Clearing Assessment Report – CPS 818

We're working for Western Australia.

Forrest Highway (H057) & Binningup Road
Northbound Acceleration Lane

South West Region
EOS#2556

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

D23#61646
May 2023

Contents

List of Figures

List of Tables

Document Control

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	Environment Officer	Draft v1	13/04/2023
Reviewer:	Senior Environment Officer	Rev 0	19/04/2023
Author:	Environment Officer	Rev A	20/04/2023
Reviewer:	Senior Environment Officer	Rev A	26/04/2023
Author:	Environment Officer	Rev B	22/05/2023
Reviewer	Senior Environment Officer	Rev B	22/05/2023

1 PROPOSAL

1.1 Purpose and Justification

Main Roads Western Australia proposes to address traffic congestion and safety concerns at the intersection of Forrest Highway (H057) and Binningup Road (2110115) through the construction of a 670 m long northbound acceleration lane. 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.

The acceleration lane will enhance the efficiency of traffic flow from the townsite of Binningup, particularly during heavy northbound traffic periods on Forrest Highway. The Proposal will also help to mitigate the risk of rear end collisions at the intersection, where drivers may pull onto the highway when it is unsafe to do so.

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 construction of a 670 m long northbound acceleration lane at the intersection of Forrest Highway (H057) and Binningup Road (2110115) including a 3.5 m wide lane with a 2.5 m wide sealed shoulder. Raised islands and improved street lighting will also be provided. Construction is to be full limestone pavement with an asphalt wearing course and drainage will be managed through roadside open drains.

1.3 Proposal Location

The Proposal Area is located on Forrest Highway between 66.4 to 67.3 SLK and Binningup Road between 0 to 0.2 SLK, in the Shire of Harvey as shown Figure 1. 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: 0.17 hectares (ha) as shown Figure 3a and 3b.

The proposed temporary clearing undertaking using CPS 818 is: None

Figure 1. Proposal Area

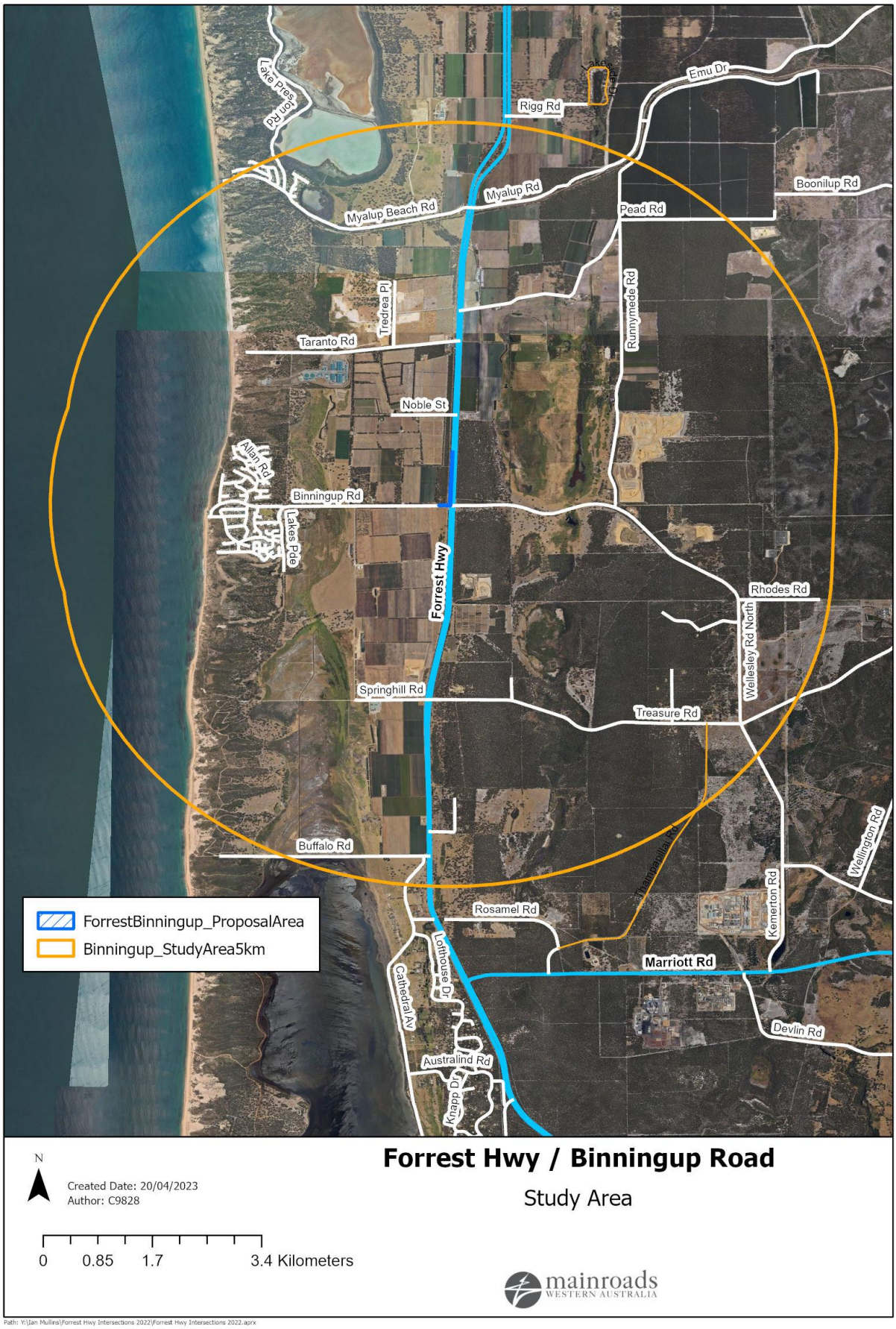

Figure 2. Study Area

Figure 3a. Clearing Area

Figure 3b. Clearing Area

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

Due to the nature of the safety concerns and location of the Proposal, there were no suitable alternatives to achieve the required safety improvements at the intersection.

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 Project Clearing Impacts

Design or Management Measure	Discussion and Justification
Alignment to one side of existing road	Due to the nature of the works, the acceleration lane can only be aligned to the inside turn pocket at the intersection of Forrest Highway and Binningup Road. No clearing within the median of Forrest Highway is proposed.
Alternative alignment located within pasture or degraded areas	There is no alternate location within pasture or degraded areas of vegetation adjacent to the proposed alignment. Land to the west of the proposed alignment is densely vegetated and any shift in this direction would only increase the required clearing.
Simplification of design to reduce number of lanes and/or complexity of intersections	Due to the significant traffic volumes on Forrest Highway, it is not possible to reduce the number of lanes past this location to use an existing lane as an acceleration lane. Furthermore, due to the size and configuration of heavy vehicles using Forrest Highway, reduction in lane widths to reduce the required pavement construction is also not possible without resulting in significant safety implications.
Steepen batter slopes	The batters on both Forrest Highway and Binningup Road have been steepened significantly to reduce the required clearing footprint for the works. Backslope batters on Forrest Highway and Binningup Road have been designed at 3:1 in order to bring the top of batter within the maintenance zone where possible. This has reduced the overall clearing footprint from the original design by more than 22%.
Installation of barriers	Installation of barriers would allow for construction of 2:1 batters along Forrest Highway (2:1 being the steepest batter than can physically be constructed), however due to the required pavement construction behind the barrier, this would likely increase the clearing footprint a further 400 mm away from the road. Due to the length of the acceleration lane, allowances would also need to be made for a widened shoulder section (emergency stopping location) in front of the barrier, which would again require an increased clearing footprint in that location.
Installation of kerbing	Due to the very flat longitudinal grade on Forrest Highway at this location, installation of kerbing would likely result in pooling water spreading into the acceleration lane in heavy rainfall events (grade too flat for water to flow away to kerb openings quick enough). Kerbing is provided at the corner itself however not longitudinally down Forrest Highway.
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.
Other	Following the flora and vegetation survey (Ecoedge 2023), a surveyor was commissioned to undertake a pick-up of the maintenance zone along Binningup Road and Forrest Highway. This was specifically undertaken to ensure data accuracy did not result in a net over, or under-estimate of the impact to sensitive environmental aspects.

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.
- Approved Conservation Advice (including listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community (Department of Environment and Energy, 2016).
- 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 OF CLEARING ASSESSMENT

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 and 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 that the Proposal Area.

2.2 Desktop Assessment

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

GIS layer viewing and mapping is done using ArcMap and/or Main Roads corporate mapping system known as iMaps. Referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. Government managed databases were searched to locate additional information, which are found under References in Section 9.

2.3 Surveys and Assessments

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

- Detailed and Targeted Flora and Vegetation Survey (Ecoedge 2023)
- Basic and Targeted Fauna Assessment (Biota 2023).

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

3 SUMMARY OF SURVEYS

3.1 Overview of Surveys

Biological and targeted surveys conducted for the Proposal are outlined in Table 1. A summary of the findings in these reports are presented in Sections 3.2 and 3.3.

Table 1. Summary of Biological and Targeted Surveys Relevant to the Proposal

Consultant & Survey Name	Survey Details
Ecoedge (2023) Detailed and Targeted Flora and Vegetation Survey Forrest Highway (H057) Binningup Intersection Upgrades	**Survey Area:** The total surveyed area was approximately 36.86 ha, of which 16.77 ha was native vegetation. The survey was undertaken along a section of Forrest Highway between SLK 65.7 to 68.8 across the Forrest Highway / Binningup Road intersection in the Shire of Harvey. The Survey Area is approximately 100 m wide. **Type:** The survey for Forrest Highway/ Binningup Road included a Detailed and Targeted flora and vegetation survey. **Timing:** The flora and vegetation survey was undertaken on 27 September, 8, 22 and 25 October, 3, 6, 8, 17, 18 November 2021 and 3 May 2022. **Shapefile TRIM Ref:** D23#328492 **Document TRIM Ref:** D23#328478
Biota (2023) Binningup Acceleration Lane – Basic and Targeted Fauna Assessment	**Survey Area:** The total surveyed area was a 2.2 km stretch of roadside vegetation adjacent to Forrest Hwy and Binningup Road, approximately 10.2 ha in area (of which approximately 6.9 ha is vegetated). **Type:** Basic and targeted fauna survey to delineate conservation significant fauna habitat within and directly adjacent to the Proposal Area. Scope included targeted and systematic searches to determine extent and quality of black cockatoo and Western Ringtail Possum (WRP) habitat. **Timing**: Fieldwork was conducted over a 1.5 day period from 6-8 February 2023. Spotlight searches for WRP were conducted on the evening of 7 February 2023. **Shapefile TRIM Ref:** D23#203287 **Document TRIM Ref:** D23#202837

3.2 Summary of Flora and Vegetation Surveys

Ecoedge Environmental Services (Ecoedge) was engaged by Main Roads in July 2021 to undertake a Detailed and Targeted flora and vegetation survey at the Forrest Highway/Binningup Road intersection, within the Shire of Harvey.

The flora and vegetation survey was undertaken in the spring of 2021 in accordance with the Environmental Protection Authority (EPA) Technical Guidance - *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016). The total area surveyed was approximately 36.86 hectares (ha), of which 16.77 ha was native vegetation.

One hundred and twenty-seven vascular flora taxa were found within the Survey Area, of which twenty-five were introduced species. Two significant taxa were found within the Survey Area, the Priority 1 taxa, *Acacia* sp. Binningup (G. Cockerton et al. WB 37784) (39 plants), and the Priority 4 *Caladenia speciosa* (18 plants). One significant range extension, *Bossiaea ornata*, was also found.

The post-survey likelihood of occurrence resulted in all other significant taxa with the potential to occur in the Survey Area as having a residual rating of "Unlikely".

The Declared Pest plants **Asparagus asparagoides* (bridal creeper), **Solanum linnaeanum* (apple of Sodom) and *Gomphocarpus fruticosus* (narrow-leaf cotton bush) were recorded within the Survey Area.

One vegetation unit A, and a degraded subunit of A, Ad, were identified within the Survey Area, comprising predominantly of Jarrah (Tuart) Banksia woodland. A total of 13.34 ha of this vegetation was recognised as the 'Banksia Woodlands of the Swan Coastal Plain' (SCP) Threatened Ecological Community and Priority Ecological Community (TEC/PEC). A total of 5.25 ha of this area was also recognised as an occurrence of the 'Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' Tuart TEC/PEC.

Vegetation condition at Binningup Road was predominately (63%) in Good-or-better condition. Vegetation within the Binningup Road Survey Area forms part of formally mapped regional ecological linkages.

One vegetation complex, the Yoongarillup Complex, is mapped across the Binningup Road Survey Area and is a good match for the Survey Area vegetation. The vegetation units are also a reasonable match for Beard's broadly described vegetation Association 998 which occurs across the Survey Area. Both the Yoongarillup Complex and Association 998 exceed the state-wide pre-European extent 30% retention target.

No wetlands, waterways or associated wetland vegetation occurs within the Survey Area.

There are no Environmentally Sensitive Areas within or in close proximity to the Binningup Road Survey Area.

3.3 Summary of Fauna Surveys

Biota Environmental Sciences (Biota) was engaged by Main Roads in February 2023 to undertake a Basic and Targeted Fauna Survey at the Forrest Highway/Binningup Road intersection, within the Shire of Harvey.

Fauna habitat assessment yielded three different habitat types within the Survey Area. A tall Tuart woodland in the area south of the intersection, a Banksia low open forest in the area north of the intersection, and the cleared areas comprised of 4WD tracks, roads and farmland. The majority of the habitats in the Survey Area were moderately disturbed (due to weeds, non-native fauna, vehicles).

A total of five native vertebrate fauna species were recorded during the survey, comprising three mammal species, one reptile species and one bird species. A total of four introduced vertebrate fauna species were also recorded, all of which were mammals.

The Western Ringtail Possum (*Pseudocheirus occidentalis*) was the only significant vertebrate species recorded. Western Ringtail Possum (WRP) is Critically Endangered under the BC Act 2016 and EPBC Act 1999. This species was represented by five individuals recorded from four locations in the Survey Area, all within the Banksia low open forest in the northern section of the Survey Area.

In addition to WRP, a further seven significant vertebrate species were assessed as having potential to occur in the Survey Area:

- Carnaby's Black Cockatoo (*Zanda latirostris*) – Endangered under BC Act 2016 and EPBC Act 1999 – May occur.
- Baudin's Black Cockatoo (*Zanda baudinii*) – Endangered under BC Act 2016 and EPBC Act 1999 – May occur.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable under BC Act 2016 and EPBC Act 1999 – May occur.
- Peregrine Falcon (*Falco peregrinus*) - Other Specially Protected under BC Act 2016 – May occur.
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Conservation Dependent under BC Act 2016 – May occur.
- Western False Pipistrelle (*Falsistrellus mackenziei*) – Priority 4 (DBCA listing) – May occur.
- Quenda (*Isoodon fusciventer*) – Priority 4 (DBCA listing) – May occur.

The black cockatoo habitat assessment identified a total of 84 potential nesting trees, with only one possible suitable nesting tree; a single Jarrah in the western central section with a potential nesting hollow. Upon further assessment with a pole mounted camera this hollow was deemed an unsuitable nesting hollow (unsuitable access, location, and orientation characteristics for black cockatoo breeding). The Banksia spp. woodland in the northern section of the Study Area was determined to be a high-quality foraging habitat for both white-tailed black cockatoo species, however, the lack of Marri in the Survey Area slightly diminishes the quality of feeding for the Forest Red-tailed Black Cockatoo.

None of the identified potential nesting trees or possible suitable nesting tree require removal and are not located within the Proposal Area.

4 VEGETATION DETAILS

4.1 Proposal Site Vegetation Description

Two vegetation units were identified within the Proposal Area by Ecoedge (2023) which are described in Table 2 including descriptions, condition within the Proposal Area and mapped extent in the wider survey areas. For a full description of the existing vegetation, refer to the Detailed and Targeted Flora and Vegetation Survey Report by Ecoedge (2023) found at D23#328492 and D23#328478.

Table 2. Summary of Vegetation Types within Clearing Area

Vegetation Type	Vegetation Condition within Clearing Area	Extent within Clearing Area (ha)	Total Extent Mapped (ha) within Survey Area
Vegetation unit A. *Eucalyptus marginata (E. gomphocephala)* medium open woodland over *Agonis flexuosa, Banksia attenuata* low woodland over *Acacia saligna, Hibbertia cuneiformis, Jacksonia sternbergiana* Isolated tall shrubs over *Acacia pulchella var. glaberrima, Bossiaea eriocarpa, Gompholobium tomentosum, Xanthorrhoea brunonis* low open shrubland over *Conostylis aculeata subsp. aculeata, Corynotheca micrantha, Dichopogon capillipes, Lomandra micrantha, Patersonia occidentalis, Sowerbaea laxiflora forbland, Austrostipa campylachne, *Briza maxima, Microlaena stipoides* Very Open Grassland and *Desmocladus flexuosus, Lepidosperma squamatum* very open sedgeland on grey-brown sand.	Degraded to Very Good (EPA 2016; Ecoedge 2023)	0.14 ha	12.76 ha
Vegetation unit Ad. *Eucalyptus gomphocephala* medium woodland over *Agonis flexuosa (Banksia attenuata)* low open woodland over isolated **Calothamnus quadrifidus, Kunzea glabrescens* tall shrubs over **Avena fatua, *Bromus diandrus, *Cynodon dactylon, *Ehrharta calycina* grassland and **Euphorbia peplus, *Lactuca serriola, *Solanum nigrum, *Sonchus oleraceus,* very open forbland on grey-brown sand.	Degraded (EPA 2016; Ecoedge 2023)	0.03 ha	4.01 ha

Table 3 provides details of the Pre-European Vegetation Association within the Proposal Area and the remaining extent of this association.

Table 3. 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. 998	**Statewide**	51,015.33	18,492.63	36.25	48.68
	IBRA Bioregion Swan Coastal Plain	50,867.50	18,492.32	36.35	48.68
	IBRA Sub-region Perth	50,876.50	18,492.32	36.35	48.68
	Local Government Authority Shire of Harvey	11,289.35	3,644.91	32.29	48.18

4.2 Vegetation Complexes and Representation

The following vegetation complex within the Proposal Area and the remaining extent is provided in Table 4.

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

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
Yoongarillup Complex - 56	27,977.93	10,018.14	35.81

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

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

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

The proposed clearing is at variance with Principle (a), (b) and (d) and is not likely to be at variance to the remaining clearing principles. This is based on removal of 0.17 ha of vegetation identified as Banksia Woodlands of the SCP Commonwealth-listed Threatened Ecological Community (TEC) (Banksia Woodland TEC) and State-listed Priority Ecological Community (PEC), as well as moderate to good quality habitat for Western Ringtail Possum and Carnaby's black cockatoo. Detailed information is provided under Principle (a), (b) and (d) , relating to the context of the Proposal and the impacts to these species and community.

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

Proposed clearing is at variance to this Principle.

Assessment

The area proposed to be cleared is up to 0.17 ha of roadside vegetation, mapped as (Ecoedge, 2023):

- Vegetation Unit A - 0.14 ha in Degraded to Very Good condition: *Eucalyptus marginata (E. gomphocephala)* medium open woodland over *Agonis flexuosa, Banksia attenuata* low woodland over *Acacia saligna, Hibbertia cuneiformis, Jacksonia sternbergiana*. Isolated tall shrubs over *Acacia pulchella var. glaberrima, Bossiaea eriocarpa, Gompholobium tomentosum, Xanthorrhoea brunonis* low open shrubland over *Conostylis aculeata subsp. aculeata, Corynotheca micrantha, Dichopogon capillipes, Lomandra micrantha, Patersonia occidentalis, Sowerbaea laxiflora forbland, Austrostipa campylachne, *Briza maxima, Microlaena stipoides* Very Open Grassland and *Desmocladus flexuosus, Lepidosperma squamatum* very open sedgeland on grey-brown sand.
- Vegetation Unit Ad - 0.03 ha in Degraded condition: *Eucalyptus gomphocephala* medium woodland over *Agonis flexuosa (Banksia attenuata)* low open woodland over isolated **Calothamnus quadrifidus, Kunzea glabrescens* tall shrubs over **Avena fatua, *Bromus diandrus, *Cynodon dactylon, *Ehrharta calycina grassland* and **Euphorbia peplus, *Lactuca serriola, *Solanum nigrum, *Sonchus oleraceus*, very open forbland on grey-brown sand.

A multivariate analysis was undertaken by Ecoedge (2023) which identified that the vegetation in which the quadrats were placed is part of the Swan Coastal Plain (SCP) floristic community type (FCT) 21a: Central *Banksia attenuata – Eucalyptus marginata* woodlands and therefore representative of the Banksia Woodlands of the SCP Commonwealth-listed Threatened Ecological Community (TEC) (Banksia Woodland TEC) and State-listed Priority Ecological Community (PEC). All 0.17 ha of vegetation in the Proposal Area was mapped by Ecoedge (2023) as the Banksia Woodland TEC/PEC (Figure 4a and 4b). Ecoedge (2023) also mapped a number of areas across the Survey Area as Tuart (*E. gomphocephala*) Woodlands and Forests of the SCP Commonwealth-listed TEC (Tuart Woodland TEC) and State-listed PEC, however none was recorded within the Proposal Area, with the nearest patch located on the opposite (southern) side of Binningup Road approximately 61 m south of the Proposal Area.

A Targeted flora survey was also undertaken as part of the flora and vegetation survey (Ecoedge, 2023). Twenty eight significant species were identified as having known records within the Study Area. Of these, three were regarded as likely, 12 were considered possible, and 12 unlikely to occur within the Survey Area.

Two species, *Acacia* sp. Binningup (P1) and *Caladenia speciosa* (P4) were recorded within the Binningup Survey Area (Ecoedge, 2023). All records of both species were located outside of the Proposal Area. The closest occurrence was a population of nine individual *Acacia* sp. Binningup (P1) plants [REDACTED] of the nearest clearing area (Figure 3a and Figure 5). The post-survey likelihood of occurrence classified all remaining significant species as 'unlikely' to occur within the Proposal Area.

Biota (2023) recorded one conservation significant species, the Western Ringtail Possum (*Pseudocheirus occidentalis*), Critically Endangered under BC Act and EPBC Act. A further seven significant species were assessed as having potential to occur in the Proposal Area given suitable habitat, including:

- Carnaby's Black Cockatoo (*Zanda latirostris*) – Endangered under BC Act 2016 and EPBC Act 1999 – May occur.
- Baudin's Black Cockatoo (*Zanda baudinii*) – Endangered under BC Act 2016 and EPBC Act 1999 – May occur.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable under BC Act 2016 and EPBC Act 1999 – May occur.
- Peregrine Falcon (*Falco peregrinus*) - Other Specially Protected under BC Act 2016 – May occur.
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Conservation Dependent under BC Act 2016 – May occur.
- Western False Pipistrelle (*Falsistrellus mackenziei*) – Priority 4 (DBCA listing) – May occur.
- Quenda (*Isoodon fusciventer*) – Priority 4 (DBCA listing) – May occur.

Although the vegetation is suitable habitat for a number of conservation significant fauna, Biota (2023) noted that none of the habitats identified are restricted to the Survey Area and their attributes area typical of habitat types in the region.

The Proposal will result in the removal of vegetation containing Black Cockatoo habitat as outlined below:

- Up to 0.17 ha of native vegetation within the Proposal Area assessed as foraging habitat (Figure 3a and 3b), also assessed as moderate to good quality foraging habitat for Carnaby's black cockatoo (DWER 2023).
- No trees with DBH>500 mm, that are potential breeding habitat (Figure 3a and 3b).
- No trees will be removed that are known roosting sites.
- No trees will be removed that contain hollows.

The Proposal Area is within the Western Ringtail Possum (WRP) natural distribution (DPaW 2017). According to Main Roads ArcGIS shapefiles, the species is known from 146 records within the 5 km Study Area, of which nine records are within [REDACTED] of the Proposal Area. Nocturnal spotlight searches undertaken by Biota (2023) recorded five individuals from four locations directly adjacent to the Proposal Area (Figure 7). No dreys were recorded in the Proposal Area or wider Survey Area by Biota (2023). All 0.17 ha of vegetation proposed for removal within the Proposal Area is considered suitable habitat for the species.

The remaining bird and three mammal species have up to 0.17 ha of suitable habitat proposed for removal within the Proposal Area.

Although the Proposal Area contains vegetation with biodiversity values, the remaining native vegetation within the Survey Area (16.6 ha), is of equal or better value to the 0.17 ha proposed for removal. The Proposal will therefore only require the removal of 1.01% of the vegetation mapped within the Survey Area. Further, the Survey Area including the clearing area has similar values to native vegetation occurring more broadly on a local scale, with an estimated 40% vegetated Study Area, and approximately 25% of the vegetated Study Area within DBCA managed land as well as other large masses of intact vegetation protected under the Special Control Area No 2 – Kemerton Industrial Zone Buffer area (Figure 7). Furthermore, the removal of 0.17 ha of native vegetation does not sever any local, nor regional ecological linkages.

The proposed clearing is at variance with principle (a), as the project area contains 0.17 ha of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community and State listed Banksia dominated woodlands of the Swan Coastal Plain IBRA Region Priority Ecological Community (Banksia TEC/PEC) and contains habitat for conservation significant fauna species.

Based on the above, the proposed clearing is at variance with this Clearing Principle.

Methodology

- Basic and Targeted Fauna Survey (Biota 2023)
- Detailed and Targeted Flora and Vegetation Survey (Ecoedge, 2023)
- EPA (2016, 2020)
- WRP Recovery Plan (DPaW 2017)
- SPRAT Database (DCCEEW 2023)
- DBCA website
- DBCA Threatened Flora and Fauna Database Searches shapefiles (Accessed 30/03/2023)
- Main Roads GIS Shapefiles

(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 0.17 ha of vegetated areas in Degraded to Very Good condition (Ecoedge 2023). The vegetation within the Proposal Area is suitable habitat for a number of conservation significant fauna species and was identified by Biota (2023) as including:

- Remnant vegetation on sandy soil between Forrest Highway and farmland. Vegetation comprised *Eucalyptus gomphocephala* (Tuart) tall woodland with *Agonis flexuosa* (Peppermint), *Acacia saligna* and *Eucalyptus marginata* (Jarrah) (0.01 ha),
- Sandy plain. Vegetation comprised Banksia attenuata (*Banksia grandis*, *Agonis flexuosa*, *Eucalyptus gomphocephala*) low open forest (0.16 ha).

Biota (2023) recorded one conservation significant species, the Western Ringtail Possum (*Pseudocheirus occidentalis*), Critically Endangered under BC Act and EPBC Act. A further seven significant species were assessed as having potential to occur in the Proposal Area given suitable habitat, including:

- Carnaby's Black Cockatoo (*Zanda latirostris*) – Endangered under BC Act 2016 and EPBC Act 1999 – May occur.
- Baudin's Black Cockatoo (*Zanda baudinii*) – Endangered under BC Act 2016 and EPBC Act 1999 – May occur.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable under BC Act 2016 and EPBC Act 1999 – May occur.
- Peregrine Falcon (*Falco peregrinus*) - Other Specially Protected under BC Act 2016 – May occur.
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Conservation Dependent under BC Act 2016 – May occur.
- Western False Pipistrelle (*Falsistrellus mackenziei*) – Priority 4 – May occur.
- Quenda (*Isoodon fusciventer*) – Priority 4 – May occur.

Although the vegetation is suitable habitat for a number of conservation significant fauna, Biota (2023) noted that none of the habitats identified are restricted to the Survey Area and their attributes are typical of habitat types in the region.

Birds

The Proposal Area is within the likely range and 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. Although the survey by Biota (2023) did not find any evidence of black cockatoos, the Proposal Area does contain foraging habitat for all three species. All potential and suitable breeding trees recorded by Biota (2023) will be avoided. The overall proposed native vegetation clearing of 0.17 ha will result in the removal of vegetation containing black cockatoo habitat as outlined below:

- Up to 0.17 ha of native vegetation within the Proposal Area assessed as potential foraging habitat (Figure 3a and 3b), also assessed as moderate to good quality foraging habitat for Carnaby's black cockatoo (DWER 2023).
- No trees with DBH>500 mm, that are potential breeding habitat (Figure 3a and 3b).
- No trees will be removed that are known roosting sites.
- No trees will be removed that contain hollows.

As depicted in Figure 8, an estimated 40% of the Study Area is vegetated and there are significant quantities (approximately 25%) of native vegetation within the Study Area within DBCA managed land as well as other large masses of intact vegetation protected under the Special Control Area No 2 – Kemerton Industrial Zone Buffer area. The removal of up to 0.17 ha of foraging habitat, over a 670 m linear strip, adjacent to a busy road and in comparably poorer condition than the intact native vegetation in the Study Area, is not likely to

have a significant impact on any populations of Baudin's Black Cockatoo or Forest Red-tailed Black Cockatoo, or more broadly, the persistence of these species. Given there is only 0.17 ha of foraging habit, 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.

With regard to Carnaby's black cockatoo:

- Vegetation within the project area contains foraging species for Carnaby's cockatoo. A quadrat close to the project area contained cover of 11-30% *Banksia attenuata*, a preferred foraging species, and 31-70% *Eucalyptus marginata*, a secondary foraging species, for Carnaby's cockatoo.
- While it is noted that vegetation within the project area is directly adjacent to Forrest Highway and is likely to be in poorer condition than vegetation further from the road, it is still considered to provide moderate to good quality foraging habitat for Carnaby's cockatoo.
- Noting the above, the proposed clearing will involve the loss of 0.17 hectares of moderate to good quality foraging habitat for Carnaby's cockatoo.

Peregrine Falcon can be found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. According to Main Roads ArcGIS shapefiles there is one record of Peregrine Falcon over 3.8 km north west of the Proposal Area. The Proposal Area contains potentially suitable foraging habitat for the species and therefore Biota (2023) determined that the species may occur. Given the small scale of clearing (up to 0.17 ha) and small scale of the Proposal activities, the works are unlikely to impact any core habitat for this species. Direct impact on individuals is also not anticipated given all species are highly mobile and are not expected to inhabit the works area once works commence. 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.

Mammals

The Proposal Area is within the Western Ringtail Possum (WRP) natural distribution (DPaW 2017). Populations of WRP along the Swan Coastal Plain are associated with stands of myrtaceous trees, usually peppermint trees (*Agonis flexuosa*) growing near swamps, water courses or floodplains, and at topographic low points which provide cooler and often more fertile conditions (DPaW 2017). Habitat critical to survival comprises long unburnt mature remnant peppermint woodlands with high canopy continuity and high nutrient foliage with minimal periods of summer moisture stress, and habitat connecting patches of remnants (DPaW 2017).

According to Main Roads ArcGIS shapefiles, the species is known from 146 records within the 5 km Study Area, of which nine records are within [REDACTED] of the Proposal Area. Nocturnal spotlight searches undertaken by Biota (2023) recorded five individuals from four locations directly adjacent to the Proposal Area (Figure 7). No dreys were recorded in the Proposal Area or wider Survey Area by Biota (2023). All 0.17 ha of vegetation proposed for removal within the Proposal Area is considered suitable habitat for the species. Although the Proposal will impact habitat for WRP, only a narrow strip of vegetation abutting directly on to Forrest Highway over a 670 m distance will be removed. It is also noted that there are larger patches of better quality vegetation contiguous and directly adjacent to the west and north-west of the Proposal Area,

Vegetation within the project area is considered to be habitat critical to WRP survival according to the Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan, noting the fauna survey recorded five WRP individuals in adjacent vegetation, its location in an area of the Swan Coastal Plain where WRP density is high, and that both vegetation types mapped within the project area have a high density of peppermint trees and a high canopy continuity. While it is noted that vegetation within the project area is directly adjacent to Forrest Highway and is likely to be in poorer condition than vegetation further from the road, it is still considered to provide moderate to good quality habitat for WRP.

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.

The Quenda, Wambenger Brush-tailed Phascogale and Western False Pipistrelle all potentially have suitable habitat within 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. The nearest known record of Quenda is a deceased opportunistic sighting in 2019 near the Forrest Highway/ Binningup Road intersection (directly adjacent to the Proposal Area). Wambenger Brush-tailed Phascogale are largely restricted to forests dominated by *Eucalyptus marginata* (Jarrah). The nearest known record of South-western Brush-tailed Phascogale is more than 2.4 km west of the Proposal Area. Western False Pipistrelle prefer wet sclerophyll forests of Karri, Jarrah and Tuart eucalypts. The nearest known record of Western False Pipistrelle is more than 3.4 km north of the Proposal Area. The removal of up to 0.17 ha of native vegetation, over a 670 m linear strip, adjacent to a busy road and in comparably poorer condition than the intact native vegetation in the Study Area, is not likely to have a significant impact on any populations of Quenda, Wambenger Brush-tailed Phascogale and Western False Pipistrelle or more broadly, the persistence of these species.

Clearing associated with the Proposal is unlikely to result in the long term decline or significantly reduce the available habitat for any conservation significant mammal 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 0.17 hectares of moderate to good quality habitat for Western Ringtail Possum and 0.17 hectares of moderate to good quality foraging habitat for Carnaby's black cockatoo.

Methodology

- Basic and Targeted Fauna Survey (Biota 2023)
- Detailed and Targeted Flora and Vegetation Survey (Ecoedge, 2023)
- EPA (2016, 2020)
- WRP Recovery Plan (DPaW 2017)
- SPRAT Database (DCCEEW 2023)
- DBCA Threatened Fauna Database Searches shapefiles (Accessed 30/03/2023)
- DBCA website
- Main Roads GIS Shapefiles

(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

Four Threatened species were identified as having known records within the Study Area. Of these four species, all were considered possible to occur within the Survey Area based on expected habitat (Ecoedge, 2023). A Targeted Flora Survey undertaken as part of the Flora and Vegetation Survey (Ecoedge, 2023) found no Threatened flora species within the Proposal Area or wider Survey Area and the post-survey likelihood of occurrence classified all Threatened flora species as unlikely to occur within the Proposal Area.

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 (Ecoedge, 2023)
- EPA (2016)
- DBCA Threatened Flora Searches shapefiles (Accessed 30/03/2023)

(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.

Assessment

The Ecoedge (2023) survey recorded no State listed Threatened Ecological Communities (TECs) in the proposed clearing area or wider Survey Area and none are considered likely to occur, however, two Commonwealth TECs (State PEC's) were recorded within the Survey Area.

A multivariate analysis was undertaken by Ecoedge (2023) which identified that the vegetation in which the quadrats were placed is part of the Swan Coastal Plain (SCP) floristic community type (FCT) 21a: Central *Banksia attenuata – Eucalyptus marginata woodlands* and therefore representative of the Banksia Woodlands of the SCP Commonwealth-listed Threatened Ecological Community (TEC) (Banksia Woodland TEC) and State-listed Priority Ecological Community (PEC). All 0.17 ha of vegetation located within the Proposal Area was mapped by Ecoedge (2023) as the Banksia Woodland TEC/PEC (Figure 4a and 4b).

Ecoedge (2023) also mapped a number of areas across the Survey Area as Tuart (*E. gomphocephala*) Woodlands and Forests of the SCP Commonwealth-listed TEC (Tuart Woodland TEC) and State-listed PEC, however, none of these areas were recorded within the Proposal Area with the nearest patch located on the opposite (southern) side of Binningup Road approximately 61 m south of the Proposal Area.

The flora and vegetation survey undertaken by Ecoedge (2023), identified a total of 13.34 ha of Banksia Woodlands TEC/PEC within the Survey Area, all of which was assessed as belonging to the same patch. Out of the total mapped Banksia Woodlands TEC/PEC within the Survey Area, only 0.17 ha (1.27%) is proposed to be cleared. Ecoedge (2023) further observed, that based on aerial imagery, this patch extended beyond the Survey Area to an area encompassing approximately 180 ha. The proposed removal of up to 0.17 ha of Banksia Woodlands TEC/PEC will not have a significant direct impact, particularly as the proposed clearing comprises a number of small separated clearing areas spread across a linear distance of 670 m. Main Roads will also ensure the Proposal will not have a significant indirect impact on Banksia TEC/PEC through the implementation of Standard and Specific Management Actions specified in the Vegetation Management Plan (Appendix 1.1).

Furthermore, given the distance (approximately 61 m) from the Proposal Area to the nearest patch of Tuart Woodland TEC/PEC, and the minor scale of the road widening to facilitate the construction of the acceleration lane, the Proposal will not impact the Tuart Woodland TEC/PEC.

During the flora and vegetation survey (Ecoedge, 2023) the Declared Pest plants **Asparagus asparagoides* (Bridal Creeper) and **Solanum linnaeanum* (Apple of Sodom) were found within or immediately adjacent to the Proposal Area (Figure 6). Both species are 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 adjacent to TEC and patches of Good-or-better condition remnant vegetation, there is a risk that these Declared Plants and WONS may cause degradation of the environment, should they be spread throughout the site. Prior to the commencement of works, a suitably qualified contractor will be commissioned to undertake weed control of all Declared Plants and WONS recorded within the Proposal Area. Standard management actions will also be included to manage weeds and to ensure they do not spread and result in environmental harm to adjacent areas of native vegetation that are in Good-or-better condition.

The works require the removal of up to 0.17 ha of Banksia Woodlands TEC/PEC within a 1.47 ha Proposal Area. The overall clearing footprint has been reduced from the original design by more than 22% through the steepening of batters to 3:1 to maximise utilisation of the existing maintenance zone. Given a direct impact of 0.17 ha to the Banksia Woodlands TEC/PEC, clearing is at variance with this Principal.

Methodology

- Detailed and Targeted Flora and Vegetation Survey (Ecoedge, 2023)
- DBCA Threatened and Priority Ecological Community database search (accessed 30/03/2023)
- Banksia TEC Conservation Advice (DoEE 2016)
- 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 0.17 ha of roadside vegetation, mapped as (Ecoedge, 2023):

- Vegetation Unit A - 0.14 ha in Degraded to Very Good condition: *Eucalyptus marginata (E. gomphocephala)* medium open woodland over *Agonis flexuosa, Banksia attenuata* low woodland over *Acacia saligna, Hibbertia cuneiformis, Jacksonia sternbergiana* Isolated tall shrubs over *Acacia pulchella var. glaberrima, Bossiaea eriocarpa, Gompholobium tomentosum, Xanthorrhoea brunonis* low open shrubland over *Conostylis aculeata subsp. aculeata, Corynotheca micrantha, Dichopogon capillipes, Lomandra micrantha, Patersonia occidentalis, Sowerbaea laxiflora forbland, Austrostipa campylachne, *Briza maxima, Microlaena stipoides* Very Open Grassland and *Desmocladus flexuosus, Lepidosperma squamatum* very open sedgeland on grey-brown sand.
- Vegetation Unit Ad - 0.03 ha in Degraded condition: *Eucalyptus gomphocephala* medium woodland over *Agonis flexuosa (Banksia attenuata)* low open woodland over isolated **Calothamnus quadrifidus, Kunzea glabrescens* tall shrubs over **Avena fatua, *Bromus diandrus, *Cynodon dactylon, *Ehrharta calycina grassland* and **Euphorbia peplus, *Lactuca serriola, *Solanum nigrum, *Sonchus oleraceus*, very open forbland on grey-brown sand.

The works require the removal of up to 0.17 ha of degraded roadside vegetation within a 1.47 ha Proposal Area. The clearing of native vegetation will occur in a previously disturbed environment to facilitate the widening of Binningup Road and Forrest Highway for the construction of the acceleration lane. The vegetation mapped within the Proposal Area (Ecoedge, 2023) is representative of the Pre-European Vegetation and Vegetation Complex (Havel and Mattiske, 2000) mapping within the Proposal Area, as below.

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

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 998 described as a Medium woodland; tuart (Government of Western Australia, 2017)	Clearing of up to 0.17 ha for road widening and construction of an acceleration lane at Forrest Hwy/ Binningup Road intersection	Degraded to Very Good condition (EPA 2016; Ecoedge 2023)	Vegetation description and condition determined from Flora and Vegetation Survey (Ecoedge, 2023).

Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 998	**Statewide**	51,015.33	18,492.63	36.25	48.68
	IBRA Bioregion Swan Coastal Plain	50,867.50	18,492.32	36.35	48.68
	IBRA Sub-region Perth	50,867.50	18,492.32	36.35	48.68
	Local Government Authority Shire of Harvey	11,289.35	3,644.91	32.29	48.18

Vegetation Complexes (Heddle/Mattiske) within the Project Area

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2013 Vegetation Extent	% Remaining
Yoongarillup Complex - 56	27,977.93	10,018.14	35.81

According to the Pre-European Vegetation Association and Vegetation Complex mapping, the percentage of vegetation remaining does not fall below the regional threshold of 30%. The minor clearing adjacent to an existing road corridor will not further dissect any local or regional ecological linkage (Figure 2 and Figure 7).

Based on the above, the vegetation proposed to be cleared is not significant as a remnant of native vegetation in an area that has been extensively cleared. Therefore, 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 (Ecoedge, 2023)
- Statewide Vegetation Statistics (Government of Western Australia 2018)
- EPA (2016)
- 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 likely to be at variance to this Principle.

Assessment

The proposed clearing area does not intersect any wetlands or watercourses. The nearest surface water feature is a resource enhancement category dampland, which is located more than 650 m east of the Proposal Area (Figure 9). Furthermore, none of the vegetation units proposed to be cleared are of wetland or riparian nature (Ecoedge 2023):

- Vegetation Unit A - 0.14 ha in Degraded to Very Good condition: *Eucalyptus marginata (E. gomphocephala)* medium open woodland over *Agonis flexuosa, Banksia attenuata* low woodland over *Acacia saligna, Hibbertia cuneiformis, Jacksonia sternbergiana* Isolated tall shrubs over *Acacia pulchella var. glaberrima, Bossiaea eriocarpa, Gompholobium tomentosum, Xanthorrhoea brunonis* low open shrubland over *Conostylis aculeata subsp. aculeata, Corynotheca micrantha, Dichopogon capillipes, Lomandra micrantha, Patersonia occidentalis, Sowerbaea laxiflora forbland, Austrostipa campylachne, *Briza maxima, Microlaena stipoides* Very Open Grassland and *Desmocladus flexuosus, Lepidosperma squamatum* very open sedgeland on grey-brown sand.
- Vegetation Unit Ad - 0.03 ha in Degraded condition: *Eucalyptus gomphocephala* medium woodland over *Agonis flexuosa (Banksia attenuata)* low open woodland over isolated **Calothamnus quadrifidus, Kunzea glabrescens* tall shrubs over **Avena fatua, *Bromus diandrus, *Cynodon dactylon, *Ehrharta calycina grassland* and **Euphorbia peplus, *Lactuca serriola, *Solanum nigrum, *Sonchus oleraceus*, very open forbland on grey-brown sand.

Given works will not require the removal of vegetation growing in, or in association with, an environment associated with a watercourse or wetland, 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 (Ecoedge, 2023)
- Government GIS shapefiles:
  - Geomorphic Wetlands (Accessed 30/03/2023)
  - Ramsar Wetlands (Accessed 30/03/2023)
  - Watercourses (Accessed 30/03/2023)
  - RIWI Act Rivers (Accessed 30/03/2023)

(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 Spearwood S2c phase, characterised by lower slopes (1-5%) of dune ridge with bleached or pale sands with a yellow-brown or pale brown subsoil. Construction of the Proposal will require the removal of up to 0.17 ha of roadside vegetation within a 1.47 ha Proposal Area.

The sandy soils known to the Proposal Area are not at risk of flooding due to their well-draining nature. The removal of the vegetation is therefore unlikely to 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 acceleration lane. 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 Australian Soil Resource Information Systems (ASRIS) mapping, the Proposal Area is within an area of extremely low risk of acid sulfate soil occurrence. Works do not require any dewatering, nor excavations below the water table. The removal of 0.17 ha of native vegetation will not result in acidification of the Proposal Area or surrounding local environment.

During the flora and vegetation survey (Ecoedge, 2023) the Declared Pest plants **Asparagus asparagoides* (Bridal Creeper) and **Solanum linnaeanum* (Apple of Sodom) were found within or immediately adjacent to the Proposal Area (Figure 6). Both species are 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 adjacent to TEC and patches of Good-or-better condition remnant vegetation, there is a risk that these Declared Plants and WONS may cause degradation of the environment, should they be spread throughout the site. Prior to the commencement of works, a suitably qualified contractor will be commissioned to undertake weed control of all Declared Plants and WONS recorded within the Proposal Area. Standard management actions will also be included to manage weeds and to ensure they do not spread and result in environmental harm to adjacent areas of native vegetation that are in Good-or-better condition.

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 (Ecoedge, 2023)
- ASRIS (Accessed 12/04/2023)

(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, Conservation Areas or Bush Forever Sites located within 100 m of the Proposal Area. The nearest DBCA Managed Land is approximately 1.69 km south east of the Proposal Area. The 'Special Control Area No 2 – Kemerton Industrial Zone Buffer' is located on the opposite side of the Forrest Highway and to the south east of the Proposal Area. Works will not enter this zone.

It is not anticipated that the removal of vegetation within the Proposal Area will impact on Nature Reserves / Conservation Areas / Bush Forever Sites as;

- only 0.17 ha of native vegetation is proposed for removal;
- the nearest parcel of DBCA Managed Land is 1.69 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 12/04/2023)

(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 works require the removal of up to 0.17 ha of roadside vegetation within the 1.47 ha Proposal Area. The clearing will occur in a previously disturbed environment and include reinstatement of existing roadside drainage. The Proposal Area is not within Proclaimed Surface Water Area. None of the vegetation proposed for removal is growing in association with a watercourse. Surface water quality is unlikely to be negatively impacted by the removal of up to 0.17 ha of vegetation growing in the road verge.

Furthermore, the removal of up to 0.17 ha of native vegetation is unlikely to impact groundwater levels or quality. Works are within a Proclaimed Groundwater Area, however are not within a Public Drinking Water Source Area. As no abstraction of water is required for the Proposal and vegetation clearing is so minor, impact to groundwater levels is not anticipated. Furthermore, the works will not intercept groundwater.

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

Methodology

- Flora and Vegetation Survey (Ecoedge, 2023)
- Basic and Targeted Fauna Survey (Biota 2023)
- Government GIS Shapefiles:
  - RIWI Act, Surface Water Areas and Irrigation Districts (Accessed 12/04/2023)
  - CAWSA Part 2A Clearing Control Catchments (Accessed 12/04/2023)
  - RIWI Act, Groundwater Areas (Accessed 12/04/2023)

(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 0.17 ha of roadside vegetation within the 1.47 ha Proposal Area. The clearing will occur in a previously disturbed environment to facilitate the widening of Binningup Road and Forrest Hwy for the construction of the acceleration lane. 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 Spearwood S2c phase, characterised by lower slopes (1-5%) of dune ridge with bleached or pale sands with a yellow-brown or pale brown subsoil. The sandy soils known to the Proposal Area are not at risk of flooding due to their well-draining nature. The removal of the vegetation is therefore unlikely to 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 (Ecoedge, 2023)

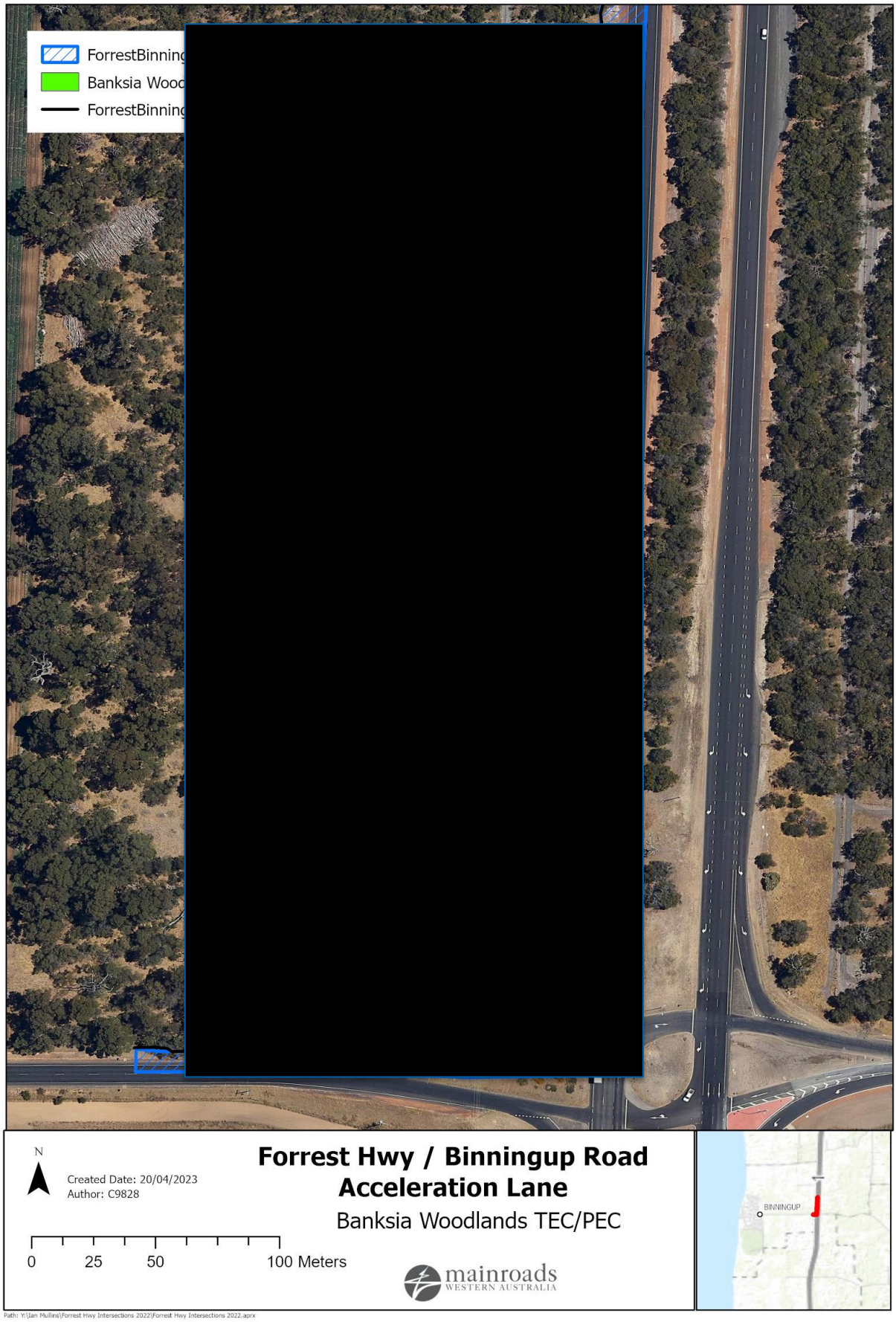

Figure 4a. TEC Mapping – Proposal Area

Figure 4b. TEC Mapping – Proposal Area

Figure 5. Priority Flora Mapping

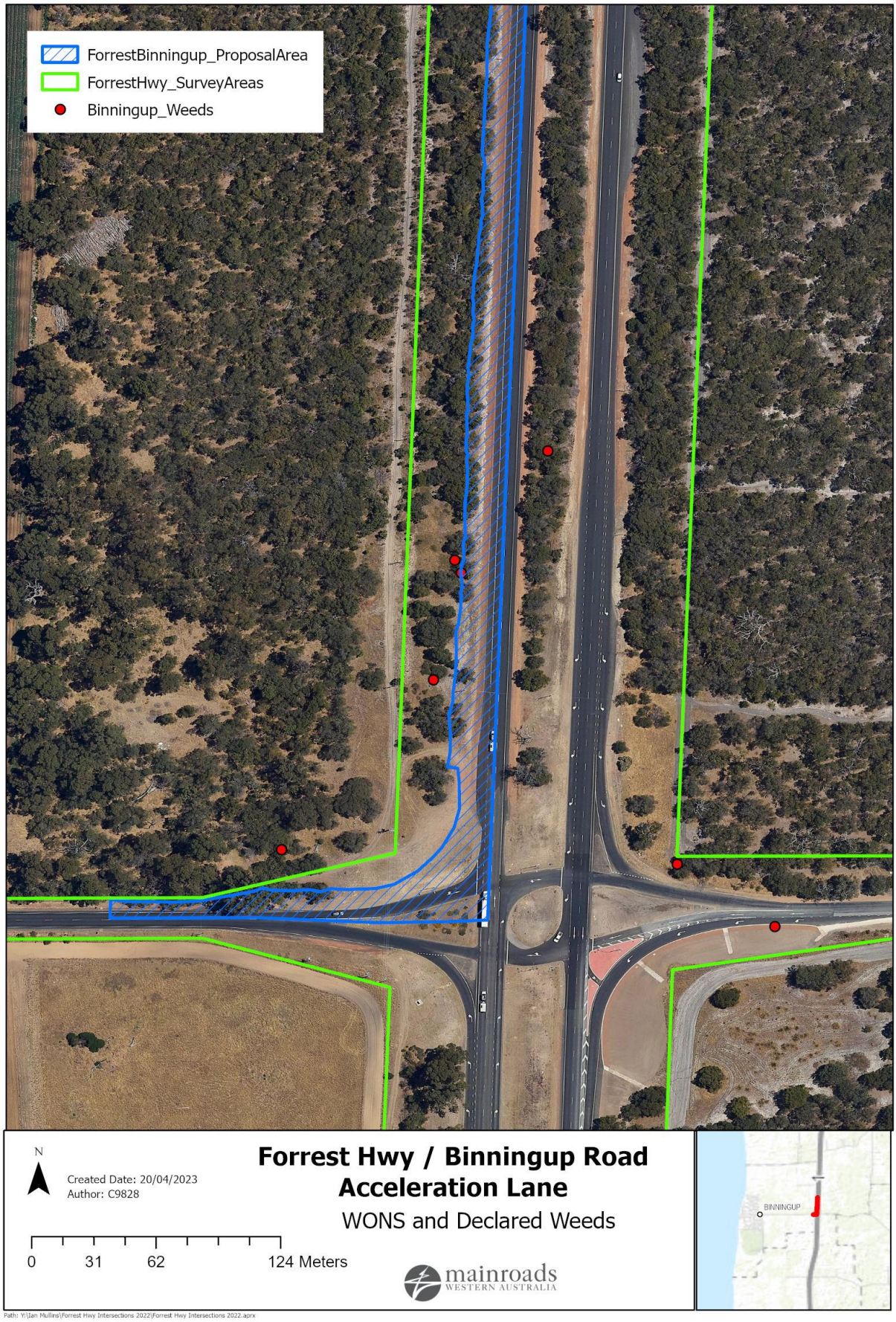

Figure 6. WONS and Declared Weeds

Figure 7. Western Ringtail Possum Habitat

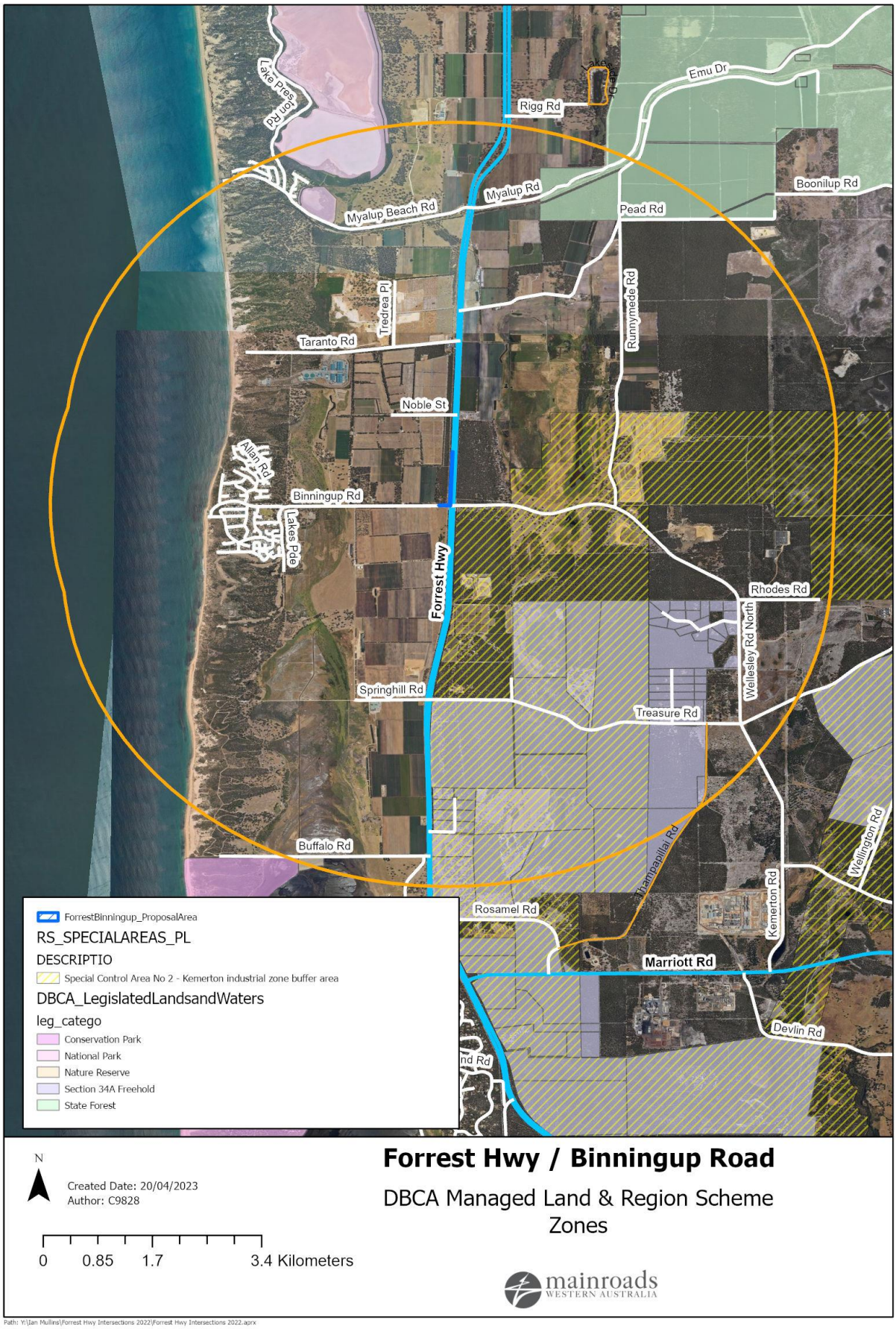

Figure 8. DBCA Managed Land and Region Scheme Zones

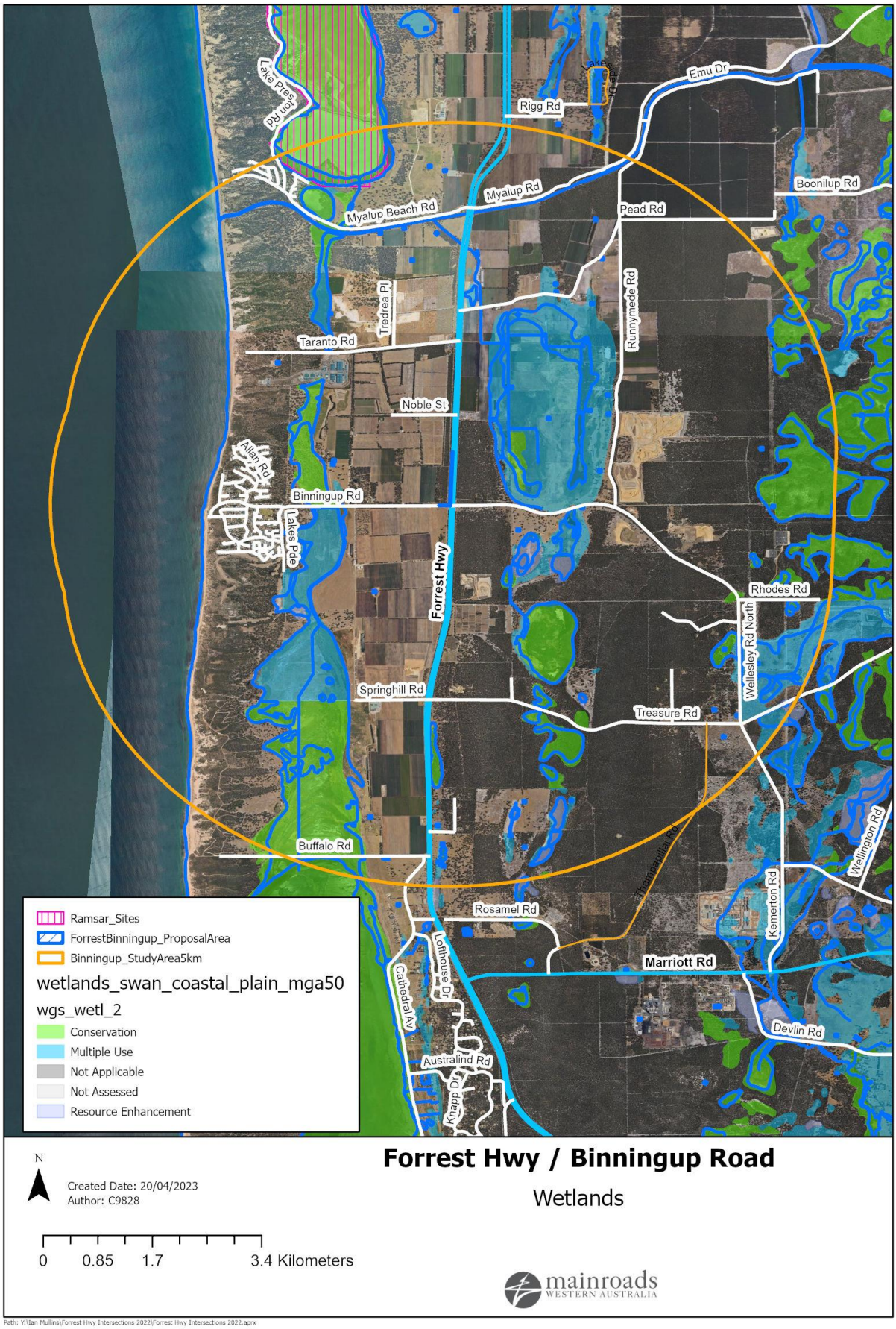

Figure 9. Wetlands

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 1).

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 clearing principles. The CAR was published on the Main Roads Website for a period of 21 days, between the 28 April 2023 and 19 May 2023. As part of this process Main Roads invited submissions from DWER and the Shire of Harvey.

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	01/05/2023	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. DWER approved the VMP for clearing as proposed. DWER determined that an offset was required to counterbalance the impacts to Western Ringtail Possum habitat, Carnaby's black cockatoo foraging habitat and the Banksia TEC/PEC.	Main Roads amended the CAR to reflect DWERs assessment and requests. An offset package was provided for consideration.	D23#466778

8 COMPLIANCE WITH CPS 818

Table 5 summarises what further pre-clearing impact assessment 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.	**Yes**	**1.** Clearing Report was published on website and submissions sought for 21 days. **2.** Submissions invited in accordance with Condition 8 of CPS 818. **3.** VMP has been completed, refer to Appendix 1. **4.** Given the impacts, MRWA provided an offset proposal to DWER for consideration. **5.** Summary of submissions and a statement addressing each of those submissions to be published on website.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **or** (j) the incidence of flooding.	**No**	No further action required.
3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **and** (j) the incidence of flooding.	**No**	No further action required.
4. The Proposal involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.
5a. Proposal is within a Region that: • has rainfall greater than 400mm; and, • is South of the 26th parallel; and, • works are necessary in 'Other than dry conditions'; and, • works have potential for **uninfested** areas to be impacted.	**Yes**	The Proposal Area is currently maintained as one linear stretch of road reserve and is therefore likely to have a consistent dieback status throughout the Proposal Area. Movement of soil may be required in non-dry conditions however all fill material required to complete the works will be cut to fill, meaning no import of sand to site is required. It is also worth noting that the Proposal Area is located on serpentine soils which are considered to be at lower risk of dieback compared to other soils due to physical and chemical properties that make them less hospitable to the *Phytophthora cinnamomi* pathogen (Shearer et al. 2004). In addition, limestone will be utilised for the subbase and basecourse, which is not known to be hospitable to dieback. As the Proposal Area is not within or adjacent to DBCA Estate, dieback is not considered to be an issue for the Proposal.

Impact of Clearing	Yes/No or NA	Further Action Required
		Standard Vehicle and Plant management actions from Principal Environmental Management Requirements (PEMRs) and Hygiene Checklists 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.
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback.	**No**	No further action required.
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	**No**	Prior to the commencement of works, a suitably qualified contractor will be commissioned to undertake weed control of all Declared Plants and WONS recorded within the Proposal Area. Standard management actions will also be included to manage weeds and to ensure they do not spread and result in environmental harm to adjacent areas of native vegetation that are in Good-or-better condition. 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.

9 REFERENCES

Biota Environmental Sciences (Biota), 2023. *Binningup Acceleration Lane – Basic and Targeted Fauna Assessment*. Prepared for Main Roads. March 2023

Commonwealth Scientific and Industrial Research Organisation, 2015. Australian Soil Resource Information System (ASRIS). Available online from http://www.asris.csiro.au
Accessed 30/03/2023.

Department of the Environment (2013). *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance, Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australian Capital Territory.

Department of Environment and Energy, 2016. *Approved Conservation Advice (including listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community*. Conservation Advice approved 26 August 2016. Available online from:
https://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservation-advice.pdf

Department of Environment and Conservation (2014). *A guide to the assessment of applications to clear native vegetation under Part V Division 2 of the Environmental Protection Act 1986*. Department of Environment Regulation. Perth, Western Australia.

Department of Natural Resources and Environment (2002). *Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local*. Department of Natural Resources and Environment, Victoria.

Department of Climate Change, Energy, the Environment and Water. (2023). Protected Matters Search Tool Report. Available online from: http://www.environment.gov.au/epbc/pmst/index.html
Accessed 25/01/2023.

Department of Climate Change, Energy, the Environment and Water. (2023). Species Profile and Threats Database. Available online from: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
Accessed 30/03/2023

Department of Natural Resources and Environment (2002) *Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local*. Victoria.

Department of Parks and Wildlife, 2013. *Carnaby's Cockatoo (Calyptorhynchus latirostris) Recovery Plan – Western Australian Wildlife Management Program No. 52*. Available online from:
https://www.dcceew.gov.au/sites/default/files/documents/carnabys-cockatoo-recovery-plan.pdf

Department of Parks and Wildlife (DPaW), 2017. *Western Ringtail Possum (Pseudocheirus occidentalis) Recovery Plan*. Wildlife Management Program No. 58. February 2017.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2012. *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo*

(endangered) Calyptorhynchus latirostris, Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii, Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso.

Department of Water and Environmental Regulation (DWER), 2023. *Clearing Permit CPS 818/5 – Forrest Hwy/ Binningup Road Acceleration Lane – Letter correspondence with Main Roads Western Australia.* 12 May 2023.

Ecoedge 2023. *Detailed and Targeted Flora and Vegetation Survey Forrest Highway (H057) Binningup Intersection Upgrade*. Prepared for Main Roads. March 2023

Environmental Protection Authority (2020). *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Perth, Western Australia.

Environmental Protection Authority (2016). *Technical Guide – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment* (eds. K Freeman, G Stack, S Thomas and N Woolfrey). Perth, Western Australia.

Government of Western Australia. (2023). 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017. WA Department of Biodiversity, Conservation and Attractions, Perth. Available online from: https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

Government of Western Australia. (2023). 2016 South West Vegetation Complex Statistics. Current as of December 2016. WA Department of Biodiversity, Conservation and Attractions, Perth.
Government of Western Australia (2019). *Native Vegetation Clearing Permits. Application, assessment, and management requirements under Part V Division 2 of the Environmental Protection Act 1986.* Department of Water and Environmental Regulation.

Government of Western Australia (2014a). *A guide to the assessment of applications to clear native vegetation Under Part V Division 2 of the Environmental Protection Act 1986*. Department of Environmental Regulation.

Government of Western Australia (2014b). *WA Environmental Offset Guidelines.* Perth, Western Australia.

Havel, J.J. and Mattiske, E.M. (2000) *Vegetation Mapping of South West Forest Regions of Western Australia*. Prepared for CALMSCIENCE, Department of Conservation and Land Management and Environment Australia

Heddle, E. M., Loneragan, O. W., and Havel, J. J (1980) *Atlas of Natural Resources Darling System, Western Australia*. Department of Conservation and Environment.

Shearer BL, Crane CE, Barrett S, Cochrane A, Barrett R, Hardy GESJ (2004) *Phytophthora cinnamomi and Australia's biodiversity: impacts, predictions and progress towards control*. Australian Journal of Botany 52, 681–692.

10 APPENDICES

Appendix 1: Vegetation Management Plan

FORREST HWY/BINNINGUP ROAD ACCELERATION LANE

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 Forrest Highway/Binningup Road Acceleration Lane.

The Proposal will involve construction of a 670 m long northbound acceleration lane at the intersection of Forrest Highway (H057) and Binningup Road (2110115) including a 3.5 m wide lane with a 2.5 m wide sealed shoulder. Raised islands and improved street lighting will also be provided. Construction is to be full limestone pavement with an asphalt wearing course and drainage will be managed through roadside open drains.

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.

Action

Appendix 1.1 references the standard Principal Environmental Management Requirements (PEMRs) (Tables 1 to 9) that will be utilised for all proposals that involve clearing to avoid, mitigate and manage the environmental impacts of the Proposal.

Proposal specific environmental management actions are contained in Appendix 1.1.

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

Timeframes

Specifies actions to be undertaken during pre-commencement of works, during works or after the works.

Responsibilities

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

Appendix 1.1: Vegetation Management

VMP Requirement	Standard Management Actions	Specific Environmental Management Actions
Clearing	Refer to Table 1: Clearing PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan • Specification 301 Vegetation Clearing and Demolition • Environment Measurement and Evaluation Checklist (for release of HOLD POINTS) Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	Not Applicable
Pegging and Flagging	Refer to Table 7: Pegging and Flagging PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan • Specification 301 Vegetation Clearing and Demolition Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	Not Applicable
Dieback Management	Refer to Table 2: Dieback Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	Not Applicable

VMP Requirement	Standard Management Actions	Specific Environmental Management Actions
Erosion and Sedimentation Control	Refer to Table 3: Erosion and Sedimentation Control PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	Not Applicable
Fauna Management	Refer to Table 4: Fauna Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	A suitably qualified fauna specialist will be present on site during all clearing activities to reduce the risk of potential direct impacts to conservation significant fauna.
Machinery and Vehicle Management	Refer to Table 5: Machinery and Vehicle Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	Not Applicable
Water Drainage Management	Refer to Table 8: Water Drainage Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan	Not Applicable

VMP Requirement	Standard Management Actions	Specific Environmental Management Actions
Weed Management	Refer to Table 9: Weed Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	Prior to the commencement of works, a suitably qualified contractor will be commissioned to undertake weed control of all Declared Plants and WONS recorded within the Proposal Area.
Monitoring	• Specification 204 Environmental Management • Construction Environmental Management Plan • Superintendent's Contract Management Plan & Environmental Measurement and Evaluation Checklist. Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	
Auditing	• Specification 204 Environmental Management • Superintendent's Contract Management Plan & Environmental Measurement and Evaluation Checklist. Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	

Principal Environmental Management Requirements (PEMR's)

Table 1: Clearing PEMR

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 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. 2. The Contractor must minimise vegetation clearing and the area of disturbance on ground by utilising existing cleared area where possible.
DURING WORKS 1. The Contractor must report any damage to vegetation beyond the Limits of Vegetation Clearing as an Environment Incident. 2. The Contractor must ensure Movements are confined to the Limits of Vegetation Clearing during the works. 3. The Contractor must undertake the clearing in accordance with the Fauna PEMR.
POST WORKS NIL

Table 2: Dieback Management PEMR

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. Prescribe where vehicles, machinery and plant are going to be stored/parked during the works. 2. Use the Hygiene Checklist (available at: https://www.mainroads.wa.gov.au/technical-commercial/contracting-to-main-roads/) or equivalent Hygiene form to check that all machinery and vehicles are clean on entry (i.e. free of soil and vegetation).
DURING WORKS 1. Restrict movement of machines and other vehicles to the Limits of Vegetation Clearing. 2. Ensure no known weed affected soil, mulch, fill or other material is brought into the Limits of Vegetation Clearing. 3. Ensure cleared materials are stockpiled or disposed at waste facilities at the locations approved by the Superintendent.
POST WORKS 1. Use the Hygiene Checklist to check that all machinery and vehicles are clean on exit (i.e. free of soil and vegetation).

Table 3: Erosion and Sedimentation Control PEMR

PRE WORKS

1. The Contractor must develop, implement and maintain processes and procedures to ensure that:
    a. The Contractor is responsive to and addresses incidents of erosion and sedimentation within and adjacent to the work areas;
    b. Prevent water and wind soil erosion within and adjacent to the works areas;
    c. Ensure that loose surfaces and recently cleared areas are protected from wind and soil erosion;
    d. Minimise exposed soil working surfaces or protect them from stormwater erosion;
    e. Ensure material such as gravel, crushed rock and excavated material is stockpiled away from drainage paths and covered to prevent erosion.

DURING WORKS

1. Implement, monitor and adhere to the sedimentation and erosion processes developed to address the requirements in the pre-works.

POST WORKS

1. The Contractor must ensure that disturbed areas are stabilised as soon as is practicable after construction activities are completed.

Table 4: Fauna Management PEMR

PRE WORKS

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.
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.

DURING WORKS

2. The Contractor must undertake the clearing in the following manner to allow fauna to move out of the clearing area;
    a. Prior to the clearing activities commencing, use machinery to tap large trees with habitat hollows to encourage any animals evacuate; and,
    b. Undertake the clearing in one direction and towards areas of native vegetation to allow the animals to escape to adjacent habitat.
3. 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.
4. The Contractor must ensure that:
    a. No pets, traps or firearms are brought into the project area;
    b. Fauna are not fed;
    c. Fauna are not intentionally harmed or killed; and,
    d. 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.).
5. 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.

POST WORKS

1. The Contractor must provide any records of fauna impact to the Superintendent.

Table 5: Machinery and Vehicle Management PEMR

PRE WORKS

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.
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.
3. The Contractor must ensure that vehicle servicing and refuelling will be undertaken at designated areas approved by the Superintendent.
4. The Contractor must ensure that all staff suitably qualified and competent to undertake works, especially refuelling activities.

DURING WORKS

1. The Contractor must maintain records of checking all vehicles, machinery and plant are clean on entry.

POST WORKS

NIL

Table 7: Pegging and Flagging PEMR

PRE WORKS

1. Pegging must be done in accordance with the requirements detailed in Specification 301.
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.

DURING WORKS

1. The Contractor must peg the Limits of Clearing by PINK flagging tape.
2. The Contractor must peg/demarcate vegetation proposed to be retained 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 proposal works are completed.

Table 8: Water Drainage Management PEMR

PRE WORKS

1. Use pollution control and containment strategies for proposal 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.

Table 9: Weed Management PEMR

PRE WORKS

1. The Contractor must remove or kill any weeds growing in proposal 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 Forms available at: https://www.mainroads.wa.gov.au/technical-commercial/contracting-to-main-roads/ must be completed and sent to the Superintendent.