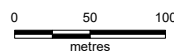




#### Legend:

- Project area
- Black Cockatoo habitat
- Black Cockatoo habitat trees
  - *Corymbia calophylla*
  - Dead Stag
  - *Eucalyptus gomphocephala*
  - *Eucalyptus marginata*
- Roads (MRWA)

Scale 1:5,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 58540

Client: Main Roads

Version: A

Drawn By: hsullivan

Date: 17-Apr-2020

Checked By: CT

**Mitchell Freeway  
Perth, WA**

**BLACK COCKATOO HABITAT  
WITHIN THE PROJECT AREA**

**FIGURE 5**







<b>Legend:</b> <div><div></div> Project area</div> <div><div></div> 4km buffer</div> <div><div></div> Carnaby's Black Cockatoo foraging habitat (DBCA)</div>	Scale 1:50,000 at A4		<div><div>00.51</div><div></div><div>Kilometers</div></div>	Mitchell Freeway Perth,WA
	Coord. Sys. GDA 1994 MGA Zone 50		<div><div></div></div>	BLACK COCKATOO HABITAT WITHIN 4KM OF PROJECT AREA
	Job No: 58540			
	Client: Main Roads			FIGURE 6
	Version: A	Date: 08-Apr-2020		<div><div></div><div>strategen</div><div>JBS&amp;G</div></div>
Drawn By: hsullivan	Checked By: CT			



# Clearing Desktop Report – Short Form



## 1. PROPOSAL DETAILS

<b>Proposal Name:</b>	Smart Freeways Mitchell Freeway Southbound Widening (Hester to Warwick) project C99.19 SFMS H2W – Whitfords on-ramp		
<b>Region/Directorate:</b>	Metro		
<b>Local Government Authority:</b>	City of Joondalup		
<b>Road/Bridge Name and No:</b>	Mitchell Freeway		
<b>Proposal Location (SLK):</b>	19.50		
<b>TRIM Link to Spatial Data:</b>	D23#155989 – Project Area 115.7831525 E, -31.8074815 S		
<b>EOS No:</b>	1969		
<b>Expected Proposal Start Date:</b>	March 2023		
<b>Project No:</b>	21115833	<b>Task Code:</b>	11.03
<b>LISC TRIM No:</b>	D22#10159665	<b>HRA TRIM No:</b>	D22#1260755

## 2. PURPOSE OF CLEARING

The proposal involves upgrades to the Whitfords Ave southbound on-ramp for the installation of Smart Freeways infrastructure. Most of the ramp works will be on land approved for clearing to construct the PSP and noise walls under EPBC 2020/8833 and clearing permit CPS 9225/1, however, the ramp design requires a tigertail configuration, which requires a slightly longer on-ramp than that considered in the concept design. The tiger tail configuration will require additional clearing of native vegetation in the freeway verge near the corner of Leyton Court and Twickenham Drive in Kingsley.

## 3. ALTERNATIVES TO CLEARING

In this location there is an existing earthen bund that was landscaped when the existing freeway was constructed. Given the time that elapsed since construction, the roots from two native trees now penetrate the bund where the ramp works needs to occur. Earthworks cannot cut into the bund without impacting the two native trees and there is not enough space to construct the on-ramp without widening the ramp into the verge. The Project area represents the maximum extent of disturbance for the Proposed Action. Where possible, vegetation and fauna habitat will be retained during detailed design and construction.

## 4. MEASURES TO AVOID, MINIMISE, MITIGATE AND MANAGE PROPOSAL CLEARING IMPACTS

The design and management measures implemented to avoid and minimise the project clearing impacts are provided in the table below, in addition to these elements the following avoidance and minimisation actions have been applied to this project:

- Works will be conducted in accordance with the Project Environmental Management Plan (D21#1185637)
- The clearing area will be demarcated prior to the commencement of native vegetation clearing.
- Where possible vegetation will be pruned as opposed to removed.
- Further project clearing will be avoided as the site office, materials storage areas, construction vehicles/machinery and access tracks will be located on previously disturbed or cleared areas.

Design or Management Measure	Discussion and Justification
Steepen batter slopes	Batters will be steepened beyond standard practice to reduce clearing requirement and ensure clearing doesn't extend outside the proposed footprint.

Installation of safety barriers	Installation of safety barriers is required in order to comply with road safety requirements. Where possible, safety barriers will be installed in previously cleared land within the road reserve.
Alignment to one side of existing road	Given works are associated with modifying the on-ramp, works must take place on the verge side. The design has minimised impacts to native vegetation.
Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded area	The design prioritised use of previously cleared land, but the nature of the geomorphology in the area makes it impossible to avoid impact these two trees of native vegetation as their root penetrate an existing earthen bund.
Installation of kerbing	Kerbing will not reduce the area of impact.
Simplification of design to reduce number of lanes and/or complexity of intersections	The Tigertail design is required to meet Smart Freeways requirements. Impact areas has been reduced as far as practicable to minimise clearing.
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	Cleared areas will be used for access tracks, construction storage and stockpiling, with no vegetation to be removed for temporary works.
Drainage modification	There are no alternative drainage options available that would reduce the clearing area any further.
Other design treatment	No other design treatment is appropriate for the required work. The Project involves using a tigertail design for the widening and upgrade of an existing on-ramp.

## 5. APPROVED POLICES 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 (see Section 1.3), Main Roads has also had regard to the following documents.

### **Environmental Protection Policies:**

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

### **Other legislation of relevance 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) (AHA)
- *Town Planning and Development Act* (WA) 1928

### **Relevant other policies and guidance documents:**

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DEC, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2021)
- Environmental Offsets Guidelines (Government of Western Australia, August 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 the three threatened black cockatoo species

- Strategic advice - EPA

## 6. CLEARING AREA

<b>Clearing Area (ha):</b>	0.10 ha	<b>No. Trees Cleared:</b>	2
<b>Species Name:</b>	<i>Eucalyptus gomphocephala</i>		
<b>Easting and Northing:</b>	115.7831401, -31.8075290		

## 7. EXISTING ENVIRONMENT AND SITE INFORMATION

<b>Site Vegetation Description/Association:</b>	<p>The vegetation comprises one native vegetation unit:</p> <p><b>Tuart Forest 2:</b> <i>Eucalyptus gomphocephala</i> mid open to closed forest over <i>Eucalyptus marginata</i> (+/- <i>Banksia attenuata</i>, <i>Allocasuarina fraseriana</i>, <i>Corymbia calophylla</i>) mid to low woodland to open woodland over <i>Xanthorrhoea preissii</i> (+/- <i>Acacia rostellifera</i>, <i>Jacksonia sternbergiana</i>, <i>Allocasuarina humilis</i>) mid shrubland to isolated shrubs over <i>Mesomelaena pseudostygia</i> and <i>Lepidosperma calcicola</i> sparse sedgeland over an introduced tussock grassland.</p> <p>Vegetation proposed for clearing comprises two Tuart trees, which represents up to 0.10 ha of remnant native vegetation mapped as Tuart Forest 2.</p>
<b>Site Vegetation Condition:</b>	<p>Completely Degraded: 0.06 ha</p> <p>Degraded to Completely Degraded: 0.04 ha</p>
<b>Pre-European Extent Remaining (%):</b>	<p>The Project area comprises Beard (1981) vegetation association (VA) VA 6, and Heddle (1980) Cottesloe Complex-Central and South vegetation complex. The Project area consists of two Tuart trees that were mapped as 0.10 ha of VA 6 (Astron 2021). There is 23.6% of VA 6 and 32.17% of the Cottesloe Complex vegetation complex remaining in the Swan Coastal Plain IBRA region.</p>

## 8. ASSESSMENT OF PROPOSAL AGAINST CLEARING PRINCIPLES

<b>Is vegetation to be cleared at variance with:</b>	<b>Justification or Evidence:</b>
<b>Principle (a)</b> – Native vegetation should not be cleared if it comprises a high level of biodiversity.	<p><b>The Project is not likely to be at variance to this principle.</b></p> <p>The Project involves clearing of up to two Tuart trees, which were mapped by Astron (2021) as 0.10 ha of Tuart Forest 2 (Figure 1). The vegetation proposed to be cleared contains 0.04 ha in 'Degraded to Completely Degraded' condition and 0.06 ha in 'Completely Degraded' condition (Astron, 2021).</p> <p>No state or federally listed Threatened flora species were recorded within the Project area.</p> <p>The vegetation proposed for clearing was originally mapped by Astron (2021) as part of a 9.4ha patch (TP20) of the Commonwealth listed Tuart Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC), which coincides with the State listed Priority Ecological Community (PEC) of the same name. However, impacts to this TEC from the Smart Freeways Project have already been assessed, approved and offset via EPBC 2020/8833 and clearing for project construction has commenced.</p> <p>As of November 2022, 1.57 ha of TP20 has been cleared and the 9.4 ha patch of TEC mapped by Astron (2021) has been fragmented into two patches (Figure 2). The native vegetation</p>

	<p>proposed for clearing for the Whitfords on-ramp includes two native Tuart trees that form part of a now 4.64 ha patch of Tuart Forest, which is predominantly planted vegetation. Given the remaining patch of Tuart Forest is less than 5 ha and that the vegetation is in a 'Degraded to Completely Degraded' condition (ie Poor Biotic Threshold as defined in Table 2 of <i>EPBC Referral Guidance – Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community</i>' (DoEE 2019), the vegetation is not considered part of the Tuart Forest TEC.</p> <p>No threatened or priority flora occur within the Project area.</p> <p>The Project area is within the known distribution range of Carnaby's Black Cockatoo. The Black Cockatoo assessment undertaken by Astron (2021) determined that no quality foraging habitat as defined by the referral guidelines (DAWE, 2022) is present due to the degraded state of vegetation and the sporadic and isolated distribution of known foraging habitat. The Project is outside the known breeding range for Black Cockatoo species and no suitable breeding trees were observed within the Project area (Kirkby, 2020). The two trees proposed for clearing are suitable DBH for Black Cockatoo breeding but do not contain suitable hollows, also Kirkby (2020) noted that the trees are too young to develop nesting hollows.</p> <p>Given the above and the degraded – completely degraded condition of the vegetation, the vegetation is not considered to comprise a high level of biodiversity and proposed clearing is unlikely to be at variance to this principle.</p>
<p><b>Principle (b)</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.</p>	<p><b>The Project is not likely to be at variance to this principle.</b></p> <p>Native vegetation within the Project area is predominantly (0.06 ha; 64%) in 'Completely Degraded' condition, and (0.04 ha; 36%) in 'Degraded to Completely Degraded' condition, and is separated from surrounding habitat patches by roads, pathways and residential land use. As such, the vegetation to be cleared is not considered likely to provide significant habitat for most fauna species in the local area, however, the vegetation may provide low quality foraging habitat for Carnaby's Cockatoo (<i>Zanda latirostris</i>) and Forest Red-tailed Black Cockatoo (<i>Calyptrorhynchus banksii naso</i>).</p> <p>Within 6 km and 12 km of the Project area, there is approximately 919.04 ha and 3,858.30 ha of potential foraging habitat (DBCA, 2020). Clearing as a result of the Project represents 0.01% and 0.003% of the foraging habitat within 6 and 12 km of the Project area, respectively.</p> <p>The Black Cockatoo assessment undertaken by Astron (2021) determined that no quality foraging habitat as defined by the referral guidelines (DAWE, 2022) is present due to the degraded state of vegetation and the sporadic and isolated distribution of known foraging habitat. No roosting habitat is present (Kirkby, 2020). The two trees proposed for clearing are suitable DBH for</p>

	<p>Black Cockatoo breeding but do not contain suitable hollows, also Kirkby (2020) noted that the trees are too young to develop nesting hollows.</p> <p>The trees to be removed are not significant habitat for fauna.</p>
<b>Principle (c)</b> – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.	<p><b>The Project is not at variance to this principle.</b></p> <p>None of the species identified in the Project area were threatened flora species listed under the <i>Biodiversity Conservation Act 2016</i> (Astron, 2021).</p>
<b>Principle (d)</b> – 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.	<p><b>The Project is not likely to be at variance to this principle.</b></p> <p>The vegetation proposed for clearing was originally mapped by Astron (2021) as part of a 9.4 ha patch (TP20) of the Commonwealth listed Tuart Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC), which coincides with the State listed Priority Ecological Community (PEC) of the same name. However, impacts to this TEC from the Smart Freeways Project have already been assessed, approved and offset via EPBC 2020/8833 and clearing for project construction has commenced.</p> <p>As of November 2022, 1.57 ha of TP20 has been cleared and the 9.4 ha patch of TEC mapped by Astron (2021) has been fragmented into two patches (Figure 2). Vegetation proposed for clearing for the Whitfords on-ramp includes two native Tuart trees that form part of a now 4.64 ha patch of Tuart Forest, which is predominantly planted vegetation. Given the remaining patch of Tuart Forest is less than 5 ha and that the vegetation is in a 'Degraded to Completely Degraded' condition (ie Poor Biotic Threshold as defined in Table 2 of DoEE 2019), the vegetation is not considered part of the Tuart Forest TEC.</p> <p>No other Threatened Ecological Communities were recorded within the Project area.</p> <p>The Project therefore does not contain any Tuart TEC and is therefore not at variance to this Principle.</p>
<b>Principle (e)</b> – Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	<p><b>Project clearing not at variance to this Principle.</b></p> <p>The Project area is mapped as Cottesloe Complex-Central and South vegetation complex, and Vegetation Association 6 described as a Medium woodland: Tuart and Jarrah. The Project proposes to clear up to 0.10 ha of native vegetation of this 64% has been assessed as 'Completely Degraded' condition and the remaining 36% in 'Degraded to Completely Degraded' condition (Astron 2021). Vegetation association 6 (23.6%) and the vegetation complex Cottesloe-Central and South (32.17) are above the 10 per cent threshold in a constrained area (Government of Western Australia, 2019) and clearing of 0.10 ha will not reduce representation below the 10% threshold recommended by the EPA.</p>
<b>Principle (f)</b> – Native vegetation should not be cleared if it is growing in, or in association with,	<p><b>Project clearing not at variance to this Principle.</b></p> <p>No wetlands or watercourses are mapped within the Project area. In addition, the Astron (2021) biological survey concluded that</p>



an environment associated with a watercourse or wetland.	no remnant vegetation considered to represent riparian vegetation was recorded from the Project area.												
<p><b>Principle (g)</b> – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p>	<p><b>Proposed clearing is not likely to be at variance to this Principle.</b></p> <p>The Project area is located within the Karrakatta Sand Yellow Phase subsystem of the Spearwood Dunes soil system. It is described as low hilly to gently undulating terrain. Yellow sand over limestone at 1–2 m. <i>Banksia</i> spp. woodland with scattered emergent Tuart and Jarrah and a dense shrub layer (DPIRD, 2020).</p> <p>The table below summarises the soil degradation risk within the Project area.</p> <table border="1"> <thead> <tr> <th>Aspect</th><th>Degradation Risk</th></tr> </thead> <tbody> <tr> <td>Wind Erosion</td><td>98%</td></tr> <tr> <td>Waterlogging</td><td>0%</td></tr> <tr> <td>Water Erosion</td><td>0%</td></tr> <tr> <td>Salinity</td><td>0%</td></tr> <tr> <td>Flood Risk</td><td>0%</td></tr> </tbody> </table> <p>Wind erosion is the only potential soil degradation aspect relevant to the Project area, due to the deep yellow sands associated with the area. It is unlikely that the Project will cause appreciable land degradation given the small amount of clearing and the implementation of appropriate measures to mitigate and manage potential wind driven erosion during construction.</p>	Aspect	Degradation Risk	Wind Erosion	98%	Waterlogging	0%	Water Erosion	0%	Salinity	0%	Flood Risk	0%
Aspect	Degradation Risk												
Wind Erosion	98%												
Waterlogging	0%												
Water Erosion	0%												
Salinity	0%												
Flood Risk	0%												
<p><b>Principle (h)</b> – 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.</p>	<p><b>The Project is not at variance to this Principle.</b></p> <p>The vegetation proposed for clearing is not associated with a conservation area. The nearest conservation area is <i>Bush Forever Site 303 Whitfords Avenue Bushland, Craigie/Padbury</i>, located 60m west of the Project area, on the other side of Mitchell Freeway. The freeway provides a physical barrier between the clearing area and the conservation reserve and therefore impacts to vegetation in the conservation estate are unlikely.</p> <p>The Project area does not contain vegetation which represents a significant ecological linkage for fauna to move between conservation reserves, and no ecological linkages will be disrupted by the proposed clearing.</p> <p>Noting the above and that the Project area is contained to the road reserve, the proposed clearing is will not result in any significant impacts to an adjacent or nearby conservation area.</p>												
<p><b>Principle (i)</b> – 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.</p>	<p><b>Project clearing not at variance to this Principle.</b></p> <p>The Project area is located in the Perth Coastal and Gwelup Underground Water Pollution Control Area (P3). The proposed clearing activities are consistent with the compatible land uses for Priority 3 areas, as outlined in the Department of Water and Environmental Regulation's Water Quality Protection Note 25: 'Land use compatibility tables for public drinking water source areas'. The Perth Groundwater Map shows depth to groundwater within the Project area is 16 m (4 mAHD) (DWER). Clearing two Tuart trees will not impact the groundwater level in the project area. There are no watercourses within the Project area. Given the minor scale and nature of clearing, water quality is unlikely to be impacted by the proposed clearing.</p>												

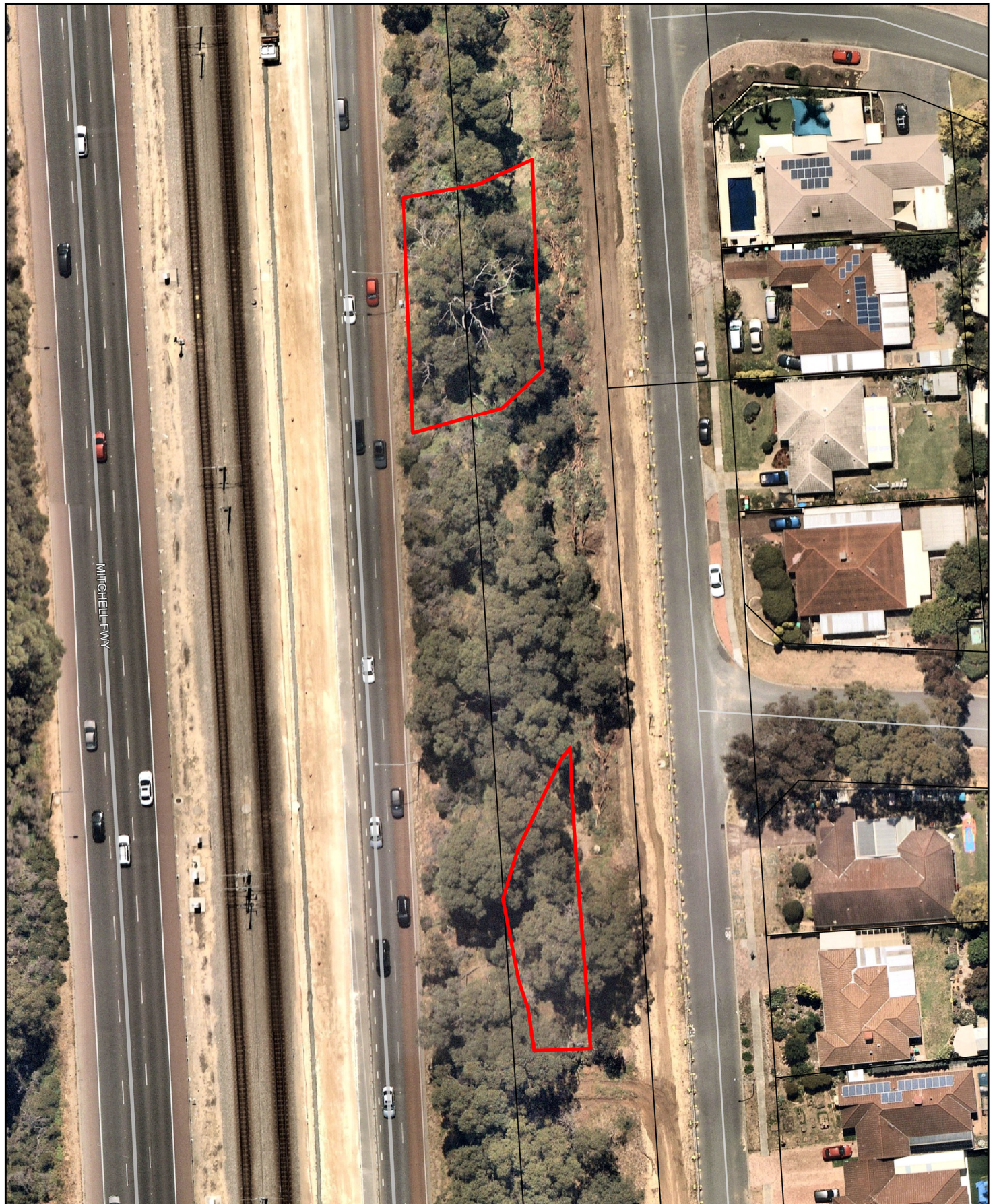
<p><b>Principle (j)</b> – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.</p>	<p><b>The Project is not at variance to this Principle.</b>  This Project proposes to clear up to 0.10 ha of native vegetation. The removal of such a small area of vegetation makes it unlikely that the incidence or intensity of flooding will increase. NRM SLIP identifies that the area has 0% risk of flooding in the area, largely attributed to presence of sandy soil and fast infiltration rates.</p>
<p><b>Methodology Used and References:</b></p>	<p>Shapefile of clearing area D23#155989 – Project Area  Astron (2021)  DAWE (2022)  DOEE (2019)  DPIRD (2022)  DWER (2022)  Kirkby (2020)</p>
<p><b>Completed By:</b></p>	
<p><b>Name</b></p>	
<p><b>Signature</b></p>	
<p><b>Job Title</b></p>	<p>SEO</p>
<p><b>Date</b></p>	<p>13/02/2023</p>

*Once all sections are completed, send the form to CRSP for review and endorsement.*

## DECISION ON CLEARING ASSESSMENT

Clearing Assessment	ENDORSED <input checked="" type="checkbox"/>	REFUSED <input type="checkbox"/>
Comments	<p>I note the following:</p> <ul style="list-style-type: none"><li>• The clearing is for 0.10ha of native vegetation comprising two Tuart Trees for the installation of smart freeways infrastructure.</li><li>• Previous approvals exist in the area, however, due to a change in design a small area of additional vegetation requires approval under CPS818.</li><li>• Vegetation is in a 'Degraded to Completely Degraded' and 'Completely Degraded' Condition.</li><li>• The vegetation has been assessed as not comprising a TEC or PEC.</li><li>• No Priority or Threatened flora exist in the clearing area.</li><li>• The two trees are suitable DBH for cockatoos, however, do not contain suitable hollows. Due to the degraded state of vegetation, no quality cockatoo foraging habitat is contained within the clearing area.</li><li>• I endorse the assessment that the clearing is not at variance/ not likely to be at variance to the clearing principles.</li></ul>	
Name		
Signature		
Job Title	Environment Contractor	
Date	2/03/2023	

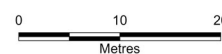




#### Legend

- Project area CPS818
- Cadastre Address (LGATE-002)
- Major road
- Minor road

Scale: 1:750 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job Number: 64016

Client: Main Roads WA

Version: A

Date: 21-Dec-2022

Drawn By: ctatcher

Checked By: AM

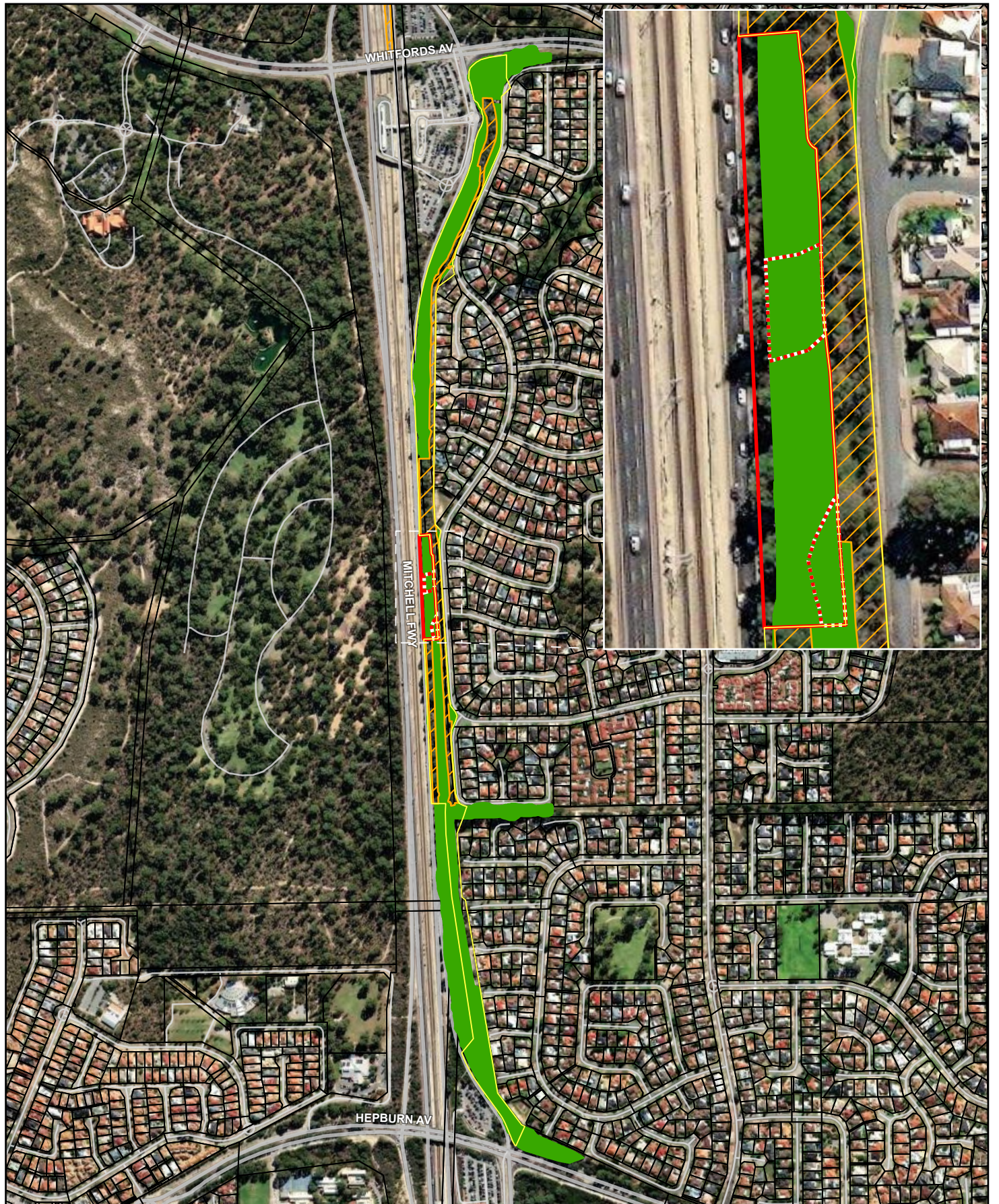
**Whitfords Ave On Ramp  
Perth, WA**

**PROJECT AREA CPS818**

**FIGURE 1**



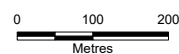




#### Legend

- Development envelope
- Project area CPS818
- As cleared areas (Alliance (HWA), 10 November 2022)
- EPBC Development Envelope
- Tuart TEC
- Cadastre Address (LGATE-002)
- Major road
- Minor road

Scale: 1:10,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job Number: 64016

Client: Main Roads WA

Version: A

Date: 08-Feb-2023

Drawn By: ianandagoda

Checked By: AM

**Whitfords Ave On Ramp  
Perth, WA**

**THREATENED ECOLOGICAL COMMUNITIES**

**FIGURE 2**







mainroads  
WESTERN AUSTRALIA

# Clearing Assessment Report – CPS 818

*We're working for  
Western Australia.*

Mitchell Freeway Southbound –  
Construction of Noise Walls and  
Principal Shared Path (PSP) between  
Hepburn Avenue and Warwick Train  
Station

November 2022

Printed copies are uncontrolled unless marked  
otherwise. Refer to iRoads for current version.

D20#713066



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# Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	Environmental Consultant - JBS&G	Draft v1	27/10/2022
Reviewer:	Senior Environment Officer	Rev 0	16/11/2022
Author:	Environmental Consultant - JBS&G	Rev 1	24/11/2022
Reviewer:	Principal Environment Officer	Rev 1	13/12/2022

# 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.

### 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

**Project Name:** Mitchell Freeway Southbound Upgrade Optional Works 2.

**Project Purpose / Components:** Main Roads Western Australia (Main Roads) proposed to upgrade of the verge of Mitchell Freeway between Hepburn Avenue and Warwick Train Station which incorporates the construction of the following elements:

- A principle shared path (PSP) to connect with existing PSPs and upgrading existing PSPs to modern standards;
- The construction of a noise wall; and
- Drainage modifications

During delivery, detailed engineering design work has been conducted for the PSP and noise walls and further consultation with affected landholders has taken place. This has identified the need for minor realignments of the PSP and noise walls. Connection of ITS infrastructure has also been added to the scope of works (Additional Project). The Additional Project area is shown in Figure 1.

## 1.3 Proposal Location

The project is situated approximately 20 km north west of Perth within the Local Government Area of City of Joondalup. The Project area is located between Hepburn Avenue (H016 SLK 18.39) and Warwick Train Station (SLK 15.30) (Figure 1).

*Start*

Latitude: -31.776817°

Longitude: 115.780886°

*End*

Latitude: -31.785953°

Longitude: 115.781839°

The location and boundaries of the study area (10 km radius) for the Project are shown in Figure 2.

## 1.4 Clearing Details

**The proposed clearing undertaking using CPS 818 is:** The Project area will require 2.40 ha of native vegetation in a.

**The proposed temporary clearing undertaking using CPS 818 is:** None.

A detailed CAR of the Project clearing activities was undertaken. The Clearing Assessment Report (CAR) was endorsed by Main Roads on 8 February 2021 (D21#256690). The CAR was updated to include the Additional Project in November 2022.

The CAR outlines the key activities associated with the entire Project, the existing environment and an assessment of native vegetation clearing. This assessment provided an evaluation of the vegetation clearing impacts associated with the Project using the ten clearing principles and strategies used to manage vegetation clearing. Key items associated with the clearing impact assessment are listed below.

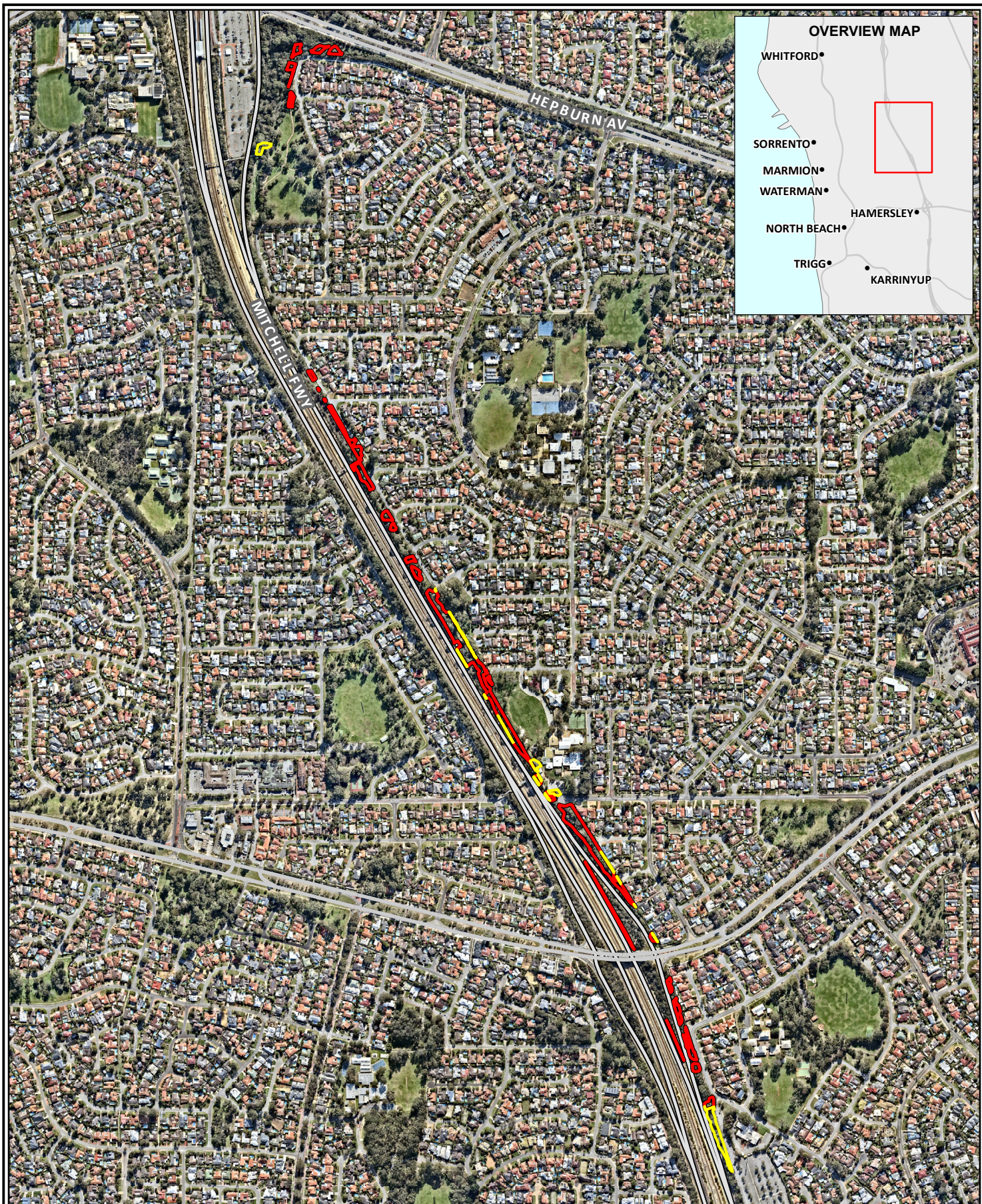
- Flora and Vegetation

- Clearing of a total 2.40 ha of remnant native vegetation, of which 2.09 ha has been mapped as in a 'Degraded' to 'Completely Degraded' condition.
- Terrestrial Fauna
  - The native vegetation clearing has the potential to impact Carnaby's Black Cockatoo through the removal of up to 2.40 ha of low-quality foraging habitat and up to 57 suitable habitat trees with a diameter at breast height (DBH) greater than 500 mm (Suitable DBH Trees), none of which contain hollows suitable for Black Cockatoo use.

The Project is not likely to be at variance with any of the clearing principles.

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

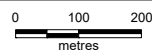




#### Legend

- Approved project area
- Proposed additional project area
- Highways
- Main road

Scale 1:12,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63847

Client: Main Roads Western Australia

Version: A

Date: 24-Nov-2022

Drawn By: ianandagoda

Checked By: CT

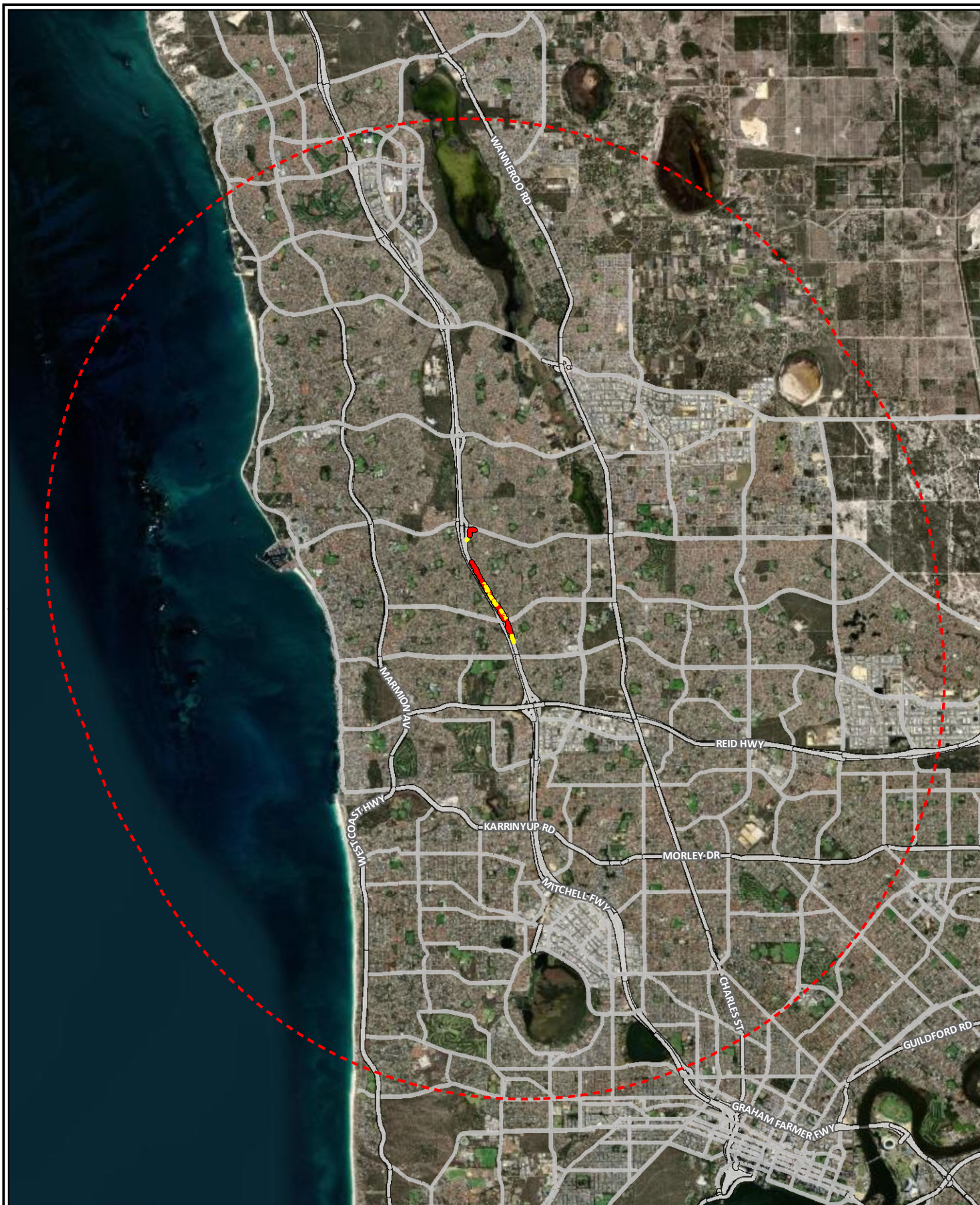
**Optional Works 2**  
**Hepburn Ave - Warwick Train Station**

**PROJECT AREA**

**FIGURE 1**







#### Legend

- Approved project area
- Proposed additional project area
- 10km study area
- Highways
- Main road

Scale 1:120,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63847

Client: Main Roads Western Australia

Version: A

Date: 24-Nov-2022

Drawn By: ianandagoda

Checked By: CT

**Optional Works 2**  
**Hepburn Ave - Warwick Train Station**

**PROJECT AREA 10 KM STUDY AREA**

**FIGURE 2**





## **1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development**

Within the road reserve there is limited space available for development of infrastructure required for the broad Smart Freeway project, which includes widening the freeway, installing the PSP and noise walls, as well as installation of services and signage for Intelligent Transport Systems (ITS). Consequently, there were limited options available for positioning of the PSP and noise wall alignment.

Where possible the PSP and noise wall alignment has utilised previously cleared land to avoid clearing of native vegetation. This has included investigating options using previously cleared land, such as realignment through existing firebreak and parks. Alternative design approaches have also been considered such as avoiding cut options that may impact native vegetation, where practicable.

Where native vegetation clearing cannot be avoided it will be minimised. The Project 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 PSP has also been positioned in its ultimate alignment where possible, to minimise potential for future clearing of native vegetation.

## **1.6 Measures to Avoid, Minimise, Reduce and Manage Project Clearing Impacts**

The design and management measures implemented to avoid and minimise the clearing impacts by the project are provided in Table 1.

In addition, impacts to vegetation will be minimised through the implementation of the following measures:

- The clearing area will be demarcated prior to the commencement of native vegetation clearing;
- Where possible vegetation will be pruned as opposed to removed;
- Further Project clearing will be avoided as the site office, materials storage areas, construction vehicles/machinery and access tracks will be located on previously disturbed or cleared areas; and
- Development and implementation of a site-specific Construction Environmental Management Plan (CEMP) which will establish the following vegetation management actions including:
  - Clearing and access control measures (such as demarcation of clearing boundaries);
  - Weed and dieback management;
  - Landscaping of earth-worked areas;
  - Erosion and sediment control;
  - Waste and fire management;
  - Topsoil management;
  - Dust control; and
  - Tree and vegetation retention where possible.

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

<b>Design or Management Measure</b>	<b>Discussion and Justification</b>
<b>Steepen batter slopes</b>	Batters will be steepened beyond standard practice to reduce the amount of clearing required and ensure clearing doesn't extend outside the proposed footprint. Where steepening the batters is impractical and installation of retaining walls is practicable, retaining walls will be used to reduce the clearing requirement.
<b>Installation of safety barriers</b>	Installation of safety barriers is required in order to comply with road safety requirements. Where possible, safety barriers will be installed in previously cleared land within the road reserve.
<b>Alignment to one side of existing road</b>	Having the PSP on the eastern side of the freeway is a design requirement and therefore the project was constrained to stay within this verge. Design has utilised previously cleared land within the verge as much as possible and native vegetation clearing will only take place when it cannot be avoided.
<b>Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas</b>	To minimise clearing required, the PSP and noise wall alignment will be positioned within existing cleared areas such as firebreaks and along batters impacted by construction of the existing freeway.
<b>Installation of kerbing</b>	Freeway surfacing with Open Graded Asphalt may prevent kerbing from being effective. Kerbing requirements are not likely to have a significant impact on the amount of native vegetation clearing required for a PSP.
<b>Simplification of design to reduce number of lanes and/or complexity of intersections</b>	Alignment has been chosen to follow existing PSP and utilise cleared areas wherever possible. Where practicable, the PSP has been positioned in its ultimate alignment to avoid future clearing of native vegetation.
<b>Preferential use of existing cleared areas for access tracks, construction storage and stockpiling</b>	Cleared areas will be used for access tracks, construction storage and stockpiling, with no vegetation to be removed for temporary works.
<b>Drainage modification</b>	The Project will modify the existing drainage for this section of Hepburn Avenue and Mitchell Freeway to increase basin capacity. Drainage alternatives have been incorporated into the design to reduce clearing requirements such as the use of levees to avoid or reduce the size of drainage basins. Where practicable existing basins will be deepened to avoid additional clearing requirements.
<b>Other design treatment</b>	To reduce the clearing requirements, cut and fill alternatives have been considered as part of the design where possible any cut options that would require additional clearing have been avoided.



## 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 (see Section 1.3), Main Roads has also had regard to the below instruments.

### **Other Legislation of relevance 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
- Aboriginal Heritage Act 1972 (WA)
- Town Planning and Development Act 1928

### **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 (DEC, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2021)
- Environmental Offsets Guidelines (Government of Western Australia, August 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 the three threatened black cockatoo species
- Strategic advice - EPA

## 2 SCOPE AND METHODOLOGY 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 or a project-specific Clearing Permit.

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 Project that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe 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 10km radius.
- **Survey Area** – Area covered by the Biological Survey, which is typically larger than 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 **Error! Reference source not found.**

### 2.3 Surveys and Assessments

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

- Mitchell Freeway Widening Southbound and PSP Mitchell Freeway Gaps Hodges Drive to Reid Highway Biological Survey (Astron, 2020).
- Targeted Black Cockatoo habitat assessment (Tony Kirkby 2020).
- Phytophthora Dieback Assessment (Terratree, 2020)

A summary of the methodology and the results of the above surveys are provided in Section **Error! Reference source not found.**

### 3 SUMMARY OF SURVEYS

#### 3.1 Biological Survey

A detailed biological survey of the area (survey area wider than the current Project area) was undertaken in 2019 (Astron, 2020). A summary of the findings from the survey are presented below.

A Black Cockatoo survey was subsequently undertaken by Tony Kirkby (2020) to provide an additional investigation into habitat trees of interest from the results of Astron (2020), between the 15<sup>th</sup> and 27<sup>th</sup> June 2020.

A summary of these surveys is provided in Sections 3.1.1 to 3.1.2 below.

##### 3.1.1 Biological Survey (Astron 2020)

Astron (Astron 2021) undertook a detailed biological survey that concluded:

##### **Vegetation:**

- Five remnant native vegetation types were defined and included:
  - One *Banksia* Woodland;
  - Two *Eucalyptus marginata* (jarrah) woodlands; and
  - Two *Eucalyptus gomphocephala* (tuart) forests.
- Remnant vegetation types were mapped across 6.40 ha (19 %) of the survey area. The remaining 27.60 ha of the survey area was either cleared (3.00 ha, 9 %) or planted vegetation (24.60 ha, 72 %).
- Remnant vegetation in the survey area was in Good to Completely Degraded condition, with the majority considered Completely Degraded as it consisted of scattered remnant species only. It is expected that quality of these remnants has been declining over time due to significant edge effects.
- Vegetation inferred to represent the EPBC Act listed 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' TEC was recorded within the survey area, with none within the Project area.
- Vegetation considered to represent the State listed PECs 'Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain' and '*Banksia* dominated woodlands of the Swan Coastal Plain IBRA Region' PEC was recorded within the survey area across 4.70 ha and 1.30 ha respectively, with none within the Project area.

##### **Flora:**

- A total of 207 vascular flora species, from 47 families and 127 genera, were recorded in the survey area. No EPBC Act or State listed threatened flora were recorded. Three priority flora species were recorded: *Ricinosarpus tuberculatus* (P2), *Grevillea olivacea* (P4) and *Jacksonia sericea* (P4).
- The survey area has considerable disturbance and limited floristic diversity which further limits the potential for any threatened or priority flora species to occur.



- Sixty-three weed species were recorded within the survey area, accounting for 30% of the species recorded. Three are listed as WoNS (Government of Australia, 2012) (*\*Asparagus asparagoides*, *\*Lantana camara* and *\*Genista linifolia*) and three are declared pest plants in Western Australia under the BAM Act (DPIRD, 2016).

**Fauna:**

- 24 conservation significant vertebrate species were identified in the desktop assessment, and three species (Quenda, Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo) were recorded within the survey area, one species was considered to have a 'moderate' likelihood and 20 species were considered to have a 'low' likelihood of occurrence.
- Based upon the current distributions for the three threatened species of black cockatoo, only the Carnaby's Cockatoo (*Zanda latirostris*) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) are likely to occur within the vicinity of the survey area.
- 329 Black Cockatoo trees (259 Tuart, 42 Jarrah, 16 dead stags and 12 Marri) with a diameter at breast height of over 50 cm were recorded within the survey area including 15 trees (nine Tuarts and six dead stags) considered to have suitable hollows for Carnaby's Cockatoos to breed in.
- Twenty-seven known foraging resource species for the Carnaby's Cockatoo and three known foraging resource species for the Forest Red-tailed Black Cockatoo were recorded within the survey area; however, only the marri, jarrah and Banksia species are considered key species for foraging Carnaby's Cockatoos. Two individual Carnaby's Cockatoos were observed foraging on *Banksia prionotes* and jarrah within the survey area.
- One individual Quenda roadkill and multiple diggings in the same area were recorded within the survey area. The sighting was recorded 228 m south of the Woodvale Open Space, and it is likely that this individual was from of a larger quenda population within Woodvale Open Space.

### 3.1.2 Black Cockatoo Habitat Assessment (Kirby 2020)

Tony Kirkby (2020) undertook a specific assessment of all trees identified during the biological survey completed by Astron (2020) to provide further clarification of potentially suitable hollows. All trees with a DBH greater than 500 mm were inspected from the ground using binoculars, and further inspected using a pole camera where necessary. The findings of this assessment are summarised below.

#### Breeding habitat:

Of the 329 trees identified by Astron (2020), four were deemed of interest (tree numbers 103, 190, 230 and 290). These trees were all located outside of the Project area for Optional Works 2. The trees of interest were described by Kirkby (2020) as:

- Tree 103: *Eucalyptus gomphocephala* – small hollow with chewed entrance. Unlikely to be Black Cockatoo breeding hollow
- Tree 190: Dead Stag – top entry hollow with chewing at entrance. Top section of hollow in poor condition however may be sufficiently deep to provide Black Cockatoo hollow
- Tree 230: *Eucalyptus gomphocephala* dead stag – hollow with entrance large enough for Black Cockatoo however no signs of use around the rim or internally. Unlikely to be a breeding hollow, possibly too shallow
- Tree 290: *Eucalyptus gomphocephala* – hollow with suitable entrance for Black Cockatoo with chew marks at entrance. Closer inspection using pole camera not possible due to presence of feral bees in nearby hollow

None of the trees identified to have potential or suitable hollows for Black Cockatoo use were recorded within the Project area.

#### Foraging habitat:

Foraging habitat was found to range from poor to completely degraded within the survey area, with remaining understorey foraging species being *Banksia sessilis*, *B. nivea*, *Hakea lissocarpa*, *H. prostrata*, *H. trifurcata*, and *Xanthorrhoea pressii*. Canopy cover was considered good, with Jarrah, Marri, Tuart, *Allocasuarina fraseriana* (Sheoak) and *Banksia* spp. present. This is of note as being particularly relevant for Forest Red-tailed Black Cockatoo which rarely feeds below the canopy level. Foraging residue from Marri and *Banksia* spp. were present. No breeding sites are located within 6 km of the Project area; therefore, this foraging habitat is not significant in supporting breeding individuals.

#### Roosting habitat:

No roosting sites are known from the Project area, and no signs of Black Cockatoo roosting was noted within the survey area.

### 3.2 Summary of Dieback Survey

Terratree (2020) completed a Phytophthora Dieback Assessment of Mitchell Freeway on the 9<sup>th</sup> of June 2020, covering an area broader than the Project area.

Terratree (2020) concluded:

- Desktop review of Dieback Information Data Management System identified no positive sample results for *Phytophthora* species within the assessment area
- Two soil and tissue samples taken during the assessment returned negative results for any *Phytophthora* species
- 0.60 ha (1.8%) of the assessment area was mapped as 'infested'
- 0.90 ha of the assessment area was mapped as 'uninfested'
- Most of the assessment area was excluded from assessment due to the vegetation being classified as Degraded or Completely Degraded (Astron 2020)

No evidence of dieback was recorded within the Project area, with the site reported as uninfested or uninterpretable.



## 4 VEGETATION DETAILS

### 4.1.1 Project Site Vegetation Description

The Project area is predominately in 'Degraded' to 'Completely Degraded' condition with one native vegetation unit present:

- **Tuart Forest 2:** *Eucalyptus gomphocephala* mid open to closed forest over *Eucalyptus marginata* (+/- *Banksia attenuata*, *Allocasuarina fraseriana*, *Corymbia calophylla*) mid to low woodland to open woodland over *Xanthorrhoea preissii* (+/- *Acacia rostellifera*, *Jacksonia sternbergiana*, *Allocasuarina humilis*) mid shrubland to isolated shrubs over *Mesomelaena pseudostygia* and *Lepidosperma calcicola* sparse sedgeland over an introduced tussock grassland.

Table 2 and Table 3 provide details of the Pre-European Vegetation Associations within the Project area and the Additional Project area and the remaining extents of these associations.

**Table 2. Summary of Project Area's Mapped Pre-European Vegetation Associations**

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 6 described as a Medium woodland: tuart and jarrah (GoWA, 2019a).	<b>Initial Project area:</b> Clearing of up to 2.06 ha for construction of noise barriers and a PSP.	Completely Degraded (0.90 ha), Degraded to Completely Degraded (0.49 ha), Degraded (0.36 ha), Degraded to Good (0.24 ha), Good (0.07 ha).	Vegetation description and condition determined from biological survey (Astron, 2020).
	<b>Additional Project area:</b> Additional clearing of up to 0.34 ha for construction of noise barriers and a PSP.	Completely Degraded (0.34 ha).	Vegetation description and condition inferred from desktop analysis of additional clearing.

**Table 3. Pre-European Vegetation Representation**

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 6</b>	<b>Statewide</b>	56,343.01	13,362.25	23.72	5,322.03 ha (9.45%)
	<b>IBRA Bioregion</b> Swan Coastal Plain	56,343.01	13,362.25	23.72	5,322.03 ha (9.45%)
	<b>IBRA Sub-region</b> Perth	56,343.01	13,362.25	23.72	5,322.03 ha (9.45%)
	<b>Local Government Authority</b> City of Joondalup	2,294.47	326.68	14.24	30.38 ha (1.32%)

#### 4.1.2 Vegetation Complexes and Representation

Vegetation Complexes within the Project area have been defined by Heddle et al. (1980) and are based on vegetation in association with landforms and underlying geology. Native vegetation complexes as described by Heddle et al. (1980) within the Project area comprise:

- **Karrakatta Complex** – Central and South: Predominately open forest of *Eucalyptus gomphocephala* (Tuart), *E. marginata* (Jarrah), *Corymbia calophylla* (Marri) and woodland of *E. marginata* and *Banksia* species.

This complex is above the minimum threshold of 10% target for the retention of vegetation complexes in constrained areas on the Swan Coastal Plain (EPA, 2015). The current extent within the local area (10 km of the Project) is more restricted, with 9.86% remaining. The current remaining extent of these vegetation complexes (GoWA, 2019b) is detailed in Table 4.

**Table 4. Vegetation Complexes (Heddle/Mattiske) within the Project Area**

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2019 Vegetation Extent	% Remaining
Karrakatta Complex - Central and South	53,080.99	12,467.20	23.49

## 5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the project's proposed clearing is likely to have a significant impact on the environment, the project was assessed against the ten Clearing Principles (Environmental Protection Act 1986, Schedule 5).

Each principle has been assessed in accordance with DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation' and other relevant CPS Decision Reports prepared by DWER.

The proposed clearing is not likely to be at variance to Principles (a) and (b) and not at variance to the remaining clearing principles.

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

Proposed clearing is not likely to be at variance to this Principle
<p><b>Comment:</b></p> <p>The Project involves the clearing of up to 2.40 ha of native vegetation comprised of the following mapped vegetation unit:</p> <ul style="list-style-type: none"> <li>• <b>Tuart Forest 2:</b> <i>Eucalyptus gomphocephala</i> mid open to closed forest over <i>Eucalyptus marginata</i> (<i>Banksia attenuata</i>, <i>Allocasuarina fraseriana</i>, <i>Corymbia calophylla</i>) mid to low woodland to open woodland over <i>Xanthorrhoea preissii</i> (<i>Acacia rostellifera</i>, <i>Jacksonia sternbergiana</i>, <i>Allocasuarina humilis</i>) mid shrubland to isolated shrubs over <i>Mesomelaena pseudostygia</i> and <i>Lepidosperma calcicola</i> sparse sedgeland over an introduced tussock grassland.</li> </ul> <p>The vegetation proposed to be cleared is in 'Completely Degraded' to 'Good' condition, with the majority (2.09 ha; 87.1%) in 'Degraded' to 'Completely Degraded' condition. The Project area represents poorer quality native vegetation in comparison to that in the surrounding area. Vegetation within the Project area comprises a linear fragment, separated from surrounding patches by main roads and residential land use.</p> <p>No State of Federally listed Threatened or Priority ecological communities were recorded within the Project area.</p> <p>No State or Federally listed Threatened flora species were recorded within the Project area.</p> <p>One population of <i>Grevillea olivacea</i> (P4), comprising of 20 individuals, was recorded immediately adjacent to the Project area. <i>G. olivacea</i> is a common horticultural species in the Perth metropolitan region and is considered to have been established via seed mix during previous revegetation work. The Project area is approximately 120 km south of the species' natural range (Astron, 2021).</p> <p>Astron (2021) observed the presence of three conservation significant fauna species within the survey area, including the Carnaby's Black Cockatoo (foraging individuals), Forest red-tailed Black Cockatoo (foraging evidence), and Quenda (roadkill and diggings) however, no observations were reported within the Project area.</p> <p>The Project area is within the known distribution range of the Carnaby's Black Cockatoo, but outside of its known breeding range, and is outside of the modelled distribution of the Forest Red-tailed Black Cockatoo (DAWE, 2022).</p> <p>Approximately 2.40 ha of potentially suitable foraging habitat was recorded by Astron (2021). The black cockatoo assessment undertaken by Astron (2021) determined that no quality foraging habitat as defined referral guidelines (DAWE, 2022) is present, due to the degraded state of vegetation and the sporadic and isolated distribution of known foraging flora species. A total of 57 trees of a suitable species for Black Cockatoo breeding with a DBH greater than 500 mm were recorded within the Project area. None of these</p>



trees contained potentially suitable hollows (Kirby 2020). The presence of foraging habitat surrounding Suitable DBH Trees may increase the significance of that habitat.

The native vegetation to be cleared is not considered to comprise a high level of biological diversity. This is based on the vegetation being predominantly in 'Degraded' to 'Completely Degraded' condition, having a small size and high level of fragmentation, and the occurrence of similar remnant vegetation in equal or better quality in the local area.

Assessed Outcome:

- Noting the above, clearing for this Project is not likely to be at variance to this principle.

#### Methodology

MRWA Shapefiles

DBCA shapefiles

DAWE (2022)

NatureMap (February, 2020)

EPA (2016)

Astron (2021)

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

#### **Proposed clearing is not likely to be at variance to this Principle**

##### **Comment:**

Native vegetation contained within the Project area is predominantly (2.09 ha; 87.1%) in 'Completely Degraded' to 'Degraded' condition, and is separated from surrounding habitat patches by roads, pathways and residential land use. The vegetation to be cleared is not considered likely to provide significant habitat for most fauna species in the local area, however does contain some Carnaby's Black Cockatoo (*Zanda latirostris*), Forest Red-tailed Black Cockatoo (*Calyptrorhynchus banksii naso*) and Quenda (*Isodon fusciventer*) foraging habitat.

Astron (2020) identified the Carnaby's Cockatoo, Forest Red-tailed Black Cockatoo and Quenda within the broader survey area. The vegetation within the Project area contains some value for Carnaby's Black Cockatoo, as discussed below.

##### **Black Cockatoo:**

The Project area is within the known distribution range of the Carnaby's Black Cockatoo, but outside of its known breeding range, and is outside of the modelled distribution of the Forest Red-tailed Black Cockatoo (DAWE, 2022).

Within the Project area, habitat suitable for Carnaby's Black Cockatoos comprises of 2.40 ha of potentially suitable foraging and 57 Suitable DBH Trees, none of which contain suitable hollows (Kirkby, 2020;).

Kirkby, 2020 observed foraging residue from Carnaby's Cockatoo from Marri and Banksia from within the Project area. Astron (2020) recorded 2.06 ha of potentially suitable foraging habitat. The Black Cockatoo assessment undertaken by Astron (2020) determined that no quality foraging habitat as defined by the referral guidelines (DAWE, 2022) was present, due to the degraded state of vegetation and the sporadic and isolated distribution of known foraging flora species. While Carnaby's will utilise occurrences of Marri and Banksia within the Project area, the vegetation is considered unlikely to be significant to support the local population.

Within 6 km and 12 km of the Project area, there is approximately 919.04 ha and 3,858.30 ha of potential foraging habitat (DBCA, 2020). Clearing as a result of the Project represents 0.26% and 0.06% of the foraging habitat within 6 and 12 km of the Project area, respectively.

While the Project area contains suitable foraging species and potential breeding habitat, the quality of this habitat is 'Low' (Astron 2021) and is outside of the modelled breeding range for the species. The closest known breeding site for Carnaby's Cockatoo is at the Edith Cowan University Campus, approximately 7.5 km north of the Project area.

With regards to Forest Red-tailed Black Cockatoo, Marri is the most important breeding tree throughout their range, however breeding has also been recorded in Tuarts (DAWE, 2022). Suitable breeding trees are large and mature Marris, approximately 120-150 years in age and a mean overall height of 20.24 m (Johnston, Kirkby and Sarti, 2013). The closest known Forest red-tailed Black Cockatoo breeding site is 30 km South-east in the Darling Range (Kirkby, 2020) and are not expected to utilise the Project area for breeding.

Within the Peel-Perth region, foraging and water resources within 6 km, as well as overlapping foraging within 12 km, are required to support roosting and breeding sites and maintain habitat connectivity to facilitate movement through the landscape (Groom, 2015). EPA (2019) note that the proximity of foraging and water is critical to support roosting and breeding sites.

Two roost sites are located within 1 km of the Project, and a further 20 occur within 6 km. No evidence of roosting within the Project area was recorded and is unlikely to occur due to the long linear nature of the native vegetation to be cleared.

Berry (2008) observed that Carnaby's Cockatoo prefer roosting at sites within close proximity to known food and water sources. Energy expenditure could be reduced where they are able to feed and drink close to (within a 6 km radius around a roost site) roost sites before and after nocturnal roosting (Berry 2008).

Le Roux (2017) determined that a greater area of Banksia and pine vegetation was associated with roost sites that had high Black Cockatoo counts. This highlights the importance of Banksia and pine in supporting significant roost sites, an observation that has been supported in a number of Carnaby's Cockatoo related studies (Valentine and Stock 2008, Finn et al. 2009, Johnston et al. 2016).

Within the local area, several habitat patches are likely to provide higher quality foraging habitat, consisting of greater abundance and quality of banksia species and in close proximity wetlands and waterbodies. The Project area is therefore considered of poorer habitat value in the context of the local area, and Black Cockatoo populations will continue to be supported by more locally significant habitat resources once clearing has been undertaken.

Flocks of Black Cockatoos move through the landscape by following vegetated corridors whilst actively avoiding cleared or open areas including dense urban areas. Ecological linkages are therefore required to facilitate this movement between habitat nodes. The Project area is not located within any Regional Ecological Linkages. Clearing associated with the Project is unlikely to have a significant impact on the available foraging habitat within 6 km of nearby roosting sites or impede the movement of individuals through the landscape.

Vegetation within the Project area is considered unlikely to provide significant habitat for foraging or breeding for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo due to its narrow, linear configuration poor condition, and the sporadic and isolated distribution of known foraging species.

#### **Other Conservation Significant Species:**

The Southern Brown Bandicoot (Quenda) occurs in wet or dry sclerophyll forest through to open woodland and scrubby, dense vegetation on sandy soils. This species was identified within the survey area near the Woodvale Nature Reserve, approximately 3.6 km north of the Project area.

It is considered unlikely that the small area of native vegetation to be cleared located in isolated pockets amongst planted vegetation, constitutes significant habitat for any species..

<p>Assessed Outcome:</p> <ul style="list-style-type: none"> <li>Noting the above, given the low quality of the habitat, its small fragmented extent and presence of larger areas of remnant vegetation in a better condition, clearing for this Project is not likely to be at variance to this principle.</li> </ul>
<p><b>Methodology</b>                      DBCA Shapefiles                      DBCA website                      DAWE 2022                      EPA (2016)                      Astron (2021)                      Aerial Photography</p>

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

<p><b>Proposed clearing is not at variance to this Principle</b></p>
<p><b>Comment:</b>                      A total of 207 vascular flora species, from 47 families and 127 genera, were recorded in the wider survey area (Astron 2020). No threatened flora species listed under the <i>Biodiversity Conservation Act</i> 2016 occur within the project area.</p> <p>Assessed Outcome:</p> <ul style="list-style-type: none"> <li>Project clearing is not at variance to this Principle.</li> </ul>
<p><b>Methodology</b>                      DBCA shapefiles                      Florabase (February, 2020)                      Astron (2021)</p>

**(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.**

<p><b>Proposed clearing is not at variance to this Principle</b></p>
<p><b>Comment:</b>                      No threatened ecological communities listed under the <i>Biodiversity Conservation Act</i> 2016 were recorded within the Project area.</p> <p>Assessed Outcome:</p> <ul style="list-style-type: none"> <li>Project clearing not at variance to this Principle.</li> </ul>
<p><b>Methodology</b>                      DBCA shapefiles                      Astron (2021)</p>



**(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 likely at variance to this Principle**

**Comment:**

The Project area is mapped as Vegetation Association 6, described as a Medium Woodland: Tuart and Jarrah. The Project proposes to clear up to 2.40 ha of native vegetation. Of this, 2.09 ha (87.1%) has been assessed as 'Completely Degraded' to 'Degraded', 0.24 (10.0%) as 'Good to Degraded', and 0.07 ha (2.9%) as 'Good'. The national objectives and targets for biodiversity conservation in Australia have a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (EPA, 2015). The Project area is within a constrained area of the Swan Coastal Plain and as such retention objectives of at least 10 per cent apply (EPA, 2016).

**Summary of Project Area's Mapped Pre-European Vegetation Associations**

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 6 described as a Medium woodland: tuart and jarrah (GoWA, 2019a).	Clearing of up to 2.06 ha for construction of noise barriers and a PSP.	Completely Degraded (0.90 ha), Degraded to Completely Degraded (0.49 ha), Degraded (0.36 ha), Degraded to Good (0.24 ha), Good (0.07 ha).	Vegetation description and condition determined from biological survey (Astron, 2020).
	Clearing of up to 0.34 ha for construction of noise barriers and a PSP.	Completely Degraded (0.34 ha)	Vegetation description and condition inferred from desktop analysis of additional clearing area.

**Pre-European Vegetation Representation**

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 6</b>	<b>Statewide</b>	56,343.01	13,362.25	23.72	5,322.03 ha (9.45%)
	<b>IBRA Bioregion</b> Swan Coastal Plain	56,343.01	13,362.25	23.72	5,322.03 ha (9.45%)
	<b>IBRA Sub-region</b> Perth	56,343.01	13,362.25	23.72	5,322.03 ha (9.45%)
	<b>Local Government Authority</b> City of Joondalup	2,294.47	326.68	14.24	30.38 ha (1.32%)

As shown in Tables above, Vegetation Association 6 and the Vegetation Complex Karrakatta (Central and South) are above the 10 per cent threshold in a constrained area (GoWA 2019a; GoWA, 2019b).

Given the highly degraded condition of the vegetation, the vegetation within the Project area is not considered representative of native vegetation that is significant as a remnant in an area that has been extensively cleared.

Assessed Outcome:

- Project clearing not at variance to this Principle.

**Methodology**

EPA (2016)

Aston (2021)

GoWA (2019a)  
GoWA (2019b)  
WALGA (2013)  
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****Comment:**

. Interrogation of DBCA and DWER hydrological and wetland datasets determined that no wetlands or watercourses are mapped within the Project area. The nearest mapped wetland is Little Carine Swamp, located approximately 600m from the Project area and will not be impacted.

In addition, the Astron (2021) biological survey concluded that no remnant vegetation considered to represent riparian vegetation was recorded from the Project area.

**Assessed Outcome:**

- Project clearing not at variance to this Principle.

**Methodology**

DWER and DBCA shapefiles

Astron (2021)

**(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****Comment:**

The Department of Primary Industries and Regional Development (DPIRD), provides a series of soil degradation risk mapping at the sub-system level. The Project area is located within the Karrakatta Sand Yellow Phase subsystem of the Spearwood Dunes soil system. It is described as low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. *Banksia* spp. woodland with scattered emergent Tuart and Jarrah and a dense shrub layer (DPIRD, 2020).

The table below summarises the soil degradation risk within the Project area.

Aspect	Degradation risk
Wind Erosion	98%
Waterlogging	0%
Water Erosion	0%
Salinity	0%
Flood Risk	0%

Wind erosion is the only potential soil degradation aspect relevant to the Project area, due to the deep yellow sands associated with the area. It is unlikely that the Project will cause appreciable land degradation given the relatively small amount of clearing and the implementation of appropriate measures to mitigate and manage potential wind driven erosion during construction.

**Assessed Outcome:**

- Project clearing is not at variance to this principle.

**Methodology**

GIS shapefiles

Astron (2021)

Natural Resource Management SLIP Soil Systems; accessed April 2020 (DPIRD, 2020)



**(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.**

<b>Proposed clearing is not likely to be at variance to this Principle</b>
<p><b>Comment:</b></p> <p>Two Nature Reserves (Woodvale Nature Reserve and Lake Joondalup Nature Reserve) are within 6 km of the Project area, along with a number of Crown Reserves managed by DBCA.</p> <p>In addition to these areas, several small local government reserves are present. The nearest conservation area to the Project area is the Craigie bushland area (Bush forever Site 303) which occurs approximately 550 m to the north of the Project area, and Carine Open Space (Bush forever Site 203) which is approximately 500 m to the south. These sites are both on the other side of the freeway and have no direct links with the Project area.</p> <p>It is not considered that the Project area contains vegetation which represents a significant ecological linkage for fauna to move between conservation reserves, and no ecological linkages will be disrupted by the proposed clearing.</p> <p>Noting the above and that the Project area is contained to the road reserve, the proposed clearing is will not result in any significant impacts to an adjacent or nearby conservation area.</p> <p>Assessed Outcome:</p> <ul style="list-style-type: none"> <li>Project clearing not at variance to this Principle.</li> </ul>
<p><b>Methodology</b></p> <p>DBCA, WALGA and DOP shapefiles</p> <p>EPA (2016)</p>

**(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.**

<b>Proposed clearing is not likely to be at variance to this Principle</b>
<p><b>Comment:</b></p> <p>There are no major or minor watercourses mapped within the Project area.</p> <p>The Project will not change the hydrology of the area. Given the small scale of clearing and that no significant dewatering or drainage modifications are required; it is considered that there will be very little to no deterioration of underground water quality.</p> <p>Assessed Outcome:</p> <ul style="list-style-type: none"> <li>Project clearing not at variance to this Principle.</li> </ul>
<p><b>Methodology</b></p> <p>DWER and DBCA shapefiles</p> <p>Astron (2021)</p>

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

<b>Proposed clearing is not at variance to this Principle</b>
<p><b>Comment:</b></p> <p>The Project will clear up to 2.40 ha of native vegetation over an approximately 3 km stretch of road. The removal of such a small area of vegetation makes it unlikely that the incidence or intensity of flooding will increase. NRM SLIP identifies that the area has 0% risk of flooding in the area, largely attributed to presence of sandy soil and fast infiltration rates.</p>

Given the small amount of clearing, that vegetation will remain in the surrounding area and that the Project area will be sealed it is unlikely that this Project will cause or exacerbate the incidence or intensity of flooding.

Assessed Outcome:

- Project clearing is not at variance to this principle.

**Methodology**

Natural Resource Management SLIP Soil Systems; accessed June 2020 (DPIRD, 2020)

## 6 VEGETATION MANAGEMENT

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

## 7 STAKEHOLDER CONSULTATION

Condition 8 of CPS 818/15 requires Main Roads WA to invite submissions from a number of parties when the proposed clearing is considered likely to be seriously at variance, at variance or may be at variance with one or more of the clearing principles.

As the assessment has determined that the proposed clearing is not at variance with any of the clearing principles, no stakeholder submission is required. Main Roads will continue to undertake stakeholder consultation in accordance with CPS 818 Condition 8.

## 8 COMPLIANCE WITH CPS 818

Table 5 summarises what further pre-clearing impact assessment and vegetation management is required in accordance with CPS 818.

**Table 5. 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.	No	No further action required.
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 <u>and</u> (j) the incidence of flooding	No	No further action required.
4. The project involves clearing for temporary works (as defined by CPS 818).	No	No further action required.
5a. Project is within Region that: <ul style="list-style-type: none"> <li>- Has rainfall greater than 400mm and</li> <li>- Is South of the 26<sup>th</sup> parallel and</li> <li>- Works are in 'Other than dry conditions' and</li> <li>- Works have potential for <b>uninfested</b> areas to be impacted</li> </ul>	Yes	4a. No further action required. A dieback assessment was conducted (Terratree, 2020).
5b. Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions?	No	4b. No further action required.
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback	No	No further action required.
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	Yes	'Completely Degraded' (0.34 ha).



Impact of Clearing	Yes/No or NA	<i>Further Action Required</i>
		Weed management will be addressed in the VMP/CEMP to avoid weed spread.
8. Did an environmental specialist conduct the survey or field assessment?	<b>Yes</b>	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?	<b>Yes</b>	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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WESTERN AUSTRALIA

# Clearing Assessment Report – CPS 818

*We're working for  
Western Australia.*

Mitchell Freeway Southbound –  
Hodges Drive on-ramp (H659)

May 2023

EOS No. 1969

D23#208996



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# Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	JBS&G	Draft v1	27/10/2022
Reviewer:	Environmental Officer	Rev 0	23/11/2022
Author:	JBS&G	Rev 1	12/12/2022
Reviewer:	Environmental Officer	Rev 1	24/01/2023
Author:	JBS&G	Rev 2	25/01/2023
Reviewer:	Environmental Officer	Rev 2	30/01/2023
Reviewer	Environment Contractor (CRSP)	Rev 2	02/02/2023
Author:	JBS&G	Rev 3	14/03/2023
Reviewer	Environment Contractor (CRSP)	Rev 3	3/04/2023
Author:	Environmental Officer	Rev 4	02/05/2023
Reviewer:	Environment Contractor (CRSP)	Rev 4	2/05/2023

## 1 PURPOSE

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.

## 2 SCOPE

### 2.1 Project Scope

**Project Name:** Mitchell Freeway Southbound – Hodges Drive on-ramp.

**Project Purpose / Components:** Main Roads Western Australia (Main Roads) proposes to install Smart Freeway infrastructure at the Hodges Drive On ramp which will require civil works and clearing for CCTV sight lines.

The required clearing area for these works (Project Area) is shown on Figure 1.

**The proposed clearing undertaking using CPS 818 is:** The Project area will require clearing of 0.34 ha of remnant vegetation (Figure 1).

**The proposed temporary clearing undertaking using CPS 818 is:** None.

This Clearing Assessment Report (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 strategies used to manage vegetation clearing. Key items associated with the clearing impact assessment are listed below.

- Flora and Vegetation
  - Clearing of 0.34 ha of remnant native vegetation, of which 0.07 ha is in 'Completely Degraded' condition, 0.09 ha is in 'Degraded to Completely Degraded' condition, 0.002 ha in 'Degraded' condition and 0.18 ha in 'Good' condition.
  - Clearing of 0.07 ha of vegetation representative of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC) and State listed Priority Ecological Community (PEC).
- Terrestrial Fauna
  - The Project has the potential to impact Black Cockatoo species, specifically Carnaby's and Forest Red-tailed Black Cockatoo through the removal of 0.34 ha of moderate quality foraging habitat, of which 0.07 ha is in 'Completely Degraded' condition, 0.09 ha is in 'Degraded to Completely Degraded' condition, 0.002 ha in 'Degraded' condition and 0.18 ha in 'Good' condition.
  - No potential breeding trees (those of a suitable species with greater than the 500 mm Diameter Breast Height [DBH]) will be impacted as a result of the proposed clearing.

- A Vegetation Management Plan has been prepared for this work and is appended to this document (Appendix 2).

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

**Project Location(s):** The Project area is located on the Hodges Drive on-ramp (H659) SLK 0.12 to SLK 0.40 and Mitchell Freeway (H016) between SLK 25.67 to SLK 38 within the local government authority boundary of the City of Joondalup ([Figure 1](#)).

*Start*

Latitude: -31.755797°

Longitude: 115.765562°

*End*

Latitude: -31.758930°

Longitude: 115.768143 °

The location and boundaries of the study area (10 km radius) for the project are shown in [Figure 2](#).

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

**Table 1. Project Description**

Project Components	Clearing Required (Y/N)	Estimated Clearing Area (ha)
Road Widening(H659) SLK 0.12 to SLK 0.40 and (H016) between SLK 25.67 to SLK 25.38	Y	0.34 ha
Pre-construction works/service Relocations	Y	
CCTV	Y	



**Figure 1. Project Location**

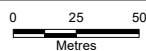




#### Legend

- Project area
- Highways
- Main road
- Minor road

Scale 1:3,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63847

Client: Main Roads Western Australia

Version: A

Date: 07-Mar-2023

Drawn By: ianandagoda

Checked By: AM

**Hodges Drive and Mitchell Freeway  
Perth, WA**

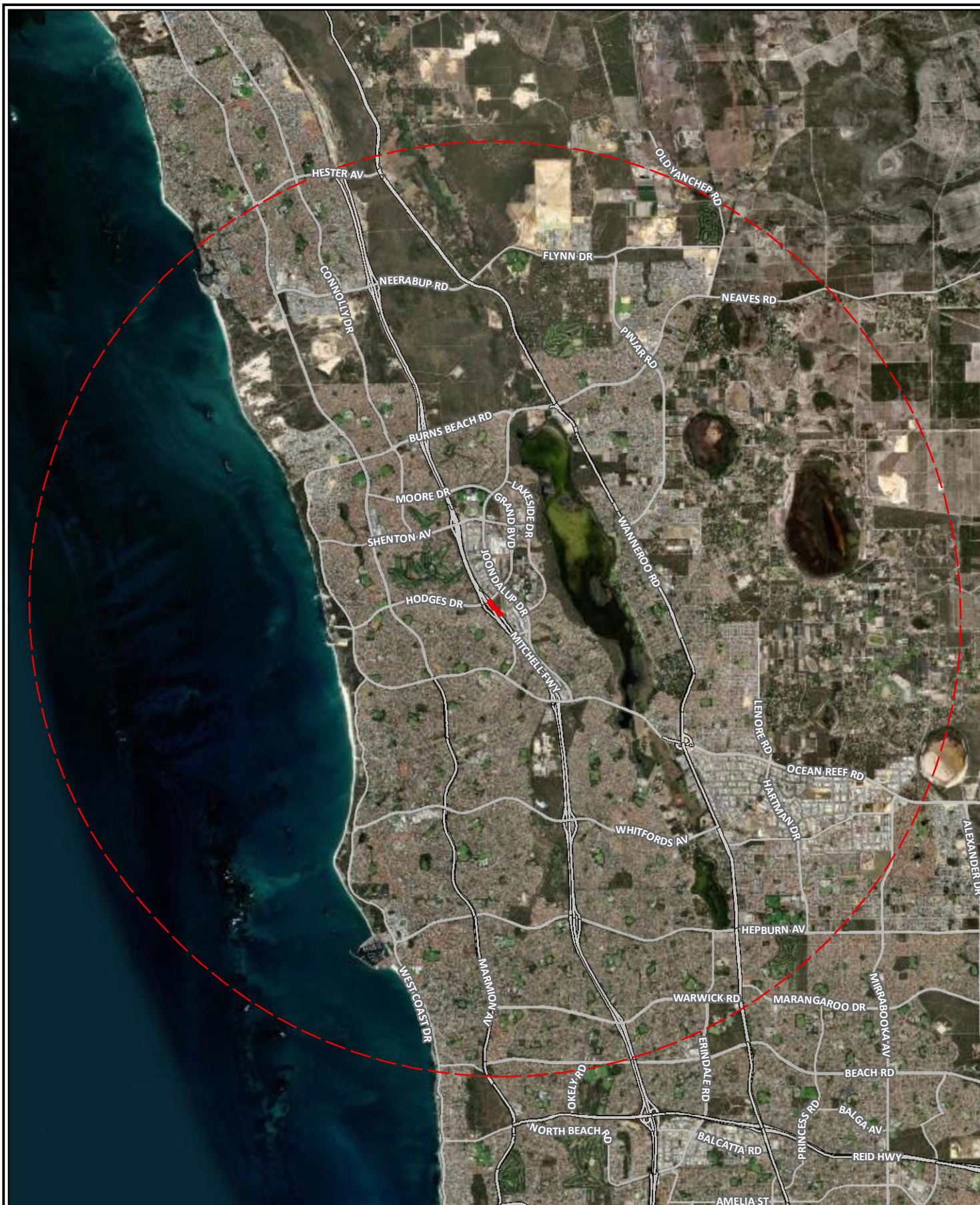
**PROJECT AREA**

**FIGURE 1**





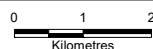
**Figure 2. Project Area and Study Area (With 10km buffer)**



#### Legend

- Project area
- 10km study area
- Highways
- Main road

Scale 1:110,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63847

Client: Main Roads Western Australia

Version: A

Date: 07-Mar-2023

Drawn By: ianandagoda

Checked By: AM

**Hodges Drive and Mitchell Freeway  
Perth, WA**

**PROJECT AREA AND STUDY AREA**

**FIGURE 2**





## **2.2 Alternatives to Clearing**

The Project area represents the maximum extent of disturbance for the proposal. Where possible, vegetation and fauna habitat will be retained during detailed design and construction.

## **2.3 Measures to Avoid, Minimise, Reduce and Manage Project Clearing Impacts**

The design and management measures implemented to avoid and minimise the project clearing impacts are provided in Table 2.

In addition to the elements discussed in Table 2 the following avoidance and minimisation actions have been applied to this project:

- The clearing area will be demarcated prior to the commencement of native vegetation clearing.
- The project design was refined to avoid clearing any potential cockatoo roosting trees.
- Where possible vegetation will be pruned as opposed to removed.
- Further project clearing will be avoided as the site office, materials storage areas, construction vehicles/machinery and access tracks will be located on previously disturbed or cleared areas.

**Table 2. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Project Clearing Impacts**

<b>Design or Management Measure</b>	<b>Discussion and Justification</b>
<b>Steepen batter slopes</b>	Batters will be steepened beyond standard practice to ensure that clearing doesn't extend outside the proposed footprint.
<b>Installation of safety barriers</b>	Installation of safety barriers is required in order to comply with road safety requirements.
<b>Alignment to one side of existing road</b>	All widening is to the verge, which has already been heavily disturbed.
<b>Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas</b>	Widening of the on-ramp must go into the verge and disturb native and planted vegetation.
<b>Installation of kerbing</b>	Kerbing will not reduce the area of impact.
<b>Simplification of design to reduce number of lanes and/or complexity of intersections</b>	Road design must allow for ramp metering and sufficient capacity on the ramp to allow for the metering. This is unfortunately complicated and is being simplified as far as possible.
<b>Preferential use of existing cleared areas for access tracks, construction storage and stockpiling</b>	No vegetation to be cleared for temporary works.
<b>Drainage modification</b>	The project will utilise the existing drainage in place for this section of Hodges Drive and Mitchell Freeway.
<b>Other design treatment</b>	No other design treatment is appropriate for the required work. The project involves the widening and upgrade of an existing on-ramp. No design alternatives exist to achieve the same outcome while reducing clearing requirements.

## 2.4 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 (see Section 1.3), Main Roads has also had regard to the below instruments.

### **Other Legislation of relevance 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)
- *Aboriginal Heritage Act 1972* (WA)
- *Town Planning and Development Act 1928* (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 (DEC, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2021)
- Environmental Offsets Guidelines (Government of Western Australia, August 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 the three threatened black cockatoo species
- Strategic advice - EPA



### 3 SUMMARY OF SURVEYS

#### 3.1 Biological Survey

A Detailed biological survey was undertaken by Astron in Spring 2019 for the widening of the Mitchell Freeway Southbound between Hodges Drive and Hepburn Avenue and for the construction of a Principal Shared Pathway within three areas between Hodges Drive and Reid Highway. An additional area between Hepburn Avenue and Warwick Train Station was surveyed in March/April 2020. This survey covered a large area, with the Project Area representing a small fraction of the total survey area (Figure 7)

The biological survey report was updated in 2021 to incorporate changes to Priority Ecological Community (PEC) mapping after the definitions for the PECs were updated by the Department of Biodiversity, Conservation and Attractions (DBCA).

A subsequent biological survey was undertaken by Focused Vision in Spring 2020 for installation of Intelligent Transport Systems (ITS) infrastructure on the Mitchell Freeway Southbound between Hester Avenue and Vincent Street. Again, this survey covered a large area, with the Project Area representing a small fraction of the total survey area. It should be noted the only data from the Focused Vision survey used for the CAR was for a 0.003 ha area of vegetation that the Astron survey did not cover.

A targeted Black Cockatoo survey was subsequently undertaken by Tony Kirkby (2020) to provide an additional investigation into habitat trees of interest from the results of Astron (2021), between the 15<sup>th</sup> and 27<sup>th</sup> June 2020.

Section 3.1.1 - 3.1.3 contain the summary of the surveys.

##### 3.1.1 Biological Survey (Astron 2021)

###### Vegetation:

- Five remnant native vegetation types were defined within the survey area including:
  - One Banksia Woodland;
  - Two *Eucalyptus marginata* (jarrah) woodlands; and
  - Two *Eucalyptus gomphocephala* (tuart) forests.

Of these types the Banksia Woodland and Jarrah Woodland 1 occur within the Project Area

- Remnant vegetation types were mapped across 6.4 ha (19 %) of the survey area. The remaining 27.6 ha of the survey area was either cleared (3.0 ha, 9 %) or planted vegetation (24.6 ha, 72 %).
- Remnant vegetation in the survey area was in 'Good' to 'Completely Degraded' condition, with the majority considered 'Completely Degraded' as it consisted of scattered remnant species only. It is expected that quality of these remnants has been declining over time due to significant edge effects.
- Vegetation inferred to represent the EPBC Act listed 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' TEC and State listed PEC 'Tuart (*Eucalyptus gomphocephala*) woodlands of the Swan Coastal Plain' was recorded within the survey area, however, was not located within the Project area.

- Vegetation inferred to represent the EPBC Act listed 'Banksia Woodlands of the Swan Coastal Plain' TEC and 'Banksia dominated woodlands of the Swan Coastal Plain IBRA Region' PEC was recorded within the Project area across 0.07 ha.

#### **Flora:**

- A total of 207 vascular flora species, from 47 families and 127 genera, were recorded in the survey area. No EPBC Act listed flora were recorded, one priority flora species of significance was recorded: *Jacksonia sericea* (Priority 4). Five individuals of *J. sericea* were recorded within the Project area.
- The survey area has considerable disturbance and limited floristic diversity which further limits the potential for any threatened or priority flora species to occur.
- Sixty-three weed species were recorded within the survey area, accounting for 30% of the species recorded. Three are listed as WoNS (Australian Weeds Committee 2012) (*\*Asparagus asparagoides*, *\*Lantana camara* and *\*Genista linifolia*) and three are declared pest plants in Western Australia under the BAM Act (Department of Agriculture and Food Western Australia 2016).
- Numerous common weeds were recorded within the Project area including *\*Avena fatua*, *\*Briza maxima*, *\*Bromus diandrus*, *\*Ehrharta calycina*, *\*Ehrharta longiflora*, *\*Erodium botrys*, *\*Euphorbia terracina*, *\*Fumaria capreolata*, *\*Gazania linearis*, *\*Gladiolus caryophyllaceus*, *\*Heliophila pusilla*, *\*Hypochaeris glabra*, *\*Lupinus cosentinii*, *\*Lysimachia arvensis*, *\*Pelargonium capitatum*, *\*Romulea rosea*, *\*Silene gallica*, *\*Urospermum picroides*, *\*Ursinia anthemoides*, as well as one declared weed species : *\*Moraea flaccida* (One-leafed Cape Tulip) – declared pest s22(2)

#### **Fauna:**

- The desktop assessment identified twenty-four conservation significant vertebrate species as potentially occurring within the Project area. Of these, three species (Quenda, Carnaby's cockatoo and Forest Red-tailed Black Cockatoo) were recorded within the survey area but not within the project area, one species was considered to have a 'moderate' likelihood and 20 species were considered to have a 'low' likelihood of occurrence. None of these species were recorded in the Project Area.
- Based upon the current distributions for the three threatened species of Black Cockatoo, only the Carnaby's Cockatoo (*Zanda latirostris*) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) are likely to occur within the vicinity of the survey area.
- Three hundred and twenty-nine Black Cockatoo potential breeding trees (259 Tuarts, 42 Jarrah, 16 dead stags and 12 Marri) with a diameter at breast height of over 50 cm were recorded within the survey area (none within current project area) including 15 trees (nine Tuarts and six dead stags) considered to have suitable hollows for Carnaby's Cockatoos to breed in. None of these trees occur within the Project area.
- Twenty-seven known foraging resource species for the Carnaby's Cockatoo and three known foraging resource species for the Forest red-tailed Black Cockatoo were recorded within the survey area; however, only the Marri, Jarrah and Banksia species are considered key species for foraging Carnaby's Cockatoos. Two individual Carnaby's Cockatoos were observed foraging on

*Banksia prionotes* and jarrah within the survey area. The Project area contains 0.34 ha of foraging habitat suitable for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo.

- One individual Quenda roadkill and multiple diggings in the same area were recorded within the survey area (outside current project area). The sighting was recorded 228 m south of the Woodvale Open Space, and it is likely that this individual was from a larger Quenda population within Woodvale Open Space.

### 3.1.2 Biological Survey (Focused Vision 2021)

A biological survey of the area of the Mitchell Freeway Southbound between Hester Avenue and Vincent Street was undertaken in 2020 (Focused Vision 2021). A summary of the findings from the survey are presented below.

#### Vegetation:

- Fourteen remnant vegetation units of varying condition and one planted vegetation unit were mapped. The remnant vegetation units comprise three *Allocasuarina* Woodlands, three *Banksia* Woodlands, one *Eucalyptus/Banksia* Woodland and seven woodlands.
- No patches of the *Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain ecological community* (Tuart woodlands and forests TEC) were considered to be part of the nationally protected ecological community when evaluated against diagnostic criteria in the Conservation Advice (DEE 2019b).
- Two patches of the *Banksia Woodlands of the Swan Coastal Plain IBRA region ecological community* (Banksia woodlands TEC) were determined to be supported within the survey area when evaluated against diagnostic criteria in the Conservation Advice (TSSC 2016).
- Of the eight remaining TECs and Priority Ecological Communities (PECs) identified in the desktop assessment, none are considered to be represented in the survey area.

#### Flora:

- No Threatened flora listed under the *Biodiversity Conservation Act 2016* (BC Act) or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded.
- Two Priority flora, *Jacksonia gracillima* (Priority 3) and *Jacksonia sericea* (Priority 4) were recorded in abundant numbers within the survey area.
- Two of the recorded weeds, *\*Echium plantagineum* and *\*Solanum linnaeanum*, are Declared pests listed under the *Biosecurity and Agriculture Management Act 2007* (BAM Act). These species are not listed as Weeds of National Significance (WoNS) (DAWE 2020f) or as Declared pests are listed under the 'Exempt' category, whereby landholders are under no obligation to control infestations.

#### Fauna:

- The survey area was found to support five key fauna habitats; Tall Woodland, Woodland, Rehabilitated and Planted Woodland, Planted Shrubland and Drain.
- The survey area supports suitable foraging habitat for Black Cockatoos, ranging from 'High' to 'Negligible/None' foraging quality. The best quality foraging habitat is provided within the Tall Woodland and Woodland habitats, and the Rehabilitated and Planted Woodland habitat also provides some foraging habitat value.
- No confirmed or unconfirmed Black Cockatoo breeding sites occur within the survey area. A known breeding site occurs within 600m of the survey area boundary (at Edith Cowan University). No trees thought to provide suitable breeding hollows that also present evidence of

Black Cockatoo use were recorded within the survey area. Four trees that support potentially suitable hollows were recorded.

- No evidence of Black Cockatoo roosting was observed during the field assessment and although there are numerous confirmed roosts within close proximity to the survey area, roosting within the survey area is considered unlikely.

### 3.1.3 Black Cockatoo Habitat Assessment (Kirby 2020)

Tony Kirkby (2020) undertook a specific assessment of all trees identified during the biological survey completed by Astron (2021) to provide further clarification of potentially suitable hollows. All trees with a DBH greater than 500 mm were inspected from the ground using binoculars, and further inspected using a pole camera where necessary. The findings of this assessment are summarised below.

#### **Breeding habitat:**

Of the 329 trees identified by Astron (2021), four were deemed of interest (tree numbers 103, 190, 230 and 290). These trees were all located outside of the Project area. The trees of interest were described by Kirkby (2020) as:

- Tree 103: *Eucalyptus gomphocephala* – small hollow with chewed entrance. Unlikely to be Black Cockatoo breeding hollow
- Tree 190: Dead Stag – top entry hollow with chewing at entrance. Top section of hollow in poor condition however may be sufficiently deep to provide Black Cockatoo hollow
- Tree 230: *Eucalyptus gomphocephala* dead stag – hollow with entrance large enough for Black Cockatoo, however, no signs of use around the rim or internally. Unlikely to be a breeding hollow, possibly too shallow
- Tree 290: *Eucalyptus gomphocephala* – hollow with suitable entrance for Black Cockatoo with chew marks at entrance. Closer inspection using pole camera not possible due to presence of feral bees in nearby hollow.

None of the trees identified to have potential or suitable hollows for Black Cockatoo use were recorded within the Project area.

#### **Foraging habitat:**

Foraging habitat was found to range from poor to completely degraded within the survey area, with remaining understorey foraging species being *Banksia sessilis*, *B. nivea*, *Hakea lissocarpha*, *H. prostrata*, *H. trifurcata*, and *Xanthorrhoea pressii*. Canopy cover was considered not good within the Project area, with Jarrah, Marri, Tuart, *Allocasuarina fraseriana* (Sheoak) and *Banksia* spp. present. Canopy height is not particularly tall with trees almost level with vehicles using the on ramp, this is of note as being relevant for Forest Red-tailed Black Cockatoo which rarely feeds below the canopy level. While foraging residue from Marri and *Banksia* spp. were present (likely utilised by Carnaby's Black Cockatoo), vegetation is considered unlikely to be significant to support the local population (Astron, 2021). No known breeding sites for Forest Red-tailed Black Cockatoo are located within 6km of the Project area as it is outside of the known breeding range (DAWE 2022); therefore, this foraging habitat is not significant in supporting breeding individuals.

The closest known breeding site for Carnaby's Cockatoo is at the Edith Cowan University Campus, approximately 0.5 km east of the Project area.



**Roosting habitat:**

No roosting sites are known from the Project area, and no signs of Black Cockatoo roosting were noted within the survey area (Kirkby, 2020).

## 4 VEGETATION DETAILS

### 4.1.1 Project Site Vegetation Description

The Project area is predominately in a 'Good' to 'Completely Degraded' condition with two native vegetation units present, described by Astron (2021) as:

- **Jarrah Woodland 1:** *Eucalyptus marginata*, *Allocasuarina fraseriana* and *Banksia attenuata* mid open forest to low woodland over *Xanthorrhoea preissii* (+/- *Jacksonia sternbergiana*/*Allocasuarina humilis*) mid open shrubland over *Hibbertia hypericoides* low open shrubland over *Mesomelaena pseudostygia* and/or *Lepidosperma calcicole* and/or *Desmoclados flexuosus* sparse sedgeland over a tussock grassland of introduced grasses
- **Banksia Woodland:** *Allocasuarina fraseriana* and *Banksia attenuata* low open woodland over *Banksia sessilis* and *Jacksonia sternbergiana* tall open shrubland over *Xanthorrhoea preissii* and *Olearia axillaris* sparse mid shrubland over *Hibbertia hypericoides*, *Synaphea spinulosa* and *Tricoryne elatior* low shrubland over *Mesomelaena pseudostygia*, *Conostylis aculeata* subsp. *aculeata* and *Alexgeorgea nitens* sparse sedgeland over *Ehrharta calycina* and *Avena fatua* sparse tussock grassland.

Table 3 and Table 4 provide details of the Pre-European Vegetation Associations within the Project area, and the remaining extents and condition of these associations (Figure 3).

**Table 3. Summary of Project Area's Mapped Pre-European Vegetation Associations**

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition (Astron 2021, Focused Vision 2021)	Comments
Vegetation Association 1007 described as a Mosaic: Shrublands; <i>Acacia lasiocarpa</i> & <i>Melaleuca acerosa</i> heath / Shrublands; <i>Acacia rostellifera</i> & <i>Acacia cyclops</i> thicket (Government of Western Australia, 2019).	<b>Project area:</b> Clearing of up to 0.198 ha for road widening, Hodges Drive on-ramp.	Good (0.131ha), Degraded to Completely Degraded (0.018 ha), Completely Degraded (0.049 ha)	Vegetation descriptions and condition determined from biological survey (Astron, 2021, Focused Vision 2021).
Vegetation Association 998 described as a Medium woodland: tuart (Government of Western Australia, 2019).	<b>Project Area:</b> Clearing of up to 0.141 ha for road widening, Hodges Drive on-ramp.	Good condition (0.044 ha), Degraded (0.002 ha) Degraded to Completely Degraded (0.071 ha), Completely Degraded (0.024 ha)	

**Table 4. Pre-European Vegetation Representation**

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 1007</b>	<b>Statewide</b>	30,407.75	20,691.11	68.05	10.04
	<b>IBRA Bioregion</b>	30,109.89	20,679.62	68.68	10.13
	<b>Swan Coastal Plain</b>	30,109.89	20,679.62	68.68	10.13
	<b>IBRA Sub-region</b>	30,109.89	20,679.62	68.68	10.13

<b>Veg Assoc No. 998</b>	Perth				
	<b>Local Government Authority</b> City of Joondalup	2,760.85	221.65	8.03	0.00
	<b>Statewide</b>	51,015.33	18,492.63	36.25	17.65
	<b>IBRA Bioregion</b> Swan Coastal Plain	50,867.50	18,492.32	36.35	17.70
	<b>IBRA Sub-region</b> Perth	50,867.50	18,492.32	36.35	17.70
	<b>Local Government Authority</b> City of Joondalup	2,841.13	273.43	9.62	0.60

#### 4.1.2 Vegetation Complexes and Representation

Vegetation Complexes within the project area have been defined by Heddle et al. (1980) and are based on vegetation in association with landforms and underlying geology. Native vegetation complexes as described by Heddle et al. (1980) within the Project area comprise:

- **Cottesloe Complex** – Central and South: mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri); closed heath on the Limestone outcrops.

This complex is above the minimum threshold of 10% target for the retention of vegetation complexes in constrained areas on the Swan Coastal Plain (EPA, 2000). The current remaining extent of this vegetation complex (GoWA, 2019) is detailed in Table 5.

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

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2013 Vegetation Extent	% Remaining
Cottesloe Complex – Central and South	45,299.6	14,567.9	32.2

## 5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the project's proposed clearing is likely to have a significant impact on the environment, the project was assessed against the ten clearing principles (EP Act 1986, Schedule 5).

Each principle has been assessed in accordance with DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation'.

The proposed clearing is not at variance to principle (c), (f), (g), (h), (i) and (j), not likely to be at variance to principle (e), and is at variance to principle (a), (b) and (d).

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

Proposed clearing is at variance to this Principle
<p><b>Comment:</b></p> <p>Clearing as a result of the project is at variance with this Principle. The project requires the clearing of up to 0.34 ha of native vegetation (Figure 3). Astron (2021) mapped two vegetation units within the project area as:</p> <ul style="list-style-type: none"> <li>• <b>Jarrah Woodland:</b> <i>Eucalyptus marginata</i>, <i>Allocasuarina fraseriana</i> and <i>Banksia attenuata</i> mid open forest to low woodland over <i>Xanthorrhoea preissii</i> (+/- <i>Jacksonia sternbergiana</i>/<i>Allocasuarina humilis</i>) mid open shrubland over <i>Hibbertia hypericoides</i> low open shrubland over <i>Mesomelaena pseudostygia</i> and/or <i>Lepidosperma calcicole</i> and/or <i>Desmocladus flexuosus</i> sparse sedgeland over a tussock grassland of introduced grasses</li> <li>• <b>Banksia Woodland:</b> <i>Allocasuarina fraseriana</i> and <i>Banksia attenuata</i> low open woodland over <i>Banksia sessilis</i> and <i>Jacksonia sternbergiana</i> tall open shrubland over <i>Xanthorrhoea preissii</i> and <i>Olearia axillaris</i> sparse mid shrubland over <i>Hibbertia hypericoides</i>, <i>Synaphea spinulosa</i> and <i>Tricoryne elatior</i> low shrubland over <i>Mesomelaena pseudostygia</i>, <i>Conostylis aculeata</i> subsp. <i>aculeata</i> and <i>Alexgeorgea nitens</i> sparse sedgeland over <i>Ehrharta calycina</i> and <i>Avena fatua</i> sparse tussock grassland.</li> </ul> <p>The vegetation was assessed to be in a 'Degraded' to 'Good' condition comprising: 52% of the vegetation in 'Good' condition and 48% of the vegetation in a 'Degraded to Completely Degraded' condition (Figure 4). Two vegetation unit was mapped within the Project area during the detailed field survey, as shown above in section 4.1.1 (Astron 2021).</p> <p>No State or Federally listed Threatened species were recorded within the Project area. One Priority flora species listed by the DBCA was recorded in the Project area, <i>Jacksonia sericea</i> (P4) (Astron, 2021). Two <i>J. sericea</i> individuals were recorded in the Project area, with a total of 17 in the broader survey area. This species was previously recorded within the survey area (mostly towards the northern end) and surrounds and is known to occur in sandy soils and limestone (Astron, 2021). This species is persistent in disturbed areas which have a significant cover of weedy grasses, it was also recorded in areas of previous cleared, planted vegetation indicating that it may have established from retained seedbank and rootstock (Astron, 2021). The inconspicuous diffuse greyish green phylloclades and a sprawling habit of <i>J. sericea</i> may indicate that it is more widespread in the local area than records indicate (Astron, 2021). <i>J. sericea</i> is found in the understorey of Banksia woodlands and displays a distribution on the Swan coastal plain from Neerabup national park through suburban Perth to the Mandurah-Pinjarra area. A survey done by PGV Environmental (no.2019-442) recorded &gt;50 <i>J. sericea</i> within Banksia woodland in the City of Wanneroo, approximately 4km from the Project area.</p> <p>The DBCA TPFL dataset identified five known populations of <i>J. sericea</i> within a 10km radius of the Project area with an estimated count of 8,480 individuals. Clearing due to the Project will impact less than 0.02% of known <i>J. sericea</i> individuals within 10km of the project area.</p>



Based on the above, it is unlikely that the proposed clearing will have a significant impact on *Jacksonia sericea*.

The Project will impact on approximately 0.07 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC and State listed Banksia dominated woodlands of the Swan Coastal Plain IBRA Region PEC. This forms part of a contiguous patch of 6.19 ha that extends into adjoining land held by Edith Cowan University (Astron, 2021). Within the Project area, vegetation associated with the TEC is in 'Degraded to Completely Degraded' condition.

The majority of the TEC within the Project area has been previously cleared. The proposed clearing is an area of 0.07 ha linear to the Mitchell Freeway Road reserve which is separated from the larger patch of 6.19 ha TEC by a fire break and fence line and will reduce the patch by 1.5%. Based on the condition and the size of the TEC within the road reserve it would not be considered a patch of TEC if it was not adjacent to the larger patch of TEC within the Edith Cowan land.

Noting this, the vegetation within the Project area is not considered representative of a diverse native vegetation remnant that comprises the whole, or a part of, a significant occurrence of an ecological community; or vegetation that has a higher diversity than other examples of an ecological community in the region.

It is also noted that Development WA intends to impact the remainder of the patch of TEC to develop the Joondalup Activity Centre Plan (JACP), which was referred under the EPBC Act (EPBC 2016/7844) and determined to be 'not a controlled action'. On this basis, clearing the much smaller portion of the TEC is unlikely to be a significant impact. Furthermore, if the surrounding vegetation is cleared for development of the JACP, the vegetation remaining in the road reserve would no longer represent a patch of Banksia Woodlands TEC, as it would be below the minimum patch size and condition thresholds for the TEC.

Within the Project area, approximately 0.34 ha of Black Cockatoo foraging habitat was recorded (Figure 5). The Black Cockatoo assessment undertaken by Astron (2021) determined that no quality foraging habitat is present, due to the altered state of vegetation and the sporadic and isolated distribution of known foraging flora species.

No potential breeding trees (those of a suitable species with greater than the 500 mm DBH) or trees with suitable hollows occur within the Project area, and no evidence of breeding was recorded at the time of the survey. The closest known breeding site for Carnaby's Cockatoo is at the Edith Cowan University Campus, approximately 0.5 km east of the Project area. Cockatoos utilising this breeding site aren't likely to be reliant on vegetation within the Project area for foraging, given the abundance and availability of much better quality foraging habitat within a 6km and 12km radius. Furthermore, the Project is considered unlikely to support breeding for the Forest Red-tailed Black Cockatoo due to the absence of intact woodland or forest habitat.

As the project area contains two individuals of Priority 4 species *Jacksonia sericea*, 0.07 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC and State listed Banksia dominated woodlands of the Swan Coastal Plain IBRA Region PEC and it contains habitat for conservation significant fauna species the proposed clearing is at variance to this principle.

#### **Assessed Outcome:**

- **Clearing for this project is at variance to this principle.**

#### **Methodology**

Astron (2021)  
 Focused Vision (2021)  
 DBCA shapefiles  
 EPA (2016)

MRWA Shapefiles  
NatureMap (February, 2020)

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

**Proposed clearing is at variance to this Principle**

**Comment:**

Clearing as a result of the project is at variance with this Principle. Within the study area there are known records of 61 protected fauna species. The biological survey identified that there were three conservation species present within the wider survey area. These are:

- *Zanda latirostris* (Carnaby's Cockatoo) -Threatened
- *Calyptorhynchus banksii naso* (Forest Red-tailed Black Cockatoo) - Vulnerable
- *Isodon obesulus* subsp. *fusciventer* (Southern Brown Bandicoot (Quenda)) - Priority 4

Within the Project area, Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo are considered to potentially utilise the area.

No evidence of Quenda presence was recorded within the project area (Astron, 2021). Evidence of this species was recorded approximately 2.7 km south-east of the project area near Woodvale Nature Reserve.

**Black Cockatoo**

The project area is within the known distribution range of the Carnaby's Cockatoo, but outside its known breeding range. The Project area is outside of the modelled distribution of the Forest Red-tailed Black Cockatoo (DCCEEW, 2022). Given the small area of potential habitat and its poor condition, it is considered unlikely to be significant habitat for foraging or breeding for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo.

Within the project area, approximately 0.34 ha of potentially suitable foraging habitat was recorded (Figure 5). The Black Cockatoo assessment undertaken by Astron (2021) determined that no quality foraging habitat is present, due to the altered state of vegetation and the sporadic and isolated distribution of known foraging flora species.

No potential breeding trees (those greater than the 500 mm DBH) or trees with suitable hollows were observed within the project area (Kirkby, 2020), and no evidence of breeding was recorded at the time of the survey. Furthermore, no evidence of roosting was recorded within the project area. The closest known breeding site for Carnaby's Cockatoo is at the Edith Cowan University Campus, located approximately 0.5 km east of the Project area.

Within 6km and 12km of the Project area, there is approximately 919.04 ha and 3,858.30 ha of potential foraging habitat available for Black Cockatoos (DBCA, 2020). Clearing as a result of the Project represents 0.04% and 0.01% of the foraging habitat within 6km and 12km of the Project area, respectively. Cockatoos utilising the Edith Cowan breeding site aren't likely to be reliant on vegetation within the Project area for foraging, given the abundance and availability of much better quality foraging habitat within a 6km and 12km radius.

The habitat within the project area is considered as moderate quality foraging habitat for Carnaby's cockatoo based on the following:

- Condition of the vegetation was in 'Degraded' to 'Good' condition comprising: (52 per cent of the vegetation in 'Good' condition and 48 per cent of the vegetation in a 'Degraded to Completely Degraded' condition)

- Two quadrats within or close to the project area contained cover of Banksia species (preferred foraging plants for Carnaby's cockatoo) of 9 per cent and 7 per cent, as well as other foraging species such as *Eucalyptus marginata* (jarrah), *Allocasuariana fraseriana sheoak* and *Xanthorrhoea pressii*.
- Consideration of site context, including:
  - Proximity to breeding and roosting sites; There are 93 known roosting sites within 20 kilometres, and 23 known white-tailed black cockatoo (WTBC) breeding locations within 12 kilometres. Several confirmed breeding locations are within the Edith Cowan University Campus, located approximately 0.5 km northeast of the project area. The closest roost site (WTBC) is approximately 1.3 km northeast of the project area.
  - the proximity of the site to significant water bodies; lake Joondalup is 1.5 kilometres from the project area.

Clearing of 0.34 hectares of moderate quality foraging habitat for Carnaby's black cockatoo may have impacts to the species when considering the local context of the project area, including the presence of confirmed breeding sites approximately 0.5 kilometres from the project area and its location within the Swan Coastal Plain.

#### **Other Conservation Significant Species**

The Southern Brown Bandicoot (Quenda) occurs in wet or dry sclerophyll forest through to open woodland and scrubby, dense vegetation on sandy soils. This species was identified within the wider survey area in close proximity to the Woodvale Nature Reserve, approximately 2.7 km south-east of the Project area near Woodvale Nature Reserve. There are no ecological linkages connecting the nature reserve to the Project area and therefore Quenda are unlikely to utilise the Project area.

It is unlikely 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.

#### **Assessed Outcome:**

- **Clearing for this project is at variance to this principle.**

#### **Methodology:**

Aerial Photography  
Astron (2021)  
Focused Vision (2021)  
DBCA Shapefiles  
DBCA website  
DCCEEW (2022)  
EPA (2016)

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

#### **Proposal clearing is not at variance to this Principle**

#### **Comment:**

Clearing as a result of the project is not at variance with this Principle. A total of 207 vascular flora species, from 47 families and 127 genera, were recorded in the wider survey area, between Hodges Drive and Reid Highway (Astron 2021). No State or Federally listed threatened flora species were recorded within the Project area.

#### **Assessed Outcome:**

- **Noting the above, clearing for this project is not at variance to this principle.**

#### **Methodology:**

Astron (2021)  
 DBCA shapefiles  
 Florabase (February, 2020)  
 Biological Survey (October, 2019)

**(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 at variance to this Principle**

**Comment:**

Clearing as a result of the Project is at variance with this Principle.

The Project will directly impact approximately 0.07 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC and State listed Banksia dominated Woodlands of the Swan Coastal Plain IBRA Region PEC. This forms part of a contiguous patch of 6.19 ha that extends into adjoining land held by Edith Cowan University (Astron, 2021).

The 0.07 ha patch of Banksia TEC is in 'Degraded' to 'Completely Degraded' condition with 0.002 ha in 'Degraded' condition, 0.043 ha in 'Degraded to Completely Degraded' condition and 0.024 ha in 'Completely Degraded' condition (Astron 2021, Focused Vision 2021).

Interpretation of current and historic aerial imagery supports the vegetation condition ratings provided by Astron (2021) and Focused Vision (2021), and suggests the majority of the TEC within the Project area has been previously cleared. The proposed clearing is an area of 0.07 ha linear to the Mitchell Freeway Road reserve which is separated from the larger patch of 6.19 ha TEC by a fire break and fence line and will reduce the patch by 1.5%. Based on the condition and the size of the TEC within the road reserve it would not be considered a patch of TEC if it was not adjacent to the larger patch of TEC within the Edith Cowan land.

On this basis, clearing the much smaller portion of the TEC is unlikely to be a significant impact.

**Assessed Outcome:**

- **Clearing for this project is at variance to this principle.**

**Methodology:**

Astron (2021)  
 Focused Vision (2021)  
 Historical Aerial footage  
 DBCA shapefiles  
 Biological Survey (October, 2019)



**(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 likely to be at variance to this Principle****Comment:**

Clearing as a result of the Project is not likely to be at variance with this Principle. The Project area is mapped as Vegetation Association 998 described as a Medium woodland: tuart and Vegetation Association 1007 described as a Mosaic: Shrublands; *Acacia lasiocarpa* & *Melaleuca acerosa* heath / Shrublands; *Acacia rostellifera* & *Acacia cyclops* thicket. The Project proposes to clear up to 0.34 ha of native vegetation. Of this, 0.07 ha has been assessed as 'Completely Degraded' condition, 0.09 ha has been assessed as 'Degraded' to 'Completely Degraded' condition, 0.002 ha in 'Degraded' condition and 0.18 ha has been assessed as 'Good' condition (Astron 2021, Focused Vision, 2021).

**Summary of Project Area's Mapped Pre-European Vegetation Associations**

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition (Astron 2021, Focused Vision 2021)	Comments
Vegetation Association 1007 described as a Mosaic: Shrublands; <i>Acacia lasiocarpa</i> & <i>Melaleuca acerosa</i> heath / Shrublands; <i>Acacia rostellifera</i> & <i>Acacia cyclops</i> thicket (Government of Western Australia, 2019).	<b>Project area:</b> Clearing of up to 0.198 ha for road widening, Hodges Drive on-ramp.	Good (0.131ha), Degraded to Completely Degraded (0.018 ha), Completely Degraded (0.049 ha)	Vegetation descriptions and condition determined from biological survey (Astron, 2021, Focused Vision 2021).
Vegetation Association 998 described as a Medium woodland: tuart (Government of Western Australia, 2019).	<b>Project Area:</b> Clearing of up to 0.141 ha for road widening, Hodges Drive on-ramp.	Good condition (0.044 ha), Degraded (0.002 ha) Degraded to Completely Degraded (0.071 ha), Completely Degraded (0.024 ha)	

**Pre-European Vegetation Representation**

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 1007</b>	<b>Statewide</b>	30,407.75	20,691.11	68.05	10.04
	<b>IBRA Bioregion</b> Swan Coastal Plain	30,109.89	20,679.62	68.68	10.13
	<b>IBRA Sub-region</b> Perth	30,109.89	20,679.62	68.68	10.13
	<b>Local Government Authority</b> City of Joondalup	2,760.85	221.65	8.03	0.00
<b>Veg Assoc No. 998</b>	<b>Statewide</b>	51,015.33	18,492.63	36.25	17.65
	<b>IBRA Bioregion</b> Swan Coastal Plain	50,867.50	18,492.32	36.35	17.70
	<b>IBRA Sub-region</b> Perth	50,867.50	18,492.32	36.35	17.70
	<b>Local Government Authority</b> City of Joondalup	2,841.13	273.43	9.62	0.60

#### Vegetation Complexes (Hedde/Mattiske) within the Project Area

Hedde/Mattiske Veg Complex	Pre-European Extent (ha)	2013 Vegetation Extent	% Remaining
Cottesloe Complex – Central and South	45,299.6	14,567.9	32.2

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The Project area is within a constrained area of the Swan Coastal Plain and as such retention objectives of at least 10 per cent apply (EPA, 2016).

As shown in Tables above, vegetation association 1007 and 998 and the vegetation complex Cottesloe (Central and South) are above the 10 per cent threshold in a constrained area (Government of Western Australia, 2019). Vegetation associations 1007 and 998 are below the 10% threshold within City of Joondalup, however, retention at the scale of local government authority has not been taken into consideration in recent assessments by DWER that have rather focussed on the IBRA region scale (e.g., CPS 8796).

Furthermore, given the condition, location and fragmented nature of the vegetation, it is not considered to be representative of native vegetation that is significant as a remnant in an area that has been extensively cleared.

#### Assessed Outcome:

- **Clearing for this project is not likely to be at variance to this principle.**

**Methodology:**

EPA (2016)

Astron (2021)

Focused Vision (2021)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****Comment:**

Clearing as a result of the project is not at variance with this Principle. Interrogation of DBCA and DWER hydrological and wetland datasets determined that no wetlands or watercourses are mapped within the Project area. The nearest mapped wetland is Lake Joondalup, located approximately 1.5 km from the Project area.

In addition, the Astron (2021) biological survey concluded that no remnant vegetation considered to represent riparian vegetation was recorded from the Project area.

**Assessed Outcome:**

- **Clearing for this project is not at variance to this principle.**

**Methodology:**

Astron (2021)

Focused Vision (2021) DWER and DBCA shapefiles

**(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****Comment:**

Clearing as a result of the Project is not at variance with this Principle. The Department of Primary Industries and Regional Development (DPIRD), provides a series of soil degradation risk mapping at the sub-system level. The Project area is located within two subsystems of the Spearwood Dunes soil systems as follows:

- Karrakatta Sand Yellow Phase subsystem of the Spearwood Dunes soil system. It is described as low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. *Banksia* spp. woodland with scattered emergent *E. gomphocephala* and *E. marginata* and a dense shrub layer; and
- Karrakatta Shallow Soils Phase subsystem. It is described as low hills and ridges. Bare limestone or shallow siliceous or calcareous sand over limestone. Dense low shrub dominated by *Banksia sessilis*, *Melaleuca huegelii* and species of *Grevillea* (DPIRD, 2018).

The table below summaries the soil degradation risk within the Project area.

Aspect	Degradation risk	
	Karrakatta Sand Yellow Phase	Karrakatta Shallow Soils Phase
Wind Erosion	98%	60%
Waterlogging	0%	0%
Water Erosion	0%	0%
Salinity	0%	0%
Flood Risk	0%	0%

Wind erosion is the only potential soil degradation aspect relevant to the Project area, due to the deep yellow sands associated with the area. It is unlikely that the Project will cause appreciable land degradation given the relatively small amount of clearing and the implementation of appropriate measures to mitigate and manage potential wind driven erosion during construction.



<b>Assessed Outcome:</b> <ul style="list-style-type: none"> <li>• <b>Clearing for this project is not at variance to this principle.</b></li> </ul>
<b>Methodology:</b> GIS shapefiles Biological Survey (October, 2019) Natural Resource Management SLIP Soil Systems (Accessed May 2020)

**(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.**

<b>Proposed clearing is not at variance to this Principle</b>
<b>Comment:</b> <p>Clearing as a result of the Project is not at variance with this Principle. The nearest conservation area to the Project is the Yellagonga Regional Park which occurs approximately 1.25 km to the east of the Project area and has no direct links to the Project area.</p> <p>It is not considered that the Project area contains vegetation which represents a significant ecological linkage for fauna to move between conservation reserves. Noting the above and that the Project area is contained to the road reserve, the proposed clearing will not result in impacts to any adjacent or nearby conservation area.</p>
<b>Assessed Outcome:</b> <ul style="list-style-type: none"> <li>• <b>Clearing for this project is not at variance to this principle.</b></li> </ul>
<b>Methodology:</b> DBCA shapefiles EPA (2016)

**(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.**

<b>Proposed clearing is not at variance to this Principle</b>
<b>Comment:</b> <p>Clearing as a result of the Project is not at variance with this Principle. There are no major or minor watercourses mapped within the project area. Although the Project area occurs within the Perth Coastal and Gwelup Underground Water Pollution Control Area (UWPCA), a Priority 3 water catchment area, the proposed clearing for transport infrastructure is not inconsistent with allowable land uses in Priority 3 catchments.</p> <p>The Project will not change the hydrology of the area. Given the small scale of clearing, it is considered that there will be very little to no deterioration of surface or underground water quality.</p>
<b>Assessed Outcome:</b> <ul style="list-style-type: none"> <li>• <b>Noting the above, clearing for this project is not at variance to this principle.</b></li> </ul>
<b>Methodology:</b> DWER and DBCA shapefiles Biological Survey (October, 2019)

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

**Proposed clearing is not at variance to this Principle**

**Comment:**

Clearing as a result of the Project is not at variance with this Principle. This Project proposes to clear up to 0.34 ha of native vegetation over an approximately 500 m stretch of road. The removal of such a small area of vegetation makes it unlikely that the incidence or intensity of flooding will increase. NRM SLIP identifies that the area has 0% risk of flooding in the area, largely attributed to presence of sandy soil and fast infiltration rates.

Given the small amount of clearing and high infiltration rates of soils in the Project area, it is unlikely that this project will cause or exacerbate the incidence or intensity of flooding.

**Assessed Outcome:**

- **Noting the above, clearing for this project is not at variance to this principle.**

**Methodology:**

Natural Resource Management SLIP Soil Systems (Accessed June 2020)

## 6 ADDITIONAL ACTIONS REQUIRED

Table 5 summarises what further pre-clearing impact assessment and vegetation management is required in accordance with CPS 818.

**Table 5. Summary of Additional Management Actions Required by CPS 818**

Impact of Clearing	Yes/No or NA	Further Action Required
<p><b>1.</b> The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.</p> <p>Where the clearing is at variance or may be at variance to Clearing Principle (f) and no other Clearing Principle, and the area of the proposed clearing is less than 0.5 hectares in size and the Clearing Principle (f) impacts only relate to:</p> <ul style="list-style-type: none"> <li>(i) a minor non-perennial watercourse(s);</li> <li>(ii) a wetland(s) classed as a multiple use management category wetland(s); and/or</li> <li>(iii) a wetland that is not a defined wetland;</li> </ul> <p>the preparation of an Assessment Report, as required by condition 6 (e), is not required.</p>	<b>Yes</b>	Condition 8 of CPS 818/15 requires Main Roads WA to invite submissions from a number of parties when the proposed clearing is considered likely to be seriously at variance, at variance or may be at variance with one or more of the clearing principles.
<p><b>2.</b> Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.</p>	<b>No</b>	No further action required.
<p><b>3.</b> The project involves clearing for temporary works (as defined by CPS 818).</p>	<b>No</b>	No further action required.
<p><b>4a.</b> Project is within Region that:</p> <ul style="list-style-type: none"> <li>- Has rainfall greater than 400mm and</li> <li>- Is South of the 26<sup>th</sup> parallel and</li> <li>- Works are in 'Other than dry conditions' and</li> <li>- Works have potential for <b>uninfested</b> areas to be impacted</li> </ul>	<b>Yes</b>	<b>4a.</b> Dieback management will be addressed in the VMP to avoid spread (Appendix 2).
<p><b>4b.</b> Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions?</p>	<b>No</b>	<b>4b.</b> No further action required.
<p><b>5.</b> 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</p>	<b>No</b>	No further action required.

Impact of Clearing	Yes/No or NA	<i>Further Action Required</i>
<p><b>6.</b> The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition and weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition</p>	<p><b>No</b></p>	<p>Some of the surrounding vegetation is expected to be in good or better condition and some good condition vegetation will be cleared.</p> <p>Weed management will be addressed in the VMP to avoid weed spread (Appendix 2).</p>



## 7 STAKEHOLDER CONSULTATION

Condition 8 of CPS 818/15 requires Main Roads WA to invite submissions from a number of parties when the proposed clearing is considered likely to be seriously at variance, at variance or may be at variance with one or more of the clearing principles. The CAR was published on the Main Roads Website for a period of 21 days, between the 12/04/2023 and the 03/05/2023. As part of this process Main Roads invited submissions from DWER and the City of Joondalup.

The only submission received was from DWER as outlined below.

Name of Stakeholder	Date of Consultation	Key Issue/Comment	Main Roads Response/Comment	TRIM Ref of Consultation
DWER	24/04/23	<p>DWER determined that the proposed clearing is at variance with Principle (a), (b) and (d) and is not likely to be at variance with the remaining clearing principles</p> <p>DWER requested amendments to the VMP to incorporate additional vegetation clearing management actions.</p> <p>DWER determine that an offset was required for the variance to principle (b)</p>	Main Roads amended the CAR/VMP to reflect DWERs assessment and requests. An offset package was provided for consideration	<a href="#">D23#401794</a>

## 8 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 VMP has been developed to manage and minimise vegetation clearing for the project (refer to Appendix 2).

## 9 REFERENCES

Astron (2021). Mitchell Freeway Widening Biological Survey. Astron Environmental Pty Ltd for Main Roads Western Australia.

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# 10 APPENDICES

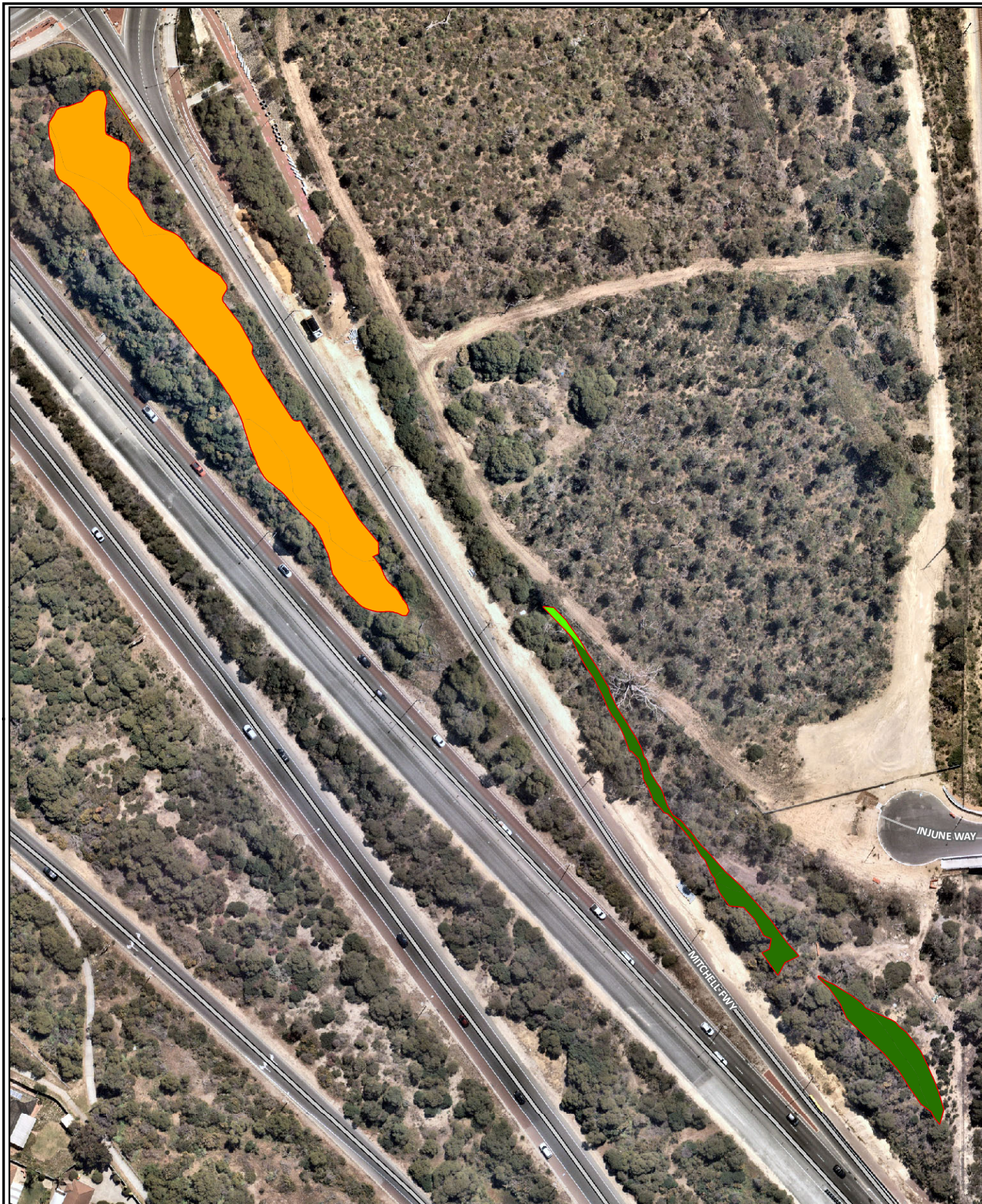
Appendix	Title
Appendix 1	Constraints Mapping
Appendix 2	Vegetation Management Plan



**Appendix 1: Constraints Mapping**

**Figure 3. Vegetation Type**





# Legend

Project area (0.339 Ha)

Vegetation association - Astron

Banksia Woodland (0.270 Ha)

Jarrahd Woodland 1 (0.067 Ha)

Vegetation associations - Focused Vision

*Banksia attenuata*, *Banksia menziesii* and *Allocasuarina fraseriana* Low Woodland over *Xanthorrhoea preissii* Sparse Shrubland over *Hibbertia hypericoides* Low Open Shrubland over *Mesomelaena pseudostygia* Open Sedgeland (0.0025 Ha)

Highways  
Main road  
Minor road

Scale 1:1,500 at A4

0 10 20  
Metres

Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63487

Client: Main Roads Western Australia

Version: A

Date: 19-Apr-2023

Drawn By: ianandagoda

Checked By: AM

Hodges Drive and Mitchell Freeway  
Perth, WA

VEGETATION ASSOCIATIONS

FIGURE 3





**Figure 4. Vegetation Condition**





# Legend

Project area (0.339 ha)

Vegetation condition - Astron

Good (0.175 ha)

Degraded - Completely degraded (0.088 ha)

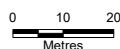
Completely degraded (0.073 ha)

Vegetation condition - Focused Vision

Degraded (0.002 ha)

Degraded - Completely degraded (0.001 ha)

Scale 1:1,500 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63487

Client: Main Roads Western Australia

Version: A

Date: 08-Mar-2023

Drawn By: ianandagoda

Checked By: AM

**Hodges Drive and Mitchell Freeway  
Perth, WA**

**VEGETATION CONDITION**

**FIGURE 4**





**Figure 5. Black Cockatoo Habitat**

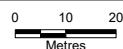




#### Legend

- Project area (0.339 ha)
- Fauna habitat
- Banksia Woodland (0.339 ha)

Scale 1:1,500 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63487

Client: Main Roads Western Australia

Version: A

Date: 08-Mar-2023

Drawn By: ianandagoda

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**Hodges Drive and Mitchell Freeway  
Perth, WA**

**BLACK COCKATOO HABITAT**

**FIGURE 5**





**Figure 6. TEC/PEC**

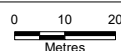




# Legend

- Project area (0.339 ha)
- Priority and Threatened Ecological Communities
- Banksia Woodland TEC/PEC (0.069 ha)
- Highways
- Main road
- Minor road

Scale 1:1,500 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63487

Client: Main Roads Western Australia

Version: A

Date: 09-Mar-2023

Drawn By: ianandagoda

Checked By: AM

**Hodges Drive and Mitchell Freeway  
Perth, WA**

**THREATENED AND PRIORITY  
ECOLOGICAL COMMUNITIES**

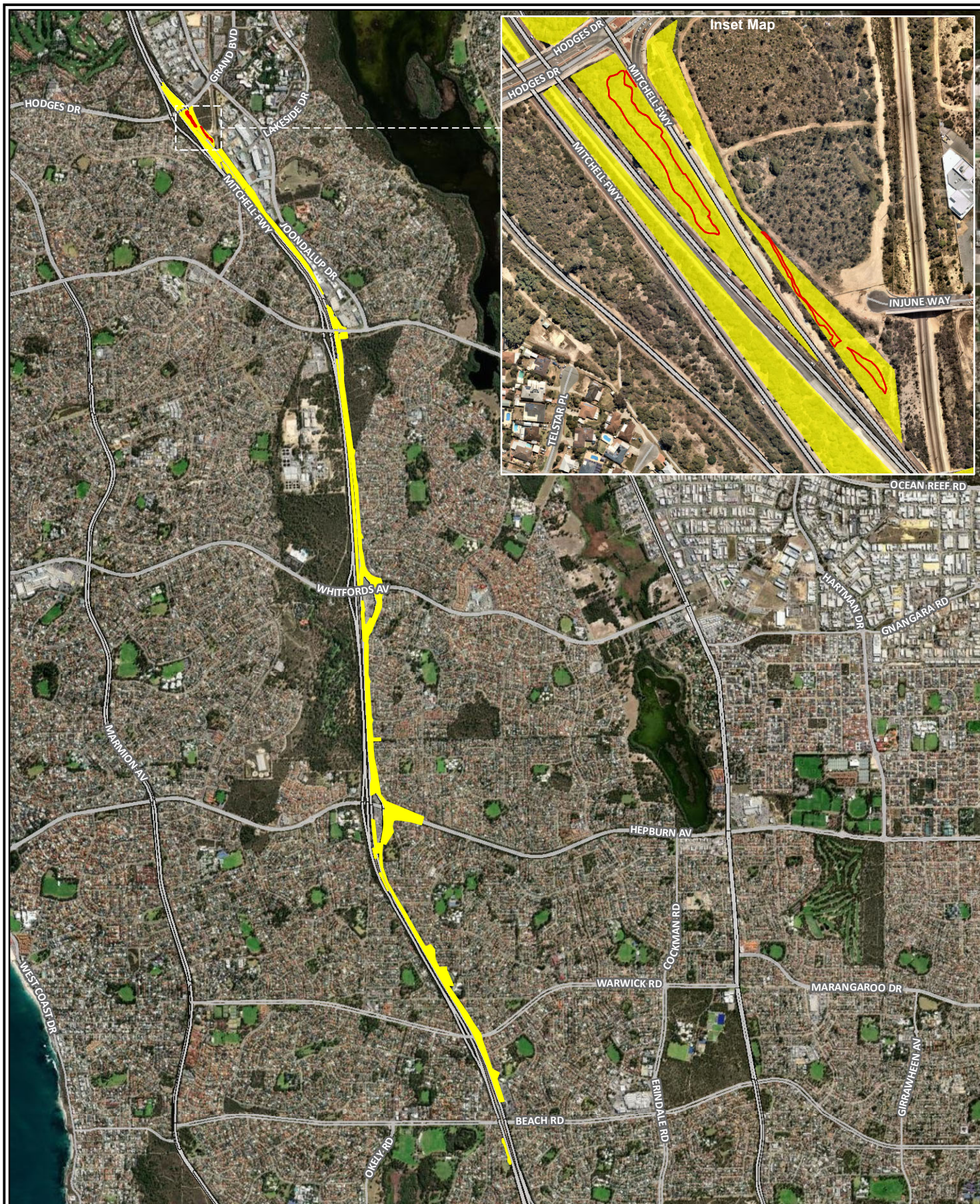
**FIGURE 6**





**Figure 7: Survey Efforts**

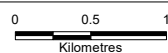




#### Legend

- ▭ Project area (0.339 ha)
- ▭ Astron Survey Area (49.58 ha)
- ▬ Highways Main road
- ▬ Minor road

Scale 1:50,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 63847

Client: Main Roads Western Australia

Version: A

Date: 13-Mar-2023

Drawn By: ianandagoda

Checked By: AM

**Hodges Drive and Mitchell Freeway  
Perth, WA**

**SURVEY EFFORTS**

**FIGURE 7**





## Appendix 2: Vegetation Management Plan

### HODGES DRIVE ON-RAMP

#### 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 Mitchell Freeway Southbound Widening – Hodges Drive On-ramp project (the project).

The project will involve the upgrade a portion of the Hodges Drive on-ramp to accommodate an additional lane as part of the wider Mitchell Freeway Southbound Widening project.

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

#### Action

Appendix 2.1 contains the standard Principal Environmental Management Requirements (PEMRs) that will be utilised for all projects that involve clearing to avoid, mitigate and manage the environmental impacts of the project.

#### Timeframes

Actions shall be undertaken in accordance with those described in the relevant PEMR and the Project Specific Environmental Management Requirements.

#### Responsibilities

It is the responsibility of the Superintendent's Contract Management Team that the requirements are implemented by the Contractor. This shall be done by adhering to the Environmental Measurement and Evaluation Checklist.



**Appendix 2.1: Vegetation Management**

# Principal Environmental Management Requirements (PEMR's)

**Table 2.1.1: Clearing**

## STANDARD MANAGEMENT ACTIONS

STANDARD MANAGEMENT REQUIREMENTS
<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must prepare, implement and maintain processes to ensure that the movement of all vehicles, plant and machinery does not occur outside of the Limits of Vegetation Clearing. This must include all turnaround areas.</li> <li>2. The Contractor must minimise vegetation clearing and the area of disturbance on ground by utilising existing cleared area where possible.</li> <li>3. The contractor must ensure the requirement to protect and avoid all impacts to native vegetation, including priority flora, outside of the pegged Limits of Vegetation Clearing is communicated through site inductions and pre-start meetings, particularly on dates when clearing is undertaken.</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. The contractor must ensure trained environmental personnel are on site to monitor the clearing.</li> <li>2. The Contractor must report any damage to vegetation beyond the Limits of Vegetation Clearing as an Environment Incident.</li> <li>3. The Contractor must ensure Movements are confined to the Limits of Vegetation Clearing during the works</li> <li>4. The Contractor must undertake the clearing in accordance with the Fauna PEMR.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. NIL</li> </ol>

**Table 2.1.2: Dieback**

**STANDARD MANAGEMENT ACTIONS**

<b>STANDARD MANAGEMENT REQUIREMENTS</b>
<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. Contractor's Pre-starts must detail the requirements from the EMP and hygiene sub-plan (HMP), where relevant, dieback management areas and the requirements of each area, maps of infested and uninfested locations, and hygiene requirements</li> <li>2. Where relevant a copy of the EMP/HMP must be onsite. This plan will include maps of management areas and obligatory control actions</li> <li>3. Prescribe where vehicles, machinery and plant are going to be stored/parked during the works.</li> <li>4. Use the Plant, Vehicle and Equipment Hygiene Checklist or equivalent Hygiene form to check that all machinery and vehicles are clean on entry (i.e. free of soil and vegetation).</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. If required, locations of dieback infested or dieback free areas and hygiene control locations marked on site in accordance with EMP/HMP.</li> <li>2. Hygiene works to be undertaken as per the EMP/HMP.</li> <li>3. Restrict movement of machines and other vehicles to the Limits of Vegetation Clearing.</li> <li>4. Ensure no known weed affected soil, mulch, fill or other material is brought into the Limits of Vegetation Clearing.</li> <li>5. Ensure cleared materials are stockpiled or disposed at waste at the locations approved by the Superintendent.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. Use the Plant, Vehicle and Equipment Hygiene Checklist to check that all machinery and vehicles are clean on exit (i.e. free of soil and vegetation).</li> </ol>

**Table 2.1.3: Erosion and Sedimentation**

<p><b>PRE WORKS</b></p> <p>1. The Contractor must develop, implement and maintain processes and procedures to ensure that:</p> <ul style="list-style-type: none"><li>• The Contractor is responsive to and addresses incidents of erosion and sedimentation within and adjacent to the work areas.</li><li>• Prevent water and wind soil erosion within and adjacent to the works areas.</li><li>• Ensure that loose surfaces and recently cleared areas are protected from wind and soil erosion.</li><li>• Minimise exposed soil working surfaces or protect them from stormwater erosion.</li><li>• Ensure material such as gravel, crushed rock and excavated material is stockpiled away from drainage paths and covered to prevent erosion.</li></ul>
<p><b>DURING WORKS</b></p> <p>1. Implement, monitor and adhere to the sedimentation and erosion processes developed to address the requirements in the pre-works.</p>
<p><b>POST WORKS</b></p> <p>1. The Contractor must ensure that disturbed areas are stabilised as soon as is practicable after construction activities are completed.</p>



**Table 2.1.4: Fauna**

<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must ensure that fauna management requirements are communicated to the crew undertaking the clearing works during the induction and pre-start meeting.</li> <li>2. Where active nests, burrows or dens are identified, works must not proceed until the Contractor obtains the Superintendents approval of the management of active nests, burrows or dens adheres to the Superintendents advice.</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must undertake the clearing in the following manner to allow fauna to move out of the clearing area;             <ol style="list-style-type: none"> <li>i. Prior to the clearing activities commencing, use machinery to tap large trees with habitat hollows to encourage any animals evacuate.</li> <li>ii. Undertake the clearing in one direction and towards areas of native vegetation to allow the animals to escape to adjacent habitat.</li> </ol> </li> <li>2. The Contractor must ensure that all onsite personnel undertake visual monitoring and are vigilant to the presence of fauna. Any sightings of fauna, including injury or fatality, must be reported as an Environmental Incident.</li> <li>3. The Contractor must ensure that;             <ol style="list-style-type: none"> <li>i. No pets, traps or firearms are brought into the project area.</li> <li>ii. Fauna are not fed</li> <li>iii. Fauna are not intentionally harmed or killed</li> <li>iv. Fauna that venture into the work area are encouraged to leave in a manner that does not harm the animal or operator (loud noise, slowly approaching in a vehicle etc.)</li> </ol> </li> <li>4. The Contractor must ensure that in the event that sick, injured or orphaned native wildlife are located on the project site, the WILDCARE Helpline ((08) 9474 9055) will be contacted for assistance. The Contractor must maintain records of any animal taken to a wildlife carer.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must provide any records of fauna impact to the Superintendent.</li> </ol>

**Table 2.1.5: Machinery and Vehicle Management**

<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must ensure that all areas associated with the storage, parking, servicing, wash down and refuelling of all vehicles, plant and machinery is located within the Limits of Clearing and approved by the Superintendent.</li> <li>2. The Contractor must ensure that all vehicles, machinery and plant are clean on entry (i.e. free of all soil and vegetation material) and comply with the requirements of 204.B.32.</li> <li>3. The Contractor must ensure that vehicle servicing and refuelling will be undertaken at designated areas approved by the Superintendent.</li> <li>4. The Contractor must ensure that all staff suitably qualified and competent to undertake works, especially refuelling activities.</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must maintain records of checking all vehicles, machinery and plant are clean on entry.</li> </ol>
<p><b>POST WORKS</b></p>

**Table 2.1.6: Mulch and Topsoil Management**

<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must ensure that poor quality topsoil and mulched vegetation does not contaminate the good quality topsoil and vegetation.</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must ensure that all machinery used in the removal of weed-infested topsoil must be cleaned down before and between operations to prevent the introduction and spread of weeds.</li> <li>2. The Contractor must ensure the movement of large equipment over topsoil materials is avoided to minimise compaction.</li> <li>3. The Contractor must ensure that Dieback and weed infected topsoil and mulch vegetation must be handled separately to minimise the risk of spreading dieback and weed species across the site and stockpiles.</li> <li>4. The Contractor must ensure that stockpiling operations must occur in a manner to ensure that the properties of the topsoil are not degraded and the topsoil made unsuitable for use in revegetation.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. NIL</li> </ol>

**Table 2.1.7: Pegging and Flagging**

<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. Pegging must be done in accordance with the requirements detailed in Specification 301.</li> <li>2. The Contractor must clearly communicate, either at the pre-start meeting or equivalent, to the crew undertaking the clearing works, through clear maps and other additional means, what the Pegging represents.</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must peg the Limits of Clearing with PINK flagging tape.</li> <li>2. The Contractor peg/demarcate vegetation proposed to be retained is demarcated by WHITE flagging tape.</li> <li>3. The Contractor must ensure that the vegetation demarcated with PINK and WHITE flagging tape is consistent with the approved clearing areas.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor remove and dispose of appropriately any demarcation, pegging or flagging once project works are completed.</li> </ol>

**Table 2.1.8: Water Drainage**

<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. Use pollution control and containment strategies for project activities in Public Drinking Water Source Areas (PDWSAs) / Underground Water Pollution Control Areas (UWPCAs) and liaise with the DWER where necessary</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. Existing natural drainage paths and channels along the road or the vicinity of the project area will not be unnecessarily blocked or restricted.</li> <li>2. Temporary drainage systems may be installed to carry surface water away from the areas where excavation and foundation construction work is taking place or from any other area where the accumulation of water could cause delay or damage to the work.</li> <li>3. Maintain these drainage systems in proper working order at all times.</li> <li>4. Runoff from disturbed areas must be managed to minimise adverse impacts on surrounding vegetation, watercourses and properties.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. Prior to backfilling the completed pipe work certify that the entire system is flushed clean and tested</li> <li>2. Disturbed areas will be stabilised soon after construction activities are completed.</li> </ol>

3. Culvert and drainage structures will be free of all grass, weeds, silt and debris

**Table 2.1.9: Weed Management**

<p><b>PRE WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must remove or kill any weeds growing in project area that are likely to spread and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.</li> <li>2. The Contractor must develop, implement and maintain procedures to identify and control declared and invasive weed species within the Contract areas, to the satisfaction of the Superintendent.</li> <li>3. The Contractor must prepare a weed control program, for nominated weed species for control and disposal, to the satisfaction of the Superintendent.</li> <li>4. The Contractor must undertake weed management in Stockpiles as directed by the Superintendent.</li> </ol>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. The Contractor must implement the weed control procedures and management plan and record and manage records of its implementation.</li> <li>2. The Contractor must treat nominated weed infestations as many times as necessary to control and eradicate the weed species in accordance with the approved weed control program</li> <li>3. The Contractor must ensure that no known weed, pest or diseased affected soil, mulch, fill or other material is brought into the Site.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. The relevant <a href="https://www.mainroads.wa.gov.au/BuildingRoads/Contracting/Pages/ReportingForms.aspx">Vegetation Maintenance Record Sheets</a> available at: <a href="https://www.mainroads.wa.gov.au/BuildingRoads/Contracting/Pages/ReportingForms.aspx">https://www.mainroads.wa.gov.au/BuildingRoads/Contracting/Pages/ReportingForms.aspx</a> must be completed and sent to the Superintendent.</li> </ol>