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WESTERN AUSTRALIA

Clearing Assessment Report – CPS 818

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Western Australia.*

Farrell and Rajander Intersection Upgrade – Collie Lake King Road (M037) SLK 84.71– 85.89

June 2021

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Amendments

Report Compilation & Review	Name and Position	Document Revision	Date
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Author:	Environment Officer	Rev 0	06/05/2021
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Reviewer:	Environment Officer	Rev 1	23/06/2021

1 PURPOSE

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

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

2 SCOPE

2.1 Project Scope

Project Name: Farrell and Rajander Intersection Upgrade – Collie Lake King Road SLK 84.71-85.89.

Project Purpose / Components:

The project involves intersection upgrades at Rajander and Farrell Roads. Both roads have poor sight distances with the Rajander Road approach to Collie Lake King Road being of particular concern, as it is a school bus route. The proposed works will include the following:

- Improvement of vertical curve between intersections to include raising of Farrell Intersection as far as practical without major realignment.
- Minimal realignment of horizontal curve west from Farrell Road which may include centreline movement to the required minimum.
- Installation of bulge treatments at both intersections.
- Culvert relocations to satisfy flow requirements.
- Localised widening between intersections to improve sight distance.

The proposed clearing undertaking using CPS 818 is: Approximately 2.93 ha of native vegetation will be cleared.

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

Project Location(s): The project area is located on Collie Lake King Road SLK 84.71 – 85.89 within the Shire of West Arthur as shown in Figure 1.

- Latitude: -33.361
- Longitude: 116.618
- to
- Latitude: -33.358
- Longitude: 116.630

2.2 Assessment Report Scope

The assessment area (see Figure 2) is confined to a local area of a 15 km radius.

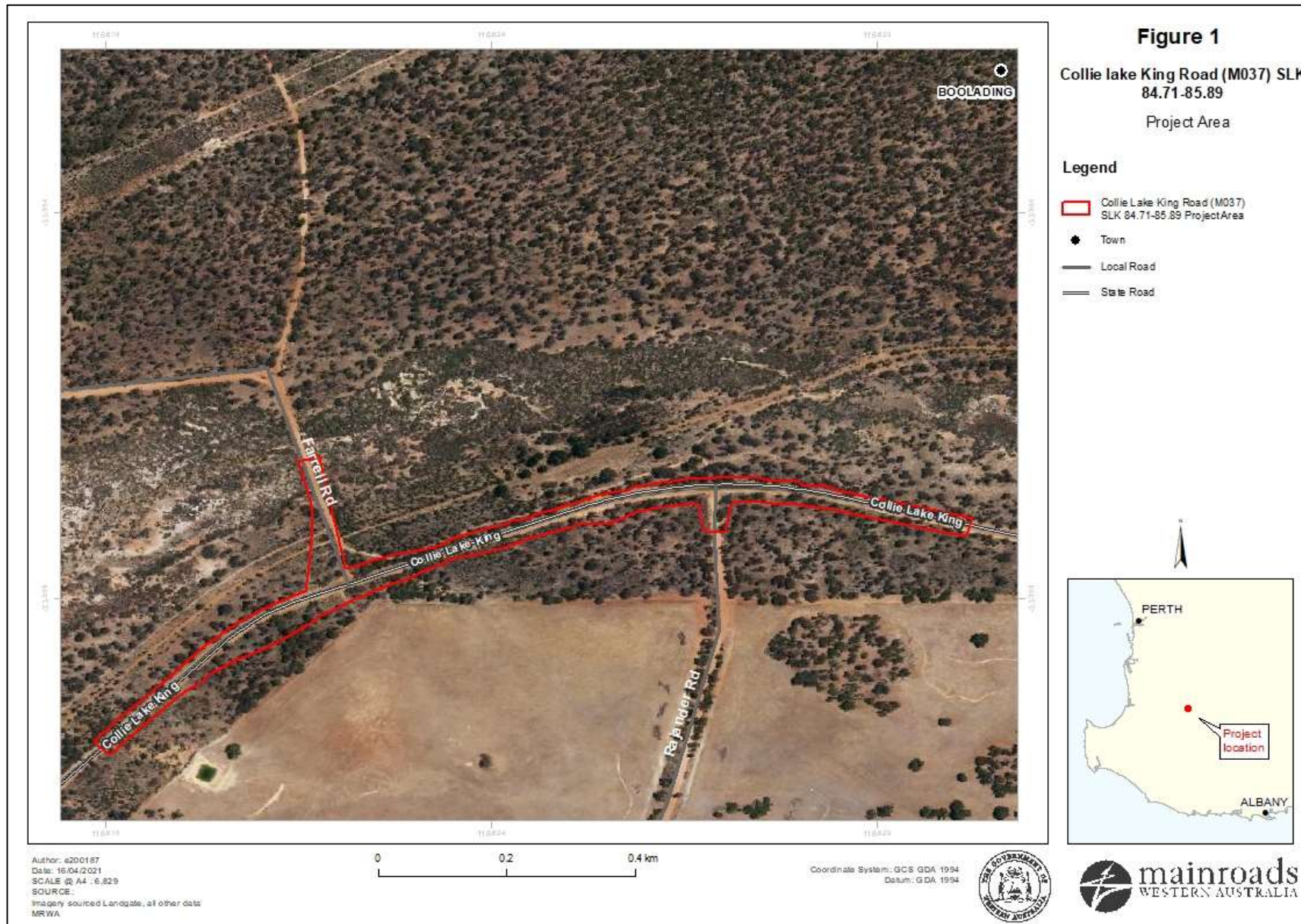


Figure 1. Project Area

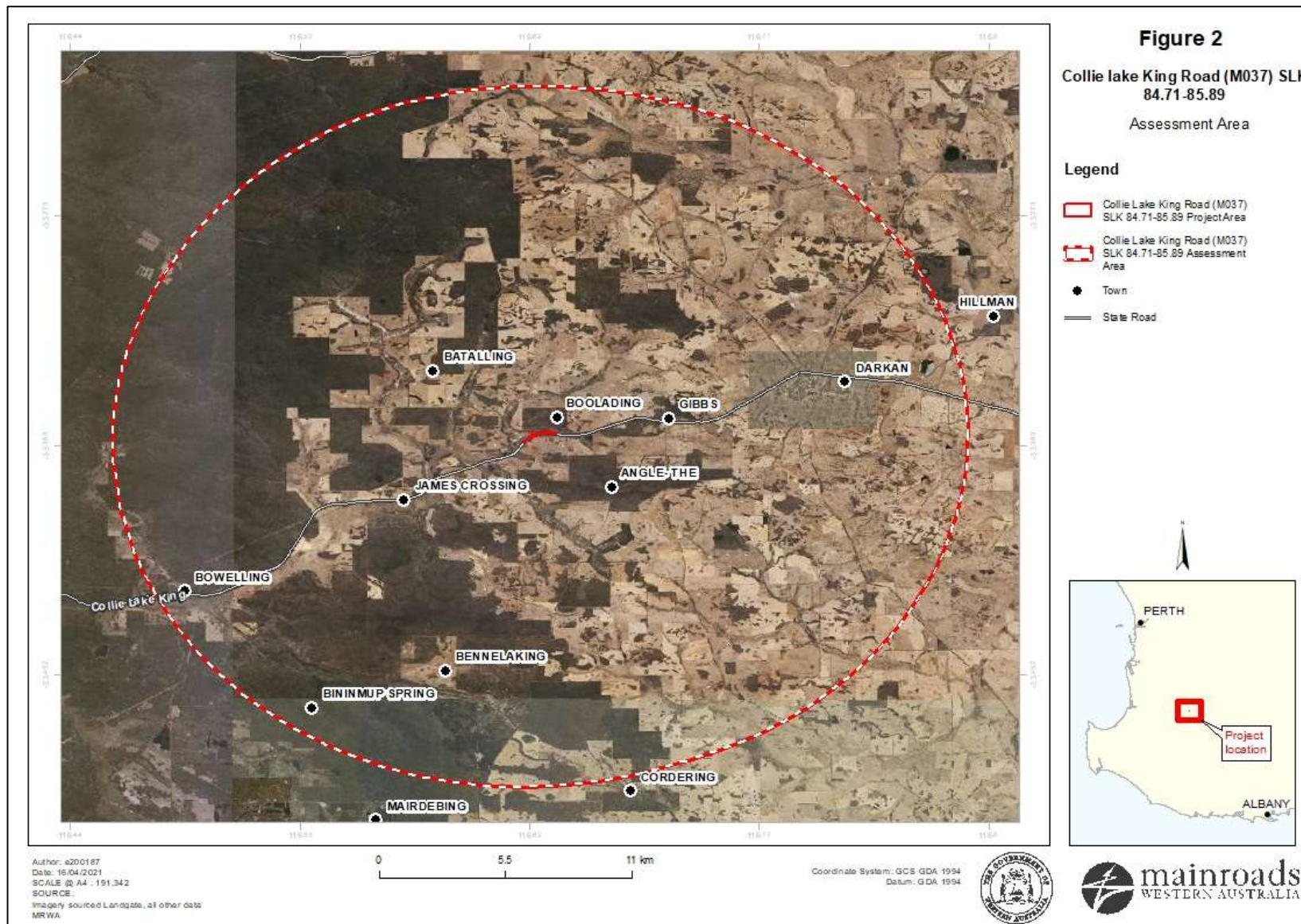


Figure 2. Assessment Area

2.3 Alternatives to clearing

The following alternatives to clearing were considered during the design phase of the project:

- The proposed footprint has been reduced as far as practicable to minimise environmental impacts. The current option minimises the extent of native vegetation clearing, meets road design standards and has the least impact on existing surrounding infrastructure.
- A minimal construction buffer of 2 m has been allowed to enable the construction of the required batter slope and table drain.
- Existing pre-disturbed or cleared areas will be used as truck turnarounds and laydown sites.

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

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

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

Design or Management Measure	Discussion and Justification
Reduction of Clearing Footprint	The original clearing footprint has been reduced as far as practicable to minimise impacts to Black Cockatoo foraging and breeding habitat. In addition, the angle of the new Farrell Road/Collie Lake King Road junction has been modified to avoid Eucalypt trees supporting hollows that are suitable for Blacking Cockatoo breeding habitat.
Steepen batter slopes	Fill batters have been steepened from the typical 1:6 to 1:4 for heights greater than 1.0 m and to 1:3 behind barriers where fill heights exceed 3 m, thus reducing the required clearing footprint, whilst complying with MRWA safety and maintenance standards. Cut batters have similarly been designed for 1V:3H where cuttings exceed 2.5 m in height to lessen the earthworks (and corresponding clearing) footprint.
Installation of safety barriers	Safety barriers have been included in locations where the fill batters have been steepened to 1V:3H for a reduced earthworks footprint. There has not been a need to install safety barriers to enable preservation of environmental values as the road alignment and intersection treatments have been designed to avoid impacts to Black Cockatoo potential nesting trees.
Alignment to one side of existing road	The horizontal and vertical alignment/realignment of both the Collie-Lake King Road and the two intersecting roads has been specifically selected to ensure that no high value (potential black cockatoo nesting) trees will be cleared and also achieving the least overall clearing area whilst achieving the targeted safety standards for sight lines and design traffic movements.

Design or Management Measure	Discussion and Justification
Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas	The re-alignment of the Collie-Lake King Road generally follows the same horizontal alignment of the existing road, with additional clearing only being required on account of the incorporated improvements to the vertical alignment and to the intersections for safe stopping sight distances. Similarly, the Rajander Road has not been repositioned and works will be conducted in the pre-existing cleared footprint. Farrell Road had to be realigned somewhat slightly further east to ensure safe sight distances were achieved whilst avoiding impacts to Black Cockatoo potential nesting trees.
Installation of kerbing	The works are located in a rural zone and installation of kerbing is not necessary.
Simplification of design to reduce number of lanes and/or complexity of intersections	The design incorporates pavement widths and provisions for turning movements into and out of the intersections with a view to ensure that the design vehicle (B-double) remains lane correct. Due to the low traffic volumes using the two sided roads, no additional channelisation has been determined to be necessary. As a result, a smaller clearing footprint was achieved as compared to the option where additional channelisation was incorporated.
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	The contract for construction will incorporate stringent provisions for use of existing cleared areas for access, construction storage, stockpiling and vehicle and machinery parking.
Drainage modification	No specific drainage modification has been incorporated in the project, other than the provision of roadside table drains which are largely in the same general areas as existing roadside drains.

2.5 Approved Policies and Planning Instruments

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

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

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

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

Environmental Protection Policies

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

Other Relevant policies and guidance documents:

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

3 SUMMARY OF SURVEYS

3.1 Biological Survey

The following biological surveys were conducted for the project area:

- GHD 2017 - Collie Lake king Road SLK 70-87 Reconnaissance Vegetation and Fauna Assessment.
- Phoenix Environmental Sciences 2020 - Biological survey for the Collie Lake King Road Widening (70 to 87 SLK).
- Tony Kirkby 2021 – Black Cockatoo Breeding Hollow Assessment.

Section 3.1.1 contains the summary of the survey.

3.1.1 Summary of Biological Survey

Collie Lake king Road SLK 70-87 Reconnaissance Vegetation and Fauna Assessment - GHD 2017

GHD was commissioned by Main Roads to undertake a reconnaissance survey along Collie Lake King Road SLK 70-87 in April 2017.

Key results

- Six broad vegetation associations as well as cleared areas were identified in the survey area. Two of these vegetation units, '*Eucalyptus marginata* and *Corymbia calophylla* woodland' and *Eucalyptus wandoo* woodland were mapped within the project area.
- Two conservation signification fauna were recorded during the field survey, Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo. An additional nine conservation significant species are considered likely to occur in the survey area based on previous records and suitability of habitat including: Baudin's Black Cockatoo, Chuditch, South western Brush-tailed Phascogale, Western Brush Wallaby, Western False Pipistrelle, Red-tailed Phascogale, Peregrine Falcon, Dell's Ctenotus, and Quenda. None of these species were recorded in the project area.
- One thousand five hundred and thirteen (1513) trees which are potentially suitable for Black Cockatoo breeding (Jarrah, Marri, Wandoo and Flooded Gum) were recorded within the survey area. This included 90 trees with hollows currently suitable for Black Cockatoo breeding. One tree on the edge of the survey area had evidence of previous Black Cockatoo use (i.e. old chew marks). Five trees with hollows were identified within the project area.
- A total of 40.97 ha was mapped as foraging habitat and 2.93 ha of this area is located in the project area.

Biological survey for the Collie Lake King Road Widening (70 to 87 SLK) - Phoenix Environmental Sciences 2020

Phoenix Environmental Sciences (Phoenix) was commissioned by Main Roads to undertake a biological survey along Collie Lake King Road SLK 70-87 in 2017. This survey follows an earlier reconnaissance survey undertaken in April 2017. The survey area consisted of a 19.13 ha corridor, parallel to the existing Collie Lake King Road. A detailed flora and vegetation survey was undertaken over three field trips in 2017, 13–15 September, 24–26 October and 16–17 November, and over four field trips in 2018, 19–21 September, 26–28 September, 23–26 October and 19 November. Field methods for the flora and vegetation survey of the survey area included surveying of quadrats and relevés, targeted flora searches and vegetation type mapping. A targeted terrestrial fauna survey was undertaken over two field trips, 13–15 September and 10–16 October 2017. Field methods included

active searches, avifauna surveys, bat echolocation and audio (bird and frog) recordings, camera trapping and black cockatoo habitat assessments.

Key results

- A total of 306 flora species and subspecies representing 49 families and 149 genera were recorded during the field survey.
- No Commonwealth or State listed Threatened flora were recorded during the survey. Two DBCA listed Priority flora were recorded: *Stylidium lepidum* (Priority 3) and *Synaphea hians* (Priority 3).
- One declared pest, **Moraia flaccida*, was recorded during the survey at two locations, none of which occur in the project area.
- Twelve native vegetation types were defined for the survey area and three of them were mapped within the project area as follows: (a) Tall *Allocasuarina fraseriana* shrubland over mid open *Hakea prostrata* shrubland over low *Borya scirpoidea*, *Romulea rosea* and *Neurachne alopecuroidea* forbland (AfHpNa), (b) Mid *Eucalyptus wandoo* woodland over low open shrubland over low sparse sedgeland (Ew) and (c) Mid *Eucalyptus wandoo* and *E. marginata* woodland over tall to low open shrubland over low open to sparse sedgeland (EwEm).
- The condition of native vegetation in the survey area ranged from Pristine to Degraded. Within the project area, the vegetation condition was ranked as Excellent, Very Good, Good and Degraded.
- No vegetation types identified within the survey area were classified as either a TEC or PEC.
- Six conservation significant fauna species were recorded, including all three Western Australian
- Threatened black cockatoo species Baudin's Cockatoo (*Calyptorhynchus baudinii*; Endangered under the EPBC Act and WC Act), Carnaby's Cockatoo (*Calyptorhynchus latirostris*; Endangered under the EPBC Act and WC Act) and Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*; Vulnerable under the EPBC Act and WC Act) and three DBCA list Priority mammals, Western Brush Wallaby (*Macropus irma*; P4), Western False Pipistrelle (*Falsistrellus mackenziei*; P4) and Southern Brown Bandicoot (*Isodon obesulus fusciventer*; P4). Only one individual of the Western Brush Wallaby was sighted in the *Eucalyptus wandoo* and *E. marginata* woodland vegetation unit.
- A total of 1,903 significant habitat trees for black cockatoos were recorded during the survey, including 69 that were assessed as having hollows suitable for breeding, a further 68 that were assessed as possibly suitable, and ten with hollows that showed signs of use. One hollow with an approximate size of 10 cm was observed in the project area.
- Foraging habitat quality for all three black cockatoo species was assessed as high in the survey area using a habitat quality scoring tool in the new draft EPBC Act survey guidelines for these species. Approximately, 2.93 ha of this foraging habitat was mapped for the project area.

Detailed Assessment of Possible Black Cockatoo Breeding Hollows, Collie – Lake King Road – Tony Kirkby 2021

The purpose of the survey was to assess hollows previously surveyed (GHD and Phoenix Environmental Services) and considered to be possible black cockatoo breeding hollows. A further 13 trees containing hollows considered too small to be Black Cockatoo breeding hollows were also re-assessed for the possible presence of larger hollows.

A total of 16 suitable hollows were inspected. Of the 16 hollows nine were blocked with no depth and were not actual hollows and five were too small (> 120mm dia). One of the hollows in Tree 4 had a suitable entrance to be used by black cockatoos but has never been used and is possibly unsuitable internally. This hollow could not be inspected with either a pole camera or drone due to branches near the hollow entrance. The trees located within the project area were too small or naturally blocked and hence unsuitable for the Black Cockatoo breeding habitat.

Of the 13 trees containing hollows previously considered too small (numbers 13-25) none had hollows of suitable size (> 120mm) to be used by Black Cockatoos.

3.2 Summary of dieback survey

The Bowelling to Gibbs Dieback Survey was conducted between 2 August 2018 and 11 October 2018 by the DBCA. Section 3.2.1 contains the summary of the survey.

3.2.1 Summary of Dieback Survey

The Forest Management Branch, Bunbury, within the Department of Biodiversity, Conservation and Attractions was requested by Main Roads to undertake a Dieback survey along Collie Lake King Road SLK 70-87 in 2018. The project area was reduced from 319.1 ha to an assessment area of 159.1 ha, having excluded all areas of high disturbance. The assessment was completed on 11 October 2018 by registered Dieback interpreters Julie Cox and Justin Chilcott.

Most of the assessment area is uninterpretable (129.4 ha) due to the vegetation lacking reliable and consistent indicator species. Uninterpretable areas associated with stream systems, the Collie River and water-logged, low-lying areas have been deemed unprotectable (19.3 ha), as they pose a high potential risk of being infested.

An infested area (7.2 ha) found south of Coalfields Road associated with a stream system, was largely identified by two positive sample results taken of recent dead *Banksia squarrosa*.

Areas found to be uninfested (22.5 ha) were generally associated with elevated land and the Pindalup vegetation complex (RFA). These areas are located 12-14 km south-west of the project area. *Armillaria* root rot was found to be extensive in the eastern extent of the assessment area causing partial to complete overstorey collapse of *Eucalyptus wandoo* and *Eucalyptus marginata* species. Thirteen plant tissue and soil samples were taken within the assessment area.

Three samples returned a positive result for the presence of *Phytophthora cinnamomi* (P.c.), and one sample returned a 'sub' result, requiring further DNA testing to identify a *Phytophthora* species other than *cinnamomi*.

Data from the survey showed that the project area is mostly 'Uninterpretable' with a small section mapped as 'Uninterpretable, Unprotectable'. No infested areas were found within and in the vicinity of the project area.

Phytophthora cinnamomi can spread autonomously and through vectors such as machinery, vehicles and animals. Therefore, disease boundaries should be revalidated if the map is more than one year old (11 October 2019). A full re-interpretation will be required after three years (11 October 2021) if there is continuing or new disturbance activities within the project area.

4 VEGETATION DETAILS

4.1.1 Project Site Vegetation Description

Based on a biological assessment undertaken in 2017 (Phoenix 2020), three vegetation types will be cleared under CPS 818 and they are as follows .

- Tall *Allocasuarina fraseriana* shrubland over mid open *Hakea prostrata* shrubland over low *Borya scirpoidea*, *Romulea rosea* and *Neurachne alopecuroidea* forbland (AfHpNa) – 0.19 ha.
- Mid *Eucalyptus wandoo* woodland over low open shrubland over low sparse sedgeland (Ew) – 0.15 ha.
- Mid *Eucalyptus wandoo* and *E. marginata* woodland over tall to low open shrubland over low open to sparse sedgeland (EwEm) – 2.59 ha.

Most of this vegetation was ranked as being in an Excellent (81.7%), Very Good (12.2%) and Good (4.5%) condition. The remaining extent (0.5 ha) was assessed as Degraded (1.6%).

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
Vegetation Association 3 described as 'Medium forest; jarrah-marri' (Government of Western Australia, 2019)	Clearing of up to 1.95 ha for road widening on Collie Lake King Road.	Degraded Good Very Good Excellent (EPA 2016)	Vegetation description and condition determined from Biological surveys conducted in 2017 and 2018.
Vegetation Association 1114 described as 'Shrublands tree-heath; paperbark over teatree thickets' (Government of Western Australia, 2019)	Clearing of up to 0.98 ha for road widening on Collie Lake King Road.	Degraded Good Very Good Excellent (EPA 2016)	Vegetation description and condition determined from Biological surveys conducted in 2017 and 2018.

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. 3	Statewide	2,661,404.62	1,803,437.48	67.76	81.50
	IBRA Bioregion Avon Wheatbelt	2,390,591.54	1,604,101.56	67.10	81.00
	IBRA Sub-region Merredin	908,099.69	723,445.91	79.67	84.03
	Local Government Authority Shire of West Arthur	98,993.88	51,072.96	51.59	50.55
Veg Assoc No. 1114	Statewide	19,836.15	12,047.29	60.73	79.03
	IBRA Bioregion Avon Wheatbelt	19,836.15	12,047.29	60.73	79.03
	IBRA Sub-region				

	Merredin	9,835.04	7,768.22	78.99	90.91
	Local Government Authority Shire of West Arthur	8,735.02	3,318.61	37.99	48.07

4.1.2 Vegetation Complexes and Representation

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

Hedde/Mattiske Veg Complex	Pre-European Extent (ha)	2018 Vegetation Extent	% Remaining
Pindalup - Pn	22,448.23	12,154.88	54.15
Swamp - S	10,951.73	4,487.69	40.98

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

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

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

The proposed clearing of 2.93 ha under CPS 818/15 is considered not likely to be at variance to Principles (a), (b), (g), and (i) and not at variance to Principles (c), (d), (e), (f), (h) and (j).

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

Proposed clearing is not likely to be at variance to this Principle
Comment Following a biological survey undertaken within and in the vicinity of the proposed clearing footprint, three vegetation types were defined for the project area (Section 4.1.1). The vegetation communities cover approximately 2.93 ha and are distributed over a distance of 1.5 km on both sides of Collie Lake King Road and Rajander/Farrell Roads. Vegetation condition within the project area was ranked as being in an Excellent (81.7%), Very Good (12.2%), Good (4.5%) and Degraded (1.6%) condition. The vegetation assemblages recorded during the survey (Phoenix 2020) are not exclusive to the project area and occur in this locality in the adjacent conservation areas as well as within sections of the road reserve along Collie Lake King Road. Results from a desktop assessment indicated that there are known records of 20 significant flora species within the study area. Of these, four species were assessed as having the potential to occur within the project area due to the availability of suitable habitats. Detailed flora and vegetation surveys undertaken in 2017 and 2018 (Phoenix 2020) did not identify any Threatened or Priority species in the project area. Given that no Threatened and Priority species will be impacted and that the vegetation assemblage of the project area is well represented locally and regionally, it is unlikely that the loss of native vegetation will significantly reduce the biodiversity of the locality. A desktop assessment showed records of 16 significant fauna species within the study area. Based on the habitats present within the project area, 11 of these species were considered as having the potential to occur. During a fauna survey conducted by Phoenix in 2017, only the Western Brush Wallaby was observed at one location in the project area. Phoenix (2020) outlined that wetland habitats may be of value for this species as it favours open, seasonally wet flats with low grasses and open scrubby thickets, due to its largely grazing behaviour. As the project will impact only 0.09 ha of vegetation associated with wetland grasses (My), it is unlikely that the Western Brush Wallaby will be significantly impacted and is not expected to be reliant on the vegetation proposed to be cleared. In addition, a total of 97 Eucalypt trees with a diameter at breast height (DBH) of ≥ 300 mm for wandoo and ≥ 500 mm for the other trees were recorded in the project area (GHD 2017, Phoenix 2020). Of these, 91 trees had no hollows. The remaining five trees supported hollows but none of them showed signs of use by the Black Cockatoos. Results from a tree hollows assessment in 2021 indicated that all of the five trees with hollows were unsuitable (too small or naturally blocked) for Black Cockatoo breeding habitat (Tony Kirkby 2021).

It was estimated that foraging habitat for the Black Cockatoos cover approximately 2.93 ha within the project area. Findings from the flora and vegetation surveys (Phoenix 2020) supported by aerial imagery showed that the vegetation assemblages recorded, extend well beyond the boundary of the project area. The available data also indicated that conservation areas found in the locality support native vegetation that would provide foraging and potential breeding habitats for the Black Cockatoos. As an example, the vegetation found in the Timber Reserve, Boolading Nature Reserve, Hillman Nature Reserve and Muja State Forest span over approximately 19462 ha. These areas support good quality breeding and foraging habitats for the Black Cockatoos as well as other significant fauna species and it is unlikely that these species are reliant on the vegetation proposed to be cleared. Therefore, the presence of large expanses of better habitat in the vicinity of the project area and the fact that the proposed clearing footprint is in close proximity to a road and its associated disturbance, would indicate that clearing will not have a significant impact on any significant fauna species and their habitats.

The desktop assessment identified the presence of the 'Claypans of the Swan Coastal Plain' TEC within the study area and this community occurs 13 km south-east of the project area. However, the 2018 flora and vegetation survey conducted by Phoenix Environmental Sciences (Phoenix 2020) did not identify any TECs or PECs within and in the immediate vicinity of the project area. Given the distance to the nearest important ecological community, the project is not expected to have any impact on any TEC or PEC.

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

Methodology

Biological surveys (GHD 2017, Phoenix 2020)

DBCA shapefiles

Department of Agriculture, Water and the Environment (DAWE) website

EPA (2016, 2020)

Government of WA (2019)

Main Roads GIS Shapefiles

NatureMap (Accessed 21/01/2021)

(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 not likely to be at variance to this Principle

Comment

A desktop assessment showed records of 16 significant fauna species within the study area. Based on the habitats present within the project area, 11 of these species were considered as having the potential to occur.

During a fauna survey conducted by Phoenix in 2017, only the Western Brush Wallaby was observed at one location in the project area. Phoenix (2020) outlined that wetland habitats may be of value for this species as it favours open, seasonally wet flats with low grasses and open scrubby thickets, due to its largely grazing behaviour. Clearing required by the project will directly impact up to 0.09 ha of vegetation meeting the described habitat requirements.

As the project will impact only 0.09 ha of vegetation associated with wetland grasses (My), it is unlikely that the Western Brush Wallaby will be significantly impacted. In addition, given the highly mobile nature of the species it is not expected to be reliant on the vegetation proposed to be cleared.

In addition, a total of 97 Eucalypt trees with a diameter at breast height (DBH) of ≥ 300 mm for wandoo and ≥ 500 mm for the other trees were recorded in the project area (GHD 2017, Phoenix 2020). Of these, 91 trees had no hollows. The remaining six trees supported hollows but none of them showed signs of use by the Black Cockatoos. Results from a tree hollows assessment in 2021 indicated that all of the six trees

with hollows were unsuitable (too small or naturally blocked) for the Black Cockatoo breeding habitat (Tony Kirkby 2021). Consequently, clearing within the project area will not significantly impact the breeding habitat of the Black Cockatoos.

Three fauna habitats were defined for the project area as follows:

(a) Jarrah/Marri/Wandoo woodland, (b) Sheoak shrubland, (c) Wandoo woodland

It was estimated that foraging habitat for the Black Cockatoos cover approximately 2.93 ha within the project area and extends over the Jarrah/Marri/Wandoo woodland, Sheoak shrubland and Wandoo woodland habitats. Findings from the flora and vegetation surveys (Phoenix 2020) supported by aerial imagery showed that the vegetation assemblages recorded, extend well beyond the boundary of the project area. The available data also indicated that conservation areas found in the locality support native vegetation that would provide foraging and potential breeding habitats for the Black Cockatoos. As an example, the vegetation found in the Timber Reserve, Boolading Nature Reserve, Hillman Nature Reserve and Muja Forest span over approximately 19462 ha. These areas support good quality breeding and foraging habitats for the Black Cockatoos as well as other significant fauna species and it is unlikely that these species are reliant on the vegetation proposed to be cleared.

According to available data, the project area is located 9-10 km west of confirmed roost areas for the Carnaby's Cockatoo. However, no evidence of nesting or roosting by any Black Cockatoo species was observed in the survey area, which extends beyond the extent of the project area (GHD 2017, Phoenix 2020). Foraging habitat for black cockatoos within 7 km of a breeding site is important to adequately support breeding pairs (EPA, 2019). The project area is not located within the mapped confirmed breeding area for black cockatoos and according to available databases, there are no confirmed breeding points within the local area. Noting this, the proposed clearing is unlikely to significantly reduce the amount of food available to breeding birds or affect chick survival rates. Foraging activities by Black Cockatoo species were also not recorded in the project area (GHD 2017, Phoenix 2020).

The local area (15 km around the project area) also retains 48.5% (36,164 ha) of remnant native vegetation cover, 54% of which occurs within DBCA managed land. Therefore, the presence of large expanses of better habitat in the vicinity of the project area coupled with the small extent of linear clearing adjacent to an existing road imply that the vegetation proposed to be cleared is not likely to comprise significant habitat for fauna.

A review of granted clearing permits indicated that clearing of Black Cockatoo habitat is not considered to be at variance in cases where there are large tracks of conservation estates containing vegetation in equal or better condition than the project area, in the locality. Four such examples include:

- CPS 1502 in Balingup involved clearing of 3.7 ha of jarrah-marri open forest over Banksia. The decision report stated that "Given the area under application is surrounded by state forest in equivalent or better condition it is unlikely the proposed clearing will contain significant fauna habitat within the local area".
- CPS 4440 in Paynedale involved clearing of 12.51 ha of jarrah – marri woodland. The decision report stated that "the proposed clearing would not significantly impact upon black cockatoo species, as it is considered the vegetation surrounding the application is likely to provide habitat of greater local significance than the vegetation under application".
- CPS 8968/1 within Collie State Forest, Mungilup involved clearing of 4.11 ha of The decision report stated that "Given the shape and extent of the proposed clearing, its location within highly vegetated landscape where the vast majority of vegetation is within DBCA managed lands in similar or better vegetation condition, the vegetation proposed to be cleared is not likely to comprise significant habitat for fauna"

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

Methodology

Biological surveys (GHD 2017, Phoenix 2020)

DBCA Shapefiles

DBCA website

EPA (2016, 2020)

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

Proposal is not at variance to this Principle

Comment

The desktop assessment indicated records of two Threatened flora species, namely *Commersonia Erythrogyna* and *Diuris micrantha* within the study area. Targeted flora searches (Phoenix 2020) undertaken during the flowering period of both species did not identify any Threatened flora species in the project area.

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

Methodology

Biological Survey (Phoenix 2020)
 DBCA shapefiles
 EPA (2016)
 Florabase (Accessed 23/04/2021)

(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

Comment

The desktop assessment identified the presence of the 'Claypans of the Swan Coastal Plain' TEC within the study area and this community occurs 13 km south-east of the project area. However, the 2017 flora and vegetation survey conducted by Phoenix Environmental Sciences (Phoenix 2020) did not identify any TEC within and in the immediate vicinity of the project area. Given the distance to the nearest important ecological community, the project is not expected to have any impact on any TEC.

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

Methodology

Biological Survey (phoenix 2020)
 DBCA shapefiles
 EPA (2016)

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

Proposed clearing is not at variance to this Principle

Comment

According to a broad scale mapping undertaken by Beard (Shepherd et al 2001), the project area lies within Vegetation Associations 3 and 1114, which are described as 'Medium forest; jarrah-marri' and 'Shrublands tree-heath; paperbark over teatree thickets' respectively (Government of Western Australia, 2019).

Pre-European Vegetation Representation

Pre-European Vegetation Associations	Pre-European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Statewide				
Vegetation Association 3	2,661,404.62	1,803,437.48	67.76	81.50
Vegetation Association 1114	19,836.15	12,047.29	60.73	79.03
IBRA Bioregion Avon Wheatbelt				
Vegetation Association 3	2,390,591.54	1,604,101.56	67.10	81.00
Vegetation Association 1114	19,836.15	12,047.29	60.73	79.03
IBRA Subregion Merredin				
Vegetation Association 3	908,099.69	723,445.91	79.67	84.03
Vegetation Association 1114	9,835.04	7,768.22	78.99	90.91
Local Government Authority Shire of West Arthur				
Vegetation Association 3	98,993.88	51,072.96	51.59	50.55
Vegetation Association 1114	8,735.02	3,318.61	37.99	48.07

Vegetation that has less than 30% remaining is said to represent an area that is significant as a remnant vegetation. The objective of the EPA is to retain more than 30% of the pre-European vegetation cover of each ecological community, as below this threshold, species loss appears to accelerate exponentially at an ecosystem level.

As shown in the table above, Vegetation Associations 3 and 1114 have more than 30% of their extent remaining at the State, IBRA bioregion, IBRA subregion levels and Shire of West Arthur. Therefore, Vegetation Associations 3 and 1114 do not correspond to significant remnants of vegetation. The removal of a small amount of native vegetation for the project is not expected to reduce ecosystem functioning or be a barrier to ecological linkages.

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

Methodology

Aerial photography

Biological Survey (Phoenix 2020)

EPA (2016)

Government of Western Australia (2019)

Shepherd et al 2001

(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 vegetation proposed to be cleared under CPS 818/15 extends over 2.93 ha and comprises vegetation units AfHpNa, Ew and EwEm. These vegetation assemblages are not associated with a watercourse or wetland (Phoenix 2020).

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

Methodology

Biological Survey (Phoenix 2020)
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****Comment**

The desktop assessment determined that the soils of the project area have the following characteristics:

Aspect	Risk
Flood Risk	Three sections with <3%, 10-30% and 50-70% of map unit showing a moderate to high flood risk
Salinity	Three sections with <3% and 50-70% of map unit showing a moderate to high salinity risk
Waterlogging	Three sections with <3%, 50-70% and >70% of map unit showing a moderate to very high waterlogging risk
Water Erosion	10-30% of map unit has a high to extreme water erosion risk
Wind Erosion	10-30% of map unit have high to extreme water erosion risk
Acid Sulphate Soils (ASS)	Extremely Low Probability of Occurrence

The table above indicates the project area is located in a zone classified as exhibiting appreciable risks of flooding, salinity and waterlogging. According to the DAFWA datasets, the project area lies within the Darling Plateau Land System, which is characterised by a lateritic plateau with gravelly soils (gravels in a sandy or loamy matrix).

Given that gravelly sandy and loamy soils have a relatively good infiltration rate, the project area will have a low risk of flooding and waterlogging. Furthermore, the small scale of clearing is not expected to exacerbate soil salinity in the area. Also, as a large expanse of native vegetation will remain in the surroundings, wind erosion and water erosion are unlikely to cause any significant deterioration. Consequently, it is unlikely that this project will cause appreciable land degradation.

The ASRIS database indicates that acid sulphate soils (ASS) has an 'Extremely Low Probability of Occurrence' in this area. As no dewatering or excavation below the water table is planned, no further investigations are required.

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

Methodology

CSIRO (2014)

DAFWA shapefiles

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

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

Comment

A search of ArcGIS shapefiles indicated that the study area intersects two Nature Reserves, one State Forest and one Timber Reserve. They are as follows:

- Boolading Nature Reserve – located adjacent to minor sections of the project area to the north and east
- Hillman Nature Reserve – 14.7 km north-east of the project area
- Muja State Forest – 3-15 km east, north-east and south-east of the project
- Un-named Timber Reserve – 1-10 km south and 7-13 km north of the project area

Measures to avoid impacts to the Boolading Nature Reserve, located in close proximity to the project area will be addressed in the Construction Environmental Management Plan (CEMP). A dieback management plan will also be prepared and will include management actions to minimise any potential spread of dieback in the area. No impacts to the Hillman Nature Reserve, Muja State Forest and Un-named Timber Reserve are expected from the proposed works.

Based on the above, the proposed clearing is not likely to be 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

Comment

The project area is not located within a Proclaimed Groundwater Area and it also does not occur on any Public Drinking Water Source Area.

It is unlikely that this project will cause a deterioration in the quality of the surface or underground water because of the minor nature of the road works and most of the existing vegetation will remain after the proposed clearing.

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

Methodology

DWER and DBCA shapefiles
EPA (2016)

(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 area receives a moderate annual average rainfall of 547.4 mm (Darkan, Station No 010542, BoM 2021) and the desktop assessment indicated a high risk of waterlogging and flooding in that area. As the

project area is composed predominately of gravelly soils, it will have relatively good infiltration rates that will lower the probability of flooding and waterlogging.

Furthermore, the project area has a linear and narrow geometry and the removal of a thin segment of native vegetation on each side of the road, makes it unlikely that the incidence or intensity of flooding will increase.

Based on the soil properties, small area of native vegetation to be removed and the amount of remaining native vegetation in the surrounding area, it is unlikely that this project will cause or exacerbate the incidence or intensity of flooding.

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

Methodology

Biological Survey (Phoenix 2020)

DAFWA shapefiles

6 ADDITIONAL ACTIONS REQUIRED

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

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

Impact of Clearing	Yes/No or NA	Further Action Required
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles. Where the clearing is at variance or may be at variance to Clearing Principle (f) and no other Clearing Principle, and the area of the proposed clearing is less than 0.5 hectares in size and the Clearing Principle (f) impacts only relate to: (i) a minor non-perennial watercourse(s); (ii) a wetland(s) classed as a multiple use management category wetland(s); and/or (iii) a wetland that is not a defined wetland; the preparation of an Assessment Report, as required by condition 6(e), is not required.	N	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.	N	No further action required.
3. The project involves clearing for temporary works (as defined by CPS 818).	N	No further action required.
4 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	Y	Comply with the Dieback Management Process D20#56909.
4b. Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions?	Y	A follow-up Dieback survey will be conducted, and a Dieback management will be prepared in consultation with the DBCA.

Impact of Clearing	Yes/No or NA	<i>Further Action Required</i>
5. 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 •	N	No further action required.
6. 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	N	No further action required.

7 STAKEHOLDER CONSULTATION

Main Roads will undertake stakeholder consultation in accordance with CPS 818/15 Condition 8.

8 REFERENCES

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9 APPENDICES

Appendix	Title
Appendix 1	Biological Survey Reports
Appendix 2	DBCA Threatened Flora and Fauna Database Searches

Appendix 1: Biological Survey Reports

GHD - Collie Lake King Road SLK 70-87. Reconnaissance Vegetation and Fauna Assessment - D17#696296

Phoenix Environmental Sciences. Biological Survey for the Collie Lake King Road Widening (70 to 87 SLK) - D20#253911

Appendix B: DBCA Threatened Flora and Fauna Database Searches

