Clearing Desktop Report – CPS 818

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Kingswood St Intersection Upgrade Project

June 2021

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D21#633175

Contents

Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
Author:	Senior Environment Officer	Draft v1	21/6/2021
Reviewer:	Environment Officer	Draft v1	29/06/2021

1 PURPOSE

This Clearing Desktop Report (CDR) is a desktop assessment of native vegetation clearing that is proposed to be cleared using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads).

2 SCOPE

2.1 Project Scope

Project Name: Kingswood St Intersection Upgrade Project

Project Purpose / Components: The project area is located approximately 70 km south-east of Coolgardie near Widgiemooltha, along Coolgardie Esperance Highway (SLK 74.3 to 75.4) in the Shire of Coolgardie, Western Australia. The project area consists of two intersection upgrades located on Kingswood St and supports the larger road widening for the Emu Rocks Project (30 km of upgrades along the Coolgardie Esperance Highway) (**Figure 1**).

The proposed clearing under CPS 818 is: 0.15 ha clearing area within a 0.22 ha envelope.

The proposed temporary clearing under CPS 818 is: None.

Project Location(s): The project area is located near the intersection of Kingswood St and Coolgardie – Esperance Highway (H010) (SLK 74.3 to 75.4) in the Shire of Coolgardie, Western Australia as shown in Figure 1.

MGA reference: 51J 364903 E 6514954 N

2.2 Desktop Assessment Scope

The assessment area is confined to a local area of a 20 km radius, as shown in Figure 2.

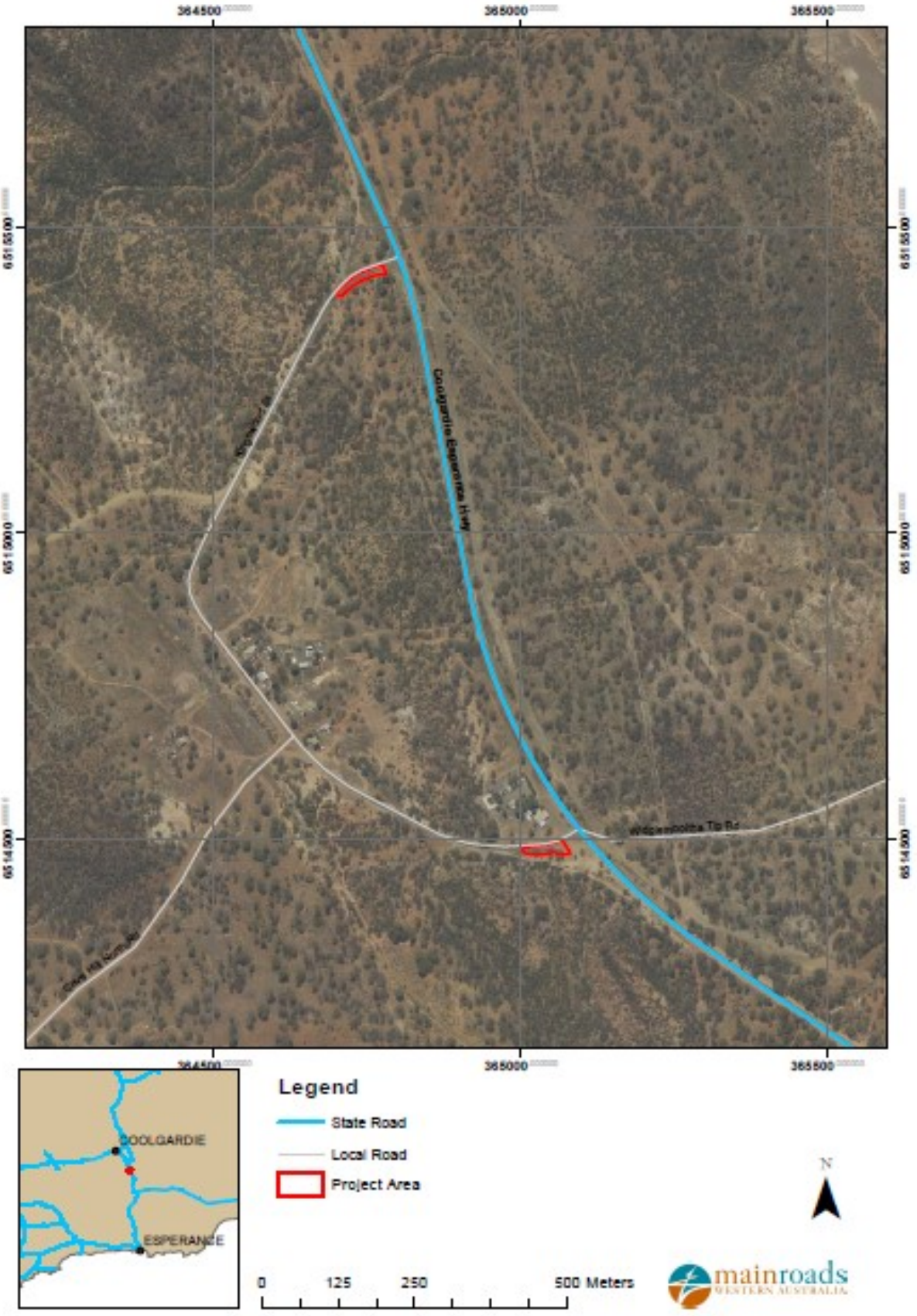

Figure 1. Project Area

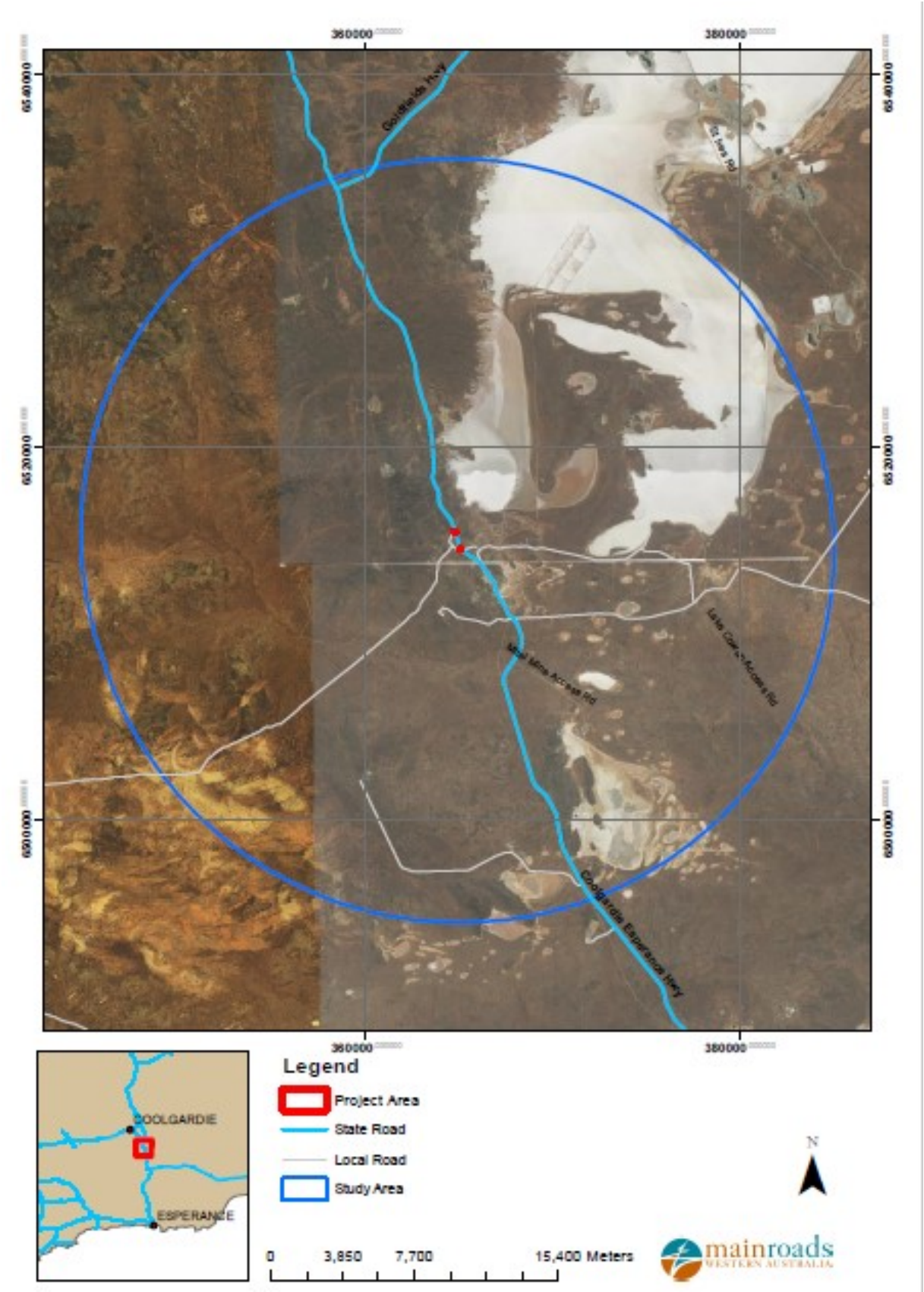

Figure 2. Project Location and Study Area

2.3 Alternatives to Clearing

The project has been designed to minimise the amount of clearing as much as possible, although clearing for the intersections will be necessary to achieve the safety objectives of the project.

2.4 Measures to Avoid, Minimise, Mitigate and Manage Project Clearing Impacts

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

Clearing impacts have been avoided and minimised via the following:

- The clearing area will be demarcated prior to the commencement of project activities and prior to the commencement of native vegetation clearing
- Follow the existing road where possible.

The design and management measures implemented to avoid and minimise the project clearing impacts are provided in **Table 2**.

Table 1. Justification of Avoiding, Minimising, Mitigating and Managing Project Clearing Impacts

Design or Management Measure	Discussion and Justification
Steepen batter slopes	Steepening batters is not applicable for this minor clearing. The clearing comprises of minor intersection widening.
Installation of safety barriers	Installation of safety barriers is not applicable for this minor clearing. The clearing comprises of minor intersection widening.
Alignment to one side of existing road	Intersection modifications have been aligned to one side of the existing road.
Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas	The clearing comprises of minor intersection widening for the existing road within already disturbed areas.
Installation of kerbing	Installation of kerbing is not applicable for this minor clearing. The clearing comprises of minor intersection widening.
Simplification of design to reduce number of lanes and/or complexity of intersections	Simplification of design to reduce complexity has been applied.
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	The project comprises of minor intersection widening. Previously disturbed areas adjacent to the existing road will be used where practicable.
Drainage modification	NA

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:

EPPs

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

Relevant other policies and guidance documents:

- The Western Australian Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DWER, 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

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

3 Methodology

3.1 Desktop Study

A desktop assessment of the project area and an assessment of native vegetation clearing were undertaken by reviewing a number of government agency managed databases, viewing GIS shapefiles and consulting with relevant stakeholders where necessary. Results from searches can be found in the relevant Appendix.

GIS layer viewing and mapping is done using ArcMap and / or Main Roads Integrated Mapping System (IMS). 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, these are referenced in Section 8.

4 VEGETATION DETAILS

4.1.1 Project Site Vegetation Description

The project area is located within the Eastern Goldfields sub-region and is broadly characterised by Mallees, Acacia thickets and shrub heaths on sandplains, with diverse Eucalyptus woodlands occurring around salt lakes, on ranges and in valleys (Cowen 2001). The project area supports mixed Eucalypt Woodland comprising of Medium woodland of *Eucalyptus lesouefii* with scattered *E. griffithsii* and *E. ravida* over open understorey of *Atriplex nummularia, Eremophila scoparia, Atriplex vesicaria, Tecticornia* sp. and *Frankenia* sp. on low stony rises, to undulating stony plains, clayey loam to loam soils. The vegetation condition ranged from 'Excellent to Very Good' (0.07 ha) to 'Good' (0.007 ha) condition (GHD 2015). The remaining area comprised of Highly Disturbed areas with scattered native vegetation in Completely Degraded condition (0.07 ha) and infrastructure areas.

Tables 2 and 3 provide details of the Pre-European Vegetation Associations within the project area and the remaining extents of these associations.

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

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Veg Assoc No. 9: Medium woodland; coral gum (*Eucalyptus torquata*) & goldfields blackbutt (*E. le soufii*)	Clearing of up to 0.15 ha within a 0.2 ha envelope for intersection widening along Coolgardie Esperance Highway.	Ranges from 'Completely Degraded' to 'Excellent to Very Good' (GHD 2015)	Vegetation description and condition determined from biological survey (GHD 2015).

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. 9: Medium woodland; coral gum (*Eucalyptus torquata*) & goldfields blackbutt (*E. lesoufii*)	**Statewide**	240,509.33	235,161.94	97.78	7.89
	IBRA Bioregion Coolgardie	240,441.99	235,100.97	97.78	7.90
	IBRA Sub-region Eastern Goldfields	235,047.15	229,757.07	97.75	8.08
	Local Government Authority Shire of Coolgardie	166,572.37	163,720.39	98.29	9.65

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* (EP Act), Schedule 5).

Each principle has been assessed in accordance with DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation'.

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 at variance to this Principle

Comments

The project area supports mixed Eucalypt Woodland comprising of Medium woodland of *Eucalyptus lesouefii* with scattered *E. griffithsii* and *E. ravida* over open understorey of *Atriplex nummularia, Eremophila scoparia, Atriplex vesicaria, Tecticornia* sp. and *Frankenia* sp. on low stony rises, to undulating stony plains, clayey loam to loam soils. The vegetation condition ranged from 'Excellent to Very Good' (0.07 ha) to 'Good' (0.007 ha) condition. The remaining area comprised of Highly Disturbed areas with scattered native vegetation in Completely Degraded condition (0.07 ha) and infrastructure areas.

Desktop assessments did not identify any TECs or PECs within the study area. GHD undertook a biological survey within the project area in 2015 and did not record any TECs or PECs.

Priority flora have been previously reported by GHD (2015, 2016) within the broader study area, however no priority flora have been recorded within the project area.

Biological Assessments conducted by GDH (2015, 2016) identified two priority species, *Calandrinia lefroyensis* (P1) (formerly *Calandrinia* sp. *Widgiemooltha*) and *Austrostipa blackii* (P3), over 2.5 km from the project area. *Austrostipa blackii* and *Calandrinia lefroyensis* were recorded on rocky ridges, hills and breakaways and saline flats, respectively, within the larger survey area. These habitats are not present within the project area. These species are unlikely to be impacted by the minor clearing for the project.

A likelihood of occurrence assessment (Appendix 3) concluded two flora taxa may possibly occur in the project area (P3 *Diocirea acutifolia* and P2 *Phebalium clavatum*) and the remaining 20 species were considered as unlikely to occur. There are 18 records of *Diocirea acutifolia* on Florabase located over 300 km. There are 15 records of *Phebalium clavatum* located over 100 km. The biological survey of the project area did not record these species. If they were present, they would occur in low numbers. Given the minor

nature of clearing for the project, previous survey in the area and the distribution of these species, a significant impact to these species is unlikely.

The connectivity within the project area is already broken by the existing road and rail corridors with most of the study area containing intact connected vegetation. The proposed clearing is expected to have minimal impact on existing habitat linkages as the clearing comprises thin linear strips adjacent to existing roads. One fauna habitat (not including highly disturbed areas), Mixed Eucalypt woodland fauna habitat was recorded in the project area. This habitat is locally common and likely to be found in better condition in locations away from the project area.

No conservation significant fauna were recorded during surveys conducted by GHD. An assessment of the likelihood of occurrence of conservation significant fauna species concluded that the Malleefowl (*Leipoa ocellata*) and Peregrine Falcon (*Falco peregrinus*) were likely to occur in the project area. Given the small amount of clearing required adjacent to the existing road, it is unlikely that the foraging or breeding habitat for these species or any other species would be significantly affected by the proposed works.

Given the assessment above, it is considered the project area does not contain a high level of biodiversity, therefore the proposal is **not at variance** to this Principle

Methodology

DBCA shapefiles
DBCA (2020)
Government of Western Australia (2019)
GHD (2015)
EPBC PMST 2021
NatureMap 2021

(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 unlikely to be at variance to this Principle

Comments

The project requires clearing of up to 0.15 ha for an intersection upgrade. Two fauna habitats were recorded within the project area:

- Mixed Eucalypt Woodland – Medium woodland of +/- *Eucalyptus lesouefii, E. transcontinentalis, E. ravida, E. flocktoniae, E. salmonophloia* (8-12 m) with mixed mallees over a mixed native shrub layer of variable density.
- Cleared and highly modified areas – cleared or highly modified areas largely devoid of native species.

Defined fauna habitats within the project area are considered to be well represented at a local and regional scale. Given the amount of connected habitat adjacent to the project area, the habitat within the project area is not considered significant to the maintenance of local fauna.

Database searches identified five significant fauna that have the potential to occur within the study area. They include:

- *Falco peregrinus* (Peregrine Falcon) OS
- *Calidris ferruginea* (Curlew Sandpiper) CE/CE
- *Falco hypoleucos* (Grey Falcon) Vu/Vu
- *Leipoa ocellata* (Malleefowl) Vu/Vu
- *Pezoporus occidentalis* (Night Parrot) CE/En

No conservation significant fauna were recorded during surveys conducted by GHD. An assessment of the likelihood of occurrence of conservation significant fauna species concluded that the Malleefowl (*Leipoa ocellata*) and Peregrine Falcon (*Falco peregrinus*) were likely to occur in the project area. The Mixed

Eucalypt Woodland and Acacia Shrublands provide some suitable habitat for the Malleefowl within the survey area. No signs of breeding (e.g. mounds) or other evidence were recorded during the field survey. The species may occasionally use the vegetation within the survey area as part of its larger home range and for foraging and/or for local movements particularly during the dispersal period for sub-adult birds. There are potential hollows for breeding for the Peregrine Falcon, however the species is unlikely to utilise or rely upon the terrestrial habitats in the survey area. The species is an aerial hunter which predominantly preys upon other birds. Given the small amount of clearing required adjacent to the existing road, it is unlikely that the foraging or breeding habitat for these species or any other species would be significantly affected by the proposed works.

The connectivity within the project area is already broken by the existing road and rail corridors with most of the study area containing intact connected vegetation. The proposed clearing is expected to have minimal impact on existing habitat linkages as the clearing comprises thin linear strips adjacent to the road. The habitat proposed to be cleared is locally common and likely to be found in better condition in locations away from the project area.

Proposed clearing is **unlikely to be at variance** with this Principle.

Methodology

DBCA Shapefiles
EPBC PMST 2021
GHD 2015
NatureMap 2021

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

Proposal is not likely to be at variance to this Principle

Comments

Database searches identified one State listed Threatened flora species listed under the Biodiversity Conservation Act 2016, *Pityrodia scabra* subsp. *scabra,* with the potential to occur in the project area. The EPBC PMST also identified *Tecticornia flabelliformis*, listed as Vulnerable under the EPBC Act and P1 by DBCA may also occur within the project area. *Pityrodia scabra* subsp. *scabra* is known from nine Florabase records within the Wyalkatchem area, over 300 km from the project area. *Tecticornia flabelliformis* has been previously recorded within 1.8 km of the project area. Suitable habitat for *Tecticornia flabelliformis* and *Pityrodia scabra* subsp. *scabra* are saline flats and disturbed native vegetation of Acacia shrublands on lateritic substrate with brown sands respectively. The project area comprises of Medium woodland of *Eucalyptus lesouefii* with scattered *E. griffithsii* and *E. ravida* over open understorey of *Atriplex nummularia, Eremophila scoparia, Atriplex vesicaria, Tecticornia* sp. and *Frankenia* sp. on low stony rises, to undulating stony plains, clayey loam to loam soils. Habitats for the *Pityrodia* and *Tecticornia* do not occur within the project area. Given the minor clearing for the project, the clearing for the project is unlikely to significantly impact these species.

Biological surveys undertaken by GHD did not record the existence of Threatened flora within the project area.

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

Methodology

DBCA shapefiles
EPBC PMST 2021
NatureMap 2021
GHD 2015

(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
Comments Desktop assessments did not identify any State listed TECs within the study area. GHD undertook a biological survey within the project area in 2015 and did not record any TECs. The nearest known TEC to the project area is the Parker Range complexes, located approximately 170 km to the west of the project. The project is not expected to impact this TEC. Proposed clearing is **not at variance** with this Principle.
Methodology DBCA shapefiles GHD 2015

(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

Comments

The EPA's objective is to protect at least 30% of the original extent of each vegetation complex in unconstrained areas and 10% representation in constrained areas of the Perth and Peel regions (EPA 2015).

The project area is considered to be an unconstrained area and therefore the 30% minimum retention target of the original vegetation extent applies. All of the regional vegetation associations of the project area are represented by more than 97% of their pre-European extent within the Coolgardie IBRA Bioregion and the Eastern Goldfields IBRA Sub-region (Table below). Therefore, none of the vegetation units of the project area are considered to be regionally significant in relation to their current extent, in comparison to pre-European extent.

Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA Reserves
Veg Assoc No. 9: Medium woodland; coral gum (*Eucalyptus torquata*) & goldfields blackbutt (*E. lesoufii*)	**Statewide**	240,509.33	235,161.94	97.78	7.89
	IBRA Bioregion Coolgardie	240,441.99	235,100.97	97.78	7.90
	IBRA Sub-region Eastern Goldfields	235,047.15	229,757.07	97.75	8.08
	Local Government Authority Shire of Coolgardie	166,572.37	163,720.39	98.29	9.65

The proposed clearing represents up to 0.15 ha next to a road and is not considered a significant remnant given the extensive vegetation remaining locally in the same or better condition.

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

Methodology

Aerial photography
EPA (2016)
Government of Western Australia (2019)

(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

Comments

The project area occurs within the Goldfields groundwater area as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act).

No watercourses intersect the project area; the nearest watercourse is a minor non-perennial watercourse, located over 260 m from the project area. No riparian vegetation was recorded from the biological survey within the project area.

Given the above, the proposed clearing is **not at variance** to this Principle.

Methodology

DWER and DBCA shapefiles

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

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

Comments

The project area lies in an area of low rainfall. Koorarawalyee (Site Number 012152) is the closest operating Bureau of Meteorology (BoM) recording station with a recorded average annual rainfall of 308.1 mm (BoM 2021).

Clearing has some potential to impact on soils, as the soil surface will become exposed once cleared and surface-water run-off and wind has the potential to result in erosion. The proposed clearing of up to 0.15 ha occurs in predominantly well vegetated areas on relatively flat to gently undulating topography. Land degradation from wind or water erosion is not considered to be a significant risk due to the minimal amount of clearing required and the fact that suitable dust management measures will be implemented during construction works. It is also unlikely that land degradation from waterlogging will result from the project. The majority of rainfall in this region is either lost to evaporation or used by vegetation, providing little for groundwater recharge.

ASRIS mapping indicates that the proposal area is located in an area with low or extremely low probability of Acid Sulphate Soils occurring.

Given the linear nature of the clearing and sealing of areas for road construction, the proposed clearing is not likely to lead to an appreciable increase in land degradation. Standard erosion and dust management control measures will be implemented during construction to reduce the incidence of wind erosion.
It is considered unlikely that the proposed clearing will lead to an increase in land degradation.

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

Methodology

ASRIS mapping (accessed 22 June 2021)
BoM 2021

(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

Comments

No reserves or conservation areas occur within the project area. One reserve occurs within the study area (20 km buffer), as summarised below Dordie Rocks Nature Reserve (Conservation of Flora and Fauna: R 3211 - vested in the CCWA) – approximately 10 km south of the project area at the closest point.

Given that the nearest reserve is over 10 km from the proposed project area, it is highly unlikely that project works will have any impact on environmental values of any conservation area.

With respect to connectivity in the landscape, the removal of a small linear section of vegetation will not significantly alter existing ecological connectivity between conservation reserves in the broader landscape. The existing highway and rail corridor currently dissect the vegetation and proposed upgrade works will not further impact ecological connectivity.

Proposed clearing is **not at variance** to this Principle.

Methodology
DBCA shapefiles

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

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

Comments
The project will not intersect the groundwater table and is unlikely to require local groundwater abstraction for water supply. No surface water will be taken for this project due to the minor nature of the works. It is unlikely that there will be a significant impact to the water quality of the area. The proposed works (both construction and operation) will not disturb any natural or existing drainage or surface run-off patterns, as surface water management features (i.e. culverts) will be installed.

The study area lies within native vegetation that has been subject to limited clearing, which coupled with low rainfall and low relief plains, provide low erosion potential. Vegetation clearing will occur within a linear corridor and is considered unlikely to change the water regime such that erosion, salinity or nutrients are mobilised into ground or surface water.

The project is situated within the Goldfields Groundwater Area but does not occur in a Proclaimed Surface Water Area or Public Drinking Water Source Areas (DWER 2020). The Goldfields region is characterised by saline groundwater where recharge by rainfall is minimal due to low annual rainfall, evaporation losses and vegetation use.

Surface water is seasonal after rains flowing along drainage channels into playa (salt) lakes where it evaporates leaving salt deposits (DoW 2007). Surface salinity is low and increases in the subsoil. Given this and the low annual rainfall, it is unlikely the removal of two thin linear strips of vegetation will contribute to increased turbidity through erosion, an appreciable increase in salinity or significant nutrient movement.

It is unlikely that this project will cause deterioration in the quality of surface or underground water.

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

Methodology
DWER (2021)
DoW (2007)

(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

Comments

The project area lies in an area of low rainfall. The average annual rainfall recorded at Koorarawalyee (Site Number 012152) is 308.1 mm. Due to the low rainfall and the small amount of linear clearing, it is unlikely that the incidence or intensity of flooding will increase.

Large connected areas of native vegetation remain in the surrounding area to attenuate water flow in the event of heavy rain before it enters drainage channels flowing into Lake Lefroy. Suitable drainage features would appropriately direct surface water and avoid any flooding of adjacent natural areas, where they exist.

The proposed clearing is **not at variance** to this Principle.

Methodology
BoM 2021

6 ADDITIONAL ACTIONS REQUIRED

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 6.

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

Impact of Clearing	Yes/No or NA	*Further Action Required*
1. The project involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.
2 a. Project is within Region that: - Has rainfall greater than 400mm and - Is South of the 26th parallel and - Works are in 'Other than dry conditions' and - Works have potential for **uninfested** areas to be impacted	**No**	Proceed with standard Vehicle and Plant management actions from PEMR's and Vehicle and Plant Hygiene Checklists.
3. 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.
4. 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	**No**	No further action required.

7 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum. Vegetation will be managed in accordance with the Principal Environmental Management Requirements (PEMR's).

8 REFERENCES

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

9 APPENDICES

Appendix	Title
Appendix 1	EPBC Protected Matters Search Report
Appendix 2	Naturemap database report
Appendix 3	Flora Likelihood of Occurrence Assessment

Appendix 1: EPBC Protected Matters Search Report

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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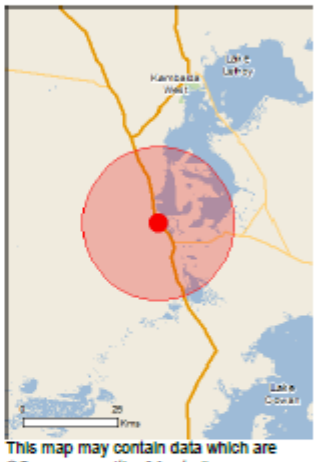
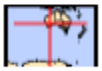


This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates
Buffer: 20.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	7
Listed Migratory Species:	6

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	10
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	12
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

v

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Plants		
Pityrodia scabra Wyalkatchem Foxglove [6421]	Endangered	Species or species habitat known to occur within area
Tecticornia flabelliformis Bead Glasswort [82664]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Thinornis rubricollis		
Hooded Plover [59510]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Dordie Rocks	WA

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis		
Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Camelus dromedarius		
Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus		
Goat [2]		Species or species habitat likely to occur within area
Equus asinus		
Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus		
Horse [5]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus		
House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua Ward's Weed [9511]		Species or species habitat likely to occur within area

Appendix 2: DBCA Threatened Flora and Fauna Database Searches

NatureMap

NatureMap Species Report

Created By Guest user on 21/06/2021

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 121° 38' 50" E,31° 39' 39" S
Buffer 20km

	Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
1.	3251	Acacia camptoclada			
2.	44514	Acacia collegialis			
3.	3315	Acacia duriuscula			
4.	16020	Acacia eremophila var. eremophila			
5.	3324	Acacia erinacea			
6.	44512	Acacia [illegible]			
7.	3366	Acacia hemiteles			
8.	3383	Acacia jennerae			
9.	3408	Acacia [illegible] (Silver Wattle, Wilyurwur)			
10.	3418	Acacia ligulata (Umbrella Bush, Watarka)			
11.	3440	Acacia merrallii			
12.	3478	Acacia pachypoda			
13.	3484	Acacia poliochroa			
14.	3485	Acacia prainii (Prain's Wattle)			
15.	3513	Acacia resinimarginea			
16.	3577	Acacia tetragonophylla (Kurara, Wakalpuka)			
17.	3589	Acacia uncinella			
18.	1721	Allocasuarina campestris			
19.	13697	Allocasuarina eriochlamys subsp. grossa		P3	
20.	6565	Alyxia buxifolia (Dysentery Bush)			
21.	40910	Androcalva luteiflora (Yellow-flowered Rulingia)			
22.	7833	Angianthus preissianus			
23.	7836	Angianthus tomentosus (Camel-grass)			
24.	7846	Asteridea athrixioides			
25.	11489	Atriplex acutibractea subsp. karoniensis			
26.	2453	Atriplex codonocarpa (Flat-topped Saltbush)			
27.	2468	Atriplex nana			
28.	11516	Atriplex nummularia subsp. spathulata (Old Man Saltbush)			
29.	2481	Atriplex vesicaria (Bladder Saltbush)			
30.	17232	Austrostipa blackii		P3	
31.	17241	Austrostipa hemipogon			
32.	17246	Austrostipa nitida			
33.	17247	Austrostipa platychaeta			
34.		Austrostipa sp.			
35.	4596	Beyeria lechenaultii (Pale Turpentine Bush)			
36.	16626	Boronia fabianoides subsp. rosea			
37.	15965	Boronia inornata subsp. inornata			
38.	4899	Brachychiton gregorii (Desert Kurrajong, Ngalta)			
39.	7871	Brachyscome ciliaris			
40.	2889	Brassica rapa	Y		
41.	48774	Calandrinia lefroyensis		P1	
42.	19454	Calandrinia sp. Needilup (K.R. Newbey 4960)			
43.	96	Callitris preissii (Rottnest Island Pine, Maro)			
44.	5408	Calothamnus gilesii			
45.	5438	Calytrix amethystina			
46.	3008	Carrichtera annua (Ward's Weed)	Y		
47.	1743	Casuarina obesa (Swamp Sheoak, Kuli)			
48.	13123	Centrolepis cephaloformis subsp. cephaloformis			
49.	1134	Centrolepis polygyna (Wiry Centrolepis)			
50.	7923	Cephalipterum drummondii (Pompom Head)			
51.	5491	Chamelaucium ciliatum			
52.	7933	Chthonocephalus pseudevax (Woolly Groundheads)			

NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum.

Department of Biodiversity, Conservation and Attractions

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NatureMap
Mapping Western Australia's Biodiversity

	Name ID	Species Name	Naturalised	Conservation Code	¹Endemic To Query Area
53.	40923	*Commersonia craurophylla (Brittle Leaved Ruingia)*			
54.	7949	*Cratystylis conocephala (Greybush)*			
55.	16184	*Cryptandra distigma*			
56.	35618	*Daviesia sp. Karonie (K. Newbey 8503)*			
57.	3977	*Daviesia aphylla*			
58.	14887	*Diocirea acutifolia*		P3	
59.	14889	*Diocirea violacea*			
60.	3499	*Dissocarpus paradoxus (Curious Saltbush)*			
61.	4769	*Dodonaea lobulata (Bead Hopbush)*			
62.	4780	*Dodonaea stenozyga*			
63.	11247	*Dodonaea viscosa subsp. angustissima*			
64.	49090	*Drosera sp. Branched styles (S.C. Coffey 190)*			
65.	6966	*Duboisia hopwoodii (Pituri, Kundugu)*			
66.		*Eremaea zonopila*			
67.	7180	*Eremophila alternifolia (Poverty Bush)*			
68.	31235	*Eremophila annosocaulis*		P3	
69.	13807	*Eremophila caperata*			
70.	17156	*Eremophila clavata*			
71.	14895	*Eremophila decipiens subsp. decipiens*			
72.	7195	*Eremophila dempsteri*			
73.	7198	*Eremophila deserti*			
74.	7212	*Eremophila gibbosa*			
75.	14340	*Eremophila glabra subsp. glabra*			
76.	7219	*Eremophila granitica (Thin-leaved Poverty Bush)*			
77.	15113	*Eremophila interstans subsp. interstans*			
78.	7226	*Eremophila ionantha (Violet-flowered Eremophila)*			
79.	15173	*Eremophila rugosa*			
80.	7264	*Eremophila saligna (Willowy Eremophila)*			
81.	7267	*Eremophila scoparia (Broom Bush ())*			
82.		*Eremophila sp.*			
83.	13035	*Eucalyptus aspratilis*			
84.	5581	*Eucalyptus campaspe (Silver Gimlet)*			
85.	14300	*Eucalyptus celastroides subsp. celastroides (Mirret)*			
86.	48436	*Eucalyptus clelandiorum*			
87.	5595	*Eucalyptus comitae-vallis (Comet Vale Mallee)*			
88.	5596	*Eucalyptus concinna (Victoria Desert Mallee)*			
89.	5612	*Eucalyptus cylindrocarpa (Woodline Mallee)*			
90.	5637	*Eucalyptus eremophila (Tall Sand Mallee)*			
91.	5648	*Eucalyptus flocktoniae (Merrit, Merid)*			
92.	5660	*Eucalyptus gracilis (Yorrell)*			
93.	5665	*Eucalyptus griffithsii (Griffith's Grey Gum)*			
94.	5673	*Eucalyptus horistes*			
95.	13056	*Eucalyptus leptopoda subsp. subluta*			
96.	5697	*Eucalyptus lesouefii (Goldfields Blackbutt)*			
97.	5701	*Eucalyptus longicornis (Red Morrel, Morl)*			
98.	13037	*Eucalyptus loxophleba subsp. lissophloia*			
99.	5735	*Eucalyptus oleosa (Giant Mallee)*			
100.	20091	*Eucalyptus oleosa subsp. oleosa*			
101.	18580	*Eucalyptus planipes*			
102.	5747	*Eucalyptus platycorys (Boorabbin Mallee)*			
103.	19094	*Eucalyptus prolixa*			
104.	12380	*Eucalyptus ravida (Silver-topped Gimlet)*			
105.	5761	*Eucalyptus rigidula (Stiff-leaved Mallee)*			
106.	12893	*Eucalyptus salicola (Salt Gum)*			
107.	5766	*Eucalyptus salmonophloia (Salmon Gum, Wurak)*			
108.	5767	*Eucalyptus salubris (Gimlet)*			
109.	46828	*Eucalyptus sp. Southern smooth-bark (D. Nicolle & M. French DN 6918)*			
110.	5780	*Eucalyptus stricklandii (Strickland's Gum)*			
111.	5792	*Eucalyptus torquata (Coral Gum)*			
112.	5793	*Eucalyptus transcontinentalis (Redwood, Pungul)*			
113.	18090	*Eucalyptus urna*			
114.	5798	*Eucalyptus websteriana (Webster's Mallee)*			
115.	13054	*Eucalyptus websteriana subsp. websteriana*			
116.	5800	*Eucalyptus yilgarnensis (Yorrell)*			
117.	10795	*Exocarpos sparteus (Broom Ballart, Djuk)*			
118.	5191	*Frankenia cinerea*			
119.	5204	*Frankenia interioris*			
120.	5205	*Frankenia irregularis*			
121.	5213	*Frankenia setosa (Bristly Frankenia)*			
122.	19925	*Glycine peratosa*			

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55.	16184	*Cryptandra distigma*			
56.	35618	*Darwinia* sp. Karonie (K. Newbey 8503)			
57.	6977	*Daviesia aphylla*			
58.	14867	*Dicrastylis acutifolia*		P3	
59.	14889	*Dicrastylis violacea*			
60.	2499	*Dissocarpus paradoxus* (Curious Saltbush)			
61.	4759	*Dodonaea lobulata* (Bead Hopbush)			
62.	4780	*Dodonaea stenozyga*			
63.	11347	*Dodonaea viscosa* subsp. *angustissima*			
64.	49090	*Drosera* sp. Branched styles (S.C. Coffey 193)			
65.	6966	*Duboisia hopwoodii* (Pituri, Kundugu)			
66.		*Eremaea zonopila*			
67.	7180	*Eremophila alternifolia* (Poverty Bush)			
68.	31235	*Eremophila annosocaulis*		P3	
69.	13807	*Eremophila caperata*			
70.	17158	*Eremophila clavata*			
71.	14895	*Eremophila decipiens* subsp. *decipiens*			
72.	7195	*Eremophila dempsteri*			
73.	7198	*Eremophila deserti*			
74.	7212	*Eremophila gibbosa*			
75.	14340	*Eremophila glabra* subsp. *glabra*			
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92.	5660	*Eucalyptus gracilis* (Yorrell)			
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94.	5673	*Eucalyptus horistes*			
95.	13059	*Eucalyptus leptopoda* subsp. *subluta*			
96.	5697	*Eucalyptus lesouefii* (Goldfields Blackbutt)			
97.	5701	*Eucalyptus longicornis* (Red Morrel, Morrl)			
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103.	19094	*Eucalyptus prolixa*			
104.	12380	*Eucalyptus ravida* (Silver-topped Gimlet)			
105.	5761	*Eucalyptus rigidula* (Stiff-leaved Mallee)			
106.	12990	*Eucalyptus salicola* (Salt Gum)			
107.	5766	*Eucalyptus salmonophloia* (Salmon Gum, Wurak)			
108.	5767	*Eucalyptus salubris* (Gimlet)			
109.	46828	*Eucalyptus* sp. Southern smooth-bark (D. Nicolle & M. French DN 6918)			
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113.	18090	*Eucalyptus urna*			
114.	5798	*Eucalyptus websteriana* (Webster's Mallee)			
115.	13054	*Eucalyptus websteriana* subsp. *websteriana*			
116.	5803	*Eucalyptus yilgarnensis* (Yorrell)			
117.	10765	*Exocarpos aphyllus* (Broom Ballart, Djuk)			
118.	5191	*Frankenia cinerea*			
119.	5204	*Frankenia interioris*			
120.	5205	*Frankenia irregularis*			
121.	5213	*Frankenia setosa* (Bristly Frankenia)			
122.	19925	*Glycine peratosa*			

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NatureMap
Mapping Western Australia's Biodiversity

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
193.	11540	*Ranunculus pentandrus var. platycarpus*			
194.	2580	*Rhagodia crassifolia (Fleshy Saltbush)*			
195.	13252	*Rhodanthe pygmaea*			
196.	4701	*Ricinocarpos stylosus*			
197.	48882	*Roepera apiculata*			
198.	48891	*Roepera fruticulosa*			
199.	30434	*Salsola australis*			
200.	2356	*Santalum acuminatum (Quandong, Wolgol)*			
201.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
202.	13151	*Scaevola thesioides subsp. filifolia*			
203.	8200	*Schoenia cassiniana (Schoenia)*			
204.	2606	*Sclerolaena cuneata (Yellow Bindii)*			
205.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
206.	2625	*Sclerolaena obliquicuspis (Limestone Bindii)*			
207.	2626	*Sclerolaena parviflora (Small-flower Saltbush)*			
208.	8207	*Senecio glossanthus (Slender Groundsel)*			
209.	3069	*Sisymbrium erysimoides (Smooth Mustard)*	Y		
210.	7023	*Solanum nummularium (Money-leaved Solanum)*			
211.	7028	*Solanum petrophilum (Rock Nightshade)*			
212.	7030	*Solanum plicatile*			
213.	7701	*Stylidium choreanthum (Dancing Triggerplant)*		P3	
214.	7751	*Stylidium limbatum (Fringed-leaved Triggerplant)*			
215.	43203	*Surreya diandra*			
216.	4202	*Swainsona canescens (Grey Swainsona)*			
217.	20103	*Taxandria spathulata*			
218.	31834	*Tecticornia flabelliformis*		P1	
219.	32236	*Tecticornia halocnemoides (Shrubby Samphire)*			
220.	31718	*Tecticornia lepidosperma*			
221.	31675	*Tecticornia lylei*			
222.	31551	*Tecticornia moniliformis*			
223.	31674	*Tecticornia peltata*			
224.	33297	*Tecticornia pergranulata subsp. pergranulata (Blackseed Samphire)*			
225.	31618	*Tecticornia pruinosa*			
226.	35840	*Templetonia ceracea*			
227.	19044	*Trachymene pyrophila*		P2	
228.	13852	*Trichanthodium skirrophorum*			
229.	17891	*Triodia desertorum*			
230.	16966	*Trymalium myrtillus subsp. myrtillus*			
231.	11708	*Vittadinia dissecta var. hirta*			
232.	48090	*Waitzia fitzgibbonii*			
233.	6938	*Westringia cephalantha*			
234.	9047	*Westringia rigida (Stiff Westringia)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap

NatureMap Species Report

Created By Guest user on 21/06/2021

Kingdom	Animalia
Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	121° 38' 26" E,31° 39' 15" S
Buffer	20km
Group By	Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	98	318
Other specially protected fauna	1	2
Rare or likely to become extinct	1	7
TOTAL	100	327

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Rare or likely to become extinct					
1.	24557	*Leipoa ocellata (Malleefowl)*		T	
Other specially protected fauna					
2.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
Non-conservation taxon					
3.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
4.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
5.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
6.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
7.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
8.	25536	*Accipiter fasciatus (Brown Goshawk)*			
9.	24561	*Anthochaera carunculata (Red Wattlebird)*			
10.	24285	*Aquila audax (Wedge-tailed Eagle)*			
11.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
12.		*Backobourkia heroine*			
13.		*Barnardius zonarius*			
14.	42380	*Brachyurophis fasciolatus subsp. fasciolatus (Narrow-banded Shovel-nosed Snake)*			
15.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
16.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
17.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
18.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
19.		*Cormocephalus turneri*			
20.	24416	*Corvus bennetti (Little Crow)*			
21.	25592	*Corvus coronoides (Australian Raven)*			
22.	24671	*Coturnix pectoralis (Stubble Quail)*			
23.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
24.	25596	*Cracticus torquatus (Grey Butcherbird)*			
25.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
26.	30893	*Cryptoblepharus buchananii*			
27.	24871	*Ctenophorus cristatus (Bicycle Dragon)*			
28.	24883	*Ctenophorus ornatus (Ornate Crevice-Dragon)*			
29.	24888	*Ctenophorus salinarum (Salt Pan Dragon)*			
30.	24889	*Ctenophorus scutulatus (Lozenge-marked Dragon)*			
31.	25089	*Cyclodomorphus melanops subsp. elongatus (Slender Blue-tongue)*			
32.	24995	*Delma australis*			
33.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
34.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
35.	24940	*Diplodactylus pulcher*			
36.	24470	*Dromaius novaehollandiae (Emu)*			
37.	24650	*Drymodes brunneopygia (Southern Scrub-robin)*			
38.	25109	*Eremiascincus richardsonii (Broad-banded Sand Swimmer)*			
39.	25621	*Falco berigora (Brown Falcon)*			

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NatureMap
Mapping Western Australia's Biodiversity

	Name ID	Species Name	Naturalised	Conservation Code	¹Endemic To Query Area
40.	24959	*Gehyra variegata*			
41.	25530	*Gerygone fusca* (Western Gerygone)			
42.	24295	*Haliastur sphenurus* (Whistling Kite)			
43.	25115	*Hemiergis initialis* subsp. *initialis*			
44.	42408	*Hesperocolletes reticulata*			
45.	24981	*Heteronotia binoei* (Bynoe's Gecko)			
46.		*Hogna salifolina*			
47.		*Isometroides vescus*			
48.		*Latrodectus hasseltii*			
49.	25102	*Lerista picturata*			
50.	42411	*Lerista timida*			
51.	25659	*Lichenostomus leucotis* (White-eared Honeyeater)			
52.	25661	*Lichmera indistincta* (Brown Honeyeater)			
53.		*Melinosa longipes*			
54.	24551	*Malurus pulcherrimus* (Blue-breasted Fairy-wren)			
55.	24583	*Manorina flavigula* (Yellow-throated Miner)			
56.	25663	*Melithreptus brevirostris* (Brown-headed Honeyeater)			
57.	25184	*Menetia greyii*			
58.	24598	*Merops ornatus* (Rainbow Bee-eater)			
59.	25690	*Microeca fascinans* (Jacky Winter)			
60.		*Missulena occatoria*			
61.	25188	*Morethia adelaidensis*			
62.	25190	*Morethia butleri*			
63.	24223	*Mus musculus* (House Mouse)	Y		
64.	25425	*Neobatrachus kunapalari* (Kunapalari Frog)			
65.	24998	*Nephrurus laevissimus*			
66.	24618	*Oreoica gutturalis* (Crested Bellbird)			
67.	24011	*Oreoica gutturalis* subsp. *gutturalis* (Crested Bellbird (southern))			
68.	24619	*Pachycephala inornata* (Gilbert's Whistler)			
69.	25253	*Parasuta gouldii*			
70.	25255	*Parasuta nigriceps*			
71.	25681	*Pardalotus punctatus* (Spotted Pardalote)			
72.	25682	*Pardalotus striatus* (Striated Pardalote)			
73.	24659	*Petroica goodenovii* (Red-capped Robin)			
74.	24409	*Phaps chalcoptera* (Common Bronzewing)			
75.	24663	*Pomatostomus superciliosus* (White-browed Babbler)			
76.	25261	*Pseudechis australis* (Mulga Snake)			
77.	24232	*Pseudomys bolami* (Bolam's Mouse)			
78.	24237	*Pseudomys hermannsburgensis* (Sandy Inland Mouse)			
79.	25259	*Pseudonaja affinis* subsp. *affinis* (Dugite)			
80.	42416	*Pseudonaja mengdeni* (Western Brown Snake)			
81.	25263	*Pseudonaja modesta* (Ringed Brown Snake)			
82.	42344	*Purnella albifrons* (White-fronted Honeyeater)			
83.	25008	*Pygopus lepidopodus* (Common Scaly Foot)			
84.	24278	*Pyrrholaemus brunneus* (Redthroat)			
85.	25614	*Rhipidura leucophrys* (Willie Wagtail)			
86.	30948	*Smicrornis brevirostris* (Weebill)			
87.	24106	*Sminthopsis dolichura* (Little Long-tailed Dunnart)			
88.		*Sminthopsis murina*			
89.	24117	*Sminthopsis ooldea* (Ooldea Dunnart)			
90.		*Storena formosa*			
91.	25597	*Strepera versicolor* (Grey Currawong)			
92.	24923	*Strophurus assimilis* (Goldfields Spiny-tailed Gecko)			
93.	25269	*Suta fasciata* (Rosen's Snake)			
94.		*Synsphyronus dorothyae*			
95.		*Tetralycosa alteripa*			
96.	30814	*Tympanocryptis cephalus* (Pebble Dragon)			
97.	24993	*Underwoodisaurus milii* (Barking Gecko)			
98.		*Urodacus novaehollandiae*			
99.	25218	*Varanus gouldii* (Bungarra or Sand Monitor)			
100.	25765	*Zosterops lateralis* (Grey-breasted White-eye, Silvereye)			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

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Appendix 3: Flora Likelihood of Occurrence Assessment

Taxon	ConsStatus (State/EPBC Act)	Habitat	Flora Likelihood of Occurrence Assessment	Source
Allocasuarina eriochlamys subsp. grossa	3	Dioecious or monoecious shrub, 1-3 m high, bracteoles prominently exceeding cone. Stony loam, laterite clay. Granite outcrops.	Unlikely– this species has been recorded within 20 km of the project area however there is limited suitable habitat present within the project area.	DBCA, NM
Austrostipa blackii	3	Tufted perennial, grass-like or herb, 1 m high. Fl. Sep to Nov. Slopes, basalt, ironstone,	Unlikely – this species has been recorded within 20 km of the project area however there is no suitable habitat present within the project area.	DBCA, NM
Austrostipa sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)	1	Slopes, outcrops and hilltops with geology including basalt, greenstone, dolerite. Clay, sandy clay soils.	Unlikely – this species has been recorded within 20 km of the project area however there is limited suitable habitat present within the project area.	DBCA
Calandrinia lefroyensis	1	Saline flats, edge of salt lakes.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA, NM
Chrysocephalum apiculatum subsp. norsemanense	3	It grows in various soil types including yellow or red sand, yellow sandy clay, and calcareous soil.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA
Diocirea acutifolia	3	Low, dense, rounded shrub, 0.3-0.8 m high. Fl. white, Nov to Dec. Clay loam, gravelly loam. Undulating flats.	Possible– this species has been recorded within 20 km of the survey area and there is suitable habitat present within the project area.	DBCA, NM
Eremophila annosocaulis	3	Low shrub to 0.8 m high. In the Coolgardie IBRA bioregion only known from the type locality where it occurs on the slopes and summit of a small hill in tall Acacia shrubland (Chinnock 2007).	Unlikely– this species has been recorded within 20 km of the project area however there is very limited/no suitable habitat present within the project area.	DBCA, NM
Eremophila perglandulosa	1	Shrub, to 1.8 m high. Fl. creamyellow, Oct. Clay loam, sandy loam. Adjacent to samphire flats and granite outcrops. Occurs in Eucalyptus low open woodland on sand (Chinnock 2007).	Unlikely– this species has been recorded within 20 km of the project area however there is limited suitable habitat present within the project area.	DBCA

Taxon	ConsStatus (State/EPBC Act)	Habitat	Flora Likelihood of Occurrence Assessment	Source
Eremophila veronica	3	Spreading, erect shrub, 0.5-1 m high. Fl. purple, Apr to May. Stony clay, clay loam. Lateritic breakaways.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA
Grevillea phillipsiana	1	Prickly shrub, 0.8-1.5 m high. Fl. red/red and orange, Jul to Sep. Red sand, stony loam. Granite hills.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA, NM
Phebalium clavatum	2	Upright shrub, 0.5-1.5 m high. Fl. white, Aug to Sep. Sandy soils. Sandplains.	Possible– this species has been recorded within 50 m of the project area.	DBCA
Philotheca apiculata	1	Erect shrub, 0.5-1.5 m high. Fl. white-pink, Aug to Nov. Stony clay loam. Rocky outcrops, hillsides.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA, NM
Pityrodia scabra subsp. dendrotricha	3	Yellow sand, salt lake shores. Largely recorded in the vicinity of Lake Lefroy.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA, NM
Prostanthera splendens	1	Erect, openly branched shrub, 0.2-1 m high. Fl. blue-purple, Aug to Oct. Stony loam, shallow soils with ironstone pebbles. Breakaways.	Unlikely– this species has been recorded within 20 km of the project area however there is limited suitable habitat within the project area.	DBCA, NM
Pterostylis xerampelina	1	Granite, slopes of greenstone cobbels and ironstone hill.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA
Ptilotus rigidus	1	Associated with salt lakes (Lally 2009)	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA, NM
Stylidium choreanthum	3	Creeping perennial, herb, 0.01-0.03 m high, to 0.3 m wide. Fl. pink/white, Sep to Nov. White/yellow or red sand. Plains.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA, NM
Tecticornia flabelliformis	1 / Vu	Erect shrub, to 0.2 m high. Clay. Saline flats.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA, NM, EPBC
Tecticornia mellarium	1	Erect, perennial shrub, 0.2-0.4 m high. Welldrained red gypseous sand, clay. Gypseous dunes, margins	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA

Taxon	ConsStatus (State/EPBC Act)	Habitat	Flora Likelihood of Occurrence Assessment	Source
		of playa lakes, on clay pans.		
Trachymene pyrophila	2	Annual, herb, 0.1-0.5 m high, indumentum of patent glandular hairs. Fl. white, Nov to Dec or Jan to Mar. Yellow or orange sand. Sandplains; germinating after fire or other disturbances such as mining.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	DBCA, NM
Melaleuca coccinea	3	Much branched shrub, 1.5-2.6 m high, leaf blade elliptic to ovate, 1.5-2.2 times as long as wide. Fl. red, Sep to Nov or Jan. Sandy loam over granite. Granite outcrops, sandplain, river valleys.	Unlikely– this species has been recorded within 20 km of the project area however there is no suitable habitat within the project area.	NM
Pityrodia scabra	T/En	Avon Wheatbelt region in disturbed native vegetation comprising Acacia acuminata, Allocasuarina acutivalvis, Acacia beauverdiana, Melaleuca uncinata and Verticordia mitchelliana on a flat, lateritic substrate with brown to white loamy/sandy soils	Unlikely - has not been recorded within 20 km of project area and habitat does not occur within project area.	EPBC