Clearing Assessment Report – CPS 818

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Ardyaloon Trochus Hatchery Access Road Upgrade

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Contents

Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
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Reviewer:	Principal Environment Officer	Rev 0	30/03/2023

1 PROPOSAL

1.1 Purpose and Justification

The Hatchery Access Road is a private road operated by the Ardyaloon (One Arm Point) Community that provides access to a Trochus shell hatchery that has some tourism potential for the community. The road is currently in poor condition that limits access to four-wheel drive vehicles only. With the impending completion of the sealing works on the Broome-Cape Leveque Road, there is increased pressure to provide suitable two-wheel drive access to key locations on the Dampier Peninsula. The State Government has requested that MRWA undertake upgrade works on the road and deliver the Project under a Direct Managed method in conjunction with the Ardyaloon Community.

1.1.1 Main Roads Approach to Road Safety and the Environment

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

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

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

Further details on measures to avoid, minimise and reduce are provided in Section 1.6.

1.2 Proposal Scope

Main Roads proposes to upgrade the 1.7 km section of Hatchery Access Road between the Ardyaloon Community and the One Arm Point Trochus Hatchery. The upgrade will comprise the following components:

- Fill / gravel overlay and sealing of the Hatchery Access Road from SLK 0 – 1.7;
- Improvements to roadside drainage;
- Improvements to horizontal curve geometry (minor realignments);
- Upgrade of an existing lookout point at Round Rock; and
- Construction of a parking lot at the end of the access road to improve the serviceability of an existing boat ramp.

1.3 Proposal Location

The Development Envelope is located on the private, community managed, Hatchery Access Road next to the Ardyaloon Community as shown in Figure 1. The planned works will occur between SLK 0 to 1.7 of the Hatchery Access Road. The centroid of the key Project Area locations is provided below.

- Latitude: -16.442651
- Longitude: 123.071514

The location of the proposed works is at Figure 1.

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818: 1.61 ha

Areas of Native Vegetation Clearing:
The areas of native vegetation to be cleared are shown in Table 1.

Type of Native Vegetation:
The type of vegetation to be cleared under this Proposal is Pindan Woodland, Heathlands and regrowth and shown in Table 2.

Figure 1. Proposal Area

Figure 2. Vegetation Types within Trochus Hatchery Road Clearing Footprint

1.5 Alternatives to clearing

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

- Reducing the speed limit to minimise clearing requirements, while still balancing safety (driver fatigue) and freight efficiency.
- Not upgrade the road, however this will potentially result in a poorer safety outcome for the road users and local community
- Realignment the entire road. The current road is constrained between the community airstrip and a large block of native vegetation. Realignment of the road will require clearing of a larger area of native vegetation.

All alternatives above were deemed as unfeasible as they failed to address the restricted access issues for the Ardyaloon community.

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

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

The design and management measures implemented to avoid and minimise the Project clearing impacts are provided in Table 1 and include:

- Utilising an existing gravel pit as a material source.
- Utilising existing bores and bore infrastructure as a water source.
- Large trees will be retained on the side of the road where safe to do so.
- Clearing areas will be clearly demarcated as part of the initial site visit and prior to the commencement of any clearing.

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

Design or Management Measure	Discussion and Justification
Steepen batter slopes	Steepening of batter slopes is not considered an effective road design in the West Kimberley. Due to the topography, soils and lack of well-defined drainage, the large volumes of precipitation during the wet season typically form sheet flow in wide areas. Steep batters (typically anything less than 1:6) are prone to scouring due to increased runoff velocity when water flows off the pavement and over the shoulders and drainage batters. This continual scouring leads to increased material requirements for repairs, which indirectly leads to more clearing required for the development and extraction of new gravel pits. Suitable gravels are rare in the West Kimberley due to the extensive sandy landscape. Leaner batters (ideally between 1:8 and 1:10) generate a significantly lower runoff velocity, which significantly reduces the rate of scouring and erosion and is therefore the recommended design principle
Installation of safety barriers	The installation of safety barriers has not been implemented for this Project. The installation of safety barriers would not reduce the clearing footprint due to the requirements of roadside drainage for the large volume of water during the wet season. Thus, this is not a suitable measure to avoid clearing.
Alignment to one side of existing road	Where possible the clearing footprint has been aligned to one side of the existing Hatchery Access Road. In some locations, this has not been possible as the existing road is narrow in places and clearing on both sides of the road to widen the road produces the safest outcome for vehicles.
Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas	The alignment of the Hatchery Access Road upgrade will follow the existing road. This has significantly reduced the amount of clearing required as the existing clearing will be utilised. The surrounding vegetation has been inspected by a botanist and has been identified as in a degraded condition, further reducing the environmental impacts associated with vegetation clearing.
Simplification of design to reduce number of lanes and/or complexity of intersections	The proposed works relate to the upgrade of an existing four-wheel drive road to improve access, this includes sealing the road and allowing two-way travel suitable for standard two-wheel drive vehicles. The design follows the existing road and utilises existing clearing where possible to do so. Further simplification of design is not possible without compromising on road safety.

Design or Management Measure	Discussion and Justification
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	Existing cleared areas will be used, this includes utilising the existing cleared Hatchery Road within the footprint of the upgrade, utilising existing cleared areas which will be upgraded to a formal stopping/lookout point and utilising an existing gravel pit as a material source. In addition, areas within the community and the existing cleared areas along the extent of the Hatchery Road can and may be used as laydown and site office facilities.
Drainage modification	Drainage design for the Hatchery Access Road has been kept to basic roadside drainage. This has reduced the clearing required.

1.7 Approved Policies and Planning Instruments

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

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

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

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

Environmental Protection Policies

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

Other Relevant policies and guidance documents:

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DEC, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 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

2 SCOPE AND METHODOLOGY OF CLEARING ASSESSMENT

Native vegetation will be cleared to accommodate this Proposal. This clearing will be undertaken using the Main Roads Statewide Clearing Permit CPS 818 or a project-specific Clearing Permit.

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

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

2.1 Report Terminology and Sources

The following terms are used in this Clearing Report:

- **Native Vegetation Clearing Area** – The maximum amount of native vegetation to be cleared for the Proposal that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe movement of machinery during construction.

- **Development Envelope** – The maximum extent within which the Clearing Area will be located. This envelope larger than the Clearing Area and the Proposal Area to allow for minor changes to the Proposal footprint as the design process continues, and to account for minor and unexpected changes that may occur during construction, such as working to avoid a large tree or encountering buried boulders or services. This flexibility allows the site personnel to make modifications to the Proposal to avoid areas that may contain better environmental values. The CAR has assessed all environmental values within the Development Envelope as though all of these values will be impacted, up to the amount specified within the Clearing Area.

- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the Proposal is confined to a local area of a 40km radius.

2.2 Desktop Assessment

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

GIS layer viewing and mapping is done using ArcMap and/or Main Roads corporate mapping system known as iMaps. Referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. Government managed databases were searched to locate additional information, which are found under References in Section 8.

2.3 Surveys and Assessments

The following assessments were undertaken to inform this CAR:

- Site Inspection December 2020
- Site Inspection June 2022

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

3 SUMMARY OF SURVEYS

3.1 Overview of Surveys

A summary of the findings in these reports are presented in Section 3.1.1.

3.1.1 Summary of Site Inspections

Main Roads WA conducted site inspections in 2020 and 2022 across a 9.52ha Development Envelope (DE) to verify Desktop Assessment verify information obtained during the Desktop Assessment, characterise flora and delineate vegetation units present, catalogue the flora within the DE, document environmental conditions on site as well as undertake targeted and opportunistic searches for priority/species of interest and Threatened/Priority Ecological Communities

The 2020 site inspection identified four vegetation types with the DE dominated by regrowth (3.65ha), Pindan Woodland (2.30ha) and Heathland (0.84hs. A small area (0.54ha) of 'Monsoon Vine Thickets on the Dampier Peninsula', a State and Federally listed Threatened Ecological Community was identified. The majority of the area was in a Degraded Condition with evidence of significant impact from fire, weed infestation, dumping of rubbish and ground disturbance throughout the DE. No Declared Weeds or Weeds of National Significance were detected however, nine invasive weed species were recorded in the DE: *Aerva javanica, Cenchrus setiger, Macroptilium atropurpureum, Merremia dissecta, Passiflora foetida, Stylosanthes hamata, S. scabra*, *Tribulus terrestris* and *Tridax procumbens,*.

The second site inspection (undertaken in June 2022) was to identify the presence of Priority Flora species deemed likely to occur from the desktop assessment but not recorded in the December 2020 site inspection: *Paranotis halfordii* (P3) and *Triodia acutispicula* (P3). The results of the two site inspections identified no Threatened or Priority flora located within the Development Envelope.

4 VEGETATION DETAILS

4.1.1 Project Site Vegetation Description

The Project is located in the Dampierland Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion. The Hatchery Road Project Area occurs within broad scale pre-European Vegetation Association 771 described as 'Shrublands, pindan; *Acacia tumida* shrubland with ghost gum (*Eucalyptus papuana*) & *E. setosa* medium woodland over curly spinifex'. This pre-European vegetation association has >97% at all scales (State, IBRA Bioregion, IBRA Sub-region and LGA). Table 3 and Table 4 provide details of the Pre-European Vegetation Associations within the Hatchery Road Project Area and the remaining extents of these associations.

Table 2. Summary of Proposal Area Mapped Pre-European Vegetation Associations

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 771 described as Shrublands, pindan; *Acacia tumida* shrubland with ghost gum (*Eucalyptus papuana*) & *E. setosa* medium woodland	Clearing of up to 1.61 ha for access road upgrade on the Trochus Hatchery Access Road.	Poor to Good (EPA 2016)	The vegetation condition was determined at the MRWA site inspection in December 2020.

Table 2. Summary of Proposal Area Mapped Pre-European Vegetation Associations

over curly spinifex *(Government of Western Australia, 2019)*			

Table 3. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 771	**Statewide**	35,671.30	34,884.39	97.79	N/A
	IBRA Bioregion Dampierland	34,907.23	34,672.53	99.33	N/A
	IBRA Sub-region Pindanland	34,907.23	34,672.53	99.33	N/A
	Local Government Authority Shire of Broome	35,671.30	34,884.39	97.79	N/A

Four vegetation communities were identified within the Survey area. The areas of these vegetation communities in the Survey Area and estimated clearing extent in the Development envelope is provided in Table 5. No Monsoon Vine Thicket vegetation will be cleared as part of the project.

Table 4. Vegetation Types in Development Envelope

Project Area	Vegetation Community	Estimated Clearing (ha)	Survey Area
Trochus Hatchery Access Road	Pindan Woodland	0.39 ha	2.30 ha
	Heathland	0.27 ha	0.84 ha
	Regrowth	0.95 ha	3.65 ha
	Monsoon Vine Thicket	0 ha	0.54 ha
	Total	**1.61 ha**	**7.33 ha**
	Cleared	1.91 ha	2.19 ha
		3.52 ha	9.52 ha

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

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

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

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

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

Proposed clearing is not likely to be at variance to this Principle
The Development Envelope is a short 1.7km by approximately 50m wide linear corridor that includes the existing Trochus Hatchery Road. The Development Envelope consists of Pindan Woodland, Heathland, regrowth and a small area of 'Monsoon Vine Thickets. 60% of the Development Envelope consists of vegetation in a Poor condition, less than 10% in a Good condition and the remaining 30% is cleared (Table 5) (MRWA2020/2022). The Development Envelopment Envelope has been impacted significantly by fire, weed infestation, dumping of rubbish and ground disturbance throughout. *Priority Flora* The desktop assessment identified 10 conservation significant flora species with the potential to occur within the 40 km study area. Eight of the species are deemed unlikely to occur due to the lack of suitable habitat or required soil types. *Paranotis halfordii* (P3) and *Triodia acutispicula* (P3) were deemed as possible to occur post the desktop assessment due to the presence of potential habitat. Follow up inspections of these preferred habitat areas within the Development Envelope did not identify any individuals of these species (MRWA 2020/2022). *Ecological communities* The Development envelope is adjacent to vegetation described as 'monsoon vine thicket community' and is representative of the Monsoon Vine Thickets on the Coastal Sand Dunes of the Dampier Peninsula (MVT) Threatened Ecological Community (TEC) (MRWA, 2020, 2022). The TEC areas are north-west of the Hatchery Road Project Area and consists of scattered trees and shrubs of taxa representative of this TEC. No clearing will be undertaken within the MVT TEC, and a physical barrier will be put in place as part of the pegging and flagging to ensure there is no vehicle movement beyond the clearing line (see Principle D) *Fauna* The desktop assessment did not identify any significant fauna habitat for conservation significant species (see Principle B). The vegetation to be cleared is small is size (1.6ha), has been subject to a high level of disturbance, and is situated immediately adjacent to a large extent of intact vegetation that provides higher quality habitat. Subsequently it is unlikely that the vegetation to be cleared provides habitat that fauna species at a local and regional scale are reliant on, and the vegetation does not comprise of a high biological diversity value. The vegetation to be cleared is linear in nature, minor in size (1.6ha) and is in Poor condition having been subject to multiple forms of disturbance. The vegetation provides no ecological linkage, and no significant species or ecological communities will be impacted from its removal. It is unlikely that clearing will significantly reduce the biodiversity of the locality with extensive vegetation in better condition located immediately adjacent to the Development Envelope. Based on the above, the Project is not likely to be at variance to this Principle.

Methodology
Main Roads Site Inspection (MRWA, 2020, 2022)
Interim Recovery Plan for Monsoon Vine Thicket TEC (DBCA, 2018; DBCA, 2020)
ASRIS (ASRIS, 2011)
NatureMap Accessed 10/11/2020 (NatureMap, 2021)
Protected Matters Search Tool accessed 10/11/2020 (DAWE, 2021)
EPA Technical Guidance (EPA, 2020; EPA, 2016)
DBCA Threatened Flora, Threatened Fauna, PEC/TEC shapefiles
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 at variance to this Principle

Comment
Two fauna habitats, Pindan Woodland (1.22ha) and Heathland (0.39Ha) were identified as occurring within the Development Envelope and are in a Poor condition.

Conservation significant species identified in the 40km radius desktop assessment consist predominately of marine, wetland or migratory species and unlikely to occur within the Development Envelope due to absence of suitable habitat and the degraded nature of the vegetation (90% cleared or in Poor condition). Fauna species are unlikely to rely on the vegetation for significant habitat due to the transient and mobile nature of the species. These species are not discussed any further.

Four conservation species Bilby (*Macrotis lagotis*), Dampierland plain slider, skink (*Lerista separanda*), Dampierland Burrowing Snake (*Simoselaps minimus)* and Gouldian Finch (*Erythrura gouldiae*) were identified in the desktop assessment as potentially occurring however these species are unlikely to occur due to the absence of suitable habitat, absence of correct soil type, proximity of nearest known records of the species (between 20 to 40km from the Development Envelope) and extensive disturbance the area has been exposed to. Furthermore, large areas of intact vegetation of a higher quality are located immediately adjacent to the Development Envelope providing a higher quality of fauna habitat for the local region.

The Development Envelope primarily consists of cleared areas and regrowth, with some small patches of remnant native vegetation in a Poor condition and are unlikely to represent significant habitat for the identified conservation significant fauna species. The vegetation does not form part of an ecological linkage and is not of a quality that is required to maintain ecological functions and processes that protect significant habitat for fauna.
Given the small amount of clearing, the high level of disturbance the Development Envelope has been exposed to, and the large extent of intact vegetation immediately adjacent, it is unlikely that any of the fauna species discussed above are reliant on the vegetation to be cleared. The loss of up to 1.61 ha of vegetation is unlikely to negatively impact fauna at a local or regional scale. The habitat types within the Development Envelope are extensively represented within the wider 40km study area.

Therefore, based on the above the proposed works are not likely to be at variance to this principle.

Main Roads Site Inspection 17/12/2020 (MRWA, 2020, 2022)
EPA Technical Guidance (EPA, 2020; EPA, 2016)
NatureMap Accessed 10/11/2020 (NatureMap, 2021)
Protected Matters Search Tool accessed 10/11/2020 (DAWE, 2021)
DBCA Threatened Flora, Threatened Fauna, PEC/TEC shapefiles
Main Roads GIS Shapefiles

DAWE (D20#1014466) and DBCA (D20#1014476) Threatened and Priority fauna database (PMST and NatureMap Species Report)

(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

No declared rare flora was identified in the desktop assessment nor was it considered as having the potential to occur in the Development Envelope. Furthermore the site inspections (MRWA 2020,2022) did not record any Priority or Declared Rare Flora.

The proposed clearing is not at variance to this Principle.

Methodology

Main Roads Site Inspection (MRWA, 2020, 2022)
Florabase (WA Herbarium, 1998-)
NatureMap Accessed 10/11/2020 (NatureMap, 2021)
Protected Matters Search Tool accessed 10/11/2020 (DAWE, 2021)
Main Roads GIS Shapefiles

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

Proposed clearing is not at variance to this Principle

The Hatchery Access Road Project Area is adjacent to Monsoon Vine Thickets on the Coastal Sand Dunes of the Dampier Peninsula (MVT) Threatened Ecological Community (TEC).

The Main Roads site inspection confirmed the presence of a small 0.54ha fragments of MVT in a degraded condition within the Development Envelope. The extent of this community within the Development Envelope consists of scattered trees and shrubs, of taxa representative of this TEC, along the north-west of the existing road and near the trochus hatchery entrance.. Amendments to the road upgrade design has allowed for all MVT patches to be avoided with no clearing required.

No MVT will be cleared or affected by the project, and a physical barrier will be put in place as part of the pegging and flagging to ensure there is no vehicle movement beyond the clearing line.

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

Main Roads Site Inspection (MRWA, 2020, 2022)
Protected Matters Search Tool accessed 10/11/2020 (DAWE, 2021)
DBCA Threatened Flora, Threatened Fauna, PEC/TEC shapefiles
Monsoon Vine Thickets on Coastal Sand Dunes of Dampier Peninsula Fact Sheet (DBCA, 2020)

(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 at variance to this Principle

Broad scale pre-European vegetation is mapped as Vegetation Association 771 described as "Shrublands, pindan; *Acacia tumida* shrubland with ghost gum (*Eucalyptus papuana*) & *E. setosa* medium woodland over curly spinifex". The pre-European vegetation association has >97% at all scales (State, IBRA Bioregion, IBRA Sub-region and LGA). As such, the Project is not located in an area with regionally significant remnant vegetation. The vegetation association is widespread throughout the area and well represented locally and regionally.

Table 5. Summary of Proposal Area's mapped pre-European Vegetation Associations

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 771 described as Shrublands, pindan; *Acacia tumida* shrubland with ghost gum (*Eucalyptus papuana*) & *E. setosa* medium woodland over curly spinifex *(Government of Western Australia, 2019)*	Clearing of up to 1.61 ha for access road upgrade on the Trochus Hatchery Access Road.	Good to Degraded (MRWA, 2020, 2022)	The MRWA site inspection was completed on the 17 December 2020 and described the area as having frequent fire impacts, invasive weeds, as well as an ad hoc asbestos dump, which have degraded the majority of the native vegetation communities. Eight invasive weed species were recorded (MRWA, 2020, 2022)

Table 6. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 771	**Statewide**	35,671.30	34,884.39	97.79	N/A
	IBRA Bioregion Victoria Bonaparte	34,907.23	34,672.53	99.33	N/A
	IBRA Sub-region Keep	34,907.23	34,672.53	99.33	N/A
	Local Government Authority Shire of Wyndham-East Kimberley	35,671.30	34,884.39	97.79	N/A

Therefore, the proposed clearing is not at variance to this Principle.

Methodology Aerial photography Main Roads Site Inspection (MRWA, 2020, 2022) EPA Technical Guidance (EPA, 2016) Statewide Vegetation Statistics (Government of Western Australia, 2019) Shepherd Report (Shepherd, Beeston, & Hopkins, 2002) Main Roads GIS Shapefiles DPIRD GIS shapefiles (pre-european vegetation)

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

Proposed clearing is not at variance to this Principle.

Comment

The desktop assessment did not identify any mapped watercourses or wetlands intersecting the proposal area. No vegetation along the Trochus Hatchery Access Road is identified as riparian and no watercourses intersect the proposal area (MRWA, 2020/2022).

The proposed clearing will not impact on any vegetation growing in, or in association with a watercourse or

The clearing is not at variance to this principle.

Methodology

DWER and DBCA shapefiles
Aerial imagery
Main Roads Site Inspection (MRWA, 2020, 2022)

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

Proposed clearing is not at variance to this Principle

Comment

The project is in an area prone to severe rainfall events, which could contribute to land degradation via flooding and heavy runoff. As clearing works will be completed in a dry period and no excavation below the groundwater table will occur, impacts to groundwater and interruption of natural surface water flows is not expected. As such the risk of the project causing appreciable land degradation is minimal.

The soil landscape mapping indicates that the Development Envelope falls within the Reeves Land System, defined as "Sandplains with scattered sandstone hills and plateaux supporting low pindan woodlands with acacias and eucalypts and curly spinifex-ribbon grass". The soils along the Hatchery Access Road are orange-yellow sandy loams, locally known as pindan. Soils are skeletal, overlying Melligo Sandstone, which outcrops as a hard surface rock, particularly between the northern end of the airstrip and the trochus hatchery. In some areas, patches of shell-grit overlie the sandy soils (MRWA, 2020).

The Development Envelope is located within an area that is prone to flood risk, salinity, waterlogging, water erosion and land stability however clearing works will be completed in a dry period alleviating the potential for soils to become waterlogged and for surface water flows to result in erosion and scour. Subsequently interruption of natural surface water flows is not expected. In addition, no excavation below the groundwater table will occur removing risks to groundwater

The close proximity to the coastline has the potential to result in erosion from wind. Dust suppression measures will be implemented to reduce loose soil movement. Main Roads standard environmental management measures will be put in place to mitigate any issues associated with land degradation and for dust management.

Acid Sulfate Soil (ASS) mapping does not extend to the Hatchery Access Road; however, planned works are not anticipated to excavate below the groundwater level. Therefore, ASS is unlikely to be a constraint for the proposed works.

The proposed clearing is linear in nature and largely adjacent to the existing Trochus Hatchery Access Road. Main Roads' standard environmental management measures will be implemented and address erosion and other land degradation processes., Based on the above the proposed clearing is unlikely to cause appreciable land degradation and as such, the project is not likely to be at variance to this Principle.

Methodology
Main Roads Site Inspection (MRWA, 2020, 2022)
Soil Landscape Mapping (DPIRD, 2021)
Soil-landscapes of Western Australia's rangelands and arid interior (Tille, 2006)
ASRIS (ASRIS, 2011)

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

Proposed clearing is not at variance to this Principle

Comment
There are no conservation reserves within 50 km of the Project. Based on the distance to this reserve, and minor and minor nature and scale of the clearing proposed, the proposal is will not affect the values of this reserve. Furthermore the proposed clearing will occur alongside an existing road and will not break any linkages between vegetation patches or reserves.

The proposed clearing is not at variance to this Principle.

Methodology
DWER and DBCA shapefiles – DBCA Managed Lands and Waters
Main Roads Site Inspection (MRWA, 2020, 2022)

(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 at variance to this Principle

Comment
The Project Area is not located in, or adjacent to, a Proclaimed Surface Water Area or Public Drinking Water Area. There are no surface water features that intersect with the Project Area. The existing gravel Hatchery Access Road has concentrated surface water runoff in some locations, resulting in gullies. The upgrade and sealing of this road, along with the installation of roadside drainage, will generally improve surface water management and runoff near the road. The Project Area is located within the Canning-Kimberley Groundwater Area however the works will not intersect any groundwater.

Based on the above, the proposed works and clearing of up to 1.61 ha of vegetation are not likely to cause deterioration in the quality of surface or groundwater and is not likely to be at variance to this Principle.

Methodology
Main Roads Site Inspection (MRWA, 2020, 2022)
DWER and DBCA shapefiles – Hydrology, groundwater areas, surface water areas, public water source areas

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

Proposed clearing is not at variance to this Principle

Comment

The Project is located in the West Kimberley, that has a tropical monsoonal climate with a warm dry season and a wet season. The closest weather station is located at Cygnet Bay (Site No 003057), approximately 6 km south of the Hatchery Access Road Project Area. The average annual rainfall received at Cygnet Bay is 796.7 mm, the majority of which falls between the months of January to March. Tropical cyclones and tropical storms can bring heavy and sustained rainfall, particularly in the months leading up to, and during, the wet season. It is common for a large proportion of the Region's rainfall to be recorded in one single event, leading to extensive flooding of rivers, creeks and roadways. Due to large amounts of rainfall during the wet season, the proposed works will be completed in the dry season.

No changes to the existing levels of flooding are anticipated from the removal of 1.6ha of vegetation as the proposal is an upgrade to an existing road (and drainage). During rainfall events, the existing gravel Hatchery Access Road has concentrated surface water runoff in some locations causing gullies and localised flooding resulting in the road becoming impassable. The proposed works are inclusive of upgrades of drainage management to ensure the natural hydrology of the local region is maintained. The proposed linear clearing along an existing road is unlikely to cause or exacerbate the incidence or intensity of flooding.

Based on the above information the proposed clearing is not at variance to this Principle.

Methodology

Main Roads Site Inspection (MRWA, 2020, 2022)
Soil Landscape Mapping (DPIRD, 2021)
Bureau of Meteorology – Climate Statistics (BoM, 2021)

6 STAKEHOLDER CONSULTATION

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

7 COMPLIANCE WITH CPS 818

The clearing associated with the proposal is unlikely or not at variance with the Clearing Principles. Additional management actions under CPS 818 are detailed in Table 7.

Table 7. Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	Further Action Required
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.	**No**	No further action required.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **or** (j) the incidence of flooding.	**No**	No further action required.
3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **and** (j) the incidence of flooding.	**No**	No further action required.
4. The Proposal involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.

Impact of Clearing	Yes/No or NA	Further Action Required
5a. Proposal is within a Region that: • has rainfall greater than 400mm; and, • is South of the 26th parallel; and, • works are necessary in 'Other than dry conditions'; and, • works have potential for **uninfested** areas to be impacted.	**No**	No further action required.
5b. Do the proposed works require clearing within or adjacent to DBCA managed lands in non-dry conditions?	**No**	No further action required.
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback.	**No**	No further action required.
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	**No**	No further action required.
8. Did an environmental specialist conduct the survey or field assessment?	**Yes**	The Environmental Specialist undertaking the biological assessments was suitably qualified and had more than three years' experience.
9. Did an environmental specialist prepare the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal?	**Yes**	The Environmental Specialist preparing the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal was suitably qualified and had more than three years' experience.

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9 APPENDICES

Appendix	Title
Appendix 1	Principal Environmental Management Requirements (PEMRs)

Appendix 1. Principal Environmental Management Requirements

Principal Environmental Management Requirements (PEMR's)

Table 1: Clearing PEMR

STANDARD MANAGEMENT ACTIONS

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. The Contractor must prepare, implement and maintain processes to ensure that the movement of all vehicles, plant and machinery does not occur outside of the Limits of Vegetation Clearing. This must include all turnaround areas. 2. The Contractor must minimise vegetation clearing and the area of disturbance on ground by utilising existing cleared area where possible.
DURING WORKS 1. The Contractor must report any damage to vegetation beyond the Limits of Vegetation Clearing as an Environment Incident. 2. The Contractor must ensure Movements are confined to the Limits of Vegetation Clearing during the works 3. The Contractor must undertake the clearing in accordance with the Fauna PEMR.
POST WORKS 1. NIL

Table 2: Erosion and Sedimentation

PRE WORKS

1. The Contractor must develop, implement and maintain processes and procedures to ensure that:
    - The Contractor is responsive to and addresses incidents of erosion and sedimentation within and adjacent to the work areas.
    - Prevent water and wind soil erosion within and adjacent to the works areas.
    - Prevent the sedimentation and siltation of watercourses located within and adjacent to the works area.
    - Ensure that sedimentation and siltation of drainage lines due to the removal of riparian vegetation is avoided, minimised and mitigated.
    - Ensure that loose surfaces and recently cleared areas are protected from wind and soil erosion.
    - Minimise exposed soil working surfaces or protect them from stormwater erosion.
    - Ensure material such as gravel, crushed rock and excavated material is stockpiled away from drainage paths and covered to prevent erosion.
    - Ensure that water quality monitoring is undertaken when turbidity and sedimentation is an issue.

DURING WORKS

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

POST WORKS

1. If required, the Contractor must continue to monitor water quality until the turbidity/sedimentation dissipates.
2. The Contractor must ensure that disturbed areas are stabilised as soon as is practicable after construction activities are completed.

Table 3: Fauna

PRE WORKS 1. The Contractor must ensure that fauna management requirements are communicated to the crew undertaking the clearing works during the induction and pre-start meeting. 2. Where active nests, burrows or dens are identified, works must not proceed until the Contractor obtains the Superintendents approval of the management of active nests, burrows or dens adheres to the Superintendents advice.
DURING WORKS 1. The Contractor must undertake the clearing in the following manner to allow fauna to move out of the clearing area; i. Prior to the clearing activities commencing, use machinery to tap large trees with habitat hollows to encourage any animals evacuate. ii. Undertake the clearing in one direction and towards areas of native vegetation to allow the animals to escape to adjacent habitat. 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. 3. The Contractor must ensure that; i. No pets, traps or firearms are brought into the project area. ii. Fauna are not fed iii. Fauna are not intentionally harmed or killed 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.) 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.
POST WORKS 1. The Contractor must provide any records of fauna impact to the Superintendent.

Table 4: Machinery and Vehicle Management

PRE WORKS 1. The Contractor must ensure that all areas associated with the storage, parking, servicing, wash down and refuelling of all vehicles, plant and machinery is located within the Limits of Clearing and approved by the Superintendent. 2. The Contractor must ensure that all vehicles, machinery and plant are clean on entry (i.e. free of all soil and vegetation material) and comply with the requirements of 204.B.32. 3. The Contractor must ensure that vehicle servicing and refuelling will be undertaken at designated areas approved by the Superintendent. 4. The Contractor must ensure that all staff suitably qualified and competent to undertake works, especially refuelling activities.
DURING WORKS 1. The Contractor must maintain records of checking all vehicles, machinery and plant are clean on entry.
POST WORKS

Table 5: Mulch and Topsoil Management

PRE WORKS 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. 2. The Contractor must ensure that poor quality topsoil and mulched vegetation does not contaminate the good quality topsoil and vegetation.
DURING WORKS 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. 2. The Contractor must ensure the movement of large equipment over topsoil materials is avoided to minimise compaction. 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. 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.
POST WORKS

Table 6: Pegging and Flagging

PRE WORKS

1. Pegging must be done in accordance with the requirements detailed in Specification 301.
2. The Contractor must clearly communicate, either at the pre-start meeting or equivalent, to the crew undertaking the clearing works, through clear maps and other additional means, what the Pegging represents.

DURING WORKS

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

POST WORKS

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

Table 7: Water Drainage

PRE WORKS

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

DURING WORKS

1. Existing natural drainage paths and channels along the road or the vicinity of the project area will not be unnecessarily blocked or restricted.
2. Temporary drainage systems may be installed to carry surface water away from the areas where excavation and foundation construction work is taking place or from any other area where the accumulation of water could cause delay or damage to the work.
3. Maintain these drainage systems in proper working order at all times.
4. Runoff from disturbed areas must be managed to minimise adverse impacts on surrounding vegetation, watercourses and properties.
5. Booms and silt fences must be used when working over or adjacent to areas of surface water in order to protect the quality of surface water from construction impacts.

POST WORKS

1. Water quality monitoring to be undertaken (if turbidity/ sedimentation is an issue).
2. Prior to backfilling the completed pipe work certify that the entire system is flushed clean and tested
3. Disturbed areas will be stabilised soon after construction activities are completed.

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

Table 8: Weed Management

PRE WORKS

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

DURING WORKS

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

POST WORKS

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