



# Clearing Assessment Report – CPS 818

*We're working for  
Western Australia.*

Causeway Pedestrian and Cyclist  
Bridge (CPCB)

February 2022

EOS 2204

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# Amendments

<b>Report Compilation &amp; Review</b>	<b>Name and Position</b>	<b>Document Revision</b>	<b>Date</b>
Author:	Environment Officer	Rev 1	02/02/2022
Reviewer:	Environment Officer	Rev 1	03/02/2022

## 1 PURPOSE

The purpose of this Clearing Assessment Report (CAR) is to provide a report detailing the assessment of native vegetation clearing that is proposed to be undertaken using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads).

The CAR outlines the key activities associated with the project, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the project using the ten Clearing Principles, and the strategies used to manage vegetation clearing.

## 2 SCOPE

### 2.1 Project Scope

**Project Name:** Causeway Pedestrian and Cyclist Bridge (CPCB) Project

**Project Purpose / Components:**

The construction of a new pedestrian and cycling bridge adjacent to the Causeway bridge via Heirisson Island has been identified by the WA transport portfolio as a key project that will prioritise safe bicycle access to the CBD for commuters and recreational users. The need for this proposal is driven by the safety concerns and congestion issues of the existing shared path facility, the significant land use development underway on both ends of the Causeway bridge, and the capacity constraints of the Causeway bridge for vehicle users. The planned PSP is to be located on the south-western side of the Causeway bridge, crossing Heirisson Island and connecting to the existing Recreational Shared Paths (RSPs) on both sides of the river.

The proposal extends over three recreational areas as follows:

- Point Fraser which is mostly landscaped and consists of parks and foreshore revegetation.
- Heirisson Island which is predominantly covered by grass with established planted trees and shrubs.
- McCallum Park which consists of an open parkland with a sparse planted vegetation cover.

**The proposed clearing undertaken using CPS 818 is:** 0.62 ha native vegetation.

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

**Project Location(s):**

The CPCB project area is located on Albany Highway and occurs within the City of Perth.

- Latitude: -31.963696
- Longitude: 115.880963

The location of the proposed works is at Figure 1.

### 2.2 Assessment Report Scope

The assessment area (see Figure 2) is confined to a local area of a 10 km radius from the project area.



Figure 1. Project Area

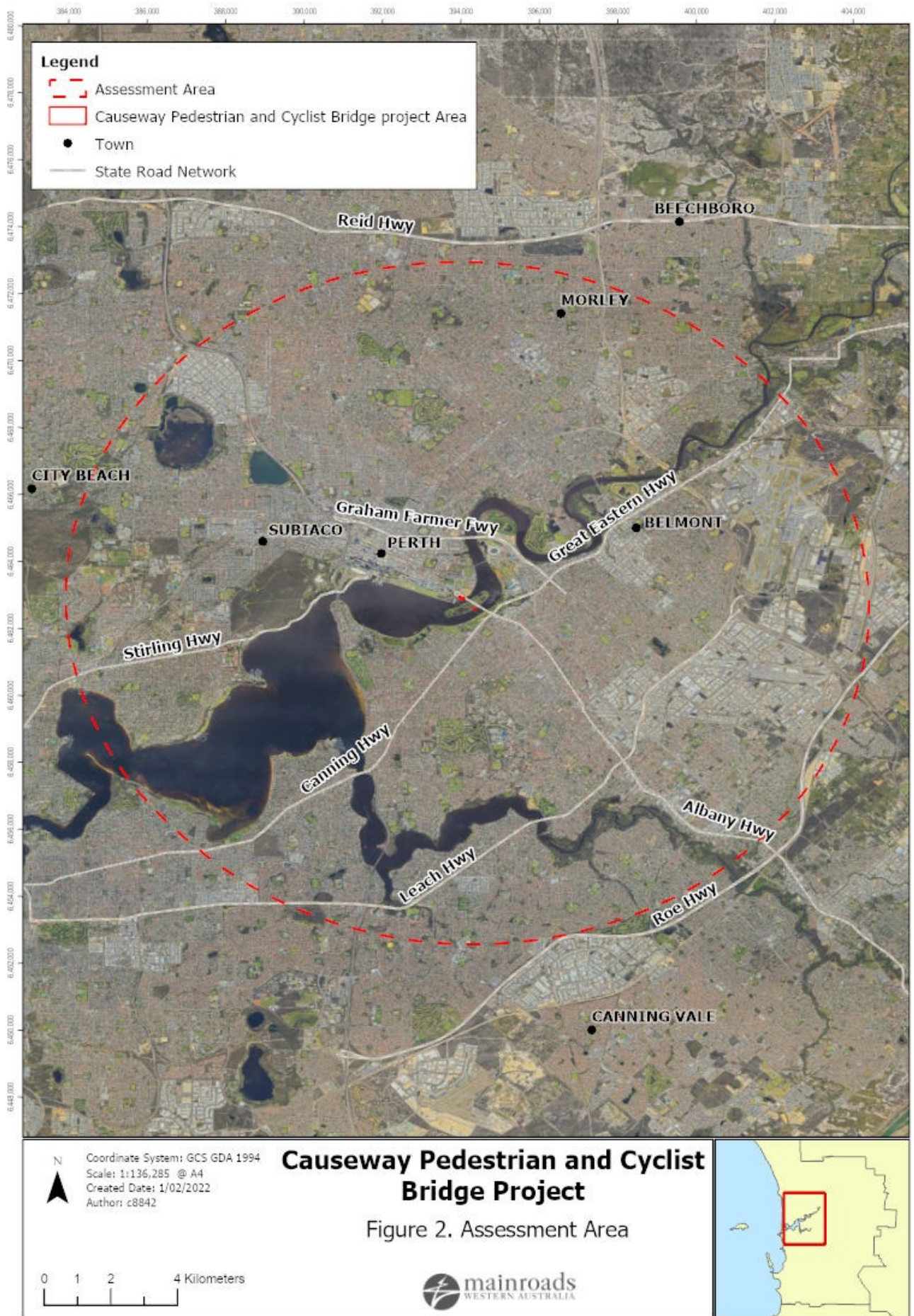


Figure 2. Assessment Area

## **2.3 Alternatives to clearing**

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

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

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

<b>Design or Management Measure</b>	<b>Discussion and Justification</b>
<b>Reduction of Clearing Footprint</b>	The clearing footprint has been reduced as far as practicable to avoid any impacts to areas mapped as the Subtropical and Temperate Coastal Saltmarsh TEC, on Heirisson island.
<b>Steepen batter slopes</b>	Not Applicable
<b>Installation of safety barriers</b>	Not Applicable
<b>Alignment to one side of existing road</b>	Not Applicable
<b>Alternative alignment to follow existing road (or) to preferentially locate within pasture or degraded areas</b>	Not Applicable
<b>Installation of kerbing</b>	Not Applicable
<b>Simplification of design to reduce number of lanes and/or complexity of intersections</b>	Not Applicable
<b>Preferential use of existing cleared areas for access tracks, construction storage and stockpiling</b>	Existing cleared areas will be utilised for vehicle turnarounds. Where possible cleared areas within the project area will be used to stockpile and store construction material and equipment.
<b>Drainage modification</b>	Not Applicable
<b>Other design treatment</b>	<p>In order to minimise clearing, the following measures have been adopted:</p> <ul style="list-style-type: none"> <li>• Abutments will be constructed 20 m from the shoreline to minimise impacts to planted riparian vegetation.</li> <li>• The pylon locations have been carefully selected with a view to avoid vegetation clearing where possible.</li> <li>• The number of pylons has been reduced from five to three to minimise impacts to the bed of the Swan River.</li> </ul>



## 2.5 Approved Policies and Planning Instruments

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

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.3), Main Roads has also had regard to the below instruments.

### **Other Legislation of relevance for assessment of clearing and planning/other matters**

- Biodiversity Conservation Act 2016 (WA) (BC Act)
- Conservation and Land Management Act 1984 (WA) (CALM Act)
- Country Areas Water Supply Act 1947 (WA) (CAWS Act)
- Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)
- Planning and Development Act 2005 (WA) (P&D Act)
- Soil and Land Conservation Act 1945 (WA)
- Rights in Water and Irrigation Act 1914
- Aboriginal Heritage Act 1972 (WA)
- Town Planning and Development Act 1928

### **Environmental Protection Policies**

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

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

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DEC, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, August 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities
- Approved Recovery Plans for threatened species
- EPBC Act Referral guidelines for the three threatened black cockatoo species
- Strategic advice - EPA

## 3 SUMMARY OF SURVEYS

### 3.1 Biological Survey

The Causeway Pedestrian & Cyclist Bridge Biological Survey was conducted in November 2021 by AECOM.

Section 3.1.1 contains the summary of the survey.

#### 3.1.1 Summary of Biological Survey

AECOM was commissioned to undertake a biological survey for the Causeway Pedestrian & Cyclist Bridge proposal which lies within Point Fraser, Heirisson Island and McCallum Park. The objective of the biological survey was to delineate key flora, vegetation, fauna and wetland values of the survey area to inform the environmental assessment and approval process.

AECOM completed a detailed flora and vegetation assessment in November 2020. Areas of native vegetation were traversed on foot and subjected to detailed surveys including flora quadrats and opportunistic recordings. A basic fauna and targeted black cockatoo survey was completed in November 2020. The basic fauna survey primarily focused on verifying the findings of the desktop assessment and mapping fauna habitat, while also searching for signs of significant fauna species. The targeted black cockatoo survey was conducted to identify potential breeding, roosting and foraging habitat.

#### Findings of the biological survey:

A total of 29 native flora species were recorded representing 19 genera and 8 families. The families Chenopodiaceae and Myrtaceae represented the majority of the native species recorded.

Seven introduced species were recorded, including *Melaleuca quinquenervia*, commonly known as the broad-leaved paperbark, and *Casuarina cunninghamiana* subsp. *cunninghamiana*, commonly known as river sheoak, both of which have been widely cultivated and often planted in parklands.

No threatened flora listed under the EPBC Act or *Biodiversity Conservation Act 2016* (BC Act) were recorded during the survey. In addition, no native endemic species listed as Priority by DBCA were recorded in the project area and broader survey area. During the survey, the Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community (TEC) was recorded on Heirisson Island fringing the artificial wetland on the southwest side. The vegetation assemblage of this TEC is the only native vegetation occurring in the survey area and was mapped as vegetation type CoSq. Vegetation type CoSq has been defined as a riparian vegetation that is in 'Good' condition, but generally lacking floristic diversity, suffering from weed invasion and having areas with cleared access paths. The Subtropical and Temperate Coastal Saltmarsh TEC was not recorded in the project area.

Three broad fauna habitats were defined and mapped, based predominantly on vegetation, landform and soils. These comprised Scattered Trees; Wetland, River and Riparian Vegetation; and Parkland and Maintained Gardens. Thirty-three vertebrate fauna species were recorded during the field survey, comprising 31 bird and two mammal species. A large majority of these species were wetland and waterbird species. A total of 416 native and introduced eucalypts with a diameter at breast height (DBH)  $\geq$  500 mm were observed and only one of these trees had a hollow of a suitable size for Black Cockatoo breeding purposes. However, there was no direct or indirect evidence for the presence of Black Cockatoo within the survey area. Data from the survey showed the presence of three eucalypt trees with a DBH  $\geq$  500 mm in the project area and none of these trees had any hollows. The habitats present were described as providing negligible to low quality value foraging habitat for Black Cockatoo species.

## 4 VEGETATION DETAILS

### 4.1.1 Project Site Vegetation Description

The project area covers a total area of 0.96 ha out of which 0.62 ha supports to native vegetation that was intentionally planted for the purpose of biodiversity conservation.

Based on a biological assessment undertaken in November 2020 (AECOM 2021), one vegetation type (Mixed trees over parkland) was defined for the project area. A site inspection of the project area indicated that the native vegetation occurring within the project area could be further described as follows:

- Riparian vegetation of *Casuarina obesa* open woodland over *Scaevola crassifolia*, *Atriplex prostrata*, *Rhagodia baccata* isolated shrubs over *Juncus kraussii* sparse sedgeland, fringing Point Fraser foreshore, (0.14 ha).
- Mixed planted native vegetation occurring as patches over lawns on Point Fraser (0.41 ha).
- Riparian vegetation consisting of isolated individuals of *Melaleuca curicularis* and *Casuarina obesa* on the southern shoreline of Heirisson Island (0.07 ha).

Tables 2, 3 and 4 provide details of the Pre-European Vegetation Association within the area to be cleared under CPS 818/15.

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

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 6 described as a Medium woodland; tuart & jarrah (Government of Western Australia, 2019)	Clearing of up to 0.62 ha for the construction of a bridge next to Albany Hwy, within the City of Perth	Degraded to Completely Degraded (EPA 2016)	Vegetation description and condition determined from Biological survey conducted in November 2020 and Main Roads Site Inspection (Appendix 1)

Vegetation that has less than 30% remaining is considered to represent an area that is significant as a remnant vegetation. The objective of the Environment Protection Authority (EPA) is to retain more than 30% of the pre-European vegetation cover of each ecological community, as below this threshold, species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). According to Beard's mapping (Beard et al. 2013), the native vegetation to be cleared lies within Vegetation Association 6 which has been defined as 'Medium woodland, Tuart and Jarrah'.

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

Pre-European Vegetation Association	Scale	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
<b>Veg Assoc No. 6</b>	<b>Statewide</b>	56,343.01	13,362.25	23.72	39.83
	<b>IBRA Bioregion</b> Swan Coastal Plain	56,343.01	13,362.25	23.72	39.83
	<b>IBRA Sub-region</b> Perth	56,343.01	13,362.25	23.72	9.83
	<b>Local Government Authority</b> City of Perth	1,377.03	332.35	24.14	96.34

Heddle et al. (1980) and Mattiske and Havel (1998) defined and mapped a series of vegetation complexes that enabled a refinement of Beard’s vegetation mapping (Beard et al. 2013) within the Perth and Peel region. Table 4 indicates the vegetation complex mapped for the project area.

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

Heddle/Mattiske Veg Complex	Pre-European Extent (ha)	2013 Vegetation Extent	% Remaining
Vasse Complex	15,691.63	4,926.97	31.40

As shown in Table 3, Vegetation Association 6 has less than 30% and more than 23% of their extents remaining at the State, IBRA bioregion, IBRA subregion and local government authority. However, the EPA recognises the Perth Metropolitan Region as a constrained area, which provides for the reduction of vegetation complexes to a minimum of 10% of the pre-European extent (EPA 2006). The Heddle Vegetation Complex (Vasse Complex) mapped within the project area retains approximately 31% of pre-European vegetation within the Swan Coastal Plain (Table 4). Consequently, the Vasse Complex is not considered as a significant remnant vegetation in the locality of the project area.

In addition, based on historical records and the 2020 biological survey, all vegetation to be cleared under CPS 818/15 has been planted (AECOM 2021). Consequently, this vegetation is not representative of Vegetation Association 6 or the Vasse Complex.

## 5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

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

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

The proposed clearing of 0.62 ha under CPS 818/15 is considered to be at variance to Principle (f), not likely to be at variance to Principles (a), (b) and (i) and not at variance to Principles (c), (d), (e), (g), (h) and (j).

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

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

##### Comment

Following a biological survey undertaken within and in the vicinity of the proposed clearing footprint, one vegetation type was defined for the project area (Section 4.1.1). A total of 0.62 ha of this vegetation represents native vegetation that was intentionally planted for the purpose of biodiversity conservation. This native vegetation occurs as isolated patches of plants that are separated by lawned areas (Appendix 1). The vegetation of the project area was assessed as being in a Completely Degraded condition (AECOM 2021).

This vegetation assemblage is not restricted to the project area and occurs to the west over Fraser point and Heirisson Island. Clearing of this vegetation is not expected to significantly impact the ecological linkage and ecosystem of the locality.

Results from a desktop assessment indicated that there are known records of 98 significant flora species within the assessment area. Of these species, none were assessed as having the potential to occur within the project area due to an absence of suitable habitats. A detailed flora and vegetation survey undertaken by AECOM in November 2020 did not identify any significant flora species within the project area (AECOM 2021). Given that no Threatened and priority flora species will be impacted and that the vegetation of the project area exists as small patches, it is unlikely that the loss of native vegetation will significantly reduce the biodiversity of the locality.

A desktop assessment showed records of 790 significant fauna species within the assessment area. Many of these are historic records of species that would no longer occur within the restricted and fragmented habitats of the local region. Due to the extensively modified nature of the area, only terrestrial and avian species inhabiting wetlands in urbanised environments were considered as having the potential to occur in the locality (AECOM 2021). The November 2020 biological survey did not identify any significant fauna species within the project area (AECOM 2021). Given the absence of suitable habitats and the fact that the project area is highly maintained and modified, no significant fauna species are expected to occur. Moreover, the regular presence of domestic dogs (*Canis familiaris*) within the project area is also expected to be a deterrent to the persistence of fauna species. Consequently, clearing within the project area is not expected to have significant impacts on any significant fauna species or fauna habitats.

The desktop assessment identified eight state listed Threatened Ecological Communities (TECs) within the assessment area. However, the 2020 biological survey did not identify any TECs in the project area (AECOM 2021). During that survey, the Subtropical and Temperate Coastal Saltmarsh TEC was recorded 45 m west of the project area on Heirisson Island. Given the very minor amount of clearing proposed, no significant indirect impacts to this TEC due to factors such as increased sedimentation, turbidity or contamination are anticipated. In addition, no excavation below the water table will be undertaken within the project area.

Precautionary management measures to avoid any indirect impacts to the Subtropical and Temperate Coastal Saltmarsh TEC will be addressed in the project specific EMP.

Native vegetation which is of similar or poorer condition to the surrounding vegetation will be cleared for this proposal. Given the small amount of clearing and the disturbed nature of the area, the proposed clearing is unlikely to impact vegetation that supports a higher biological diversity than the surrounding vegetation.

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

#### **Methodology**

Biological Survey June 2021 (AECOM 2021)

DBCA shapefiles

Department of Natural Resources and Environment (2002)

EPA (2016, 2020)

Main Roads Site Inspection (30/09/2021)

Main Roads GIS Shapefiles

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

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

#### **Comment**

A desktop assessment showed records of 790 significant fauna species within the study area. Many of these are historic records of species that would no longer occur within the restricted and fragmented habitats of the local region.

Three broad fauna habitats were defined and mapped within the project area as follows:

- Scattered trees
- Parkland and maintained gardens
- Wetland, river and riparian vegetation

The highly maintained and modified nature of the project area, coupled with the notable fragmentation and small size of vegetation patches (areas not lawned) were deemed unsuitable for mammals and medium quality to large reptiles (AECOM 2021). Only avian taxa (terrestrial species inhabiting wetlands in urbanised environments), smaller reptiles and amphibian species were considered as having the potential to occur in the locality (AECOM 2021). However, the project area does not constitute an important habitat for the establishment of migratory avian species and is likely to receive only transient visitors on their way to a more suitable environment. In addition, the regular presence of domestic dogs (*Canis familiaris*) within the project area is expected to be a deterrent to the persistence of fauna species (AECOM 2021). The November 2020 biological survey did not identify any significant fauna species within the project area (AECOM 2021).

No direct observations or evidence of foraging or roosting were recorded in the project area during the biological survey (AECOM 2021). The closest confirmed BirdLife Australia (2020) roosting site for the Black Cockatoo is located 600 m south-west of the project area. According to the biological survey, the fauna habitats of the project area support little biodiversity and proposed clearing comprises only 0.62 ha of negligible to low quality Black Cockatoo foraging habitat (AECOM 2021). The Black Cockatoo species are not considered to be reliant on the food source present in the project area due to the absence of plants such as Marri (*Corymbia calophylla*), Jarrah (*Eucalyptus marginata*) and proteaceous species. Better quality habitat for the Black Cockatoo species include Kings Park (approximately 3.5 km west), Bold Park (approximately 9 km north-west), and areas around Perth Airport (approximately 8 km east). Data from the biological survey also indicated that a total of three Eucalypt trees having a diameter at breast height (DBH) of  $\geq 500$  mm but with no hollows, were observed in the project area. These trees consisted of *Eucalytus camaldulensis*, *Eucalyptus albobpurpurea* and introduced Eucalypt species. All of these trees were

planted within the last 80 years in previously cleared parkland along the Perth foreshore and Heirisson Island. Studies have shown that hollows suitable for Black Cockatoos may not begin to appear in eucalypts until they are well over 100 to 200 years old (Johnstone et al 2013; Whitford 2002). The lack of breeding hollows along with the existing disturbance from historical clearing, ongoing recreational usage of the project area, and traffic noise from the heavily utilised Causeway Bridge, make this habitat unlikely to be utilised by the Black Cockatoo species for breeding purposes.

A marine geophysics and hydrographic survey conducted by Golder in 2021 did not identify any significant benthic habitat classes (i.e seagrass or macroalgae) in the riverbed adjacent to proposed clearing. Findings from the survey indicated that the Swan River is generally characterised by bare substrate with fine/silty sands or rock rubble with no or very sparse filter feeders/macroalgae (Golder 2021). Impacts to the existing benthic community (due to increased sedimentation or contamination) are considered unlikely. Management measures to further reduce this risk will be addressed in the project specific EMP.

It should be noted that the State and Commonwealth listed Carter's Freshwater Mussel (*Westalunio carteri*) was identified as historically occurring in the locality of the project area, although the species has not been recorded since 1905. Subsequent alteration of the river following the 1905 record has included increased sedimentation, nutrient loading, an increased extent of estuarine conditions further up the river system and influx of contamination. These changes have caused the benthic habitat surrounding Heirisson Island to become unsuitable for the occurrence of Carter's Freshwater Mussel (Kluzinger et al 2015). Consequently, this species is not expected to occur in the vicinity of the project area.

Furthermore, the presence of significant turtles in the project area is not anticipated as the waterway in that locality has been heavily contaminated with pesticides, herbicides and excessive high nutrients from domestic and industrial runoff (Larsen et al. 2019).

Consequently, clearing within the project area is not expected to have any significant impacts on any significant fauna species or fauna habitats.

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

### Methodology

Biological Survey June 2021 (AECOM 2021)  
 DBCA Shapefiles  
 DBCA website  
 EPA (2016, 2020)  
 Golder 2021  
 Johnstone et al 2013  
 Kluzinger et al 2015  
 Nice and Fisher 2011  
 Main Roads Site Inspection (30/09/2021)  
 Whitford 2002

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

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

#### Comment

The desktop assessment indicated records of 12 Threatened flora species within the assessment area and they are, *Acacia denticulosa*, *Andersonia gracilis*, *Caladenia huegelii*, *Conospermum undulatum*, *Diuris drummondii*, *Diuris purdiei*, *Eleocharis keigheryi*, *Eremophila glabra subsp. Chlorella*, *Eucalyptus rhodantha var. rhodantha*, *Grevillea thelemanniana*, *Macarthuria keigheryi* and *Tetraria australiensis*.

A detailed flora and vegetation survey (AECOM 2021) undertaken in November 2020 did not identify these species or any other Threatened flora species in the project area. None of these species are expected to occur due to a lack of suitable habitats within the planted patches of vegetation.

Based on the above, the proposed clearing is not at variance to this Principle.
<p><b>Methodology</b>                  Biological Survey June 2021 (AECOM 2021)                  DBCA shapefiles                  EPA (2016)                  Florabase (Accessed 24/11/2021)</p>

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

<b>Proposed clearing is not at variance to this Principle</b>
<p><b>Comment</b>                  The desktop assessment identified eight state listed Threatened Ecological Communities (TECs) within the assessment area. However, the 2020 biological survey did not identify any TECs in the project area (AECOM 2021).                   Based on the above, the proposed clearing is not at variance to this Principle.</p>
<p><b>Methodology</b>                  Biological Survey June 2021                  DBCA shapefiles                  EPA (2016)                  Main Roads Site Inspection (30/09/2021)</p>

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

<b>Proposed clearing is not at variance to this Principle</b>
<p><b>Comment</b>                  The EPA recognises the Perth Metropolitan Region as a constrained area, which provides for the reduction of vegetation complexes to a minimum of 10% of the pre-European extent (EPA 2006). The Hedde Vegetation Complex (Vasse Complex) mapped within the project area retains approximately 31% of pre-European vegetation within the Swan Coastal Plain (Table 4). Consequently, the Vasse Complex is not considered as a significant remnant vegetation in the locality of the project area.                   In addition, given that the 0.62 ha of native vegetation to be cleared was planted, this area is not representative of the Vasse Complex. Consequently, no vegetation corresponding to pre-European vegetation associations/complexes will be cleared for this project.                   Based on the above the proposed clearing is not at variance to this Principle.</p>
<p><b>Methodology</b>                  Aerial photography                  Beard et al 2013                  Biological Survey June 2021                  EPA (2006)                  Government of Western Australia (2017)                  Main Roads Site Inspection (30 September 2021)                  Perth Biodiversity Project (2013)</p>



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

<b>Proposed clearing is at variance to this Principle</b>
<p><b>Comment</b></p> <p>The project area is located within the Swan River Estuary which is classified as a Conservation Category Wetland (CCW). A total of 0.22 ha of Completely Degraded to Degraded riparian vegetation which has been intentionally planted for conservation purposes, will be cleared for the project. This vegetation consists of wetland dependant vegetation such as <i>Casuarina obesa</i>, <i>Juncus kraussii</i> and <i>Melaleuca lanceolata</i>. These plants occur in a highly modified locality and grow over a ground layer that is mostly composed of lawned or bare areas. Consequently, clearing will not result in the loss of regionally significant vegetation as the area to be cleared supports planted vegetation. In addition, the small amount of vegetation that will be removed is unlikely to cause hydrological change or secondary impacts to the remaining planted riparian vegetation.</p> <p>A marine geophysics and hydrographic survey conducted by Golder in 2021 also did not identify any significant benthic habitat classes (i.e seagrass or macroalgae) in the vicinity of the project area. Findings from the survey indicated that the riverbed adjacent to the project area is generally characterised by bare substrate with fine/silty sands or rock rubble with no or very sparse filter feeders/macroalgae. Consequently, the proposed clearing is not expected to have a significant impact on benthic vegetation.</p> <p>Based on the above the proposed clearing is at variance to this Principle.</p>
<p><b>Methodology</b></p> <p>Biological Survey June 2021 (AECOM 2021)  DWER and DBCA shapefiles  Main Roads Site Inspection (30 September 2021)  Marine geophysics and hydrographic survey August 2021</p>

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

<b>Proposed clearing is not at variance to this Principle</b>												
<p><b>Comment</b></p> <p>The desktop assessment determined that the soils of the project area have the following characteristics:</p> <table border="1"> <thead> <tr> <th>Aspect</th> <th>Risk</th> </tr> </thead> <tbody> <tr> <td>Flood Risk</td> <td>&lt;3% of map unit has a moderate to high flood risk</td> </tr> <tr> <td>Salinity</td> <td>&lt;3% of map unit has a moderate to high salinity risk</td> </tr> <tr> <td>Waterlogging</td> <td>&lt;3% of map unit has a moderate to very high waterlogging risk</td> </tr> <tr> <td>Water Erosion</td> <td>&lt;3% of map unit has a high to extreme water erosion risk</td> </tr> <tr> <td>Wind Erosion</td> <td>&lt;3% of map unit have high to extreme water erosion risk</td> </tr> </tbody> </table> <p>As evident from the table above, the project area exhibits a predominately low risk of flooding, salinity, waterlogging, water erosion and wind erosion.</p> <p>The project area occurs over sandy soils (Appendix 1). This soil type has a relatively good infiltration rate, implying that the risk of waterlogging is relatively low. Potential impacts, including surface water runoff and erosion of sediments into the Swan River will be managed during construction through the EMP. Given the disturbed nature of the existing vegetation, clearing of small patches of vegetation and scattered trees/shrubs is not expected to cause significant deterioration.</p> <p>The SLIP/ASRIS database indicated that the area is classified as High to Moderate risk of acid sulfate soils (ASS). As excavation below the water table is not proposed for the project area, ASS investigations and management will not be required.</p>	Aspect	Risk	Flood Risk	<3% of map unit has a moderate to high flood risk	Salinity	<3% of map unit has a moderate to high salinity risk	Waterlogging	<3% of map unit has a moderate to very high waterlogging risk	Water Erosion	<3% of map unit has a high to extreme water erosion risk	Wind Erosion	<3% of map unit have high to extreme water erosion risk
Aspect	Risk											
Flood Risk	<3% of map unit has a moderate to high flood risk											
Salinity	<3% of map unit has a moderate to high salinity risk											
Waterlogging	<3% of map unit has a moderate to very high waterlogging risk											
Water Erosion	<3% of map unit has a high to extreme water erosion risk											
Wind Erosion	<3% of map unit have high to extreme water erosion risk											

<p>Consequently, it is unlikely that this project will cause appreciable land degradation because of the minor clearing associated with the works and the fact that most of the existing vegetation will remain after completion of the project.</p> <p>Based on the above the proposed clearing is not at variance to this Principle.</p>
<p><b>Methodology</b>                  Main Roads Site Inspection (30/09/2021)                  DAFWA shapefiles</p>

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

<p><b>Proposed clearing is not likely to be at variance to this Principle</b></p>
<p><b>Comment</b>                  A search of ArcGIS shapefiles indicates that the project area intersects a River Reserve (Swan River). However, the proposed works are unlikely to significantly impact the environmental values of the reserve. Studies have shown that runoff from domestic and industrial properties has resulted in pesticides, herbicides and excessively high nutrients entering the Swan River resulting in eutrophication and degradation of benthic communities (Larsen et al. 2019). It was also reported that residual elevated concentrations of phosphorus, heavy metals, asbestos, as well as long-lived herbicides and pesticides could remain in elevated concentrations within the sediments of the river banks and bed (Nice, 2009). Consequently, the benthic habitat diversity is expected to be negligible in this locality. Management measures to minimise any impacts to the existing communities will comply with the Swan and Canning Rivers Management regulations and will be addressed in the project specific EMP.</p> <p>A Development application and approval from the DBCA Rivers and Estuaries division to undertake construction within the Swan River Trust Development Control Area will be required for the project.</p> <p>There are no other conservation areas or reserves in the immediate vicinity of the project area.</p> <p>Based on the above the proposed clearing is not likely to be at variance to this Principle.</p>
<p><b>Methodology</b>                  DBCA shapefiles                  EPA (2016)                  Main Roads Site Inspection (30/09/2021)</p>

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

<p><b>Proposed clearing is not likely to be at variance to this Principle</b></p>
<p><b>Comment</b>                  The project area intersects the Swan River but does not occur on any Proclaimed Surface Water Area or Public Drinking Water Source Area. Potential impacts, including surface water runoff and erosion of sediments into the Swan River will be managed during construction through the EMP.</p> <p>The project area lies within the Perth Groundwater Proclamation Area but groundwater abstraction will not be undertaken within the proposed clearing footprint.</p> <p>It is important to note that the uncontrolled historical filling followed by the domestic and industrial pollution subjected by Point Fraser, Heirrisson Island and McCallum Park have resulted in significant environmental degradation of this area. This site is also a landscaped one with a lawn as the ground cover in most of the project area. Clearing of 0.62 ha of vegetation in a Completely Degraded to Degraded condition is an already disturbed area, is therefore unlikely to cause sedimentation, soil erosion and waterlogging. Clearing of the small patches of vegetation is also not expected to alter surface flows or</p>

<p>cause hydrological change. The project specific EMP will include measures to implement soft and hard landscaping to prevent erosion and hence deterioration of water quality within the Swan River.</p> <p>Based on the above the proposed clearing is not likely to be at variance to this Principle.</p>
<p><b>Methodology</b>                  DWER and DBCA shapefiles                  Main Roads Site Inspection (30/09/2021)</p>

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

<p><b>Proposed clearing is not at variance to this Principle</b></p>
<p><b>Comment</b>                  The desktop assessment indicated low risk of flooding and waterlogging in that area. As the project area is composed predominately of fill material, it will have high infiltration rates that will lower the probability of flooding and waterlogging.</p> <p>Furthermore, the project area has a linear and narrow geometry and the removal of patches of vegetation in that footprint, makes it unlikely that the incidence or intensity of flooding will increase.</p> <p>Based on the substrate properties, small area of native vegetation to be removed and the amount of remaining native vegetation in the surrounding area, it is unlikely that this project will cause or exacerbate the incidence or intensity of flooding.</p> <p>Based on the above the proposed clearing is not at variance to this Principle.</p>
<p><b>Methodology</b>                  Main Roads Site Inspection (30/09/2021)                  DAFWA shapefiles</p>

## 6 ADDITIONAL ACTIONS REQUIRED

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

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

Impact of Clearing	Yes/No or NA	Further Action Required
<p><b>1.</b> The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.</p> <p>Where the clearing is at variance or may be at variance to Clearing Principle (f) and no other Clearing Principle, and the area of the proposed clearing is less than 0.5 hectares in size and the Clearing Principle (f) impacts only relate to:</p> <ul style="list-style-type: none"> <li>(i) a minor non-perennial watercourse(s);</li> <li>(ii) a wetland(s) classed as a multiple use management category wetland(s); and/or</li> <li>(iii) a wetland that is not a defined wetland;</li> </ul> <p>the preparation of an Assessment Report, as required by condition 6(e), is not required.</p>	<b>Y</b>	<ol style="list-style-type: none"> <li><b>1.</b> Submissions have been sought from relevant parties, including the LGA, in accordance with Condition 8 of CPS 818/15 published on the website.</li> <li><b>2.</b> VMP has been completed, refer to Appendix 2.</li> <li><b>3.</b> Main Roads will request an offset exemption from DWER.</li> </ol>
<p><b>2.</b> Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.</p>	<b>N</b>	No further action required.
<p><b>3.</b> The project involves clearing for temporary works (as defined by CPS 818).</p>	<b>N</b>	No further action required.
<p><b>4 a.</b> Project is within Region that:</p> <ul style="list-style-type: none"> <li>- Has rainfall greater than 400mm and</li> <li>- Is South of the 26<sup>th</sup> parallel and</li> <li>- Works are in 'Other than dry conditions' and</li> <li>- Works have potential for <b>uninfested</b> areas to be impacted</li> </ul>	<b>N</b>	The NRM WA Dieback mapping tool has no records of dieback occurrence in the area. Given the built-up nature of the locality, the project area can be treated as 'Dieback Uninterpretable' as this site has been subjected to widespread historical clearing, landscaping, land reclamation and degradation. Consequently, the risk of dieback is relatively low in this area.

Impact of Clearing	Yes/No or NA	<i>Further Action Required</i>
		Proceed with standard Vehicle and Plant management actions from PEMR's and Vehicle and Plant Hygiene Checklists.
<b>4b.</b> Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions?	<b>N</b>	No further action required.
<b>5.</b> Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback	<b>N</b>	No further action required.
<b>6.</b> The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition and weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition	<b>N</b>	No further action required.

## 7 STAKEHOLDER CONSULTATION

Main Roads has undertaken stakeholder consultation in accordance with CPS 818/15 Condition 8.

Main Roads received submissions from the following stakeholders:

- City of Perth
- Department of Biodiversity, Conservation and Attractions (DBCA)
- Department of Planning, Lands and Heritage (DPLH)
- Department of Transport (Marine)
- Town of Victoria Park
- Traditional Owners

Table 6 details the key issues raised and Main Roads response to these key issues.

**Table 6. Summary of Main Roads Response to Stakeholder Submissions**

Key Issue	Main Roads Response
<u>City of Perth</u> <ul style="list-style-type: none"> <li>• Impacts to Point Fraser related to City of Perth Riverfront Masterplan under development</li> <li>• Bridge design to minimise impact on vegetation</li> </ul>	<ul style="list-style-type: none"> <li>• Main Roads has committed to have the least impact on vegetation through careful selection of the route and will continue to liaise with the City of Perth regarding Heirisson Island and any future plans the City may develop.</li> <li>• Concerns raised by the City of Perth have been documented and form part of the design imperatives for the successful bidder.</li> </ul>
<u>DBCA</u> Minimise footprint	Where possible, the final design will integrate with the latest master plans for foreshore areas. Alliance (Contractor) will engage with stakeholders during the design process to minimise impacts and develop an acceptable design where possible.
<u>DPLH</u> Compliance with recommendations of the Archae-Aus Heritage Impact Assessment report	Main Roads has committed to adhering to the recommendations from the Heritage Impact Assessment Report by Achae-Aus.
<u>Department of Transport (Marine)</u> Compliance with existing regulations	Bridge minimum vertical clearance is to be increased to accommodate future navigational requirements as agreed by DoT Maritime.
<u>Town of Victoria Park</u> <ul style="list-style-type: none"> <li>• Stakeholder engagement going forward</li> <li>• Interfacing with Burswood Park Masterplan</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholder engagement is ongoing.</li> <li>• Although the proposal will have no direct impact on Burswood Park, Main Roads indicated its willingness to work with Burswood to “tie-in” infrastructure.</li> </ul>
<u>Traditional Owners</u> Ensure that engagement is not a ‘ticking boxes’ process for regulatory purposes	<ul style="list-style-type: none"> <li>• Main Roads commissioned an “Engagement Strategy Report” from consultants Aboriginal Land Services in August 2021. This report identified opportunities for stronger engagement with Traditional Owners and is currently under consideration within the Agency.</li> <li>• Main Roads set up the “Matagarup Elders Group” at the end of September 2021</li> </ul>

	<ul style="list-style-type: none"><li>• Main Roads is also involved with the Aboriginal Journey Ways project, a collaborative initiative between Main Roads and Kurongkurl Katitjin, the Centre for Australian Indigenous Education and Research at Edith Cowan University. This initiative will investigate and document traditional Aboriginal journey ways, tracks and places that aligned with Main Roads' road network.</li></ul>
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## 8 VEGETATION MANAGEMENT

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

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## 10 APPENDICES

Appendix	Title
<b>Appendix 1</b>	Vegetation Management Plan

## Appendix 1: Vegetation Management Plan

### CAUSEWAY PEDESTRIAN AND CYCLIST BRIDGE (CPCB)

#### **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 Causeway Pedestrian and Cyclist Bridge (CPCB) project.

Main Roads Western Australia (Main Roads) are proposing to deliver a new Causeway Shared Path bridge. The current preferred option is a 6 m wide bridge with cable stay design. This design would have two spans (Point Fraser span and McCallum Park span) and approximately three pylons in the Swan River.

In specified circumstances, Main Roads VMP is required to be approved by Department of Water and Environmental Regulation (DWER) as a condition of Main Roads Statewide Clearing Permit CPS 818. Management measures will adhere to requirements of the DBCA as well as the Swan and Canning Rivers Management regulations.

#### **Action**

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

Project Specific Environmental Management Requirements are contained in Table 1.

#### **Timeframes**

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

#### **Responsibilities**

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

## Appendix 1.1: Vegetation Management

VMP Requirement	Standard Management Action	Specific Management Action
Clearing	<p>Refer to Table 1: Clearing PEMR</p> <ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> <li>• Specification 301 Vegetation Clearing and Demolition</li> <li>• Environment Measurement and Evaluation Checklist (for release of HOLD POINTS)</li> </ul> <p>Contract Tender Documents available at <a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a></p>	<p>Clearing will be consistent with the conditions of the Development Application approval.</p>
Erosion and Sedimentation Control	<p>Refer to Table 3: Erosion and Sedimentation Control PEMR</p> <ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> </ul> <p>Contract Tender Documents available at <a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a></p>	<ul style="list-style-type: none"> <li>• All drainage water will be treated prior to entering the receiving water body.</li> <li>• Silt fence will be utilised to prevent over land transport of sediment into the river.</li> <li>• Post-construction hard and soft landscaping will be implemented to control erosion and sedimentation.</li> </ul>
Fauna	<p>Refer to Table 4: Fauna PEMR</p> <ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> </ul> <p>Contract Tender Documents available at <a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a></p>	Not Applicable
Machinery and Vehicle Management	<p>Refer to Table 5: Machinery and Vehicle Management PEMR</p> <ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> </ul> <p>Contract Tender Documents available at <a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a></p>	Not Applicable
Mulch and Topsoil Management	<p>Refer to Table 6: Mulch and Topsoil Management</p> <ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> <li>• Specification 301 Vegetation Clearing</li> <li>• Specification 304 Revegetation and Landscaping</li> </ul> <p>Contract Tender Documents available at</p>	Not Applicable

VMP Requirement	Standard Management Action	Specific Management Action
	<a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a>	
Pegging and Flagging	Refer to Table 7: Pegging and Flagging PEMR <ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> <li>• Specification 301 Vegetation Clearing and Demolition</li> </ul> Contract Tender Documents available at <a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a>	Not Applicable
Water Drainage Management	Refer to Table 8: Water Drainage PEMR <ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> </ul>	Not Applicable
Weed Management	Refer to Table 9: Weed Management PEMR <ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> </ul> Contract Tender Documents available at <a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a>	Not Applicable
Monitoring	<ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Construction Environmental Management Plan</li> <li>• Superintendent's Contract Management Plan &amp; Environmental Measurement and Evaluation Checklist.</li> </ul> Contract Tender Documents available at <a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a>	
Auditing	<ul style="list-style-type: none"> <li>• Specification 204 Environmental Management</li> <li>• Superintendent's Contract Management Plan &amp; Environmental Measurement and Evaluation Checklist.</li> </ul> Contract Tender Documents available at <a href="https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/">https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/</a>	

# Principal Environmental Management Requirements (PEMR's)

**Table 1: Clearing PEMR**

**STANDARD MANAGEMENT ACTIONS**

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

**Table 2: Erosion and Sedimentation**

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



**Table 3: Fauna**

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

**Table 4: Machinery and Vehicle Management**

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

**Table 5: Mulch and Topsoil Management**

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

**Table 6: Pegging and Flagging**

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

**Table 7: Water Drainage**

<p><b>PRE WORKS</b></p>
<p><b>DURING WORKS</b></p> <ol style="list-style-type: none"> <li>1. Existing natural drainage paths and channels along the road or the vicinity of the project area will not be unnecessarily blocked or restricted.</li> <li>2. Temporary drainage systems may be installed to carry surface water away from the areas where excavation and foundation construction work is taking place or from any other area where the accumulation of water could cause delay or damage to the work.</li> <li>3. Maintain these drainage systems in proper working order at all times.</li> <li>4. Runoff from disturbed areas must be managed to minimise adverse impacts on surrounding vegetation, watercourses and properties.</li> <li>5. Booms and silt fences must be used when working over or adjacent to areas of surface water in order to protect the quality of surface water from construction impacts.</li> </ol>
<p><b>POST WORKS</b></p> <ol style="list-style-type: none"> <li>1. Water quality monitoring to be undertaken (if turbidity/ sedimentation is an issue).</li> <li>2. Prior to backfilling the completed pipe work certify that the entire system is flushed clean and tested</li> <li>3. Disturbed areas will be stabilised soon after construction activities are completed.</li> <li>4. Culvert and drainage structures will be free of all grass, weeds, silt and debris</li> </ol>

## Table 8: Weed Management

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