Clearing Assessment Report and Vegetation Management Plan (VMP)

Project Specific Clearing Permit

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Kwinana Freeway Upgrades

H015 Kwinana Freeway
Metropolitan Region
EOS 3639

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Document Control

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1 PROPOSAL

1.1 Purpose and Justification

Kwinana Freeway continues to be one of the busiest roads in Perth and currently experiences congestion during peak periods. With Perth's population forecast to increase from 2.17 million in 2025 to 3.5 million by 2050, it is important transport infrastructure can support this growth and facilitate future economic opportunities.

Main Roads Western Australia (Main Roads) is proposing to widen and upgrade Kwinana Freeway between Roe Highway and Safety Bay Road to improve safety, reduce congestion, enhance user journeys and provide better connection to Perth's southern suburbs. Additional lanes will increase the Freeway's capacity and smart technology, in the form of coordinated ramp signals, will improve safety, smooth traffic flow and enhance freight efficiency.

1.1.1 Main Roads Approach to Road Safety and the Environment

Main Roads is committed to minimising the environmental impacts of all of its activities and manages the State road network to achieve balanced economic, social, safety and environmental benefits for the community. Main Roads recognises that Western Australia's environment is significant from a global perspective and the unique conservation values that are contained within its road reserve. Main Roads road network often adjoins natural areas and, in some locations, the reserve itself hosts remnant vegetation with high environmental values. Although the reserves were not established for this purpose, Main Roads recognises that it has a responsibility to conserve the environmental values that occur within the State's road network and minimise the impact its proposals have on the environment. In addition to providing a safe and efficient road network for all people using the roads under its control, Main Roads is also committed to protecting the natural environment.

In accordance with National and State Government road safety policies, Main Roads is also committed to substantially reducing road trauma on the road network through Safe System principles. The Safe System approach acknowledges that more than two thirds of all serious crashes are due to human error rather than deliberate risk taking (e.g. speeding or drink driving) and seeks to improve behaviour through education and enforcement while managing the safety of vehicles, speeds and the road and road infrastructure. It is shown that improving sub-optimal road formation will substantially reduce the likelihood and severity of road crashes. For example, according to the Road Safety Management Guideline, increasing the sealed shoulder from 0.5 m to 2 m will reduce Killed and Seriously Injured numbers by more than 50%.

As the statutory authority responsible for providing and managing a safe and efficient main road network in Western Australia, Main Roads focuses on improving road safety by thoroughly considering all environmental, economic and community benefits and impacts. It operates on a hierarchy of avoiding, minimising, reducing and then, if required, offsetting our environmental impacts. This has been achieved through changes in proposal scope and design. Main Roads regularly reduces its clearing footprint by restricting earthworks limits for proposals, steepening batters, installing barriers, establishing borrow pits in cleared paddocks and avoiding temporary clearing for storage, stockpiles and turn around bays to avoid and minimise its impacts.

Further details on measures to avoid, minimise and reduce are provided in Section 1.5.

1.2 Proposal Scope

The Proposal involves:

- Vegetation clearing and earth works;
- Widening of Kwinana Freeway and ramp upgrades;
- Relocation of services and paths;
- Construction of noise walls; and
- Improvements to safety barriers, surfacing and drainage.

As part of preparing this Clearing Assessment Report (CAR), Main Roads has undertaken desktop analysis and commissioned biological field surveys to map remnant native vegetation units, non-native vegetation units (roadside revegetation) and other land categories (such as infrastructure/cleared areas) within the Project footprint to accurately determine the extent of native vegetation clearing required to deliver the Project. Areas deemed not to meet the *Environmental Protection Act 1986* definition of '*native vegetation*' and areas eligible for a clearing permit exemption have been excluded from this CAR.

1.3 Proposal Location

The Proposal is located on Kwinana Freeway within the City of Cockburn and the City of Kwinana as shown in Figure 1. The central coordinate of the Proposal is -32.1579368, 115.8569001.

The location and boundary of the Native Vegetation Clearing Area associated with the Proposal is shown in Figure 1.

1.4 Clearing Details

Proposed Clearing to be undertaken using project specific permit: The Proposal will require clearing of up to 9.68 ha of native vegetation.

Areas of Native Vegetation Clearing: The areas of native vegetation to be cleared (the Native Vegetation Clearing Area) is shown in Figure 2.

Type of Native Vegetation: Clearing of native vegetation for the Proposal comprises seven native vegetation types as mapped by GHD (2025a) and Biota (2025), including:

- 1.852 ha of BmBa – *Banksia menziesii B. attenuata* woodland;
- 4.447 ha of EgBspp. – *Eucalyptus gomphocephala* and *Banksia* spp. Woodland;
- 1.104 ha of EmBspp. – *Eucalyptus marginata* and *Banksia* spp. Woodland; and
- 1.087 ha of ErMr – *Eucalyptus rudis* over *Melaleuca rhaphiophylla* +/- *M. preissiana* woodland.
- 1.038 ha of B2 *Banksia menziesii* (*B. attenuata*) over *Xanthorrhoea* spp. with *Hibbertia* and *Conostylis*
- 0.151 ha of EB1 *Eucalyptus marginata* (*Banksia* spp.) over *Kunzea* and *Acacia* with *Xanthorrhoea* spp. over *Hibbertia*
- 0.002 ha of M1 *Melaleuca preissiana* low woodland over *Astartea.*

The vegetation types within the Native Vegetation Clearing Area, the subject of this Proposal are displayed in Figure 2.

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

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

- With the predicted increase in Perth's population, the freeway network south of Roe Highway in its current form will not adequately support future opportunities that depend on it for access. No feasible alternatives for the Proposal were identified given the current and predicted traffic congestion issues that affect Kwinana Freeway and that increasing the capacity of the freeway is the only solution with additional lanes and upgrades required to safely and efficiently service current and future predicted traffic volumes on Kwinana Freeway.
- Although no feasible alternative options are available to alleviate current and future congestion, it should be noted the Government of Western Australia is continuing to implement an integrated approach to public and freight movement, with the recent extension of the passenger rail network and future consideration for freight rail upgrades. The Thornlie-Cockburn Link is Perth's first east-west domestic train cross line connection, making travel more flexible while providing a higher level of public transport service to Perth's south-eastern suburbs. Connecting the Mandurah and Armadale-Thornlie lines provides additional flexibility for public transport use, resulting in less private vehicles using the road network. The Thornlie-Cockburn Link will support growth and accessibility across the south-eastern suburbs by providing direct access to employment and recreation opportunities.
- Main Roads retains frangible vegetation where a clear zone is to be established for road projects. For this Proposal, 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. This Proposal will primarily address congestion issues that are not attested to road speed. 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.

The Native Vegetation Clearing Area represents the maximum extent of disturbance for the Proposal. Where possible, vegetation and fauna habitat will be retained during detailed design.

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

Design or Management Measure	Discussion and Justification
Additional lanes added towards the median	The existing road lanes will be maintained, with as little modification as practical to achieve the ultimate lane configuration and number. North of the rail portal, there is limited opportunity to add lanes to the median, due to rail corridor safety and access requirements. However, south of the rail portal, lanes will be incorporated into the cleared median to avoid clearing of native vegetation on the verge of the existing Kwinana Freeway.
Simplification of design	Traffic volumes, traffic mix, and road safety influence the intersection and ramp layouts and carriageway cross section. Ramps will be located to reduce points of conflict and ensure maximum sight distance can be achieved, while avoiding future abortive works and minimising native vegetation clearing. Design of the additional lanes will be consistent with the existing freeway cross-section to reduce earthworks and disturbance footprint.
Steepen batter slopes	The detailed design will seek to reduce earthworks (fill height/cut depth), particularly in areas of heavy vegetation. Rock pitching will be incorporated for batters and embankments of 3:1 or steeper to minimise clearing of native vegetation.
Installation of barriers	The detailed design will utilise barriers where possible to protect high-quality vegetation, by reducing clearing requirements and potential native vegetation and fauna impacts.
Installation of kerbing	Clearing and native vegetation impacts will be minimised by implementing measures such as the use of kerbing where appropriate to alleviate the need for table drains, that require a larger clearing footprint
Use of existing cleared areas for access tracks, construction storage and stockpiling	Site office(s), materials storage areas, construction vehicles/machinery and access tracks will be located in existing cleared areas so as to avoid the need to clear native vegetation.
Drainage modification	Drainage design will maintain existing surface flow lines to avoid impacting retained native vegetation. This will be investigated further during detailed design.

1.7 Approved Policies and Planning Instruments

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

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

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

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

Other relevant policies and guidance documents:

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DER, 2014)
- Procedure: Native vegetation clearing permits (DWER, 2021)
- Environmental Offsets Guidelines (Government of Western Australia, 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities
- Referral guideline for 3 WA threatened black Cockatoo Species Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*) and the Forest Red-tailed Black-cockatoo (*Calyptorhynchus banksii naso*) (Department of Agriculture, Water and the Environment (DAWE) 2022)
- EPBC Act Matters of National Environmental Significance, Significant Impact Guidelines 1.1 (DoE 2013).

2 SCOPE AND METHODOLOGY ASSESSMENT OF CLEARING

Native vegetation will be cleared to accommodate this Proposal. This clearing will be undertaken using a project-specific Clearing Permit.

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 (Clearing Area)** – The maximum amount of native vegetation to be cleared for the Proposal that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe movement of machinery during construction. The Clearing Area for this Proposal is 9.68 ha
- **Survey Area** – Area covered by the Biological Surveys.

2.2 Desktop Assessment

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

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:

- Kwinana Freeway widening Biological Survey (GHD, 2025a)
- Targeted Orchid Survey Kwinana Freeway Upgrade (GHD, 2025b)
- Anketell Road Upgrade (Leath Road to Kwinana Freeway) Consolidated Biological Report (Biota, 2025)
- Phytophthora Dieback Occurrence Report for Kwinana Freeway Upgrade Assessment (Glevan Consulting, 2025)

Biological survey data from GHD (2025a) covers the Clearing Area, with the exception of the Kwinana Freeway and Anketell Road Interchange, where biological survey data from Biota (2025) was used. The targeted orchid survey completed by GHD (2025b) covers the entirety of the Clearing Area.

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 Sections 3.1 to 3.4.

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

Consultant and Survey Name	Survey Details
Kwinana Freeway widening - Biological Survey (GHD, 2025a)	**Survey Area:** The survey area was located along the Kwinana Freeway, extending from Roe Highway intersection, approximately 22 km south to Safety Bay Road intersection. The survey area comprised three sections: • Kwinana Freeway from the intersection of Roe Highway south to Mortimer Road; • Kwinana Freeway, Mundijong intersection west; and • Kwinana Freeway, Safety Bay Road intersection west. The survey area covered 285.44 ha. **Type:** The biological survey included a detailed and targeted flora and vegetation survey, floristic community type assessment, basic fauna survey, targeted short-range endemic survey for signs of burrows of the trapdoor spider (*Idiosoma sigillatum)*, a wetland assessment and targeted Black Cockatoo habitat assessment. **Timing:** The targeted flora survey for *Drakaea elastica* and wetland assessment were completed in July 2024. The detailed and targeted flora and vegetation survey, basic fauna survey, targeted SRE survey and targeted Black Cockatoo habitat assessment were completed in September and November 2024. **Survey Results Shapefile TRIM Ref: D25#664309** **Document TRIM Ref: D25#534061**
Targeted Orchid Survey Kwinana Freeway Upgrade (GHD, 2025b)	**Survey Area:** The survey area included all remnant native vegetation types and two roadside revegetation types (as mapped in GHD 2025a). The survey area covered 25.43 ha. **Type:** The survey included a targeted flora survey for Glossy-leaved Hammer Orchid (*Drakaea elastica*), King Spider-orchid (*Caladenia huegelii*) and Dwarf Bee-orchid (*Diuris micrantha*), **Timing:** The survey was conducted from 27th to 30th October 2025. **Survey Results Shapefile TRIM Ref: D25#1444175** **Document TRIM Ref: D25#1299693**
Anketell Rd Upgrade – Consolidated Biological Report (Biota, 2025)	**Survey Area:** The survey area extended along Anketell Road from Leath Road within the Kwinana Industrial Area to east of Kwinana Freeway (to Treeby Road). The survey area covered 224.83 ha. **Type:** The biological survey included detailed and targeted flora and vegetation surveys, floristic community type assessment, basic fauna surveys, targeted significant fauna surveys, an SRE invertebrate survey and Black Cockatoo habitat assessment. **Timing:** Surveys were completed between October 2020 and October 2024. **Survey Results Shapefile TRIM Ref: D25#56046** **Document TRIM Ref: D24#1541577**

Consultant and Survey Name	Survey Details
Phytophthora Dieback Occurrence Report for Kwinana Freeway Upgrade Assessment (Glevan Consulting, 2025)	**Survey Area:** The Project Area totalled 347.62 ha, spanning from Farrington Road in the north to Safety Bay Road in the south. **Type:** The Phytophthora Dieback occurrence assessment was completed in August 2025 by an accredited Dieback Interpreter. All Dieback detection, diagnosis and mapping were completed in accordance with FEM047 Phytophthora Dieback Interpreter's Manual for Lands Managed by the Department (Department of Parks and Wildlife, 2015). **Survey Results Shapefile TRIM Ref: D25#972821** **Document TRIM Ref: D25#972827**

3 SURVEY RESULTS

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 Kwinana Freeway Widening Biological Survey (GHD, 2025a)

Main Roads commissioned GHD to undertake a detailed and targeted flora and vegetation survey, floristic community type (FCT) assessment, basic fauna survey, including a targeted Short-Range Endemic (SRE) survey for signs of burrows of the trapdoor spider (*Idiosoma sigillatum*), targeted black cockatoo habitat assessment and wetland assessment of the survey area. The survey area extended approximately 27 kilometres (km) along Kwinana Freeway, between Roe Highway in the north and Safety Bay Road in the south. The survey area covered 285.44 ha.

Vegetation

Most of the survey area consisted of cleared areas (173.87 ha, 60.9%) and roadside revegetation (92.65 ha, 32.5%) from circa 2002 or before. Native vegetation covered 18.92 ha (6.6%) of the survey area. In some sections, particularly where the revegetation lies adjacent to remnant vegetation, the revegetation has been mapped using a consistent vegetation type to the native vegetation extents. This is because endemic flora species were selected when these areas were revegetated and as a result the revegetation has integrated with adjacent remnant bushland. Five native vegetation types were mapped for the survey area. This included three Banksia woodland types, one *Corymbia calophylla* woodland and a wetland vegetation type. Another five vegetation types were mapped as roadside revegetation. Infrastructure such as roads and houses were mapped as cleared.

A FCT analysis was performed using native vegetation quadrats. The native vegetation of the survey area was generally fragmented linear extents where the quality of the vegetation was variable. As a result, not all quadrats were able to be placed in vegetation of good or better condition. For the analysis, quadrats from a nearby survey of Roe Highway were used to supplement the Kwinana data due to the vegetation quality in the survey area. From the analysis, four FCTs were determined; wetland community 11 and Banksia/ Eucalyptus communities 21a, 23a and 28. None of the FCTs identified in the survey area are listed as Threatened Ecological Communities (TECs) under the EPBC Act or BC Act, nor are they listed as Priority Ecological Communities (PECs) by the Department of Biodiversity, Conservation and Attractions (DBCA).

Vegetation condition was variable throughout the survey area and ranged from Very Good to Completely Degraded. Apart from Cleared areas (which were not rated) most of the survey area was in Completely Degraded condition (89.30 ha, 31.3%). The poor condition of the survey area was reflected in the patch assessments for significant vegetation. Patch and condition thresholds were applied to patches of remnant vegetation considered representative of Banksia Woodlands of the Swan Coastal Plain (Banksia Woodlands) and/or Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain (Tuart woodlands and forests) EPBC Act listed TECs and DBCA listed PECs. The results of the patch assessments concluded 13.34 ha of the Banksia Woodlands TEC and PEC and 2.56 ha of the Tuart woodlands and forests TEC and PEC occur within the survey area.

Flora

Two hundred and twenty (220) vascular flora species were recorded in the survey area. No EPBC Act listed flora were recorded within the survey area. Three significant flora species were recorded within the survey area, however two of these species are considered naturalised and therefore they

are not bound by the regulatory requirements for significant species as listed by the EPBC Act and/ or BC Act or DBCA.

- *Jacksonia gracillima* (P3)
- *Grevillea curviloba* listed as Endangered under the BC Act (naturalised)
- *Grevillea olivacea* (P4) (naturalised).

The likelihood of occurrence assessment post-field survey concluded one taxon was known and recorded in the survey area during the survey (*Jacksonia gracillima*) and two taxa were considered possibly occurring (*Poranthera moorokatta*, Priority 2 and *Dodonaea hackettiana*, Priority 4).

Of the 220 flora species recorded during the survey, 64 were introduced. Five of the introduced species are listed as Declared Pest (DP) plants in Western Australia under the *Biosecurity and Agriculture Management Act 2007* (BAM Act), two are also listed as Weeds of National Significance (WoNS) (Australian Weeds Committee, 2012).

Wetlands

Twenty four geomorphic wetlands had been mapped across the survey area by DBCA. A Preliminary wetland evaluation was carried out on eight Conservation category and one Resource Enhancement wetland by a Senior Ecologist as part of the biological survey. Upon completion it was determined that a secondary evaluation was not required as all nine wetlands met the preliminary criteria to meet the Conservation category due to the condition of their associated vegetation. Resource Enhancement wetland (UFI 6664) was deemed fit to be upgraded to a Conservation category. This wetland was dissected by an existing freeway noise/screening wall, with the extent considered Conservation category occurring outside the survey area.

The remaining 25 wetlands intersecting the survey area were not evaluated, as they had been subject to high levels of clearing or fragmentation, had lost functionality, or were classified as a Dryland by DBCA.

Fauna Habitats

Eight broad fauna habitat types were identified during the survey, including cleared areas that account for 60.9% of the total survey area. The habitats were generally highly degraded in most areas due to survey area location in an extensively urbanised landscape. Habitat remnants are highly fragmented and subject to long-term degradation from the effects of weed invasion, landscape modification, and vegetation loss. Habitat present does provide suitable foraging and shelter for several locally occurring significant fauna.

Significant fauna

The field survey recorded three significant species including:

- Carnaby's Cockatoo (*Zanda latirostris*) – Endangered under EPBC Act and BC Act
- Forest Red-tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksia naso*) – Vulnerable under EPBC Act and BC Act
- Quenda (*Isoodon fusciventer*) – listed Priority 4 by DBCA.

Carnaby's Cockatoo was recorded during the field survey at several locations from sightings and foraging evidence in Banksia woodland habitats. FRTBC was observed and heard calling at several locations and foraging evidence recorded at several locations across the survey area. Baudin's Cockatoo was not recorded during the survey but is known to occasionally forage and roost regionally. The survey area is located on the western edge of current known foraging distribution and lies outside the known breeding range of this species, which has a bearing on the habitat

suitability and value for this cockatoo. Baudin's Cockatoo should be considered an occasional visitor however this is only likely to be in the context of temporary fly-over activity or rare and temporary foraging activity.

The survey area contains suitable foraging habitat for Carnaby's and FRTBC including:

- Carnaby's Cockatoo – 26.67 ha (mod-high)
- FRTBC – 1.97 ha (high), 14.40 ha (mod) and 10.30 ha (low).

The survey area contains Black Cockatoo breeding habitat including 44 suitable diameter breast height (DBH) trees without breeding hollows. These trees included Marri, Flooded Gum, Tuart and Jarrah trees. It is noteworthy that many of these are replanted trees and while they ultimately carry the potential as future breeding trees, this is unlikely to be the case for at least another 50 to 100 years in some cases. Although no confirmed roosts occur within the survey area, 40 individual tree groupings of suitable height, species type and location were assessed as potential roost habitat based on suitable roosting habitat criteria.

Quenda were recorded from signs of foraging during the field survey and scat confirming species' presence within the survey area. Numerous local records indicate populations persisting in small, fragmented bushland areas within and around the survey area. Dense remnant and modified vegetation provides habitat for this species.

Several species of vertebrate and invertebrate occurring locally were not recorded during the survey but are likely to occur based on habitat suitability and proximity of records including Peregrine Falcon (OS), Perth Slider (Priority 3), Black-striped Snake (Priority 3), Swan Coastal Plain Shield-backed Spider (Priority 3), Blue-billed Duck (Priority 4) and Graceful Sun Moth (Priority 4).

3.2 Summary of Targeted Orchid Survey Kwinana Freeway Upgrade (GHD, 2025b)

Main Roads commissioned GHD to conduct a targeted survey for three State and Commonwealth-listed Threatened orchid species in suitable habitat areas within the Proposal footprint. The orchid species targeted during the survey included Glossy-leaved Hammer Orchid (*Drakaea elastica*) (Critically Endangered & Endangered), King Spider-orchid (*Caladenia huegelii*) (Critically Endangered & Endangered) and Dwarf Bee-orchid (*Diuris micrantha*) (Vulnerable & Vulnerable), listed under the BC Act and EPBC Act, respectively.

All five remnant native vegetation types and two roadside revegetation types (based on the mapping in GHD 2025a) were included in the search area for the targeted survey. These vegetation/revegetation types were considered potential/may be potential habitat for one or more of the target orchids.

No orchids were recorded during the survey.

3.3 Summary of Anketell Road Upgrade Biological Survey (Biota, 2025)

Main Roads commissioned Biota to complete detailed and targeted flora and vegetation surveys, floristic community type assessment, basic fauna surveys, targeted significant fauna surveys, an SRE invertebrate survey and Black Cockatoo habitat assessment for the Anketell Road Upgrade project. The results and associated spatial data have been consolidated into a single report for a survey area covering 224.83 ha.

Results specific to the Kwinana Freeway and Anketell Road interchange are summarised below.

A total of 1.191 ha of native vegetation was identified in the Kwinana Freeway and Anketell Road interchange survey area. Native vegetation was mapped as three vegetation types, B2 *Banksia menziesii* (*B. attenuata*) over *Xanthorrhoea* spp. with *Hibbertia* and *Conostylis* (1.038 ha), EB1 *Eucalyptus marginata* (*Banksia* spp.) over *Kunzea* and *Acacia* with *Xanthorrhoea* spp. over *Hibbertia* (0.151 ha) and M1 *Melaleuca preissiana* low woodland over *Astartea* (0.002 ha). These vegetation types aligned with three fauna habitats Banksia Woodland (B1), Jarrah/Banksia Woodland (EB1) and Damplands (M1).

Two patches of Banksia Woodland TEC/PEC were identified in the Kwinana Freeway and Anketell Road interchange survey area. Patch BT03 is mapped as 0.856 ha of B1 in Very Good to Excellent Condition. Patch BT04 is mapped as 0.181 ha of B1 in Good condition and 0.151 ha of EB1 in Good condition. State Priority 3 PEC Northern Spearwood shrublands and woodlands (SCP24) was mapped within EB1 in Patch BT04.

Black Cockatoo foraging quality was scored using the Bamford Consulting Ecologist (BCE) foraging habitat scoring system (BCE 2020). Fauna habitat Damplands (M1) (0.002 ha) was not deemed as suitable Black Cockatoo habitat therefore not scored. There is 1.91 ha of suitable foraging habitat for Carnaby's Cockatoo and 0.151 ha of suitable foraging habitat for FRTBC.

3.4 Summary of Dieback Survey (Glevan, 2025)

Glevan Consulting was commissioned by Westport Roads IPT to conduct a Phytophthora Dieback assessment of remnant bushland along Kwinana Freeway spanning from Farrington Road in the north to Safety Bay Road in the south. Portions of the Project Area had previously been assessed by Glevan Consulting, with the most recent surveys taking place in 2013 and 2014. The Glevan Consulting Project Area totalled 347.62 ha.

The assessment began on 7 July 2025 and was finalised on 13 August 2025 by Glevan Consulting. The assessment was carried out in accordance with the Phytophthora Dieback Interpreter's Manual for lands managed by DPaW (2015).

Of the intact native vegetation, 41.94 ha (12.06 %) was classed as Uninfested with adequate amounts of susceptible species present. Permanently Uninterpretable Protectable vegetation accounted for 27.78 ha (7.99 %) of the Project Area due to the overall lack of sufficient indicators, with a further 1.51 ha (0.43 %) ha classed as Permanently Uninterpretable Unprotectable. This classification was used due to the presence of an Infested area upslope of the Permanently Uninterpretable vegetation. There was 268.43 ha classified as Excluded due to the complete lack of natural vegetation often found in paddocks, residential areas and private businesses where natural vegetation has become degraded or completely cleared. The remaining 5.47 ha (1.57 %) was classified as Infested.

Three soil and tissue samples were taken throughout the course of the assessment, one of which returned a positive result for *Phytophthora cinnamomi*.

4 VEGETATION DETAILS

4.1 Proposal Site Vegetation Description

The Clearing Area has 9.68 ha of native vegetation in Completely Degraded to Very Good Condition.

Table 3: Summary of Vegetation Types within the Clearing Area (GHD 2025a, Biota 2025)

Vegetation Type	Vegetation Type Description	Extent within Clearing Area	Vegetation Condition
BmBa – *Banksia menziesii B. attenuata* woodland B2	*Banksia menziesii* and *Banksia attenuata* woodland over *Hibbertia hypericoides Scholtzia involucrata Styphelia conostephioide*s low shrubland over *Patersonia occidentalis, Desmocladus flexuosus* and *Lyginia barbata* open herb/sedgeland	2.890 ha	Completely Degraded 0.507 ha Degraded 0.267 ha Good 1.092 ha Very Good 0.168 ha Very Good to Excellent 0.856 ha
EgBspp. – *Eucalyptus gomphocephala* and *Banksia* spp. woodland	+/- *Eucalyptus gomphocephala* tall open woodland over *Banksia attenuata* and *B. menziesii* woodland over *Acacia pulchella* var *pulchella, Xanthorrhoea preissii* and *Hibbertia hypericoides* low open shrubland over *Mesomelaena pseudostygia* and **Ehrharta calycina* sedgeland/ grassland	4.447 ha	Degraded 3.565 ha Good 0.469 ha Very Good 0.412 ha
EmBspp. – *Eucalyptus marginata* and *Banksia* spp. woodland	+/- *Eucalyptus marginata* tall open woodland over Banksia attenuata, *B. menziesii* and Allocasuarina fraseriana woodland over *Acacia pulchella var pulchella Hibbertia hypericoides*, *Bossiaea eriocarpa* low open shrubland over weedy grasses	1.104 ha	Degraded 1.026 ha Good 0.078 ha
ErMr – *Eucalyptus rudis* over *Melaleuca rhaphiophylla* +/- M. *preissiana* woodland	*Eucalyptus rudis* over *Melaleuca rhaphiophylla +/- M. preissiana* over *Kunzea glabrescens* tall sparse shrubland over *Xanthorrhoea preissii* low shrubland over *Lepidosperma longitudinale* sedgeland	1.087 ha	Completely Degraded 0.371 ha Degraded 0.467 ha Good to Degraded 0.249 ha
EB1 *Eucalyptus marginata* (*Banksia* spp.) over *Kunzea* and *Acacia* with *Xanthorrhoea* spp. over *Hibbertia*	*Eucalyptus marginata subsp. marginata, Banksia menziesii, B. attenuata* low open forest to open forest over *Kunzea glabrescens, Acacia cyclops* tall open shrubland over *Xanthorrhoea preissii, X. brunonis subsp. brunonis* open grass trees over *Hibbertia hypericoides subsp. hypericoides, Acacia pulchella* low open shrubland over **Ehrharta calycina* open grassland	0.151 ha	Good 0.151 ha
M1 *Melaleuca preissiana* low woodland over *Astartea*	*Melaleuca preissiana low woodland to closed forest over Astartea scoparia tall open shrubland to tall open scrub over *Ehrharta longiflora open*	0.002 ha	Good 0.002 ha

	grassland.		

The Clearing Area is located within the Swan Coastal Plain IBRA bioregion and the Perth subregion (SWA02). Mitchell et al. (2002) describes the Swan Coastal Plain as a low lying coastal plain, mainly covered with woodlands. It is dominated by Banksia or Tuart on sandy soils, *Casuarina obesa* on outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah woodland. The Perth subregion is composed of colluvial and aeolian sands, alluvial river flats and coastal limestone. Heath and/or Tuart woodlands occur on limestone, Banksia and Jarrah Banksia woodlands occur on Quaternary marine dunes of various ages and Marri on colluvial and alluvials (Mitchell et al., 2002).

Broad scale (1:250,000) pre-European vegetation mapping identified two Vegetation Associations within the Clearing Area, as shown in Table 4.

Table 4: Summary of Clearing Area Mapped Pre-European Vegetation Associations

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
6: Medium woodland of Tuart and Jarrah.	Clearing up to 0.607 ha of native vegetation	Degraded (EPA, 2016)	Vegetation condition determined from biological survey (GHD, 2025; Biota 2025)
1001: Medium very sparse Jarrah woodland with low woodland of Banksia and Casuarina.	Clearing up to 9.073 ha of native vegetation	Completely Degraded to Very Good (EPA, 2016)	Vegetation condition determined from biological survey (GHD, 2025; Biota 2025)

The pre-European mapping has been adapted and digitised by Shepherd et al. (2002). The extent of vegetation associations has been determined by the state-wide vegetation remaining extent calculations maintained by DBCA, most recently updated in 2019 (GoWA, 2019). The current remaining extent of the vegetation associations within the Clearing Area at all scales is greater than 20% (Table 5).

Table 5: Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
Veg Assoc No. 6	**Statewide** WA	56,343.01	13,362.25	23.72	9.45
	IBRA Bioregion Swan Coastal Plain	56,343	13,362	24	9.45
	IBRA Subregion Perth	56,343	13,362	24	9.45
	Local Government Authority City of Cockburn	2,287	480	20.99	9.45

Pre-European Vegetation Association	Scale	Pre–European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
	Local Government Authority City of Kwinana	1,477.48	547.36	37.05	-
Veg Assoc No. 1001	**Statewide** WA	57,410	12,661	22.05	3.13
	IBRA Bioregion Swan Coastal Plain	57,410	12,661	22.05	3.13
	IBRA Subregion Perth	57,410	12,661	22.05	3.13
	Local Government Authority City of Cockburn	7,328	2,003	27.33	4.08
	Local Government Authority City of Kwinana	4,694.17	1,745.29	37.18	0.73
	Local Government Authority City of Rockingham	3,010.32	1,154.53	38.32	0.21

4.2 Vegetation Complexes and Representation

Vegetation complexes within the Clearing Area have been defined by Heddle et al. (1980) and are based on vegetation in association with landforms and underlying geology. Three native vegetation complexes as described by Heddle et al. (1980) occur within the Clearing Area, as follows:

- **Cottesloe Complex – Central and South** - Mosaic of woodland of *Eucalyptus gomphocephala* (Tuart) and open forest of *Eucalyptus gomphocephala* (Tuart) - *Eucalyptus marginata* (Jarrah) – *Corymbia calophylla* (Marri); closed heath on Limestone outcrops
- **Herdsman Complex** - Sedgelands and fringing woodland of *Eucalyptus rudis* (Flooded Gum) – Melaleuca species.
- **Bassendean Complex – Central and South** - Vegetation ranges from woodland of *Eucalyptus marginata* (Jarrah) – *Allocasuarina fraseriana* (Sheoak) - *Banksia* species to low woodland of Melaleuca species, and sedgelands on the moister sites. This area includes the transition of *Eucalyptus marginata* (Jarrah) to *Eucalyptus todtiana* (Pricklybark) in the vicinity of Perth.

The current remaining extent of the vegetation complexes are detailed in Table 6. The remaining extent of each complex is above the above threshold of 10% that is the target for retention in constrained areas (DWER, 2014).

Table 6: Vegetation Complexes (Heddle/Mattiske) within the Clearing Area

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
Cottesloe Complex – Central and South	45,299.61	14,571.43	32.17
Herdsman Complex	9,665.15	3,081.05	31.88
Bassendean Complex – Central and South	87,476.25	23,533.09	26.90

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 variance to Clearing Principles (a), (b), (d), (f) and (h) and is not at variance, or not likely to be at variance, to the remaining Clearing Principles.

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

Proposed clearing is at variance to this Principle.

Vegetation

The Clearing Area comprises 9.68 ha of native remnant vegetation mapped as six vegetation types ranging from Completely Degraded to Very Good to Excellent condition (GHD, 2025a and Biota 2025). The vegetation types include:

- BmBa – *Banksia menziesii B. attenuata* woodland and B2 – *Banksia menziesii* (*B. attenuata*) over *Xanthorrhoea* spp. with *Hibbertia* and *Conostylis*
- EgBspp. – *Eucalyptus gomphocephala* and *Banksia* spp. Woodland
- EmBspp. – *Eucalyptus marginata* and *Banksia* spp. woodland
- ErMr – *Eucalyptus rudis* over *Melaleuca rhaphiophylla +/- M. preissiana* woodland.
- EMB1 – *Eucalyptus marginata* (*Banksia* spp.) over *Kunzea* and *Acacia* with *Xanthorrhoea* spp. over *Hibbertia*
- M1 – *Melaleuca preissiana* low woodland over *Astartea*

Threatened Ecological Communities / Priority Ecological Communities (TECs/PECs)

The native vegetation represents three state listed PECs, of which two are synonymous with the EPBC Act listed TECs:

- Banksia Woodlands Priority 3 PEC and EPBC Act Endangered TEC
- Tuart woodlands and forests Priority 3 PEC and EPBC Act Critically Endangered TEC
- Northern Spearwood Shrublands and Woodlands Priority 3 PEC

There is 6.23 ha of the Banksia Woodlands TEC/PEC mapped across four patches within the Clearing Area (see Figure 4). A patch assessment was undertaken to determine if the extent of the patches remaining (following clearing of the Clearing Area) still meet the minimum size and condition thresholds required to be representative of the TEC (DEE 2016) (Table 7). The asessment identified that clearing for the Proposal will occur on the edge of each patch and will not result in any patch becoming unviable with all four patches extending beyond the Clearing Area.

Table 7: Extent of Banksia Woodlands TEC/PEC in the Clearing Area

Patch ID	Size of patch overall (ha)	Extent of patch within Clearing Area (ha)	% of patch being cleared	Comments
BT03	17.76	2.708	15.248	Proposed clearing occurs on the edge of each patch. All patches will meet
BT04	62.59	2.002	3.066	

BT05	7.15	1.104	15.440	size threshold and condition thresholds (>2 ha and Good condition or better condition) post clearing. Remains Banksia TEC/PEC patch.
BT06 and BT07	51.94	0.413	0.795	

There is 0.15 ha of the Northern Spearwood Shrublands and Woodlands (SCP24) PEC within the Clearing Area. This PEC occurs at one location south of the Kwinana Freeway and Anketell Road interchange and is also mapped as the Banksia Woodlands TEC/PEC. Biota (2025) mapped approximately 186 ha of FCT 24 within its survey contextual area for the nearby Anketell Road project area. The proposed clearing of 0.15 ha for this Proposal represents approximately 0.08 % of the extent mapped by Biota (2025) and is therefore not considered locally or regionally significant.

There is 0.88 ha of Tuart woodlands and forests TEC/PEC mapped across two patches within the Clearing Area (see Figure 4). A patch assessment was undertaken to determine if the extent of the patches remaining following the proposed clearing still meet the minimum size and condition thresholds required to be representative of the TEC (DEE 2019) (Table 8). The assessment identified that clearing for the Proposal will occur on the edge of each patch and will not result in any patch becoming unviable with both patches extending beyond the Clearing Area.

Table 8: Extent of Tuart forests and woodlands TEC/PEC in the Clearing Area

Patch ID	Size of patch overall (ha)	Extent of patch within the Clearing Area (ha)	% of patch being cleared	Comments
TT01	11.08	0.696	6.28	Clearing on western edge of patch. Patch will meet size threshold (>5 ha) post clearing. Remains Tuart TEC/PEC patch.
TT02	8.12	0.187	2.31	Clearing on eastern edge of patch. Patch will meet size threshold (>5 ha) post clearing. Remains Tuart TEC/PEC patch.

Flora

Two hundred and twenty (220) vascular flora taxa (including species, subspecies, varieties, forms) from 54 families and 153 genera, were recorded in the broader GHD (2025a) survey area. One-hundred and forty-eight (148) of the flora recorded were native taxa, seven were naturalised and 65 were introduced. Naturalised and introduced taxa accounted for approximately one third of all recorded taxa, reflective of the high levels of disturbance in the Clearing Area.

Conservation significant flora

The EPBC Act Protected Matters Search Tool (PMST) (DCCEEW, 2025) and DBCA TPFL and WA Herbarium databases identified the presence/potential presence of 32 conservation significant flora taxa within a 5 km buffer of the Clearing Area. This included:

- Two Critically Endangered taxa listed under the EPBC Act and/or BC Act.
- Eight Endangered taxa listed under the EPBC Act and/or BC Act
- Five Vulnerable taxa listed under the EPBC Act and/or BC Act
- Two Priority 1 taxa, listed by the DBCA
- Two Priority 2 taxa, listed by the DBCA
- Six Priority 3 taxa listed by the DBCA
- Seven Priority 4 taxa listed by the DBCA.

One significant flora species, *Grevillea curviloba* (Endangered under the BC Act) was recorded in the Clearing Area. Although listed as Threatened under the BC Act, it is considered to be cultivated flora within the Clearing Area, as defined in the BC Act, as it occurs outside its natural range and habitat. The natural range of *Grevillea curviloba* is north of the Clearing Area around Bullsbrook and Muchea and is found growing in winter wet heaths (GHD, 2025a). According to the Atlas of Living Australia (2025), *Grevillea curviloba* is cultivated as an ornamental plant by plant nurseries, for use in gardens and drought tolerant landscaping. It is grown as a shrub with erect forms, or maintained as a 0.61 m by 4.6 m groundcover with prostrate forms. Therefore, in accordance with section 173 of the BC Act, a section 40 authorisation is not required to take individuals of *Grevillea curviloba* within the Clearing Area e (GHD, 2025a). The presence of five cultivated *Grevillea curviloba* individuals within the Clearing Area is not of significance from a biological diversity perspective.

A Post-survey Likelihood of Occurrence assessment by GHD (2025a) determined one species as 'Known' and two species as 'Possible' occurring in the broader Survey Area. The likelihood of these species occurring in the Clearing Area, including the potential significance of their occurrence if present, is discussed further below:

Jacksonia gracillima (Priority 3) is a spreading shrub that produces pink to orange flowers in October and November. It is generally found in low lying areas associated with sandy to loamy soils (Western Australian Herbarium, 1998 –). Three individuals of this species were recorded growing within an isolated pocket of Cc vegetation (*Corymbia calophylla* woodland), which was restricted to 0.42 ha. Vegetation extending beyond the boundary of the survey area was vegetation type ErMr. This area was searched and no further records of *J. gracillima* were located (GHD, 2025a). The Cc vegetation type is not present within the Clearing Area and no individuals of *Jacksonia gracillima* were located in the Clearing Area, despite adequate search effort during the optimal time to record the species. As such, the likelihood of this species occurring within the Clearing Area is considered 'Unlikely'.

Poranthera moorokatta (Priority 2) is a small annual species which is only visible for a short period of time, that can be cryptic. There is suitable habitat present in the Clearing Area and a single individual of this species was located outside of the Clearing Area, near Anketell Road. According to the Western Australian Herbarium (1998 -), the species has been recorded from ten Local Government Areas from the Swan Coastal Plain IBRA region, with records spanning approximately 400 km north to south (Dandaragan to Busselton). Whilst occurrence of this species in the Clearing Area is 'Possible', it is unlikely that the proposed clearing of degraded, narrow and linear roadside habitat will result in the loss of significant habitat for *Poranthera moorokatta*.

Dodonaea hackettiana (Priority 4) was possibly observed on the edge of a slip lane near Roe Highway and Kwinana Freeway. However, the area was too dangerous to pull over and so the plant was unable to be collected for identification (GHD, 2025a). There is suitable habitat for this species within the Clearing Area. According to the Western Australian Herbarium (1998 -), the species has been recorded from sand and outcropping limestone across eight Local Government Areas from the Swan Coastal Plain IBRA region, with records spanning approximately 130 km north to south (Gingin to Rockingham). Whilst occurrence of this species in the Clearing Area is 'Possible', it is unlikely that the proposed clearing of degraded, narrow and linear roadside habitat will result in the loss of significant habitat for *Dodonaea hackettiana*.

Fauna habitat

The Clearing Area consists of four broad habitat types that provide habitat for a range of native fauna species. The fauna habitat types include:

- Banksia woodland – 2.890 ha
- Eucalyptus woodland over Banksia – 5.551 ha
- Melaleuca dampland and sparse flooded gum – 1.087 ha
- Jarrah/Banksia Woodland – 0.151 ha
- Damplands – 0.002 ha

The fauna habitats are highly degraded in most areas due to the location being in an extensively urbanised landscape. Habitat remnants are also subjected to long-term degradation from the effects of weed invasion, landscape modification and vegetation loss.

Conservation significant fauna

Three conservation significant species were recorded during the GHD (2025a) and Biota (2025) field surveys:

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

A post-survey likelihood of occurrence assessment was refined for the Clearing Area. This assessment concluded a further eight conservation significant fauna species may potentially occur in the Clearing Area. The significance of habitat for fauna species is addressed in Clearing Principle (b).

Bush Forever

The Clearing Area intersects the edge of Bush Forever site 270 – Sandy Lake and Adjacent Bushland Anketell. The Proposal will clear up to 0.32 of Very Good to Excellent, 0.13 ha of Degraded and 0.40 ha of Very Good condition native vegetation in Bush Forever site 270. Given the existing levels of disturbance due to the existing freeway, PSP, boundary fences and associated fire breaks, it is unlikely the Proposal will result in any further impact on the values of the Bush Forever site 270.

Assessed outcome:

The Proposal will result in the loss of 9.68 ha of native vegetation ranging from Very Good to Excellent to Completely Degraded condition. The Clearing Area comprises narrow linear areas alongside the existing Kwinana Freeway. The native vegetation within the Clearing Area represents Banksia Woodlands TEC/PEC, Tuart forests and woodlands TEC/PEC, Northern Spearwood Shrublands and Woodlands (SCP24) PEC, and suitable habitat for conservation significant fauna species including Quenda and Black Cockatoos. Based on the above, the proposed clearing is at variance to this Principle.

Methodology

- Biota (2025)
- DCCEEW (2025)
- DEE (2016)
- DEE (2019)
- GHD (2025a)
- GHD (2025b)
- Western Australian Herbarium (1998-)
- Government GIS Shapefiles:
  - DBCA Threatened and Priority Ecological Community database search (Accessed July 2025)
  - DBCA Threatened and Priority flora database search (Accessed July 2025)
  - DBCA Threatened and Priority fauna database search (Accessed July 2025)
  - WA Herbarium Threatened and Priority flora (Accessed July 2025)
  - Bush Forever Areas (DPLH-019)
- Government of Western Australia (2019)

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

Proposed clearing is at variance to this Principle.

Fauna habitat

The proposed clearing will result in the direct loss of fauna habitat via the clearing of up to 9.68 ha of native vegetation. The native vegetation to be cleared broadly consists of five fauna habitats as described in Table 9 (GHD, 2025a; Biota, 2025).

Table 9: Fauna Habitat types in the Clearing Area

Habitat type	Description	Mapped within Clearing Area
Banksia woodland	This habitat type corresponds with vegetation types BmBa, and Isolated Banksia spp. It is present as several small areas and includes isolated scattered patches. Floristically characterised by *Banksia attenuata, B. menziesii* and scattered areas of *B. ilicifolia* woodland over Hibbertia species, *Scholtzia involucrata Styphelia conostephioides* over, *Patersonia occidentalis Desmocladus flexuosus Lyginia barbata*. Patches of understory include *Xanthorrhoea preissii* and *Hibbertia subvaginata* over *Dasypogon bromeliifolius, Phlebocarya ciliata, Schoenus caespititius* shrub layer. Substrate is pale grey deep sand. Habitat condition varies widely from degraded to very good. Retention of upper stratum Banksia maintains high foraging value for Black Cockatoos.	2.890 ha
Eucalyptus woodland over Banksia	This habitat type corresponds with vegetation types EgBspp and EmBspp. It is characterised as emergent sparse to open Tuart or Jarrah and occasional patches of *Allocasuarina* over *Banksia attenuata* and *B. menziesii* woodland over *Acacia, Xanthorrhoea* and *Hibbertia* low shrubland over weedy sedgeland/ grassland. Substrate is deep pale grey sandy soil. Habitat condition varies widely from degraded to very good. Retention of upper emergent eucalypts and mid-story Banksia maintains high foraging value for Black Cockatoo.	5.551 ha

Melaleuca dampland and sparse flooded gum	This habitat type corresponds with vegetation type ErMr and is comprised of occasional to sparse Flooded Gum over *Melaleuca rhaphiophylla* and / or *M. preissiana* over *Kunzea glabrescens, Xanthorrhoea preissii* and *Lepidosperma longitudinale*. Soil is sandy grey Bassendean formation but tends to be poor draining and relatively low elevation. Habitat condition varies from degraded to very good however the lower stratum vegetation tends to retain high density although tends to be weedy.	1.087 ha
Jarrah/Banksia	This habitat type corresponds with vegetation types EB1 Vegetation: *Eucalyptus marginata* and *Banksia menziesii/B. attenuata* woodland over *Kunzea, Hibbertia hypericoides and Acacia* spp. Shrublands and *Xanthorrhoea brunonis* over scattered herbland/grassland	0.151
Damplands	This habitat type corresponds with vegetation types M1 (*Melaleuca preissiana low woodland over Astartea*) *Melaleuca preissiana* low woodland to closed forest over *Astartea scoparia* tall open shrubland to tall open scrub over **Ehrharta longiflora* open grassland.	0.002

The habitat remnants are highly fragmented due to being in an extensively urbanised landscape and subject the long-term degradation due to the effects of weed invasion, landscape modification, and vegetation loss. Habitat present does provide suitable foraging and shelter for locally occurring significant fauna.

Fauna

Desktop searches of the EPBC Act PMST (DCCEEW, 2025) and DBCA Threatened Fauna databases identified the presence/potential presence of 56 significant fauna taxa within a 5km buffer of the Clearing Area. Of this, 50 were terrestrial vertebrate species and six were invertebrate species of conservation significance. Fourteen species are both threatened and migratory. The search included:

- Three species taxa listed as Critically Endangered (CR) under the EPBC Act and/or BC Act
- Thirteen species listed as Endangered (EN) under the EPBC Act and/or BC Act
- Fourteen species listed as Vulnerable (VU) under the EPBC Act and/or BC Act
- One species listed as Conservation Dependant (CD) under the EPBC Act and/or BC Act
- One species listed as a species of Special Protection (OS) under the BC Act
- Twenty-two species listed as Migratory (MI) under the EPBC Act and/or BC Act
- One species of Priority 1 taxa listed by DBCA
- Five species of Priority 3 taxa listed by DBCA
- Nine species of Priority 4 taxa listed by DBCA

During the GHD (2025a) and Biota (2025) field surveys, three conservation significant species were recorded:

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

A likelihood of occurrence assessment of significant fauna was conducted post-survey with consideration to the ecological field observations. Most species were assessed as unlikely to occur based on unsuitable or marginal habitat or species' distribution. The assessment was reviewed and refined for the Clearing Area. In addition to the recorded significant fauna, a further eight species are considered possible or likely to occur within the Clearing Area (Table 10).

Table 10: Significant fauna present or likely to occur within the Clearing Area

Common name (Species)	BC Act/ DBCA Status	EPBC Act Status	Likelihood of occurrence
Birds			
Carnaby's Cockatoo (*Zanda latirostris*)	EN	EN	**Recorded**. Direct and indirect evidence recorded during the biological surveys from bird sightings and extensive foraging evidence (chewed banksia pods) in multiple locations within the Clearing Area.
FRTBC (*Calyptorhynchus banksii naso*)	VU	VU	**Recorded**. Direct and indirect evidence recorded during the biological surveys from bird sightings, calls and extensive foraging evidence (chewed marri pods) in multiple locations within the Survey Area, albeit not within the Clearing Area.
Blue-billed Duck (*Oxyura australis*)	P4		**Possible**. Suitable wetland habitat and occurs locally even though not recorded during the survey. While the artificial drainage lines and modified wetlands do not represent core habitat of higher quality than neighbouring wetlands and lakes, there remains some habitat of potentially suitable quality to allow of at least occasional, temporary foraging and refuge-based activity when other suitable habitats are less available.
Peregrine Falcon (*Falco peregrinus*)	OS		**Likely**. Trees within the Clearing Area represent marginal nesting habitat. Likely to hunt on at least an occasional to regular basis given the presence of open grasslands and series of recent records within close proximity to the Clearing Area.
Mammals			
Quenda (*Isoodon fusciventer*)	P4		**Recorded**. Secondary evidence of Quenda was recorded during the survey from foraging signs (diggings) at one location in close proximity to the Clearing Area. The more hardy, adaptable, generalist diet and habitat suitability for this species suggests that sufficiently suitable habitat is present for the species to persist on at least an occasional basis.
Reptiles			
Perth Slider (*Lerista lineata*)	P3		**Likely**. Several database records in close proximity to survey area (within 1-3 km) and suitable remnant bushland habitat present.
Black Striped Snake (*Neelaps calonotos*)	P3		**Possible**. Locally recorded and there is marginally suitable habitat present in the form of native woodlands and shrublands with sandier soils of comparatively reduced disturbance. The smaller sections of potentially suitable shelter and foraging are still present to the extent that they may offer occasional, temporary occurrence within the Clearing Area given the typically small natural ranges and areas of occupancy for associated with this species.
Invertebrates			
Swan Coastal Plain Shieldbacked Spider (*Idiosoma sigillatum*)	P3		**Possible**. The Clearing Area contains suitable Banksia Woodland habitat in Anketell in the vicinity of the Spectacles Wetland area. Even though it was not detected during the field surveys, the species may occasionally be found within remnant patches of Banksia woodland that are of comparatively better condition to the rest of the Clearing Area. The short-range endemic nature of this species typically allows for persistence within small areas of suitable habitat, and the persistence of an individual to a single location or burrow for its entire life if necessary. Therefore, small areas of suitable habitat may allow the species to occur, albeit with reduced abundance or regularity.
Short-tongued bee species (*Leioproctus contrarius*)	P3		**Possible**. Based on field assessment host plants *Scaevola repens* is present, and *Leschenaultia* spp. also present within the Clearing Area, even though the sections of suitable breeding display habitat and caterpillar food source without excessive disturbance are small in size

			with comparatively superior habitat in nearby reserves and public lands. Despite this, the species is known to utilise particularly small sections of narrow, isolated suitable feeding and display habitats that feature major host flora species as the in the present case, and while records are very sparse, total species absence cannot be ruled out entirely and occasional visitation to favoured pollinating plants as a host is a possibility.
Graceful Sun Moth (*Synemon gratiosa*)	P4		**Possible**. The host plants for this species, namely *Lomandra hermaphrodita*, are recorded within the Clearing Area, even though the sections of suitable breeding display habitat and caterpillar food source without excessive disturbance are small in size with comparatively superior habitat in nearby reserves and public lands. Despite this, the species is known to utilise particularly small sections of narrow, isolated suitable feeding and display habitats that feature major host flora species as the in the present case. Therefore, while other areas offer more significant and suitable habitat, occasional occurrence within these small suitable section remains a possibility, particularly given recent records in close proximity.
Stylet Bush Cricket (*Throscodectes xiphos*)	P1		**Possible**. Potentially suitable Banksia Woodland habitat within the Clearing Area. Even though it was not detected during the field surveys, the species may occasionally be found within remnant patches of Banksia woodland that are of comparatively better condition to the rest of the Clearing Area. The short-range endemic nature of this species typically allows for persistence within small areas of suitable habitat, and while neighbouring habitats in protected lands and reserves are of higher quality, there remains a possibility of occasional feeding and calling activity due to the short range nature of the species.

Black Cockatoos

An assessment of the foraging habitat value for Black Cockatoo utilising the BCE foraging habitat system scoring system was applied. There is 8.59 ha of Carnaby's Cockatoo foraging habitat in the Clearing Area; 8.441 ha with a quality score of 6 and 0.151 ha with a quality score of 7 (Appendix 3),. There is 8.59 ha of FRTBC foraging habitat in the Clearing Area; 5.551 ha with a quality score of 4, 2.890 ha with a quality score of 2 and 0.151 ha with a quality score of 7 (Appendix 3).

Within 12 km of the Clearing Area there is approximately 15,968 ha of potential Black Cockatoo foraging habitat. Of this, approximately 8,679 ha is within reserved lands (in Bush Forever and/or DBCA managed lands).

Two suitable DBH trees, without hollows, were recorded and mapped within the Clearing Area. No Black Cockatoo breeding evidence or trees with hollows for breeding were recorded within the Clearing Area. The nearest confirmed and unconfirmed breeding area for Carnaby's Cockatoo is approximately 11.8 km.

No confirmed Black Cockatoo roosts were recorded within the Clearing Area during the field survey.

Peregrine Falcon (*Falco peregrinus*)

The Peregrine Falcon is uncommon but wide ranging across Australia and utilises many different habitats. The Clearing Area represents marginal nesting habitat. The species is likely to hunt on at least an occasional to regular basis within the Clearing Area, however, the Clearing Area is not considered significant habitat for the species.

Quenda (Isoodon fusciventer)

Quenda were recorded from signs of foraging (digging), scat confirming species' presence and direct observation during the GHD (2025a) and Biota (2025) surveys. Numerous local records indicate populations persisting in small, fragmented bushland areas around the Clearing Area. Dense remnant and modified vegetation provides habitat for this species.

The full extent of the Clearing Area (9.68 ha) is considered potentially suitable Quenda habitat. This habitat is located within existing road verges, which are not expected to comprise preferred habitat in the wider local and regional context.

Perth Slider (*Lerista lineata*)

This species has a strong habitat preference for sandy, coastal heath and shrubland. Suitable habitat is present in the Clearing Area, however, there is suitable habitat in comparatively better condition adjacent to and outside of the Clearing Area. The proposed clearing is therefore not anticipated to have a significant impact on the species persistence in the local area.

Blue-billed Duck (Oxyura australis)

There is a small amount of suitable habitat in wetland areas within the Clearing Area. However, there is suitable habitat in comparatively better condition adjacent to and outside of the Clearing Area. The proposed clearing is therefore not anticipated to have a significant impact on the species persistence in the local area.

Black Striped Snake (*Neelaps calonotos*)

There is marginally suitable habitat for this species in the Clearing Area. However, there is suitable habitat in comparatively better condition adjacent to and outside of the Clearing Area. The proposed clearing is therefore not anticipated to have a significant impact on the species persistence in the local area.

Trapdoor Spider (Idiosoma sigillatum)

The Clearing Area intersects suitable Banksia Woodland habitat in Anketell in the vicinity of the Spectacles Wetland area. The species was not detected during the GHD (2025a) survey and a targeted SRE search during the Biota (2025) survey. There is suitable habitat for the species within remnant patches of Banksia woodland in comparatively better condition adjacent to and outside of the Clearing Area. The proposed clearing is therefore not anticipated to have a significant impact on the species persistence in the local area.

Short-tongued bee species (Leioproctus contrarius), Graceful Sun Moth (Synemon gratiosa), Stylet Bush Cricket (Throscodectes xiphos)

There are small amounts of suitable habitat for these species within the Clearing Area. However, there is suitable habitat in comparatively better condition adjacent to and outside of the Clearing Area. The proposed clearing is therefore not anticipated to have a significant impact on the persistence of these species in the local area.

Assessed outcome:

The fauna habitat proposed for clearing comprises narrow, linear areas alongside the existing Kwinana Freeway in an urban landscape. The fauna habitat has been subject to long-term degradation from weed invasion, landscape modification and vegetation loss. It is unlikely that the small areas of vegetation to be cleared constitute significant habitat for most of the species discussed above, which are more likely to occur in larger pockets of native vegetation associated

with local bushland reserves. However, the Clearing Area does contain foraging habitat for Carnaby's Cockatoo and to a lesser extent, Forest Red-tailed Black Cockatoo. As such, the proposed clearing is at variance to this Principle.

Methodology

- ABCS (2025)
- Bamford Consulting Ecologists (2020)
- Biota (2025)
- DAWE (2022)
- DCCEEW (2025)
- GHD (2025a)
- Government GIS Shapefiles:
  - Black Cockatoo Breeding Sites (DBCA 063) (Accessed July 2025)
  - Black Cockatoo Roosting Sites (DBCA 064) (Accessed July 2025)
  - DBCA Threatened and Priority fauna database search
-

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

Proposed clearing is not at variance to this Principle.

The EPBC Act PMST (DCCEEW 2025) and DBCA TPFL and WA Herbarium databases identified the presence/potential presence of 32 significant flora taxa within a 5 km buffer of the Clearing Area. This included 15 taxa listed under the EPBC Act and/or Threatened under the BC Act.

One Threatened flora species, *Grevillea curviloba* (Endangered under the BC Act) was recorded in the Clearing Area. Although listed as Threatened under the BC Act, it is considered to be cultivated flora within the Clearing Area, as defined in the BC Act, as it occurs outside its natural range and habitat. The natural range of *Grevillea curviloba* is north of the Clearing Area around Bullsbrook and Muchea and is found growing in winter wet heaths. According to the Atlas of Living Australia (2025), *Grevillea curviloba* is cultivated as an ornamental plant by plant nurseries, for use in gardens and drought tolerant landscaping. It is grown as a shrub with erect forms, or maintained as a 0.61 m by 4.6 m groundcover with prostrate forms. Therefore, in accordance with section 173 of the BC Act, a section 40 authorisation is not required to take individuals of *Grevillea curviloba* within the Clearing Area (GHD, 2025a).

A likelihood of occurrence assessment conducted post field survey, concluded that no Threatened flora are considered likely, or possible to occur, due to the absence of suitable habitat and adequate search effort (GHD, 2025a). These results were further supplemented with a targeted flora survey for three orchid species in October 2025. This survey targeted Glossy-leaved Hammer Orchid (*Drakaea elastica*), King Spider-orchid (*Caladenia huegelii*) and Dwarf Bee-orchid (*Diuris micrantha*). The survey covered the Clearing Area and no individuals of any of the species were recorded (GHD, 2025b).

Assessed outcome:

Based on the biological survey findings that no Threatened flora are present within the Clearing Area, or considered likely or possible to occur, the Clearing Area does not include, or is not

necessary to support the continued existence of Threatened flora. The proposed clearing is not at variance to this Principle.

Methodology

- Atlas of Living Australia (2025)
- Biota (2025)
- DCCEEW (2025)
- GHD (2025a)GHD (2025b)
- Government GIS shapefiles:
  - DBCA Threatened flora database search (DBCA)
  - WA Herbarium Threatened and Priority flora (WAHERB)

(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.

The native vegetation represents three state listed PECs, of which two are synonymous with the EPBC Act listed TECs:

- Banksia Woodlands Priority 3 PEC and EPBC Act Endangered TEC
- Tuart woodlands and forests Priority 3 PEC and EPBC Act Critically Endangered TEC.

There is 6.22 ha of the Banksia Woodlands TEC/PEC mapped across four patches within the Clearing Area. A patch assessment was undertaken to determine if the extent of the patches remaining (following the proposed clearing) still meet the minimum size and condition thresholds required to be representative of the TEC (DEE, 2016) (Table 17). The asessment identified that clearing for the Proposal will occur on the edge of each patch and will not result in any patch becoming unviable with all four patches extending beyond the Clearing Area.

Table 11: Extent of Banksia Woodlands TEC/PEC in the Clearing Area

Patch ID	Size of patch overall (ha)	Extent of patch within Clearing Area (ha)	% of patch being cleared	Comments
BT03	17.76	2.708	15.248	Proposed clearing occurs on the edge of each patch. All patches will meet size threshold and condition thresholds (>2 ha and Good condition or better condition) post clearing. Remains Banksia TEC/PEC patch
BT04	62.59	2.002	3.066	
BT05	7.15	1.104	15.440	
BT06 and BT07	51.94	0.413	0.795	

There is 0.88 ha of Tuart woodlands and forests TEC/PEC mapped across two patches within the Clearing Area. A patch assessment was undertaken to determine if the extent of the patches remaining (following the proposed clearing) still meet the minimum size and condition thresholds required to be representative of the TEC (DEE, 2019) (Table 18). The assessment identified that clearing for the Proposal will occur on the edge of each patch and will not result in any patch becoming unviable with both patches extending beyond the Clearing Area.

Table 12: Extent of Tuart forests and woodlands TEC/PEC in the Clearing Area

Patch ID	Size of patch overall (ha)	Extent of patch within the Clearing Area (ha)	% of patch being cleared	Comments
TT01	11.08	0.696	6.28	Clearing on western edge of patch. Patch will meet size threshold (>5 ha) post clearing. Remains Tuart TEC/PEC patch.
TT02	8.12	0.187	2.31	Clearing on eastern edge of patch. Patch will meet size threshold (>5 ha) post clearing. Remains Tuart TEC/PEC patch.

Assessed outcome:

The native vegetation within the Clearing Area represents Banksia Woodlands TEC/PEC and Tuart forests and woodlands TEC/PEC. The proposed clearing is at variance to this Principle.

Methodology

- Biota (2025)
- DEE (2016)
- DEE (2019)
- GHD (2025a)Government GIS shapefiles:
  - DBCA Threatened Ecological Community database search (Accessed July 2025)

(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.

Vegetation associations and complexes

There are two vegetation associations mapped within the Clearing Area, association 6 (Medium woodland of Tuart and Jarrah) and association 1001 (Medium very sparse Jarrah woodland with low woodland of Banksia and Casuarina). Table 5 in Section 4.1 summarises the extent of pre-European vegetation associations 6 and 1001 remaining.

There are three vegetation complexes mapped within the Clearing Area:

- Cottesloe Complex – Central and South
- Herdsman Complex
- Bassendean Complex – Central and South.

Table 6 in Section 4.2 summarises the extent of pre-European vegetation complexes remaining.

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 except in constrained areas (such as Perth and Peel) where 10% representation should be maintained (EPA, 2016).

The current extents of vegetation associations 6 and 1001 are greater than 20% of their pre-European extents at all scales (Statewide, IBRA bioregion, IBRA subregion, LGA). The current extents of vegetation complexes Cottesloe Complex – Central and South, Herdsman Complex and Bassendean Complex – Central and South are greater than 26% for the SCP. The proposed

clearing will not reduce any of the vegetation associations or vegetation complexes below the 10% threshold at any scale.

Ecological linkages

The proposed clearing comprises narrow, linear areas alongside the existing Kwinana Freeway. The proposed clearing will not fragment or interrupt any ecological linkages connecting native vegetation remnants within the local area east and west of the Freeway. The proposed clearing will marginally reduce the connectivity of native vegetation in a north-south direction along each side of the Freeway.

The Clearing Area intersects the edge of Bush Forever site 270 – Sandy Lake and Adjacent Bushland Anketell. Clearing for the proposal will not fragment or interrupt connectivity at this site.

Assessed outcome:

The proposed clearing occurs in an area that has been extensively cleared at a local and regional scale. However, the Clearing Area does not represent a significant remnant of native vegetation. The proposed clearing is not likely to be at variance to this Principle.

Methodology

- Biota (2025)
- EPA (2016)
- GHD (2025a)
- Government GIS shapefiles:
  - Pre-European vegetation (Accessed July 2025)
  - Vegetation complexes (Accessed July 2025)

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Proposed clearing is at variance to this Principle.

The Clearing Area does not intersect any mapped watercourses or proclaimed Surface Water Areas. It does intersect the Jandakot Underground Pollution Control Area which is a Public Drinking Water Source Area in the vicinity of Roe Highway and Gibbs Road.

The Clearing Area is not located within any Internationally Important Wetlands (Ramsar) or Nationally Important Wetlands. The Clearing Area intersects five geomorphic wetlands of the Swan Coastal Plain, all associated with Mandogalup Swamp:

- Mandogalup Swamp Mid North (UFI 6664) – Resource Enhancement
- Mandogalup Swamp South (UFI 6530) – Multiple Use
- Mandogalup Swamp South (UFI 12981) – Conservation
- Mandogalup Swamp Mid South (UFI 15583) – Multiple Use
- Mandogalup Swamp Mid South (UFI 15584) – Conservation.

As shown in Table 19 and Figure 5, the Clearing Area comprises 0.778 ha of native vegetation growing in association with mapped geomorphic wetlands across three management categories (Conservation, Multiple Use and Resource Enhancement).

Table 13: Wetland vegetation within the Clearing Area

Wetland Management Category	Vegetation Condition	Area (ha)
Conservation Category Wetland (CCW)	Completely Degraded	0.115
	Good to Degraded	0.221
Multiple Use Wetland (MUW)	Completely Degraded	0.211
	Good to Degraded	0.028
	Good	0.002
Resource Enhancement Wetland (REW)	Degraded	0.202
Total native vegetation		**0.778**

Clearing of vegetation associated with wetlands has been avoided as far as possible. There is 0.267 ha of native vegetation within CCWs mapped as ErMr - *Eucalyptus rudis* and *Melaleuca rhaphiophylla* woodland, ranging from Completely Degraded to Good to Degraded in condition (Table 20). The Clearing Area intersects Mandogalup Swamp South (UFI 12981) on its western edge. The proposed clearing represents a loss of 7.85% of the total CCW. The existing Kwinana Freeway intersects Mandogalup Swamp Mid Sth, and this wetland has been divided into three areas based on the geomorphic wetland of the SCP mapping. The Clearing Area intersects UFI 15584 on its western side and the proposed clearing represents a loss of 7.44% of the total CCW.

Table 14: Summary of Native Vegetation Clearing within Conservation Category Wetlands

UFI	Wetlands Name	Type	Total wetland area (ha)	Condition	Area (ha)
12981	Mandogalup Swamp South	Dampland	3.4	Completely Degraded	0.046
				Good to Degraded	0.221
15584	Mandogalup Swamp Mid Sth	Sumpland	0.9	Completely Degraded	0.069

Assessed outcome:

The proposed clearing includes 0.778 ha of native vegetation that grows in association with wetlands. Of this, 0.267 ha occurs within CCWs. The proposed clearing is at variance to this Principle.

Methodology

- Biota (2025)
- DBCA (2019b)
- GHD (2025a)Government GIS shapefiles:
  - Geomorphic Wetlands (DBCA-019) (Accessed July 2025)
  - Ramsar Wetlands (DBCA-010) (Accessed July 2025)
  - Important Wetlands (DBCA-045) (Accessed July 2025)
  - Hydrography Linear (DWER-031) (Accessed July 2025)
  - RIWI Act Rivers (DWER-036) (Accessed July 2025)
  - RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037) (Accessed July 2025)
  - Public Drinking Water Sources Areas (DWER-033) (Accessed July 2025)

(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.

There are two soil landscapes zones mapped within the Clearing Area (DPIRD-027):

- Bassendean Zone (212): Mid Pleistocene Bassendean sand. Fixed dunes inland from coastal dune zone. Non-calcareous sands, podsolised soils with low-lying wet areas (4.211 ha)
- Perth Coastal Zone (211): Coastal sand dunes and calcarenite. Late Pleistocene to Recent age. Calcareous and siliceous sands and calcarenite (5.469 ha)

Less than 3% of the Clearing Area is mapped as having a moderate to high flood risk (DPIRD-007) and high to extreme wind erosion risk (DPIRD-016). The proposed clearing is linear in nature, limited to narrow areas alongside the existing Kwinana Freeway. The removal of 9.68 ha of native vegetation from the landscape is unlikely to significantly increase the intensity or frequency of waterlogging or water erosion. Following clearing, exposed soils will be sealed and/or stablised as part of project construction works. Land degradation from increased wind erosion is not likely.

According to Acid Sulfate Soil Risk mapping, the Clearing Area is predominately located within areas mapped as moderate to low acid sulphate soil risk. The removal of 9.68 ha of native vegetation over a 15 km span is unlikely to result in acidification of the Clearing Area or surrounding local environment.

Assessed outcome:

The proposed clearing will temporarily expose the natural soils which may increase the risks related to erosion. However, the proposed clearing is limited to narrow, linear areas occurring over a 15 km span in a highly modified environment. Management actions are included in the Vegetation Management Plan (VMP) to manage erosion impacts. The proposed clearing is not likely to cause appreciable land degradation. The proposed clearing is not likely to be at variance to this Principle.

Methodology

- Biota (2025)
- GHD (2025a)
- Government GIS Shapefiles:
  - Soil landscape mapping (DPIRD-027) (Accessed July 2025)
  - Soil landscape land quality – Water Erosion Risk (DPIRD-013) (Accessed July 2025)
  - Soil landscape land quality – Wind Erosion Risk (DPIRD-016) (Accessed July 2025)
  - Soil landscape land quality – Salinity Risk (DPIRD-009) (Accessed July 2025)
  - Soil landscape land quality – Waterlogging Risk (DPIRD-015) (Accessed July 2025)
  - Soil landscape land quality – Flooding Risk (DPIRD-007) (Accessed July 2025)
  - Acid Sulfate Soil Risk Map (DWER-055) (Accessed July 2025)

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

Proposed clearing is at variance to this Principle.

Forty-two (42) Department of Biodiversity, Conservation and Attractions (DBCA) managed lands occur within a 5 km radius of the Clearing Area, comprising 33 Crown freehold DBCA-managed

lands, three conservation parks, six nature reserves and one Section 5(1)(h) reserve (DBCA, 2024b).

The Clearing Area does not intersect any DBCA managed lands. However, there is one area, Beeliar Conservation Park, abutting the Clearing Area boundary. This Conservation Park is Class A (R 53313) and is located south of Anketell Road on both sides of the Kwinana Freeway. The Proposal will involve works in the road reserve (as zoned by the MRS boundary) and is not expected to directly impact Beeliar Conservation Park.

Fifty-one (51) Environmentally Sensitive Areas (ESAs) occur within a 5 km radius of the Clearing Area. Of these, five intersect the Clearing Area (identifiers 3287, 3296, 3299, 3349 and 3393) (DWER, 2018a). The ESAs (and their buffers) represent conservation category wetland areas and occurrences of the Bush Forever site 270.

Forty-nine (49) Bush Forever sites occur within a 5 km radius of the Clearing Area. The Clearing Area intersects the edge of one site, Bush Forever Site 270 – Sandy Lake and Adjacent Bushland Anketell. This site is approximately 202.59 ha in area, of which approximately 188 ha consists of native vegetation (DPLH, 2021). The Proposal will clear up to 0.85 ha of native vegetation (0.32 ha of Very Good to Excellent, 0.40 ha of Very Good and 0.13 ha of Degraded condition) in Bush Forever site 270, along a 1 km linear corridor along the eastern edge of the site in road reserve. The clearing within Bush Forever site 270 occurs in areas zoned by the MRS boundary as primary regional road. Given the existing levels of disturbance to Bush Forever areas in the road reserve (due to the existing freeway, PSP, boundary fences and associated fire breaks), it is unlikely the proposed clearing will result in significant impacts on the environmental values of Bush Forever site 270.

Main Roads will submit a Development Approval Application to undertake works where one is required. Main Roads understands works cannot commence until all necessary approvals have been obtained.

Assessed outcome:

The removal of native vegetation within the Clearing Area is considered unlikely to have an impact on the environmental values of the adjacent Beeliar Conservation Park. However, the proposed clearing will impact the environmental values of Bush Forever Site 270, due to the clearing of 0.85 ha of native vegetation which includes Black Cockatoo foraging habitat and Banksia Woodlands TEC/PEC values. The potential impact to Bush Forever Site 270 represents less than 0.5 per cent of the native vegetation extent within the Site. Management actions, including hygiene controls, are included in the Vegetation Management Plan (VMP) to manage potential impacts to conservation areas. Based on the above, the proposed clearing is at variance to this Principle.

Methodology

- Biota (2025)
- DPLH (2021)
- GHD (2025a)
- Government GIS Shapefiles:
  - DBCA Legislated Lands and Waters (DBCA-011) (Accessed July 2025)
  - DBCA Lands of Interest (DBCA-012) (Accessed July 2025)
  - Environmentally Sensitive Areas (DWER-046) (Accessed July 2025)
  - Bush Forever Areas – 2000 (DPLH-019) (Accessed July 2025)

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

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

The Clearing Area does not intersect any mapped watercourses and is not located within a proclaimed surface water area under the RIWI Act. There are no RAMSAR or Nationally Important Wetlands within the Clearing Area. The closest RAMSAR Wetland is the Thomsons and Forrestdale Lakes wetland system. Thomsons Lake is 1.3 km west of the Clearing Area at the closest point, south of Russell Road, while Forrestdale Lake is more than 5 km to the east. The Clearing Area does not have a direct surface water connection to Thomsons and Forrestdale Lakes wetland system. Given the distance to Thomsons Lake and urban development located between there is a lack of direct hydrological connectivity.

As outlined in Clearing Principle (f) and shown in Figure 5, the Clearing Area intersects five geomorphic wetlands of the Swan Coastal Plain, all associated with Mandogalup Swamp:

- Mandogalup Swamp Mid North (UFI 6664) – Resource Enhancement
- Mandogalup Swamp South (UFI 6530) – Multiple Use
- Mandogalup Swamp South (UFI 12981) – Conservation
- Mandogalup Swamp Mid South (UFI 15583) – Multiple Use
- Mandogalup Swamp Mid South (UFI 15584) – Conservation.

Clearing associated with wetlands has been avoided as much as possible. As outlined in Table 19, most of the clearing associated with mapped wetlands consists of vegetation in Degraded to Completely Degraded condition. General management actions for vegetation clearing are included in the Vegetation Management Plan which will minimise the potential for erosion and associated impacts to surface water quality.

The Clearing Area intersects the Jandakot and Serpentine groundwater areas proclaimed under the RIWI Act. It also intersects the Jandakot Underground Pollution Control Area which is a Public Drinking Water Source Area in the vicinity of Roe Highway and Gibbs Road.

The Clearing Area is mapped as having a low salinity risk (i.e. <3% of map unit has a moderate to high salinity risk or is presently saline).

Assessed outcome:

The Proposal is located in an area that is highly disturbed and degraded as a result of existing urban development, land clearing and road infrastructure. The proposed clearing is linear in nature, limited to narrow areas alongside the existing Kwinana Freeway. Surface water flows will be maintained through construction of appropriate drainage infrastructure. The proposed clearing is unlikely to cause direct or indirect deterioration in surface or groundwater quality.

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

Methodology

- Government GIS Shapefiles:
  - RIWI Act Surface Water and Irrigation Districts (DWER-037) (Accessed July 2025)
  - RIWI Act Groundwater Areas (DWER-034) (Accessed July 2025)
  - Public Drinking Water Source Areas (DWER-033) (Accessed July 2025)
  - Soil Landscape Mapping (DPIRD-027) (Accessed July 2025)
  - Flooding Risk (DPIRD-007) (Accessed July 2025)
  - Water Erosion Risk (DPIRD-013) (Accessed July 2025)
  - Acid Sulfate Soil Risk Map (DWER-055) (Accessed July 2025)

(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.

Three soil landscapes systems are mapped in the Clearing Area:

- Bassendean system (212Bs): Sand dunes and sandplains with pale deep sand, semi-wet and wet soil.
- Spearwood System (211Sp): Sand dunes and plains. Yellow deep sands, pale deep sands and yellow/brown shallow sands
- Vasse System (211Va): Poorly drained estuarine flats, of the Swan Coastal Plain. Tidal flat soil, saline wet soil and pale deep sand.

The soils of the Clearing Area are mostly deep sands with low water retention properties.

The majority of the Clearing Area is mapped as having a low to moderate waterlogging risk (i.e. <10% of map unit has a moderate to very high waterlogging risk) and flooding risk. Areas near Mandogalup Swamp are mapped as having a high waterlogging risk (>70% of the map unit has a moderate to very high waterlogging risk). The Proposal involves clearing of up to 9.68 ha of native vegetation along an established Freeway. Following clearing, exposed soils will be sealed and/or stabilised and as part of construction surface water drainage infrastructure implemented to reduce incidences of flooding.

Assessed outcome:

The proposed clearing is linear in nature, limited to narrow areas alongside the existing Kwinana Freeway. The proposed clearing is not considered to be of a scale that would cause or exacerbate the incidence or intensity of flooding. The proposed clearing is not likely to be at variance to this Principle.

Methodology

- Government GIS Shapefiles:
  - Soil Landscape Mapping (DPIRD-027) (Accessed July 2025)
  - Flooding Risk (DPIRD-007) (Accessed July 2025)
  - Waterlogging Risk (DPIRD-015) (Accessed July 2025)

6 VEGETATION MANAGEMENT

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

7 REHABILITATION, REVEGETATION AND OFFSETS

7.1 Revegetation and Rehabilitation

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

7.2 Offset Proposal

To offset the residual impacts from clearing, Main Roads is developing an offset proposal in accordance with the current WA Environmental Offsets Policy and will work with DWER on the finalisation of the offset proposal.

8 STAKEHOLDER CONSULTATION

Main Roads has undertaken stakeholder consultation on the Proposal.

Stakeholders that have an interest in the planning and development phase of the Proposal are listed in Table 15. The stakeholders include all three levels of government, regulators, landowners, residents, business owners and operators, environmental groups, special interest groups, communities and road users.

Table 15: Stakeholders

Stakeholder Group	Stakeholders
State Government	Main Roads Department of Planning, Lands and Heritage (DPLH) Western Australian Planning Commission (WAPC) Department of Biodiversity, Conservation and Attractions (DBCA) Department of Water and Environmental Regulation (DWER) Department of Transport, Public Transport Authority (PTA) Environmental Protection Authority (EPA) Department of Fire and Emergency Services (DFES) Member for Kwinana Member for Cockburn
Traditional landowners	Westport's Noongar Advisory Group South West Land and Sea Council (SWALSC) Gnaala Karla Booja Regional Corporation Whadjuk Regional Corporation
Federal Government	DCCEEW
Local Government	City of Cockburn City of Kwinana City of Rockingham
Business	Services Authorities (Water Corp, ATCO, Western Power) Freight and logistics industry Land Developers ARC Infrastructure (freight rail operator)
Community/ interest/ environmental groups that use this section of the Kwinana Freeway	Conservation Groups BirdLife Australia (member of Westport reference group) Conservation Council WA Friends of The Spectacles Greening Australia ((member of Westport reference group) Kaarakin Black Cockatoo Conservation Centre Perth NRM (member of Westport reference group) Urban Bushland Council (member of Westport reference group) Wildflower Society of WA

8.1 Stakeholder engagement process

The Westport Roads Integrated Project Team, on behalf of Main Roads, has developed an engagement strategy to facilitate input from the community and stakeholders for the Proposed Action. A summary of community consultation undertaken to inform the Proposal planning and development to date is provided in Table 22.

Table 16: Community Consultation Strategy Summary

Stakeholder Group	Stakeholders	Timing
Cities of Kwinana, Cockburn and Rockingham	Technical Working Group to discuss issues for the scope, design and mitigation of the project	May 2025
Cities of Kwinana, Cockburn and Rockingham	Forum to share knowledge and identify known issues/concerns held by local interest groups / residents	June 2025
Freight and Road User Group	Technical Working Group with government and industry representation to discuss road user requirements that inform the project scope and design.	June 2025
All community and stakeholders	Project website as a primary source of information, includes a project overview brochure with map	June 2025
Email subscribers	Monthly project updates	June 2025
Residents and businesses in the Cities of Kwinana, Cockburn and Rockingham adjacent to the alignment (23,000)	Letterbox drop – to raise project awareness, promote the project website and email subscriptions for ongoing information / updates	June 2025
Residents and businesses in the Cities of Kwinana, Cockburn and Rockingham	Community Pop Up events at shopping centres to provide project information and answer questions	June 2025
All community and stakeholders	Community Survey on the Kwinana Freeway project website, via My Say Transport.	June 2025
All community and stakeholders	Social media advertising via Main Roads Facebook page	June 2025
All community and stakeholders	Third party communications – Social media advertising shared with the Cities of Kwinana, Cockburn and Rockingham for distribution to local social / digital networks	June 2025

Stakeholder Group	Stakeholders	Timing
Residents and businesses in the Cities of Kwinana, Cockburn and Rockingham	Community Pop Up events at shopping centres to provide project information and answer questions	July 2025
All community and stakeholders	Project e-newsletter to advise of upcoming nightwork site investigations (geotechnical and service scanning) within the Kwinana Freeway corridor and potential disruption to road users.	August 2025
All community and stakeholders	Project e-newsletter to advise outcomes of community pop-up sessions including key discussion themes and insights shared.	August 2025
All community and stakeholder	Webpage update to advise Commonwealth environmental referral public comment period.	September 2025
City of Kwinana, City of Rockingham and City of Cockburn	GA Working Group Kwinana Freeway – Session 2 Workshop to discuss Ultimate planning, lane configuration, project case design, approvals, traffic modelling and assumptions, upcoming works, sustainability, communications and stakeholder engagement, program/procurement update.	September 2025
All community and stakeholder	Webpage update advising expressions of interest open to industry and contractors for the project's construction.	October 2025

A Community and Stakeholder Engagement (CSE) Plan has been developed to inform the early planning of the Proposal. Stakeholder and community engagement is a key input into the planning, development, design and, subject to approvals, construction of the proposed works.

Main Roads has established a governance framework including a Westport Roads and Rail Projects Board and Project Control Group to provide strategic guidance, technical input and decision making.

Main Roads will continue to engage with directly impacted property owners, key stakeholders and the wider community regarding the Proposal throughout the planning and development phase of the road planning process, subject to any statutory obligations including requirements arising from environmental approvals.

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10 APPENDICES

Appendix 1: Biological Surveys and Field Assessment Executive Summary and Report Conclusions

Flora and Vegetation Surveys (GHD, 2025a)

Flora and Vegetation Conclusion

- The vegetation of the survey area consisted of patches of native vegetation (18.92 ha, 6.6%) intermittently divided by roadside revegetation (92.65 ha, 32.5%) and infrastructure/cleared areas (173.87 ha, 60.9%). Five vegetation types were mapped for remnant native vegetation and seven vegetation types were mapped for roadside revegetation to assist with Black Cockatoo foraging habitat mapping
- The FCTs identified in the survey area are not listed as TECs under the EPBC Act or BC Act, nor are they listed as PECs by DBCA. The FCTs identified within the survey area included 11, 21a, 23a and 28
- The remnant native vegetation and revegetation of the survey was variable and ranged from Very Good to Completely Degraded. Approximately 60% of the remnant native vegetation was in Degraded or poorer condition. The majority of the revegetated areas were in Completely Degraded condition
- Two significant ecological communities were mapped within the survey area Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain TEC and PEC and Banksia Woodlands of the SCP TEC and PEC. Three Tuart patches represented by vegetation type EgBspp. were mapped within the survey area with a combined total of 2.56 ha. Seven patches of Banksia Woodlands of the SCP TEC and PEC were mapped with a combined total extent of 13.34 ha in the survey area
- Two hundred and twenty vascular flora taxa were recorded during the field survey. A species accumulation curve to assess sampling effort showed adequate sampling and diversity for the survey area
- No EPBC Act listed flora were recorded within the survey area. Three significant flora species were recorded within the survey area, however two of these species are considered naturalised
- The likelihood of occurrence assessment post-field survey concluded one taxon was known and recorded in the survey area during the survey and two taxa were considered possibly to occur
- Sixty-four introduced flora species were recorded within the survey area, five of these species are listed as DP plants in Western Australia under the BAM Act, two are also listed as WoNS
- Nine wetlands that intersected the survey area were evaluated, based on both desktop information and the site assessment. All were assessed and assigned to a Conservation category, on the basis that equal to or greater than 90% of each wetland supported vegetation in a Good or better condition.

Fauna Surveys (GHD, 2025a)

- Fauna habitats are generally highly degraded and fragmented in most areas due to survey area location in an extensively urbanised landscape
- Some areas of good quality habitat present provide suitable foraging and shelter for several locally occurring significant fauna, particularly in the vicinity of The Spectacles bushland that intersects with the survey area
- There is 26.67 ha of moderate to high value Carnaby's Cockatoo foraging habitat, which includes Banksia woodland, Eucalyptus over Banksia Woodland and Marri Woodland

- There is 1.97 ha of high, 14.40 ha of moderate and 10.30 ha of low value Forest Red-tailed Black Cockatoo foraging habitat, which includes remnant Marri trees and Eucalyptus over Banksia Woodland
- A total of 44 suitable Black Cockatoo DBH trees were recorded across the survey area. The majority of trees were Marri (50%), Flooded Gum (23%) and Tuart (14%). None of the trees contained suitable hollows for Black Cockatoos
- A total of 40 individual Black Cockatoo potential roosting sites were identified across the survey area based on DAWE (2022) tree height, species type and proximity to nearby water sources and significant feeding habitat in surrounding areas
- Quenda habitat includes dense remnant and modified vegetation.

Dieback (Glevan Consulting, 2025)

Glevan Consulting was commissioned by West Port Roads IPT to conduct a Phytophthora Dieback assessment of remnant bushland along Kwinana Freeway spanning from Farrington Road in the north to Safety Bay Road in the south. Portions of the Project Area had previously been assessed by Glevan Consulting, with the most recent surveys taking place in 2013 and 2014. The Project Area totalled 347.62 hectares (ha).

The assessment began on the 7th of July and was finalised on the 13th of August. The assessment was carried out in accordance with the Phytophthora Dieback Interpreter's Manual for lands managed by the Department of Biodiversity, Conservation and Attractions (DBCA) (Department of Parks and Wildlife, 2015).

Of the intact native vegetation, 41.94 ha (12.06 %) were classed as Uninfested with adequate amounts of susceptible species present. Permanently Uninterpretable Protectable vegetation accounted for 27.78 ha (7.99 %) of the Project Area due to the overall lack of sufficient indicators, with a further 1.51 ha (0.43 %) ha classed as Permanently Uninterpretable Unprotectable. This classification was used due to the presence of an Infested area upslope of the Permanently Uninterpretable vegetation. 268.43 ha was classified as Excluded due to the complete lack of natural vegetation often found in paddocks, residential areas and private businesses where natural vegetation has become degraded or completely cleared. The remaining 5.47 ha (1.57 %) was classified as Infested.

Three soil and tissue samples were taken throughout the course of the assessment, one of which returned a positive result for *Phytophthora cinnamomi*.

Summary of Targeted Orchid Survey Kwinana Freeway Upgrade (GHD, 2025b)

Main Roads commissioned GHD to conduct a targeted survey for three orchid species in suitable habitat areas within the Proposal footprint. The orchid species targeted during the survey included Glossy-leaved Hammer Orchid (*Drakaea elastica*) (Endangered), King Spider-orchid (*Caladenia huegelii*) (Endangered) and Dwarf Bee-orchid (*Diuris micrantha*) (Vulnerable), listed under the Commonwealth EPBC Act.

All five remnant native vegetation types and two roadside revegetation types (based on the mapping in GHD 2025a) were included in the search area for the targeted survey. These

vegetation/revegetation types were considered potential/may be potential habitat for one or more of the target orchids.

No orchids were recorded during the survey.

Summary of Anketell Road Upgrade Biological Survey (Biota, 2025)

Main Roads commissioned Biota to complete detailed and targeted flora and vegetation surveys, floristic community type assessment, basic fauna surveys, targeted significant fauna surveys, an SRE invertebrate survey and Black Cockatoo habitat assessment for the Anketell Road Upgrade project. The results and associated spatial data have been consolidated into a single report for a survey area covering 224.83 ha.

Results specific to the Kwinana Freeway and Anketell Road interchange are summarised below.

A total of 1.191 ha of native vegetation was identified in a 17.885 ha survey area. Native vegetation was mapped as three vegetation types, B2 *Banksia menziesii (B. attenuata*) over *Xanthorrhoea* spp. with *Hibbertia* and *Conostylis* (1.038 ha), EB1 *Eucalyptus marginata (Banksia* spp.) over *Kunzea* and *Acacia* with *Xanthorrhoea* spp. over *Hibbertia* (0.151 ha) and M1 *Melaleuca preissiana* low woodland over *Astartea* (0.002 ha). These vegetation types aligned with three fauna habitats Banksia Woodland (B1), Jarrah/Banksia Woodland (EB1) and Damplands (M1).

Two patches of Banksia Woodland TEC/PEC were identified in the survey area. Patch BT03 is mapped as 0.856 ha of B1 in Very Good to Excellent Condition. Patch BT04 is mapped as 0.181 ha of B1 in Good condition and 0.151 ha of EB1 in Good condition. State Priority 3 PEC Northern Spearwood shrublands and woodlands was mapped within EB1 in Patch BT04.

Black Cockatoo foraging quality was scored using the BCE foraging habitat scoring system (BCE 2020). Fauna habitat Damplands (M1) (0.002 ha) was not deemed as suitable Black Cockatoo habitat therefore not scored. There is 1.91 ha of suitable foraging habitat for Carnaby's Black Cockatoo and 0.151 ha for FRTBC. For Carnaby's Cockatoo two vegetation units had an overall score of 4/10 (B2) and 7/10 (EB1) (GHD 2025c). For FRTBC, two vegetation units has overall scores of 0/10 (B2) and 7/10 (EB1) (GHD, 2025c).

Appendix 2: Vegetation Management Plan

KWINANA FREEWAY UPGRADES

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 Kwinana Freeway Upgrade

Main Roads is proposing to widen and upgrade the Kwinana Freeway between Roe Highway and Mortimer Road to improve safety, reduce congestion, enhance user journeys and provide better connection to Perth's southern suburbs. Additional lanes will increase the Freeway's capacity and smart technology, in the form of coordinated ramp signals, will improve safety, smooth traffic flow and enhance freight efficiency.

The Proposal involves

- Vegetation clearing and earth works
- Widening of the Kwinana Freeway and ramp upgrades
- Relocation of services and paths
- Construction of noise walls
- Improvements to safety barriers, surfacing and drainage.

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

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

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

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

Avoiding, Mitigating and Managing the Impacts of Clearing

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

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

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

VMP Actions

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

Appendix 2.1: General vegetation management actions for clearing

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

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

- Engage an environmental specialist (zoology) to identify the areas to demarcate for all significant fauna habitat to be avoided within the development envelope.
- Engage an environmental specialist (fauna) to undertake a preclearance check of conservation significant fauna residences.
- prepare a weed control program, for nominated weed species for control and disposal.

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

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

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

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

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

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

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

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

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

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

   i) Suitable and unsuitable topsoil zones have been identified.

   j) Vegetation and topsoil stockpile locations have been identified.

   o) All clearing machinery is compliant with controls.

Monitoring and Maintenance Program

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

Non-Compliance

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

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

Appendix 3: Black Cockatoo scores

Table 17: Carnaby's Cockatoo foraging habitat quality scores using the BCE system

Fauna Habitat Type	Area (ha)	Site Condition (out of 6)	Site Context (out of 3)	Species Stocking rate (out of 1)	Foraging Score (out of 10)	Comments / Score justification
Banksia woodland	2.890	4	1	1	6	This habitat type corresponds with vegetation types BmBa and Isolated Banksia spp. woodland with tree banksias (of key species *B. attenuata* and *B. menziesii*) 20-40% projected foliage cover (Bamford Consulting Ecologists, 2020). Floristically characterised by *Banksia attenuata, B.menziesii* and scattered areas of *B.ilicifolia* woodland over *Hibbertia* species, *Scholtzia involucrata Styphelia conostephioides* over, *Patersonia occidentalis Desmocladus flexuosus Lyginia barbata*. Patches of understory include *Xanthorrhoea preissii* and *Hibbertia subvaginata* over *Dasypogon bromeliifolius, Phlebocarya ciliata, Schoenus caespititius* shrub layer. Substrate is pale grey deep sand. Habitat condition varies widely from degraded too very good (GHD, 2025). Banksia species in this habitat type are of high foraging value for Carnaby's Cockatoo (ABCS, 2025).
Eucalyptus woodland over Banksia	5.551	4	1	1	6	This habitat type corresponds with vegetation types EgBspp and EmBspp. Upper emergent Eucalypt species and mid-story Banksia species 20-40% projected foliage cover (Bamford Consulting Ecologists, 2020). It is characterised as emergent sparse to open Tuart or Jarrah and occasional patches of *Allocasuarina* over B*anksia attenuata* and *B.menziesii* woodland over *Acacia, Xanthorrhoea* and *Hibbertia* low shrubland over weedy sedgeland/ grassland. Substrate is deep pale grey sandy soil (GHD, 2025). Habitat condition varies widely from degraded too very good. Species in this habitat type are of moderate-high foraging value for Carnaby's Cockatoo (ABCS, 2025).
Melaleuca Dampland	1.087	1	0	0	1	This habitat type corresponds with vegetation type ErMr and is comprised of occasional to sparse Flooded Gum over *Melaleuca rhaphiophylla* and / or *M. preissiana* over *Kunzea glabrescens, Xanthorrhoea preissii* and *Lepidosperma longitudinale* (GHD, 2025). It contains scattered specimens of known food plants but projected foliage cover of these is < 2% (Bamford Consulting Ecologists, 2020). Flooded Gum (*E. rudis*), *Melaleuca rhaphiophylla* and *Melaleuca preissiana* are not foraging species for Carnaby's Cockatoo (ABCS, 2025).
Jarrah/Banksia Woodland	0.151	5	1	1	7	Upper emergent Eucalypt species and mid-story Banksia species within this habitat type are of medium-high foraging value for Carnaby's Cockatoo (ABCS, 2025).

Table 18: FRTBC foraging habitat quality scores using the BCE system

Fauna Habitat Type	Area (ha)	Site Condition (out of 6)	Site Context (out of 3)	Species Stocking rate (out of 1)	Foraging Score (out of 10)	Comments / Score justification
Banksia woodland	2.890	2	0	0	2	This habitat type corresponds with vegetation types BmBa and Isolated Banksia spp. (GHD, 2025) and B2 (Biota, 2025). Woodland with scattered specimens of known food plants (1-5 % projected foliage cover) (Bamford Consulting Ecologists, 2020). Floristically characterised by *Banksia attenuata, B.menziesii* and scattered areas of *B.ilicifolia* woodland over *Hibbertia* species, *Scholtzia involucrata Styphelia conostephioides* over, *Patersonia occidentalis Desmocladus flexuosus Lyginia barbata*. Patches of understory include *Xanthorrhoea preissii* and *Hibbertia subvaginata* over *Dasypogon bromeliifolius, Phlebocarya ciliata, Schoenus caespititius* shrub layer. Substrate is pale grey deep sand. Habitat condition varies widely from degraded too very good (GHD, 2025). FRTBC do not forage on Banksia species (ABCS, 2025).
Eucalyptus woodland over Banksia	5.56	3	1	0	4	This habitat type corresponds with vegetation types EgBspp and EmBspp. Eucalypt Woodland with known food plants (5-20% projected foliage cover) (Bamford Consulting Ecologists, 2020). It is characterised as emergent sparse to open Tuart or Jarrah and occasional patches of *Allocasuarina* over B*anksia attenuata* and *B.menziesii* woodland over *Acacia, Xanthorrhoea* and *Hibbertia* low shrubland over weedy sedgeland/ grassland. Substrate is deep pale grey sandy soil (GHD, 2025). Tuart is a low priority foraging species for FRTBC. Jarrah is a high priority foraging species for FRTBC, although Jarrah was sparse to open in this habitat type. FRTBC do not forage on Banksia species (ABCS, 2025).
Melaleuca Dampland	1.09	1	0	0	1	This habitat type corresponds with vegetation type ErMr and is comprised of occasional to sparse Flooded Gum over *Melaleuca rhaphiophylla* and / or *M. preissiana* over *Kunzea glabrescens, Xanthorrhoea preissii* and *Lepidosperma longitudinale* (GHD, 2025). It contains scattered specimens of known food plants but projected foliage cover of these < 1%. Could include urban areas with scattered foraging trees (Bamford Consulting Ecologists, 2020). Flooded Gum (*E. rudis*), *Melaleuca rhaphiophylla* and *Melaleuca preissiana* are not foraging species for FRTBC (ABCS, 2025).
Jarrah/Banksia Woodland	0.151	5	1	1	7	This habitat type corresponds with vegetation type EB1 (Biota, 2025). Jarrah/Banksia woodland with 40-60% projected foliage cover (Biota, 2025). Jarrah is a high priority foraging species for FRTBC, although Banksia species are not used by FRTBC for foraging (ABCS, 2025).