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Clearing Assessment Report/ Vegetation Management Plan (VMP) – CPS 818

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Western Australia.*

Brunswick to Roelands Reconstruction and Seal Widening
H009 South Western Highway
South West Region
EOS# 2429

Contents

1	PROPOSAL	5
1.1	Purpose and Justification	5
1.1.1	Main Roads Approach to Road Safety and the Environment	5
1.2	Proposal Scope	5
1.3	Proposal Location	6
1.4	Clearing Details	6
1.5	Alternatives to Native Vegetation Clearing Considered During Proposal Development	13
1.6	Measures to Avoid, Minimise, Reduce and Manage Proposal Clearing Impacts	13
1.7	Approved Policies and Planning Instruments	15
2	SCOPE AND METHODOLOGY ASSESSMENT OF CLEARING	16
2.1	Report Terminology and Sources	16
2.2	Desktop Assessment	16
2.3	Surveys and Assessments	16
3	SURVEY RESULTS	17
3.1	Summary of Flora and Vegetation Surveys	17
4	VEGETATION DETAILS	19
4.1	Proposal Site Vegetation Description	19
4.2	Vegetation Complexes and Representation	20
5	ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES	21
6	VEGETATION MANAGEMENT	37
7	REHABILITATION, REVEGETATION & OFFSETS	38
7.1	Revegetation and Rehabilitation	38
7.2	Offset Proposal	38
8	STAKEHOLDER CONSULTATION	38
9	COMPLIANCE WITH CPS 818	39
10	REFERENCES	41
11	APPENDICES	43
	Appendix 1: CPS 818 condition 8 (e) (iii) Biological Surveys and Field Assessment Executive Summary and Report Conclusions	43
	Appendix 2: Vegetation Management Plan	46
	Appendix 2.1: General vegetation management actions for clearing	48

List of Figures

Figure 1: Proposal Location 7

Figure 2: Study Area 8

Figure 3a: Clearing area 9

List of Tables

Table 1. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Proposal Clearing
Impacts 14

Table 2. Summary of Biological and Targeted Surveys Relevant to the Proposal 17

Table 3. Summary of Vegetation Types within Proposal Area. 19

Table 4. Pre-European Vegetation Representation 20

Table 5. Vegetation Complexes (Heddle/Mattiske) within the Proposal Area 20

Table 6. Summary of Additional Management Actions Required by CPS 818..... 39

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1 PROPOSAL

1.1 Purpose and Justification

Main Roads Western Australia proposes to improve road user safety and reduce the risk of runoff crashes along South Western Highway (H009) between Brunswick and Roelands in the Shire of Harvey (SLK 132.5 to SLK 136.1). The proposal includes widening works and pavement rehabilitation to improve road surface roughness. The proposal is part of Main Roads Western Australia's ongoing efforts to improve road infrastructure and ensure the safety of motorists across the South West Region.

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 1.5.

1.2 Proposal Scope

The proposal will involve the construction of the following:

- Overlay and reconstruction of pavement to provide a 40 year design life (minimum)

- Widening pavement and seal shoulders to provide 12 m pavement, 12 m seal and 0.6 m Wide Centre Line Treatment (WCLT)
- Replacement and extension of culverts at 132.88 SLK and 134.65 SLK
- Reinstatement of driveways as required for private property owners with access to South West Highway.
- Intersection Upgrades (BAR treatments) at:
 - Papps Road (132.55 SLK)
 - Heppington Road (133.09 SLK)
 - Kelly Road (134.81 SLK)
 - Government Road (135.70 SLK)

1.3 Proposal Location

The proposal area is located on South Western Highway between 132.5 to 136.1 SLK in the Shire of Harvey as shown in Figure 3. The central coordinate of the proposal is 115.8319108°E and 33.2766877°S. The Study Area is a 5 km radius of the proposal area as is shown on Figure 2.

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818:

0.36 ha

Areas of Native Vegetation Clearing:

The areas of native vegetation to be cleared are shown in Figure 3a to Figure 3d.

Type of Native Vegetation:

The type of vegetation to be cleared under this proposal is Degraded to Completely Degraded roadside vegetation mapped as (Stream 2022):

- **CcXp:** Open forest of *Corymbia calophylla* and **Eucalyptus camaldulensis* over scattered low shrubland of *Xanthorrhoea preissii* over closed sedgeland of **Watsonia meriana* var. *bulbillifera* and grassland of **Cenchrus clandestinus*
- **MrEr:** Open forest of *Melaleuca raphiophylla* and *Eucalyptus rudis* over shrubland of *Typha orientalis* and grassland of **Cenchrus clandestinus*
- **CcEr:** Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over scattered low shrubland of *Xanthorrhoea preissii* over closed sedgeland of **Watsonia meriana* var. *bulbillifera*
- **EwCc:** Woodland of *Eucalyptus wandoo* and *Corymbia calophylla* over scattered low shrubland of *Xanthorrhoea preissii* and *Hakea lissocarpa* over closed sedgeland of **Watsonia meriana* var. *bulbillifera* and grassland of **Cenchrus clandestinus*.



Figure 1: Proposal Location

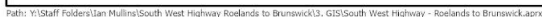


Figure 2: Study Area



Figure 3a: Clearing area



Figure 3b: Clearing area



Figure 3c: Clearing area



Figure 3d: Clearing area

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

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

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

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

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

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

Design or Management Measure	Discussion and Justification
Alignment to one side of existing road	Due to the existing road formation, constraints of the road reserve, and private residential properties to the south, widening on only one side of South West Highway is not possible as a measure to avoid further impacts. In addition, deviation from the existing centreline will significantly increase the impacts to clearing and identified trees.
Alternative alignment located within pasture or degraded areas	Locating the road within pasture areas would require more overall clearing and therefore it was not considered further.
Simplification of design to reduce number of lanes and/or complexity of intersections	Significant traffic volumes, including heavy vehicles, utilise this section of South Western Highway. The widening scope of works cannot be further simplified whilst retaining the necessary safety benefits. If the widening was not undertaken, this would likely result in no improvements in crash density, which is unacceptable to Main Roads on this dangerous stretch of road network. Whilst the scope of widening works cannot be further simplified, culvert extensions required as part of the widening works have been shortened in two locations which has resulted in avoidance of impacts to two potential black cockatoo breeding trees (Marri > 50 cm DBH with no hollows).
Steepen batter slopes	Alternative designs and modelling undertaken by Main Roads for steepening batters did not result in any significant reduction in the clearing required. Given the non-optimal road design and construction and nil to negligible environmental gain, these alternatives are not being pursued. Localised changes to the design have been made in order avoid impacts to a further two potential black cockatoo trees (Marri > 50 cm DBH with no hollows)
Installation of barriers	The installation of safety barriers would not reduce the clearing footprint. Thus, this is not a suitable measure to avoid clearing vegetation.
Installation of kerbing	Kerbing has been designed where possible but will have limited impact on the construction footprint (and thus clearing footprint) due to the offsets required for road safety and drainage requirements.
Use of existing cleared areas for access tracks, construction storage and stockpiling	All stockpile locations and access tracks into the site are already cleared. No additional clearing is required at all for these purposes.
Translocation of grasstrees for BORR	Up to 19 grasstrees (<i>Xanthorrhoea preissii</i>) are proposed to be salvaged during clearing to be used in revegetation efforts as part of State and Commonwealth environmental offset obligations for the Bunbury Outer Ring Road (BORR) project.

1.7 Approved Policies and Planning Instruments

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

In addition to the matters considered in accordance with section 51O of the EP Act, Main Roads has also had regard to the below instruments where relevant.

Other Legislation potentially relevant for assessment of clearing and planning/other matters:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914*
- *Aboriginal Heritage Act 1972* (WA).

Environmental Protection Policies:

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

Other relevant policies and guidance documents:

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (Government of WA, December 2014)
- Procedure: Native vegetation clearing permits (Government of WA, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities.
- EPBC Act referral guidelines for three threatened black cockatoo species (Department of Sustainability, Environment, Water, Populations and Communities, 2012).
- Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan (Department of Parks and Wildlife, 2013)

2 SCOPE AND METHODOLOGY ASSESSMENT OF CLEARING

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

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

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

2.1 Report Terminology and Sources

The following terms are used in this Clearing Report:

- **Native Vegetation Clearing Area** – The maximum amount of native vegetation to be cleared for the proposal that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe movement of machinery during construction.
- **Proposal Area** – The total footprint of the proposal including both cleared and uncleared areas. This is based on the current design. It usually includes a buffer to allow for constructability and the movement of machinery during construction.
- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the proposal is confined to a local area of a 5 km radius.
- **Survey Area** – Area covered by the Biological Survey, which is typically larger than the Proposal Area.

2.2 Desktop Assessment

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

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

2.3 Surveys and Assessments

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

- Detailed and targeted flora and vegetation survey (Stream 2022).

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

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

Consultant & Survey Name	Survey Details
Stream Environmental and Water (November 2021) Flora and Vegetation Survey of South Western Highway: Brunswick to Roelands (132.6 – 136.4 SLK)	Survey Area: The survey area (area which was physically surveyed), is situated along the South Western Highway from 132.6 – 136.4 SLK, approximately 3.8 km in length and 22.6 ha in area (Figure 1). A desktop study area (the 'study area') has been defined for the desktop assessment. The study area includes the survey area with a 10km buffer and extends across the Swan Coastal Plain and onto the Darling Scarp. Type: The objective of the study was to undertake a reconnaissance spring flora and vegetation survey of the survey area in accordance with 'Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment' (EPA 2016). Timing: Fieldwork was completed on 1 November 2021. The survey was timed to coincide with the flowering times of most flora species, in particular significant species identified during the desktop assessment. Survey Results Shapefile TRIM Ref: D22#250605 Document TRIM Ref: D22#250611

3 SURVEY RESULTS

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

3.1 Summary of Flora and Vegetation Surveys

Stream Environment and Water (Stream) were commissioned by the Main Roads Western Australia (Main Roads) to undertake a flora and vegetation survey, incorporating a reconnaissance vegetation and flora survey and targeted flora survey of roadside remnant vegetation along a section of South Western Highway between Brunswick and Roelands.

A reconnaissance flora and vegetation survey and targeted flora survey was completed on 1 November 2021 in accordance with 'Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment' (EPA 2016). The survey was timed to coincide with the flowering times of most flora species, in particular significant species identified during the desktop assessment.

The field survey recorded 51 vascular plant taxa from 21 families. Twenty-five of the 51 taxa were found to be introduced. The most common families by number of taxa were Poaceae (9 taxa), Myrtaceae (9 taxa) and Fabaceae (7 taxa). The dominance of Poaceae was considered by Stream to be a reflection of the number of introduced species consistent with the condition of vegetation and level of disturbance in the road reserve.

No Threatened or Priority flora species were recorded during the field survey. Of the 15 significant species identified by the desktop study as likely or potentially occurring within the survey area; following the field survey, one was considered to have a moderate (possible) likelihood of occurrence, *Rumex drummondii* (P4). All other species were considered unlikely or highly unlikely to occur based on vegetation types and condition within the survey area and survey effort.

One of the 25 introduced flora species, *Asparagus asparagoides* (bridal creeper) is listed as Declared pest under the BAM Act. The roadside vegetation within the survey area was generally in a degraded

to completely degraded condition with a high cover of weeds. *Watsonia meriana* var. *bulbillifera* was particularly dominant and occurred in all vegetation types.

The 26.2 ha survey area contains a total of 6 ha of native vegetation, 3.2 ha of revegetation and 17 ha of cleared areas (including roads). Six vegetation units were identified within the survey area, four native vegetation units in a Degraded/Completely Degraded condition, one unit of Revegetation, one Planted and one unit defined as Cleared.

Vegetation condition across the survey area was Degraded to Completely Degraded, reflective of the isolated nature of the majority of the remnant vegetation and an extended history of disturbance in adjoining areas. The majority of the survey area (20.2 ha of a total of 26.2 ha) was mapped as cleared, or planted and native vegetation condition was not assigned. The remaining 6 ha was mapped as native vegetation and assigned a vegetation condition. The most widespread category of native vegetation condition was Completely Degraded, covering 2.9 ha of the survey area.

The conservation significance of the vegetation units was assessed against the potentially occurring TECs and PECs (identified in the desktop analysis) using diagnostic characteristics (where appropriate). Vegetation unit CcXp was considered by Stream to potentially have some affinities to the TEC *Corymbia calophylla* – *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c). However, the condition of this community was found to be in a Degraded to Completely Degraded condition with an understorey dominated by weeds, predominantly *Watsonia meriana* var. *bulbillifera*. It was considered by Stream likely that the area mapped as CcXp may have historically been representative of the TEC; however, given the poor condition and level of disturbance it is not considered representative of the TEC within the survey area). Given the Degraded to Completely Degraded condition and lack of native understorey species, survey of quadrats and FCT analysis of this community was not considered suitable.

4 VEGETATION DETAILS

4.1 Proposal Site Vegetation Description

Four native vegetation units were identified within the proposal area by Stream (2022) which are described in Table 3 including descriptions, condition within the clearing area and mapped extent in the wider survey area. For a full description of the existing vegetation, refer to the Flora and Vegetation Survey Report by Stream (2022) found at D22#250611 and D22#250605.

Table 3. Summary of Vegetation Types within Proposal Area.

Vegetation Type	Vegetation Condition within Clearing Area	Extent within Proposal Area (ha)	Total Extent Mapped (ha) within Survey Area
<u>Vegetation Unit MrEr</u> Open forest of <i>Melaleuca raphiophylla</i> and <i>Eucalyptus rudis</i> over shrubland of <i>Typha orientalis</i> and grassland of <i>*Cenchrus clandestinus</i>	Degraded	0.06 ha	0.6 ha
<u>Vegetation Unit CcEr</u> Woodland of <i>Corymbia calophylla</i> and <i>Eucalyptus rudis</i> over scattered low shrubland of <i>Xanthorrhoea preissii</i> over closed sedgeland of <i>*Watsonia meriana</i> var. <i>bulbillifer</i> .	Degraded / Completely Degraded	0.18 ha	2.8 ha
<u>Vegetation Unit EwCc</u> Woodland of <i>Eucalyptus wandoo</i> and <i>Corymbia calophylla</i> over scattered low shrubland of <i>Xanthorrhoea preissii</i> and <i>Hakea lissocarpa</i> over closed sedgeland of <i>*Watsonia meriana</i> var. <i>bulbillifera</i> and grassland of <i>*Cenchrus clandestinus</i> .	Degraded	0.11 ha	1.4 ha
<u>Vegetation Unit CcXp</u> Open forest of <i>Corymbia calophylla</i> and <i>*Eucalyptus camaldulensis</i> over scattered low shrubland of <i>Xanthorrhoea preissii</i> over closed sedgeland of <i>*Watsonia meriana</i> var. <i>bulbillifera</i> and grassland of <i>*Cenchrus clandestinus</i> .	Degraded / Completely Degraded	0.01 ha	1.2 ha
<u>Total</u>		0.36 ha	6 ha

Table 4 provides details of the Pre-European Vegetation Association within the proposal area and the remaining extent of this association.

Table 4. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
Veg Assoc No. 968	Statewide	296,877.84	95,048.82	32.02	18.45
	IBRA Bioregion Swan Coastal Plain (SWA)	136,188.20	9,017.32	6.62	1.43
	IBRA Sub-region Perth (SWA02)	136.188.20	9,017.32	6.62	1.43
	Local Government Authority Shire of Harvey	23,465.19	1,260.92	5.37	1.98

4.2 Vegetation Complexes and Representation

The following vegetation complexes within the proposal area are provided in Table 5.

Table 5. Vegetation Complexes (Hedde/Mattiske) within the Proposal Area

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

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

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

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

The proposed clearing is at or may be at variance with one or more of the ten Clearing Principles.

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

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

Assessment

The flora and vegetation survey undertaken by Stream (2022) identified 6 ha of native vegetation within a 26.2 ha survey area. Four native vegetation units were identified in a Degraded/Completely Degraded condition. The area proposed to be cleared is up to 0.36 ha of roadside vegetation, mapped by Stream (2022) as the following vegetation units:

- **MrEr:** Open forest of *Melaleuca raphiophylla* and *Eucalyptus rudis* over shrubland of *Typha orientalis* and grassland of **Cenchrus clandestinus*.
- **CcEr:** Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over scattered low shrubland of *Xanthorrhoea preissii* over closed sedgeland of **Watsonia meriana* var. *bulbillifer*.
- **EwCc:** Woodland of *Eucalyptus wandoo* and *Corymbia calophylla* over scattered low shrubland of *Xanthorrhoea preissii* and *Hakea lissocarpha* over closed sedgeland of **Watsonia meriana* var. *bulbillifera* and grassland of **Cenchrus clandestinus*.
- **CcXp:** Open forest of *Corymbia calophylla* and **Eucalyptus camaldulensis* over scattered low shrubland of *Xanthorrhoea preissii* over closed sedgeland of **Watsonia meriana* var. *bulbillifera* and grassland of **Cenchrus clandestinus*.

Stream (2022) assessed the conservation significance of the vegetation units against the potentially occurring TECs and PECs using diagnostic characteristics (where appropriate). Vegetation unit CcXp was considered by Stream (2022) to potentially have some affinities to the TEC *Corymbia calophylla* – *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c). However, given the Degraded to Completely Degraded condition and level of disturbance, including presence of introduced tree species (*Eucalyptus camaldulensis*) as a component of the overstorey and weed dominated understorey, it was not considered representative of the TEC within the survey area. Vegetation was not considered representative of the remaining TEC's and PEC's identified in the desktop analysis (Stream 2022).

The flora and vegetation survey incorporated targeted survey for Threatened and Priority flora identified in desktop assessment and was undertaken in November to coincide with flowering times of most species including significant species (Stream 2022). The survey recorded 51 vascular plant taxa from 21 families. Twenty-five of the 51 taxa are introduced. The most common families by number of taxa were Poaceae (9 taxa), Myrtaceae (9 taxa) and Fabaceae (7 taxa). Stream (2022) commented that the dominance of Poaceae is a reflection of the number of introduced species consistent with the condition of vegetation and level of disturbance in the road reserve. No Threatened or Priority flora species were recorded during the field survey. Of the 15 significant species identified by the desktop study as likely or potentially

occurring within the survey area, following the field survey one was considered to have a moderate (possible) likelihood of occurring, *Rumex drummondii* (P4). All other species were considered unlikely or highly unlikely to occur based on vegetation types and condition within the survey area.

As discussed further under Principle b, the proposal area provides suitable habitat for the three black cockatoo species, namely:

- Carnaby's Black Cockatoo (*Zanda latirostris*) – Endangered under BC Act 2016 and EPBC Act 1999 – Likely to occur;
- Baudin's Black Cockatoo (*Zanda baudinii*) – Endangered under BC Act 2016 and EPBC Act 1999 – May occur; and
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable under BC Act 2016 and EPBC Act 1999 – May occur.

The clearing area has similar or worse values to native vegetation occurring within the local area. Small patches of intact vegetation remain on the Swan Coastal Plain, with larger intact vegetation areas to the east in the Jarrah Forest. The removal of 0.36 ha of native vegetation does not sever any local or regional ecological linkages with the closest regional linkages located approximately 1.1 km south and 1.3 km north respectively. Given the proposed clearing is adjacent to existing roads and in degraded to completely degraded condition, separated from good or better condition vegetation by disjunct isolated trees and planted vegetation interspersed with cleared agricultural areas, it does not provide a high regional ecological value.

As the clearing area does not comprise a high level of biodiversity, the proposed clearing is not likely to be at variance with this principle.

Methodology

- Flora and Vegetation Survey (Stream 2022)
- DBCA Threatened Fauna Searches shapefiles (Accessed June 2024)
- SPRAT Database (DCCEEW 2024)
- Main Roads GIS Shapefiles
- DCCEEW Protected Matters Search Tool Report
- South West Ecological Linkages (WALGA) (Accessed June 2024)

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

Proposed clearing is at variance to this Principle.

Assessment

The proposal area contains 0.36 ha of roadside vegetation in Degraded to Completely Degraded condition. The fauna habitat types available match the vegetation units mapped as (Stream 2022):

- **MrEr:** Open forest of *Melaleuca raphiophylla* and *Eucalyptus rudis* over shrubland of *Typha orientalis* and grassland of **Cenchrus clandestinus*.
- **CcEr:** Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over scattered low shrubland of *Xanthorrhoea preissii* over closed sedgeland of **Watsonia meriana* var. *bulbillifer*.
- **EwCc:** Woodland of *Eucalyptus wandoo* and *Corymbia calophylla* over scattered low shrubland of *Xanthorrhoea preissii* and *Hakea lissocarpha* over closed sedgeland of **Watsonia meriana* var. *bulbillifera* and grassland of **Cenchrus clandestinus*.
- **CcXp:** Open forest of *Corymbia calophylla* and **Eucalyptus camaldulensis* over scattered low shrubland of *Xanthorrhoea preissii* over closed sedgeland of **Watsonia meriana* var. *bulbillifera* and grassland of **Cenchrus clandestinus*.

According to DBCA record data there are 11 species of Threatened and priority fauna with known records within the 5 km study area including:

- Western Ringtail Possum (*Pseudocheirus occidentalis*) – Critically Endangered under BC Act 2016 and EPBC Act 1999
- Carnaby's Black Cockatoo (*Zanda latirostris*) – Endangered under BC Act 2016 and EPBC Act 1999
- Baudin's Black Cockatoo (*Zanda baudinii*) – Endangered under BC Act 2016 and EPBC Act 1999
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable under BC Act 2016 and EPBC Act 1999
- Numbat, Walpurti (*Myrmecobius fasciatus*) – Endangered under BC Act 2016 and EPBC Act 1999
- Carter's Freshwater Mussel (*Westralunio carteri*) – Vulnerable under BC Act 2016 and EPBC Act 1999
- Chuditch, Western Quoll (*Dasyurus geoffroii*) – Vulnerable under BC Act 2016 and EPBC Act 1999
- Swan Coastal Plain Shield-backed Trapdoor Spider (*Idiosoma sigillatum*) – Priority 3 (DBCA Listing)
- Pouched lamprey (*Geotria australis*) – Priority 3 (DBCA Listing)
- Quenda (*Isodon fusciventer*) – Priority 4 (DBCA Listing)
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Conservation Dependent (DBCA Listing)

Mammals

The proposal area is outside of the WRP Swan Coastal Plain Management Zone (DPaW 2017) and vegetation within the proposal area is not mapped as suitable habitat by DBCA (DBCA-049). According to the DBCA Threatened Fauna Database, the species is known from five records within the 5 km Study Area, the nearest of which is over 830 m south of the proposal area. This record as well as others further south are represented by road kills along South Western Highway and Coalfields Highway. The vegetation within the proposal area is represented as road reserve passing adjacent to cleared land and although contains potentially suitable habitat, is isolated habitat due to roads and agriculture and does not contain Peppermint trees commonly associated with the species. Native vegetation within the proposal area lacks continuity with any more significant areas of habitat and thus reduces its likelihood to represent linkage habitat. Furthermore, the proposal area lacks any Peppermint trees and is therefore lacking as core habitat. In addition, although WRP have been recorded further to the south as road kill, a lack of records within the proposal area and further north, as well as the fragmented and degraded nature of the vegetation in a largely agricultural context, would suggest it is unlikely the proposal area would be used by the species as secondary or linkage habitat.

The vegetation within the proposal area is not considered core habitat and unlikely to be used as secondary habitat and therefore is not considered to be habitat critical to WRP survival according to the WRP (*Pseudocheirus occidentalis*) Recovery Plan. In addition, no WRP individuals have been recorded within or adjacent to the proposal area and clearing will not result in fragmentation of vegetation or habitat critical for WRP. It is not considered likely that the removal of 0.36 ha of native vegetation will have a significant direct or indirect impact on any populations of WRP or more broadly, the persistence of the species. Fauna will be managed through the Construction Environmental Management Plan with specific measures including a suitably qualified fauna specialist present on site during all clearing activities to reduce the risk of potential direct impacts to conservation significant fauna.

Quenda and Chuditch and Numbat records within the study area are limited to single recordings made in the 1970's. The historic Chuditch record is located over 1 km north of the proposal area along the Brunswick River whilst the Quenda record is approximately 5 km to the north east within remnant vegetation. The Numbat record is over 4.3 km to the south of the proposal area. Quenda inhabit scrubby, often swampy, vegetation with dense cover up to 1 m high and often feed in adjacent forest and woodland that is burnt on a regular basis. Chuditch habitat is largely restricted to the southwest forests of WA and generally requires suitable dens or habitat logs to be present. Numbats need large areas of natural woodland vegetation because of their relatively large home ranges and limited food resources. Given the paucity of records, lack of ideal habitat for all species as well as the small, isolated and degraded vegetation in the proposal area, the presence of these species and subsequent impacts to habitat or individuals is considered unlikely.

There are six records of the South-western Brush-tailed Phascogale within the study area, the nearest of which is located approximately 1.2 km to the west of the proposal area. The species prefers dry sclerophyll forests and open woodlands that contain hollow bearing trees but sparse ground cover. There are no hollow bearing trees within the proposal area however, given the location is within its documented range, numerous records within the study area and habitat within the proposal area that appears to be suitable, the presence of the species cannot be ruled out. It is not considered likely that the removal of 0.36 ha of native vegetation will have a significant direct or indirect impact on any populations of South-western Brush-tailed Phascogale or more broadly, the persistence of the species. Fauna will be managed through the Construction Environmental Management Plan with specific measures including a suitably qualified fauna specialist present on site during all clearing activities to reduce the risk of potential direct impacts to conservation significant fauna.

Birds

The proposal area is within the predicted breeding range of Baudin's Black Cockatoo, the known range (including breeding range) for Carnaby's Black Cockatoo and the modelled distribution for the Forest Red-tailed Black Cockatoo. No evidence (feeding evidence or sightings) of any of the three black cockatoo species was recorded during multiple site visits by the Main Roads Environment Officer during December 2023 and February and May 2024. This is supported by the DBCA Threatened Fauna Database with no previous records of black cockatoos within the proposal area. A targeted assessment identified ten DBH trees within the proposal area, none of which had hollows. Of these, six DBH trees (no hollows) will require removal, with the remaining four DBH trees being retained due to intentional changes in design to avoid impacts (culvert shortening and localised changes to the design footprint).

Main Roads have assessed potential foraging habitat based on the vegetation types recorded by Stream (2022) as well as targeted assessment, and using the scoring tool developed by Bamford Consulting Ecologists (2020). Foraging species within the vegetation types and proposed clearing areas is largely limited to sporadic occurrences of Marri (> 10% projected foliage cover) over predominantly weeds with occasional occurrences of *Hakea lissocarpa* (> 20% projected foliage cover) within the EwCC vegetation type only, which is represented by 0.11 ha of proposed clearing. The assessment determined that the proposal area represents low to moderate quality foraging habitat for all three black cockatoo species largely given the degraded nature of the vegetation and limited foraging species. The 0.36 ha of vegetation to be cleared also represents just 0.0023% of the 15,677.8 ha of native vegetation within 12 km

(DPIRD-005) which is likely to be of equal or better quality foraging, roosting and breeding habitat for black cockatoos. There are no known black cockatoo breeding sites within 20 km of the proposal area (DBCA-063); however, there are numerous confirmed roosting sites for Carnaby's black cockatoo within 12 km of the proposal area, the two nearest of which are approximately 700 m and 800 m to the east of the proposal area (DBCA-064). The application of the Bamford (2020) scoring tool indicated a score of 4/10 for Carnaby's Black Cockatoo largely reflecting the presence of known roosting areas rather than the quality of the vegetation. For Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo the score was 3/10 with the lower score a reflection of there being no records within 5 km and few records within 12 km.

The overall proposed native vegetation clearing of 0.36 ha will result in the removal of vegetation containing black cockatoo habitat as outlined below:

- Up to 0.36 ha of native vegetation within the proposal area assessed as low to moderate quality foraging habitat (Figure 3a and 3d).
- Six trees with DBH > 500 mm, which is potential breeding habitat (Figure 3a and 3d).
- No trees will be removed that are known roosting sites.
- No trees will be removed that contain hollows.
- No vegetation within 0.74 km of a known black cockatoo roosting site (DBCA-064).
- No vegetation within 37 km of a known black cockatoo nesting site (DBCA-063).

These impacts are largely considered to be relevant to Carnaby's black cockatoo with the presence of Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo in the local area not supported by publicly available data. It is considered that within a local and regional context the removal of up to 0.36 ha of low to moderate quality foraging habitat for black cockatoos is unlikely to have a significant impact to the persistence of these species. The 0.36 ha of vegetation to be cleared also represents just 0.0023% of the 15,677.8 ha of native vegetation within 12 km (DPIRD-005) which is likely to be of equal or better quality foraging, roosting and breeding habitat for black cockatoos. The removal of up to 0.36 ha of low to moderate quality foraging habitat, over a linear road length of 4 km, adjacent to a busy road and in Degraded to Completely Degraded condition compared to equal or better quality native vegetation in the study area, is not likely to have a significant indirect impact on any populations of black cockatoos or more broadly, the persistence of these species. Given there is only 0.36 ha of low to moderate quality foraging habitat, no known roosts and no suitable breeding trees that are proposed for removal within the proposal area, project activities are also unlikely to have a significant direct impact on any individuals.

Invertebrates

The Swan Coastal Plain Shield-backed Trapdoor Spider is a poorly known species of mygalomorph spider which occurs from Dalyellup north to Ledge Point, with the eastern limit of its range along the sandy foothills of the Darling Escarpment from Boyanup to Gingin (Rix et al. 2018). One record from 1999 occurs within the study area approximately 1.1 km to the north west of the proposal area adjacent to riparian vegetation associated with the Brunswick River. Burrows of the Shield-backed Trapdoor Spider usually occur in Banksia woodland and heathland on sandy soils (Rix et al. 2018) which does not occur within the proposal area. Given the lack of Banksia woodland, paucity of records, as well as the small, isolated and degraded vegetation in the proposal area, the presence of this species and subsequent impacts to its habitat are considered unlikely.

Aquatic species

The proposed clearing area contains no habitat for aquatic species (Carters freshwater mussel and Pouched lamprey).

Clearing associated with the proposal is unlikely to result in the long term decline or significantly reduce the available habitat for any conservation significant species. The proposed clearing is adjacent to an existing highway and the clearing will not result in the fragmentation of an existing fauna population, nor interrupt any breeding cycles. .

The proposed clearing is at variance with this Principle, as the application area contains 0.36 ha of native vegetation assessed as low to moderate quality foraging habitat for threatened black cockatoos.

Methodology

- Flora and Vegetation Survey (Stream 2022)
- DBCA Threatened Fauna Searches shapefiles (Accessed June 2024)
- Detailed and Targeted Flora and Vegetation Survey (Stream 2022)
- Western Ringtail Possum Habitat Suitability (DBCA-049)
- WRP Recovery Plan (DPaW 2017)
- SPRAT Database (DCCEEW 2024)
- DCCEEW Protected Matters Search Tool Report
- DBCA website
- Main Roads GIS Shapefiles
- Black Cockatoo foraging scoring tool (Bamford Consulting Ecologists 2020)
- Black Cockatoo Breeding Sites - Buffered (DBCA-063)
- Black Cockatoo Roosting Sites - Buffered (DBCA-064)

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

Proposal is not likely to be at variance to this Principle.

Assessment

As part of a desktop assessment, three Threatened flora species were considered to have a moderate (possible) likelihood of occurrence including:

- *Diuris drummondii* (Tall Donkey Orchid) – Endangered (BC Act) and Vulnerable (EPBC Act)
- *Diuris micrantha* (Dwarf Bee-orchid) – Vulnerable (BC Act and EPBC Act)
- *Eleocharis keigheryi* (Keighery's Eleocharis) – Vulnerable (BC Act and EPBC Act)

The flora and vegetation survey incorporated targeted survey for Threatened flora identified in desktop assessment and was undertaken in November to coincide with flowering times of most species including significant species (Stream 2022). No Threatened flora species were recorded during the field survey with all three Threatened species listed above considered unlikely to occur within the survey area or proposal area following field survey (Stream 2022).

Based on the above, the clearing of native vegetation is not likely to be at variance with this Clearing Principle.

Methodology

- Flora and Vegetation Survey (Stream 2022)
- EPA (2016)
- DBCA Threatened Flora Searches shapefiles (Accessed June 2024)

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

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

Assessment

As part of a desktop assessment, two State listed TEC's were considered to potentially occur within the proposal area including:

- *Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. (1994) – Critically Endangered (BC Act) and Endangered (EPBC Act); and
- Dense shrublands on clay flats (floristic community type 9 as originally described in Gibson et al. (1994)) – Vulnerable (BC Act) and Critically Endangered (EPBC Act).

In addition to the above, several Commonwealth listed TEC's and State Listed PEC's were also identified as potentially occurring within the proposal area based on desktop analysis including:

- Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain – Critically Endangered (EPBC Act) and Priority 3 PEC (BC Act);
- Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region – Endangered (EPBC Act) and Priority 3 PEC (BC Act)
- Low lying *Banksia attenuata* woodlands or shrublands – Endangered (EPBC Act) and Priority 3 (BC Act)
- Subtropical and Temperate Coastal Saltmarsh – Vulnerable (EPBC Act)
- Southern *Eucalyptus gomphocephala*- *Agonis flexuosa* woodland – Priority 3 PEC (BC Act)

The survey undertaken by Stream (2022) identified 6 ha of native vegetation within a 26.2 ha survey area. Four native vegetation units were identified in a Degraded/Completely Degraded condition. Stream (2022) assessed the conservation significance of the vegetation units against the potentially occurring TECs and PECs (identified above) using diagnostic characteristics (where appropriate). Vegetation unit CcXp was considered by Stream (2022) to potentially have some affinities to the TEC *Corymbia calophylla* – *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c). However, given the Degraded to Completely Degraded condition and level of disturbance, including presence of introduced tree species (*Eucalyptus camaldulensis*) as a component of the overstorey and weed dominated understorey, it was not considered representative of the TEC within the survey area. Vegetation was not considered representative of the remaining TEC's and PEC's identified in the desktop analysis (Stream 2022).

Based on the above, the clearing of native vegetation is not likely to be at variance with this Clearing Principle.

Methodology

- Detailed and targeted flora and vegetation survey (Stream 2022).
- DBCA Threatened Ecological Community database search (Accessed June 2024)
- *Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain conservation listing advice (DoEE 2017)
- EPA (2016)

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

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

Assessment

The area proposed to be cleared is up to 0.36 ha of degraded to completely degraded roadside vegetation within an 8.02 ha proposal area, mapped as (Stream 2022):

- **MrEr:** Open forest of *Melaleuca raphiophylla* and *Eucalyptus rudis* over shrubland of *Typha orientalis* and grassland of **Cenchrus clandestinus*.
- **CcEr:** Woodland of *Corymbia calophylla* and *Eucalyptus rudis* over scattered low shrubland of *Xanthorrhoea preissii* over closed sedgeland of **Watsonia meriana* var. *bulbillifer*.
- **EwCc:** Woodland of *Eucalyptus wandoo* and *Corymbia calophylla* over scattered low shrubland of *Xanthorrhoea preissii* and *Hakea lissocarpa* over closed sedgeland of **Watsonia meriana* var. *bulbillifera* and grassland of **Cenchrus clandestinus*.
- **CcXp:** Open forest of *Corymbia calophylla* and **Eucalyptus camaldulensis* over scattered low shrubland of *Xanthorrhoea preissii* over closed sedgeland of **Watsonia meriana* var. *bulbillifera* and grassland of **Cenchrus clandestinus*.

Stream (2022) described the vegetation units as being generally consistent with the broad vegetation expected based on the Guildford vegetation complex and geomorphological units occurring within the survey area. Pre-European Vegetation and Vegetation Complex (Havel and Mattiske, 2000) mapping within the proposal area is as below.

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

Pre-European Association(s)	Vegetation	Clearing Description	Vegetation Condition	Comments
Vegetation Association 968 described as a Medium woodland; jarrah, marri & wandoo (Government of Western Australia, 2017)		Clearing of up to 0.36 ha for road widening at South Western Highway	Degraded to Completely degraded condition (EPA 2016)	Vegetation description and condition determined from Flora and Vegetation Survey (Stream 2022).

Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 968	Statewide	296,877.84	95,048.82	32.02	18.45
	IBRA Bioregion Swan Coastal Plain (SWA)	136,188.20	9,017.32	6.62	1.43
	IBRA Sub-region Perth (SWA02)	136,188.20	9,017.32	6.62	1.43
	Local Government Authority Shire of Harvey	23,465.19	1,260.92	5.37	1.98

Vegetation Complexes (Hedde/Mattiske) within the Project Area

Hedde/Mattiske Complex	Veg	Pre-European Extent (ha)	2013 Vegetation Extent	% Remaining
Guildford Complex		90,513.13	4,607.91	5.09

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

The proposal area is located on the Swan Coastal Plain, an area that has been cleared primarily for agriculture and some urban development. There is approximately 5.09% of the Guildford complex remaining and 1.98% of Vegetation Association 968 within DBCA Managed Land within the Shire of Harvey. Statewide there is 32.02% of Vegetation Association 968 remaining, 18.45% of which is located in the DBCA reserve system.

The percentage of vegetation remaining does fall below the regional threshold of 10% (in a constrained and fragmented agricultural area) however it is not considered significant as a remnant due to:

- The small area proposed to be cleared in the road reserve over a linear road length of 4 km, adjacent to a busy road.
- The degraded to completely degraded nature of the vegetation, consisting of trees over a ground cover strata dominated by weed species to the exclusion of native species, significantly changing the structure of the vegetation (See plates 1 and 2 below).
- The lack of biological diversity and lack of connection with other larger contingent patches of vegetation and or mapped ecological linkages.
- Does not contain rare or priority flora, or threatened/priority ecological communities.
- Does not contain breeding or roosting habitat for threatened black cockatoos.

To provide context to the nature and scale of the likely impact and to illustrate the degraded nature of the vegetation, Google street view images of the proposed vegetation to be impacted are provided below with an overlay of the proposed clearing area shapefile as a pink polyline. Vegetation ranged from degraded to completely degraded condition with a high cover of weeds. *Watsonia meriana* var. *bulbillifera* was particularly dominant and occurred in all vegetation types.

Northern Section



Kelly Road intersection



Given the above, the vegetation within the proposal area is not considered significant as a remnant of in an area that has been extensively cleared and therefore the proposed works are not likely to be at variance with this Principle.

Methodology

- Detailed and Targeted Flora and Vegetation Survey (Stream, 2022)
- Statewide Vegetation Statistics (Government of Western Australia 2018)
- EPA (2016)
- Aerial photography
- South West Ecological Linkages (WALGA) (Accessed June 2024)

(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 likely to be at variance to this Principle.

Assessment

The proposed works intercept an agricultural drain which eventually runs into Eluira Gully, a major tributary to the Brunswick River some 900 m to the west of the proposal area. The works will require the removal of approximately 0.01 ha of Completely Degraded roadside vegetation to facilitate road widening and the extension of a culvert (SLK 135.6). The vegetation in question includes a small isolated and degraded patch of *Melaleuca raphiophylla* growing in the roadside drain and culvert. Although *Melaleuca raphiophylla* are often associated with watercourses and wetland areas, the vegetation proposed for removal is associated with a road culvert which transmits surface water sheet flow from adjacent farmland. In addition, none of the vegetation proposed for removal is growing on the bed and banks of a watercourse but rather is growing in the roadside drain and is therefore not considered riparian vegetation.

The proposed works do not intercept any wetland features with the nearest wetland being multiple use palusplain wetland mapped over agricultural land some 150 m to the west of the proposal area.

Given the above, the proposed works are not likely to be at variance with this Principle.

Methodology

- Detailed and Targeted Flora and Vegetation Survey (Stream, 2022)
- Aerial photography
- Government GIS shapefiles:
 - Geomorphic Wetlands South West (DBCA-040) (Accessed June 2024)
 - Ramsar Wetlands (DBCA-010) (Accessed June 2024)
 - Important Wetlands (DBCA-045) (Accessed June 2024)
 - Hydrography Linear (DWER-031) (Accessed June 2024)
 - RIWI Act Rivers (DWER-036) (Accessed June 2024)

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

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

Assessment

The soil within the proposal area is mapped as the Pinjarra P1b phase, Pinjarra P3 phase and Forrestfield F2b phase (DPIRD-027). Pinjarra phase soils are described as poorly draining; however, the proposal area is not mapped within an area or soils which are at risk of flooding (DPIRD-007) or water erosion (DPIRD-013). Given the minor removal of up to 0.36 ha of vegetation over a linear road length of 4 km it is therefore unlikely that the works will cause waterlogging or water erosion. Whilst the proposed clearing will increase the risk of wind erosion, the scale of this is very small and temporary due to the sealing of the widened road and compaction and stabilisation of the shoulders and backslope. Therefore, the overall unvegetated areas present within the road reserve will decrease following implementation of the proposal, therefore reducing the risk of wind erosion.

According to risk mapping the proposal area is within a moderate to low risk area for acid sulfate soil occurrence (DWER-055). Works do not require any dewatering, nor excavations below the water table. The removal of 0.36 ha of native vegetation will not result in acidification of the proposal area or surrounding local environment.

During the flora and vegetation survey (Stream, 2022) the Declared Pest plants **Asparagus asparagoides* (Bridal Creeper) was recorded outside of the proposal area. The species is in the category s22(2) (unassigned declared pests) under the *Biosecurity and Agriculture Management Act 2007*. Bridal Creeper is also recognised as a Weed of National Environmental Significance (WONS). Given the proposal area is located in a highly degraded and fragmented environment and is not adjacent to threatened communities or patches of vegetation in Good-or-better condition, the risk that these records of bridal creeper which are outside of the proposal area may cause degradation of the environment is low. Standard management actions will be included to manage weeds and to ensure they do not spread and result in environmental harm to adjacent areas of native vegetation.

The clearing will occur in a previously disturbed, roadside environment and includes the reinstatement of roadside drainage. The proposed clearing is very minor in scale and located in a highly modified environment and is therefore not likely to cause appreciable land degradation. Given this the proposed clearing of native vegetation is not likely to be at variance with this Clearing Principle.

Methodology

- Flora and Vegetation Survey (Stream 2022)
- Government GIS Shapefiles:
 - Soil Landscape Mapping (DPIRD-027) (Accessed June 2024)
 - Flooding Risk (DPIRD-007) (Accessed June 2024)
 - Water Erosion Risk (DPIRD-013) (Accessed June 2024)
 - Acid Sulfate Soil Risk Map (DWER-055) (Accessed June 2024)

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

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

Assessment

A search of ArcGIS shapefiles indicates no nature reserves or conservation areas are located within 100 m of the proposal area. The nearest DBCA managed lands are approximately 8 km to the south east of the proposal area associated with Wellington National Park.

The removal of vegetation within the proposal area will impact on nature reserves or conservation areas as;

- only 0.36 ha of native vegetation is proposed for removal;
- the nearest parcel of DBCA Managed Land is approximately 8 km away and is therefore unlikely to be impacted in any way;
- standard hygiene measures and construction timing will manage the potential introduction and spread of weeds and dieback;
- the proposal will tie into existing roadside drainage; and
- no ecological linkages, either locally or regionally will be impacted by the proposed works.

With the above assessment and management, it is not likely that works will have any impacts to any conservation area. Therefore, the proposed clearing of native vegetation is not likely to be at variance with this Clearing Principle.

Methodology

- DBCA Legislated Lands and Waters & Lands of Interest (Accessed June 2024)
- South West Ecological Linkages (WALGA) (Accessed June 2024)
- Aerial photography

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

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

Assessment

The proposal area is not within a Public Drinking Water Supply Catchment or proclaimed groundwater area, however, is within a proclaimed surface water area (Collie River Irrigation District). The proposed works intercepts an agricultural drain which eventually runs into Eluira Gully, a major tributary to the Brunswick River some 900 m to the west of the proposal area; however, none of the vegetation proposed for removal under this application is growing on the bed and banks of the watercourse. The works require the removal of up to 0.01 ha of roadside vegetation in Completely Degraded condition.

Surface water quality is unlikely to be negatively impacted by the removal of 0.01 ha of vegetation which is not riparian vegetation. No water abstraction is proposed as part of the works. In addition, replacement of the culvert headwall and outlet to the west of the existing road will improve drainage from the adjacent flood plain whilst maintaining existing surface water flows. Standard environmental management will be incorporated into the CEMP to further prevent the risk of sedimentation or water quality changes.

The removal of up to 0.36 ha of native vegetation is unlikely to impact groundwater levels or quality. Furthermore, the works will not involve dewatering or excavation below the water table.

The proposed clearing of native vegetation is not likely to be at variance with this clearing principle.

Methodology

- Detailed and Targeted Flora and Vegetation Survey (Stream, 2022)
- Aerial photography
- Government GIS shapefiles:
 - RIWI Act Surface Water and Irrigation Districts (DWER-037) (Accessed June 2024)
 - RIWI Act Groundwater Areas (DWER-034) (Accessed June 2024)
 - Public Drinking Water Source Areas (DWER-033) (Accessed June 2024)
 - CAWSA Part 2A Clearing Control Catchments (DWER-004) (Accessed June 2024)
 - Hydrography Linear (DWER-031) (Accessed June 2024)

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

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

Assessment

The works require the removal of up to 0.36 ha of roadside vegetation within the 8.02 ha proposal area. The clearing will occur in a previously disturbed environment to facilitate the widening of South West Highway. The additional area of sealed road is unlikely to make a notable difference to the quantity of runoff entering the road drainage system. Roadside drainage will be reinstated adjacent to the newly constructed acceleration lane, tying into the existing roadside drainage.

The soil within the proposal area is mapped as the Pinjarra P1b phase, Pinjarra P3 phase and Forrestfield F2b phase (DPIRD-027). Pinjarra phase soils are described as poorly draining however the proposal area is not mapped within an area or soils which are at risk of flooding (DPIRD-007). Given the minor removal of up to 0.36 ha of vegetation over a linear road length of 4 km it is therefore unlikely that the works will exacerbate the incidence or intensity of flooding.

The clearing of native vegetation is not likely to be at variance with this Clearing Principle.

Methodology

- Flora and Vegetation Survey (Stream 2022)
- Government GIS Shapefiles:
 - Soil Landscape Mapping (DPIRD-027) (Accessed June 2024)
 - Flooding Risk (DPIRD-007) (Accessed June 2024)

6 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum. A Vegetation Management Plan (VMP) has been developed to manage and minimise vegetation clearing for the proposal (refer to Appendix 2).

7 REHABILITATION, REVEGETATION & OFFSETS

7.1 Revegetation and Rehabilitation

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

7.2 Offset Proposal

In accordance with CPS 818/17 condition 11(a), to offset the residual impacts from clearing 0.36 ha of low to moderate quality foraging habitat for threatened black cockatoo species, Main Roads has developed an offset proposal in accordance the current WA environmental offsets Policy.

The proposed offset consists of a financial contribution. Main Roads will work with DWER on the finalisation of the offset proposal.

8 STAKEHOLDER CONSULTATION

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

9 COMPLIANCE WITH CPS 818

Table 6 summarises what further pre-clearing impact assessment 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
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.	Yes	1. Clearing Report to be published on website and submissions sought for 21 days. 2. Submissions invited from relevant parties, including the LGA, the owner or occupier of the land and other stakeholders in accordance with Condition 8 of CPS 818. 3. VMP has been completed, refer to Appendix 2. 4. An offset proposal for approval by DWER has been prepared. 5. Summary of submissions and a statement addressing each of those submissions to be published on website.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.	No	No further action required.
3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality and (j) the incidence of flooding.	No	No further action required.
4. The Proposal involves clearing for temporary works (as defined by CPS 818).	No	No further action required.
5a. Proposal is within a Region that: • has rainfall greater than 400mm; and, • is South of the 26th parallel; and, • works are necessary in 'Other than dry conditions'; and, • works have potential for uninfested areas to be impacted.	No	Standard Vehicle and Plant management actions from Annexure 204B (TABLE 204B.9.1), <u>Hygiene Checklists</u> and <u>Vehicle, Plant and Machinery Hygiene Register Template</u> will be applied
5b. Do the proposed works require clearing within or adjacent to DBCA managed lands in non-dry conditions?	No	No further action required.

Impact of Clearing	Yes/No or NA	Further Action Required
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback.	NA	No further action required.
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	No	No further action required.
8. Did an environmental specialist conduct the survey or field assessment?	Yes	The Environmental Specialist undertaking the biological assessments was suitably qualified and had more than three years' experience.
9. Did an environmental specialist prepare the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal?	Yes	The Environmental Specialist preparing the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset proposal was suitably qualified and had more than three years' experience.

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11 APPENDICES

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

Flora and Vegetation Surveys

Executive Summary (relevant sections summarised)

1.1 Project Background

Stream Environment and Water Pty Ltd (Stream Environment and Water) were commissioned by the Main Roads Western Australia (Main Roads) to undertake a flora and vegetation survey, incorporating a reconnaissance vegetation and flora survey and targeted flora survey of roadside remnant vegetation along a section of South Western Highway between Brunswick and Roelands. The results of the survey will inform the preparation of a clearing permit (and potentially other environmental approvals) in association with proposed road widening and associated works.

1.3 Scope and Objectives of the Study

The objective of the study was to undertake a reconnaissance spring flora and vegetation survey of the survey area in accordance with 'Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment' (EPA 2016).

2.2 Field Survey

2.2.1 Personnel, timing and weather conditions A reconnaissance flora and vegetation survey and targeted flora survey was completed by Stream Environment and Water on 1 November 2021. The survey was timed to coincide with the flowering times of most flora species, in particular significant species identified during the desktop assessment.

4.1 Flora

4.1.1 Flora Diversity

The field survey recorded 51 vascular plant taxa from 21 families. Twenty-five of the 51 taxa are introduced. The most common families by number of taxa were Poaceae (9 taxa), Myrtaceae (9 taxa) and Fabaceae (7 taxa). The dominance of Poaceae is a reflection of the number of introduced species consistent with the condition of vegetation and level of disturbance in the road reserve.

4.1.2 Significant Flora

No Threatened or Priority flora species were recorded during the field survey. Of the 15 significant species identified as likely or potentially occurring within the survey area, following the field survey, one was considered to have a moderate (possible) likelihood of occurring, *Rumex drummondii* (P4). All other species were considered unlikely or highly unlikely to occur based on vegetation types and condition within the survey area and survey effort.

4.1.3 Weeds

One of the 25 introduced flora species, *Asparagus asparagoides* (bridal creeper) is listed as Declared pest under the BAM Act. The roadside vegetation within the survey area was generally in a degraded to completely degraded condition with a high cover of weeds. *Watsonia meriana* var. *bulbillifera* was particularly dominant and occurred in all vegetation types.

4.2.1 Vegetation Units

The 26.2 ha survey area contains a total of 6 ha of native vegetation, 3.2 ha of revegetation and 17 ha of cleared areas (including roads). Six vegetation units were identified within the survey area, four

native vegetation units in a Degraded/Completely Degraded condition, one unit of Revegetation, one Planted and one unit defined as Cleared. Community descriptions are based on the results of relevés surveyed in each (for native vegetation units), supplemented by opportunistic recording of additional species during targeted searches.

4.2.2 Vegetation Condition

Vegetation condition across the survey area was Degraded to Completely Degraded, reflective of the isolated nature of the majority of the remnant vegetation and an extended history of disturbance in adjoining areas. The majority of the survey area (20.2 ha of a total of 26.2 ha) was mapped as cleared, or planted and native vegetation condition was not assigned. The remaining 6 ha was mapped as native vegetation and assigned a vegetation condition. The most widespread category of native vegetation condition was Completely Degraded, covering 2.9 ha of the survey area.

4.2.3 Significance of Vegetation Units

The conservation significance of the vegetation units was assessed against the potentially occurring TECs and PECs (identified in the desktop analysis) using diagnostic characteristics (where appropriate). Vegetation unit CcXp potentially has some affinities to the TEC *Corymbia calophylla* – *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c). However, the condition of this community was found to be in a Degraded to Completely Degraded condition with an understorey dominated by weeds, predominantly *Watsonia meriana* var. *bulbillifera*. It is considered likely that the area mapped as CcXp may have historically been representative of the TEC, however, given the poor condition and level of disturbance it is not considered representative of the TEC within the survey area). Given the Degraded to Completely Degraded condition and lack of native understorey species, survey of quadrats and FCT analysis of this community was not considered suitable.

Conclusions

The flora and vegetation survey of South Western Highway between Brunswick and Roelands found that native vegetation had been cleared in just over half of the survey area and where native vegetation had been retained and that the condition of remaining native vegetation was Degraded or Completely Degraded.

The vegetation units recorded in the survey generally match the broader vegetation descriptions as of the Guilford vegetation complex mapping by Matisse and Havel (1998) (A mixture of open forest to tall open forest of *Corymbia calophylla* (Marri) – *Eucalyptus wandoo* (Wandoo) – *Eucalyptus marginata* (Jarrah) and woodland of *Eucalyptus wandoo* (Wandoo) (with rare occurrences of *Eucalyptus lane-poolei* (Salmon White Gum)). Minor components include *Eucalyptus rudis* (Flooded Gum) – *Melaleuca raphiophylla* (Swamp Paperbark)). This complex has <10% pre-European extent remaining.

No Threatened or Priority flora species were recorded during the field survey. Following the field survey, one species was considered to have a moderate (possible) likelihood of occurring, *Rumex drummondii* (P4). All other species were considered unlikely or highly unlikely to occur based on vegetation type, condition and survey effort.

Vegetation unit CcXp potentially has some affinities to the TEC *Corymbia calophylla* – *Xanthorrhoea preissii* woodlands and shrublands, Swan Coastal Plain (floristic community type 3c). However given the Degraded to Completely Degraded condition and level of disturbance, including presence of

introduced tree species (*Eucalyptus camaldulensis*) as a component of the overstorey and weed dominated understorey, it is not considered representative of the TEC within the survey area.

One Declared pest plant under the BAM Act, *Asparagus asparagoides* (bridal creeper) was recorded during the field survey. The most dominant invasive weed species was observed to be *Watsonia meriana* var. *bulbillifera*, recorded as a dominant understorey species in all vegetation types.

The low diversity of flora species recorded, and dominance of the family Poaceae is reflective of the Completely Degraded/Degraded condition of vegetation within the survey area.

Overall, intact native vegetation within the survey area is of low conservation value given the Completely Degraded/Degraded condition of the vegetation and the high level of disturbance within and immediately adjacent to the survey area.

Appendix 2: Vegetation Management Plan

BRUNSWICK TO ROELANDS RECONSTRUCTION AND SEAL WIDENING H009 SOUTH WESTERN HIGHWAY

Purpose and Scope

This Vegetation Management Plan (VMP) has been prepared by Main Roads for the purpose of managing native vegetation clearing impacts associated with the Brunswick to Roelands Reconstruction and Seal Widening H009 South Western Highway proposal.

The proposal will involve the construction of the following:

- Overlay and reconstruction of pavement to provide a 40 year design life (minimum)
- Widening pavement and seal shoulders to provide 12 m pavement, 12 m seal and 0.6 m Wide Centre Line Treatment (WCLT)
- Replacement and extension of culverts at 132.88 SLK and 134.65 SLK
- Reinstatement of driveways as required for private property owners with access to South West Highway.
- Intersection Upgrades (BAR treatments) at:
 - Papps Road (132.55 SLK)
 - Heppington Road (133.09 SLK)
 - Kelly Road (134.81 SLK)
 - Government Road (135.70 SLK)

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

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

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

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

Avoiding, Mitigating and Managing the Impacts of Clearing

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

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

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

VMP Actions

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

Appendix 2.1: General vegetation management actions for clearing

Management Action	Responsibility	Timing
The Contractor must ensure plant, machinery and equipment, is cleaned down prior to arrival to the site.	Superintendent	During construction
Vehicle hygiene inspection checklists will be utilised to manage potential weed/dieback spread on earth-moving machinery.	Superintendent	During construction
No known dieback infested soil, mulch, fill or other material will be permitted into the works area.	Superintendent	During construction
All Clearing must be undertaken in such a way to allow fauna to move out of the Clearing area.	Superintendent	During construction
The Limits of Vegetation Clearing will be demarcated on site prior to the commencement of clearing to prevent entry into areas of native vegetation.	Superintendent	During construction
Natural drainage pathways will not be obstructed from stockpile gravel, crushed rock and excavated material.	Superintendent	During construction
All recently cleared, exposed and loose surface areas shall be protected from wind, water and soil erosion.	Superintendent	During construction
The Contractor will ensure that clearing of native vegetation is only undertaken in dry conditions, unless otherwise approved and / or directed by the Superintendent.	Superintendent	During construction
The Contractor must develop and detail a Site induction training program as part of the CEMP that includes as a minimum, the significant environmental impacts, actual or potential, of work activities associated with the Contract	Superintendent	During construction

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

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

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

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

1. Prior to the commencement of any clearing operations, the Contractor must certify for the Superintendent's verification and approval that the following activities have been completed in accordance with the relevant specification:
 - a) The pegging of limits of vegetation clearing has been undertaken.
 - b) The pegged vegetation clearing area does not exceed the Limits of Vegetation Clearing.
 - c) Mature trees have been conserved as far as practicable.
 - d) The pegging of special environmental areas has been undertaken.
 - f) All pre-clearing weed control has been undertaken.
 - g) All pre-clearing fauna operational controls have been undertaken.
 - h) All pre-clearing dieback operational controls have been undertaken.
 - i) Suitable and unsuitable topsoil zones have been identified.
 - j) Vegetation and topsoil stockpile locations have been identified.
 - o) All clearing machinery is compliant with controls.

Monitoring and Maintenance Program

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

Non-Compliance

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

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

Revegetation

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