Appendix B

EPBC Significance Assessment

26 June 2025

[redacted]

Dear [redacted],

RE: (SW612) Collie River Bridge replacement: Memorandum - Self-assessment under the *Environment Protection and Biodiversity Conservation Act 1999* self-assessment guidelines

Please find a self-assessment for the following Matters of National Environmental Significance that have potential to be impacted at the Collie River Bridge site, against the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (DAWE 2013):

- Baudin's cockatoo (Endangered)
- Carnaby's cockatoo (Endangered)
- FRTBC (Vulnerable)
- CFM (Vulnerable)
- Chuditch (Vulnerable)
- Quokka (Vulnerable)
- Woylie (Endangered)
- Western ringtail possum (WRP) (Critically Endangered)

Please note that the onus is on the proponent to refer a proposal under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). For legal certainty a pre-referral meeting with the federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) may confirm that the assessment aligns with the Departments' interpretation of the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance*. SW Environmental, however, consider it highly unlikely that with the implementation of a suitable Carters Freshwater Mussel Management Plan, the Action as proposed would trigger the need to refer the Action to DCCEEW for assessment under the EPBC Act.

If you have any enquiries regarding this assessment, please contact me on [redacted]

Yours sincerely,

[redacted]

ATTACHMENTS

Attachment 1 Memorandum: Self-assessment under the EPBC Act
Attachment 2 PMST Search results (2025)

ATTACHMENT 1 MEMORANDUM: SELF-ASSESSMENT UNDER THE EPBC ACT

1. PROPOSAL BACKGROUND

1.1. PROJECT BACKGROUND

GHD, on behalf of the Shire of Dardanup (the Shire), are working towards replacing the Collie River Bridge, on the Collie River Road (SLK 0.01), within the Shires of Dardanup and Harvey. The bridge is located approximately 8.4 km east of Burekup (Figure 1) (the Project). Construction works for the bridge replacement on Collie River Road are scheduled to commence in late 2026. The proposed impact area around the bridge is approximately 0.16 ha, with a proposed laydown area in existing cleared paddock of 0.13 ha (herein referred to as the Proposed Action).

Flora, ecological communities and fauna may be listed as 'threatened' and afforded protection as Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). If there is any potential for significant impact any MNES, then proposed impacts may trigger the requirement to refer the project to the federal Department of Climate Change, Energy, the Environment and Water (DCCEEW) for assessment.

Following technical biodiversity surveys conducted in 2024 and 2025, it was identified that the proposal may impact on several MNES (threatened fauna) as listed under the EPBC Act. A self-assessment under the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (Commonwealth of Australia 2013) was required to determine if the project required referral for the DCCEEW for assessment under the EPBC Act.

1.2. PROPOSED ACTION

The Proposed Action includes the replacement (and removal) of the existing dilapidated timber pile bridge, construction of the associated temporary access ramps (immediately to the south), associated temporary causeway across the river (including culverts to maintain water flow), and reconstruction of a similar scale bridge. Some clearing of native vegetation will be required around the bridge (0.16 ha). The proposed laydown area (0.13 ha) will also be utilised. As the proposed laydown area is in an existing cleared paddock upland and west of the bridge, it is not considered further in this assessment.

To construct the replacement bridge, a causeway would extend under the current structure for demolition purposes. It will use a geotextile base to help preserve the riverbed during construction and removal activities. The causeway will accommodate a 250-ton hydraulic crane and will include several suitably sized culverts to maintain water flow. A silt curtain will be installed on the downstream side to manage sedimentation. The construction footprint has been adjusted to retain trees, with a clear zone of 10 meters incorporated around the abutments. The Proposed Action will impact the following fauna habitat types (mapped in SW Environmental 2025), and include the clearing or disturbance of approximately 0.091 ha of vegetation:

1. Flooded Gum (*Eucalyptus rudis*) and Peppermint (*Agonis flexuosa*) woodland (0.022 ha)
2. Marri (*Corymbia calophylla*) woodland (0.004 ha)
3. Flooded Gum (*Eucalyptus rudis*) and Peppermint (*Agonis flexuosa*) woodland with planted exotic Eucalyptus spp. (0.033 ha)
4. Marri (*Corymbia calophylla*) woodland with planted exotic Eucalyptus spp. (0.012 ha)
6. Planted exotic Eucalyptus and Corymbia spp. with occasional Flooded Gum (*Eucalyptus rudis*) (0.021 ha)
7. Riverbed (0.021 ha)
8. Cleared (0.046 ha)

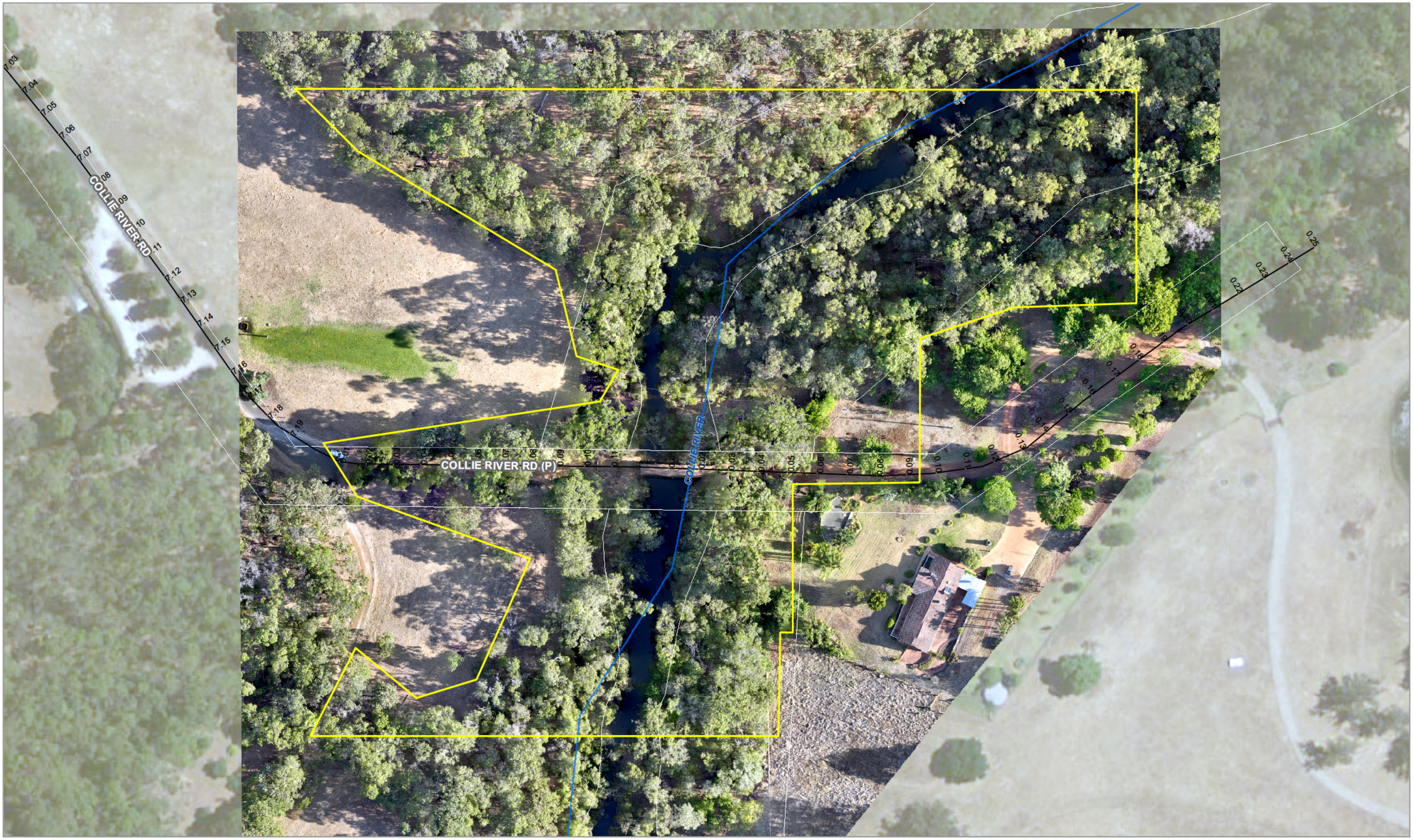

FIGURE 1. SURVEY AREA

COLLIE RIVER BRIDGE, COLLIE

Survey Area
Road
Major watercourse

A3 @ 1:1200

0 5 10 20 m

N

SW Environmental
www.swenvironmental.com.au

Ref: SW612
Date: 12/05/2025 Author: SP

Source: Base map © Esri and its data suppliers. SLIP Landgate (2025)

1.3. PMST SEARCH RESULTS

A Protected Matters Search (DCCEEW, 2025) was conducted which identified the following MNES relating to biodiversity, as potentially occurring within a 10 km search buffer (Attachment 2):

- Two Listed Threatened Ecological Communities 2 (Banksia Woodlands of the Swan Coastal Plain ecological community (Endangered) and Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community (Critically Endangered),
- 34 Listed Threatened Species (18 fauna and 16 flora),
- Nine Listed Migratory Species.

1.2. PREVIOUS TECHNICAL SURVEYS

1.2.1. Surveys conducted

Technical flora, fauna and vegetation surveys relevant to the project include

- Biota (2020). *Regional Population Assessment of the Western Ringtail Possum* (Unpublished report prepared for Main Roads Western Australia).
- Ecoedge (2025). *Targeted and Detailed Flora and Vegetation Survey, Collie River Road Bridge, Burekup, Shire of Harvey* (Report prepared for GHD, 2025).
- Murdoch University (2025). Threatened Fish Survey, Collie River Road Bridge, Burekup, Shire of Harvey (Report prepared for GHD, 2025).
- SW Environmental (2025a) Basic and Targeted Fauna Survey: Black Cockatoo, Western Ringtail Possum and Carter's Freshwater Mussel
- SW Environmental (in preparation, 2025b). Quantitative Survey of Carter's Freshwater Mussel, Collie River Road Bridge, Burekup, Shire of Harvey (Unpublished report prepared for GHD, 2025).

1.2.2. Summary of survey results

- Western Ringtail Possum (Biota 2020)

Three key management zones have been established in the WRP Recovery Plan (DPaW 2017), comprising of areas known to currently, or previously support large numbers of WRP. These management zones include the Swan Coastal Plain zone, Southern Forest zone and South Coast zone. Biota (2020) undertook a regional survey of WRP which estimated a combined number of over 20,000 WRP within the areas surveyed from the three regional populations. The closest and most populated management area to the Proposed Action is the Swan Coastal Plain Management Zone, occurring just east of the Survey Area with population estimates at 9,270 individuals. The proposed action falls outside of the three key management zones and if WRP are present within the Survey Area, they may occur in low numbers.

- Detailed and Targeted flora and vegetation survey (Ecoedge 2025)

Ecoedge (2025) reported on a 2024 spring Detailed and Targeted flora and vegetation survey of the broader 4.67 ha site. No Threatened flora listed under the EPBC Act 1999 were found, and any Threatened taxa potentially occurring in the survey area were assigned a post-survey residual likelihood of "unlikely". The vegetation type was assigned FCT 11 (Wet forests and woodlands), a relatively species-poor FCT often dominated by *Eucalyptus rudis*. FCT 11 is not a Threatened Ecological Community (TEC). No TECs were recorded from the site. Most vegetation within the survey area was in Degraded (33%) or Completely Degraded (51%) condition. The main causes of degradation were partial clearing (in parts), livestock grazing and accompanying weed invasion.

No impacts to Threatened flora or TEC listed under the EPBC Act 1999 are proposed.

- Fish surveys (Murdoch University 2025)

Harry Butler Institute (HBI) from Murdoch University (2025) conducted an aquatic faunal survey in the vicinity of bridge construction works to identify listed threatened species at the site. The only listed threatened teleost known to potentially inhabit the site is *Nannatherina balstoni* (Balston's Pygmy Perch), listed as Vulnerable under the EPBC Act 1999. A single specimen was apparently captured by Dr Luke Pen in the southern branch of the Collie

River in the 1980s, but the species has not been found in any of the multiple surveys that have been conducted more recently (e.g. DWER, 2025; Beatty et al., 2020). The results of the survey identified five native teleosts and two native decapod crustacean species, as well as two introduced teleost species, with no listed threatened species recorded. The population of Balston's Pygmy Perch known anecdotally from the Collie River has either been extirpated or is in such low abundance that it has evaded detection in six aquatic fauna surveys at this site. Neither Balston's Pygmy Perch, nor any other listed threatened freshwater teleost or decapod, has been reported elsewhere in the Collie River catchment.

While the bridge works are likely to have some localised, short-term impacts on the native aquatic fauna present within and downstream of the construction footprint, it is likely that the site will be rapidly recolonised by teleosts and decapods from adjoining river reaches once the works are completed and no long-term impacts to the aquatic fauna community are expected.

- Basic and Targeted fauna survey (SW Environmental 2025a)

SW Environmental prepared a Basic and Targeted fauna survey of the broader area, with targeted components for the three Black Cockatoo species (Forest Red-tailed Black Cockatoo (FRTBC) (*Calyptorhynchus banksii* subsp. *naso*) (Vulnerable), Baudin's cockatoo (*Zanda baudinii*) (Endangered) and Carnaby's cockatoo (*Zanda latirostris*) (Endangered)), Western Ringtail Possum (*Pseudocheirus occidentalis*) (WRP) (Critically Endangered) and Preliminary Carter's Freshwater Mussel (*Westralunio carteri*l) (CFM) (Vulnerable).

Threatened fauna recorded during survey included FRTBC (Vulnerable), Baudin's Cockatoo (Endangered) and CFM (Vulnerable). Carnaby's cockatoo (Endangered)had the potential to occur within the Survey Area (*Zanda latirostris*). No (active or probable) breeding hollows were recorded during the survey. Two black cockatoo roosts were recorded within the Survey Area. One Baudin's cockatoo roost was recorded in habitat type 6, and one FRTBC roost was recorded in habitat type 3.

There were 84 trees of suitable DBH recorded within the Survey Area, twelve of which contained hollows. One hollow in tree ID 15, located in habitat type 3 approximately eight metres north of the road, was technically of suitable size for black cockatoos, however considered unlikely to be used due to its low height and the marginal internal dimensions. The hollow did not have any signs of use.

There were no Carnaby's cockatoo, Woylie, Chuditch or Quokkas recorded within the Survey Area. Two probable WRP dreys were observed in Peppermint (*Agonis flexuosa*) trees within habitat type 1, however no WRP individuals were recorded during nocturnal surveys. Twenty-seven Common brushtail possum (CBP) (*Trichosurus vulpecula*) were observed over two nights with a maximum of 18 on a single night .

The following fauna taxa were assessed as having nil or marginal habitat present and unlikely to occur. These will not be impacted by the proposed action due to lack of habitat and are not considered further in this assessment:

- Fork-tailed swift (Migratory)
- Australasian bittern (Endangered)
- Grey Falcon (Vulnerable)
- Malleefowl (Vulnerable)
- Australian Painted Snipe (Endangered)
- Glossy ibis (Migratory)
- Numbat (Endangered)

The following fauna taxa were assessed as potentially having some chance of being present based on habitat and local records, therefor having some potential for impact. They have been assessed further in the following sections:

- Baudin's cockatoo (Endangered)
- Carnaby's cockatoo (Endangered)
- FRTBC (Vulnerable)
- CFM (Vulnerable)
- Chuditch (Vulnerable)
- Quokka (Vulnerable)
- Woylie (Endangered)
- Western ringtail possum (Critically Endangered)

Table 1 Fauna MNES that may occur within the proposed impact area.

Genus species	Vernacular	Status	Presence of habitat	Likelihood of occurrence
Zanda baudinii	Baudin's cockatoo	EN	Present -core	Present
Zanda latirostris	Carnaby's cockatoo	EN	Present - core	Possible
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	VU	Present -core	Present
Westralunio carteri	Carter's Freshwater Mussel	VU	Present -core	Present
Dasyurus geoffroii	Chuditch, western quoll	VU	Present - supporting	Possible
Setonix brachyurus	Quokka	VU	Marginal	Possible
Bettongia penicillata ogilbyi	Woylie, brush-tailed bettong	EN	Present - supporting	Possible
Pseudocheirus occidentalis	Western ringtail possum	CR	Present - supporting	Possible

2. EPBC ACT REFERRAL FRAMEWORK

2.1. SIGNIFICANT IMPACT GUIDELINES 1.1 - MATTERS OF NES

Significant Impact Guidelines 1.1 – SIGNIFICANT IMPACT FRAMEWORK

What is a significant impact?

A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment, which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.

When is a significant impact likely?

To be 'likely', it is not necessary for a significant impact to have a greater than 50% chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility.

If there is scientific uncertainty about the impacts of your action and potential impacts are serious or irreversible, the precautionary principle is applicable. Accordingly, a lack of scientific certainty about the potential impacts of an action will not itself justify a decision that the action is not likely to have a significant impact on the environment.

To make a decision as to whether or not to refer an action to the Minister, you should consider the following:

1. Are there any matters of national environmental significance located in the area of the proposed action (noting that 'the area of the proposed action' is broader than the immediate location where the action is undertaken; consider also whether there are any matters of national environmental significance adjacent to or downstream from the immediate location that may potentially be impacted)?

2. Considering the proposed action at its broadest scope (that is, considering all stages and components of the action, and all related activities and infrastructure), is there potential for impacts, including indirect impacts, on matters of national environmental significance?

3. Are there any proposed measures to avoid or reduce impacts on matters of national environmental significance (and if so, is the effectiveness of these measures certain enough to reduce the level of impact below the 'significant impact' threshold)?

4. Are any impacts of the proposed action on matters of national environmental significance likely to be significant impacts (important, notable, or of consequence, having regard to their context or intensity)?

What is a population of a species?

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- a geographically distinct regional population, or collection of local populations, or

- a population, or collection of local populations, that occurs within a particular bioregion.

What is an invasive species?

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species or ecological community?

'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

What is an important population of a species?

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

3. ASSESSMENT OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

3.1. BLACK COCKATOOS

The three black cockatoos previous listed may occur within the survey area (Baudin's cockatoo and FRTBC confirmed) and the proposed action has been assessed against the Commonwealth *Referral guideline for 3 WA threatened black cockatoo species Carnaby's Cockatoo (Zanda latirostris), Baudin's Cockatoo (Zanda baudinii) and the Forest Red-tailed Black-cockatoo (Calyptorhynchus banksii naso) Department of Agriculture, Water and the Environment* (DAWE 2022). The following documents have also been considered

- Department of Parks and Wildlife (2013). *Carnaby's cockatoo (Calyptorhynchus latirostris) Recovery Plan*. Department of Parks and Wildlife, Perth, Western Australia.
- Department of Environment and Conservation (DEC) (2008) Forest Black Cockatoo (Baudin's Cockatoo *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* Recovery Plan.
- Commonwealth EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered), *Zanda latirostris,* Baudin's cockatoo (vulnerable), *Zanda baudinii*, and Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso* (SEWPaC 2012).

Table 2 contains a detailed assessment against the referral thresholds for Baudin's cockatoo, Carnaby's cockatoo and FRTBC impacts against DAWE (2022). Refer to SW Environmental (2025a) for survey results and context.

In summary, the proposed action does not trigger the need to refer the proposed action for either Baudin's cockatoo, Carnaby's cockatoo or FRTBC due to the very small scale and nature of the action, along with the local site context.

Table 2 Referral thresholds for black cockatoos from DAWE (2022). Refer to SW Environmental (2025a) for survey results.

Attribute	Referral threshold	Proposed impact	Considerations and rationale	Referral threshold triggered?
Breeding	Any loss of / impact upon known, suitable or potential nesting trees, and the habitat around these trees, is highly likely to require a referral to the minister. Loss of any potential nesting habitat is likely to require a referral to the minister.	Clearing of four suitable DBH trees (>50 cm diameter at breast height) • one Marri 55 cm DBH no hollows, • two Flooded gums 50 and 55cm DBH, • one Flooded gum 60 cm DBH with hollow potentially large enough but highly unlikely to be utilized by black cockatoo due to low height (<3 m). Several other young planted eastern states Eucalypts <50-75 cm DBH and induvial trees and shrubs under 50 cm DBH.	DBCA database records no instances of black cockatoo breeding within 12 km of the Survey Area. Table 2A (DAWE 2022) defines potential nesting trees as trees that have a suitable diameter at breast height (DBH) to develop a nest hollow, but do not have hollows. For most species of trees, suitable nest hollows are only found in live trees with a DBH of at least 500 mm. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH. Age is a critical factor influencing hollows formation - "hollows large enough for nesting black cockatoos are usually only found in trees that are more than 200 years old" (SEWPC, 2012). Trees younger than 100 years are generally not able to form hollows large enough for black cockatoos to use for nesting (Tony Kirkby pers. comm.). The Non-endemic eastern state eucalypts are fast growing and not typically of a sufficient age in WA to contain suitably large hollows at 50 cm DBH. There are currently no recorded instances of breeding occurring in planted eastern state eucalypt species in WA (Main Roads 2025). The planted eastern states Eucalypts are not considered potential habitat trees due to small size, young age and narrow girth of branches (multi-stemmed at height). The area of native vegetation remaining within six km of the Survey Area is just over 60 % of the total area. The area remaining within 12 km is slightly less, at 52 % of the total area. Of the 43 % and 36 % of land reserved by the State within six km and 12 km of the site (respectively), the majority of reserved land is associated with the Wellington National Park, occurring ~1.6 km east of the Survey Area at the closest point (Landgate, 2024). These areas contain extensive areas of similar or better breeding habitat. No proposed loss of known or potential breeding trees or nesting habitat is proposed. The loss of four individual suitable DBH trees is not likely to result in a significant impact to any of the three black cockatoo species.	No for Baudins cockatoo. No for Carnaby's cockatoo. No for FRTBC.

<table>
<tr><th>Attribute</th><th>Referral threshold</th><th>Proposed impact</th><th>Considerations and rationale</th><th>Referral threshold triggered?</th></tr>
<tr>
<td>High-quality native foraging habitat</td>
<td>Loss of greater than or equal to 1 ha of foraging habitat scoring 5-10 using the foraging quality scoring tool is likely to require referral to the minister.</td>
<td>Clearing of the 0.004 ha of Habitat type 2. Marri (Corymbia calophylla) woodland (0.004 ha) which represents high quality black cockatoo foraging habitat.</td>
<td>Both FRTBC and Baudin’s cockatoo foraging residue was observed during the survey in the adjacent vegetation. Although Carnaby’s cockatoos were not observed, it is likely that they may utilise the site for foraging also.

Extensive areas of similar or better-quality foraging habitat is present within 6 and 12 km of the Survey Area. Native vegetation remaining, along with DBCA-managed reserve areas are presented in the table below (Landgate 2024).
<table>
<tr><th>Foraging range</th><th>Total area (ha)</th><th>Reserved (DBCA) %, Area (ha)</th><th>Native vegetation (including regrowth) remaining % of total area, Area (ha)</th></tr>
<tr><td>6 km</td><td>11,872</td><td>43 % (5,054 ha)</td><td>61 % (7,317 ha)</td></tr>
<tr><td>12 km</td><td>46,335</td><td>36 % (16,520 ha)</td><td>52 % (23,963 ha)</td></tr>
</table>
The loss of 0.004 ha of potential high quality black cockatoo foraging habitat is well under (250 times) the 1 ha clearing threshold (DAWE 2022).</td>
<td>No for Baudins cockatoo.
No for Carnaby’s cockatoo.
No for FRTBC.</td>
</tr>
<tr>
<td>Lower-quality native foraging habitat</td>
<td>Loss of greater than or equal to 10 ha of foraging habitat scoring 0-4 using the foraging quality scoring tool is likely to require referral to the minister.</td>
<td>Clearing of the 0.087 ha of Habitat types 1, 3, 4, 6, 7, 8. These may provide nil to low quality foraging habitat.</td>
<td>The loss of 0.087 ha of lower quality black cockatoo foraging habitat is (approximately 115 times) under the 10 ha clearing threshold (DAWE 2022).</td>
<td>No for Baudins cockatoo.
No for Carnaby’s cockatoo.
No for FRTBC.</td>
</tr>
<tr>
<td>Exotic foraging habitat</td>
<td>Loss of greater than or equal to 1 ha of predominantly exotic habitat (e.g. Cape Lilac trees and pine trees) known to be utilised by black cockatoos is likely to require a referral to the minister.</td>
<td>No exotic trees known to be important to black cockatoos are proposed to be cleared.</td>
<td>Not applicable.</td>
<td>No for Baudins cockatoo.
No for Carnaby’s cockatoo.
No for FRTBC.</td>
</tr>
</table>

Attribute	Referral threshold	Proposed impact	Considerations and rationale	Referral threshold triggered?
Night roosting habitat	Removal of any part of a known night roosting site is likely to require referral to the minister.	Two roosts, identified over 15 surveys, occur within 6 km of the Survey Area, with the closest occurring ~920 m to the southwest (DBCA, 2025b). Two black cockatoo roosts were observed within the Survey Area, one being Baudin's and one FRTBC, with each located 20m south and 30m north respectively from the proposed action. The importance of the roosts is unknown, though the number of birds at each appeared to be less than five each, and the amount of whitewash beneath the roosts was low. This may indicate that the roosts were temporary or of relatively low importance. No active breeding trees were recorded. These roost trees will be retained.	As the roost trees will be retained and are night roosts, they will not be impacted by the daytime construction activities (proposed action).	No for Baudins cockatoo. No for Carnaby's cockatoo. No for FRTBC.

3.2. VULNERABLE SPECIES

The assessments are made against Vulnerable species outlined in the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (DAWE 2013) for

- CFM (Vulnerable)
- Chuditch (Vulnerable)
- Quokka (Vulnerable)

A brief background of the ecology and critical habitat is provided along with the assessment and definition of an important population of a species below (DAWE 2013).

3.2.1. Carter's Freshwater Mussel (CFM) *(Westralunio carteri)*

Patchily distributed in sandy/muddy sediments of freshwater lakes, rivers and streams with greatest densities associated with woody debris and overhanging riparian vegetation near stream banks and edges of lakes/dams (DAWE, 2017). Adults mostly sessile, but do move through sediments with a muscular foot, creating visual tracks; Juveniles much more mobile, moving in a similar fashion as a caterpillar (DAWE, 2017). CFM breed in winter (June-August) with glochidia released from females in strings of mucus during late August to December/early January. They are sexually dimorphic and brooders, with glochidia attaching to fish hosts as a dispersal mechanism. (DCCEEW 2018).

Critical habitat

There is no recovery plan for this species under the EPBC Act and critical habitat is not defined.

3.2.2. Chuditch *(Dasyurus geoffroii)*

Chuditch may occupy a range of habitats including forest, woodland and desert, though in the SW they are largely restricted to Jarrah forest or scattered through the southern and eastern wheat belt (DEC, 2010). Current records indicated that this only represents approximately 5% of their former range. Habitat critical to Chuditch are large areas of undisturbed habitat which a sufficient variety of key food and other resources such as large hollow logs, burrows or small caves at ground level for denning. To be suitable as den sites, logs must have a diameter of at least 30 cm but usually greater than 50 cm, a hollow diameter of 7–20 cm and generally 1m long (Orell & Morris, 1994). Annually, an adult female Chuditch will utilise an estimated average of 66 logs and 110 burrows within her home range. A large amount of den sites is required for both sexes. They occupy relatively large home ranges, with males utilizing over 15 km^2 and females, 3-4 km^2 (Orell & Morris, 1994).

Abundance of suitable denning habitat was low for Chuditch within the Survey Area. The species may periodically pass through the site as part of a larger area of occupancy, however the Survey Area is not considered core habitat for the species and is not critical to the species survival. The closest record occurs ~2.2 km from the Survey Area (DBCA, 2025b).

Critical habitat outlined in Chuditch (*Dasyurus geoffroii*) Recovery Plan (DEC 2012)

Habitats critical to chuditch survival and maintenance of important populations comprise:

- Areas currently occupied by chuditch
- Areas of natural vegetation in which chuditch breed
- Areas of natural vegetation in which chuditch forage
- Areas of natural vegetation that chuditch use to move from one area to another
- Areas of suitable vegetation within the recorded range in which undiscovered chuditch populations may exist

Areas not currently occupied by chuditch due to recent fire but are capable of supporting chuditch populations when sufficiently recovered

Areas previously occupied and that still provide suitable habitat and into which chuditch can be reintroduced.

Chuditch have historically been present in a large variety of habitats so it is not possible to list a set of characteristic habitats that should be preserved for chuditch. However, some key aspects are required for chuditch survival in an area. These are: adequate den resources (e.g. hollow logs, burrows or rock crevices), adequate prey resources (particularly large invertebrates) and sizeable areas (> 20 000 ha.). Incorporation of management practices such as the retention of den logs during logging and burning operations, and implementation of fox baiting programs are important to the conservation of the chuditch. Cooler prescribed burning regimes over areas of 2000 – 4000 ha are likely to be beneficial to chuditch populations, because they maintain prey resources and prevent broad scale, high intensity bushfires. Chuditch need large natural areas because of their large home ranges.

3.2.3. Quokka (*Setonix brachyurus*)

The understorey structure of the habitats currently used by Quokka consist of dense, low vegetation that provides refuge from predation (Hayward, 2002). The mainland habitats include dense riparian vegetation (Hayward et al., 2005), but additionally (from SPRAT (n.d.))

- heath and shrubland,
- Swamp Peppermint (*Taxandria linearifolia*) dominated swamps in Jarrah forest,
- swampy shrublands,
- swordgrass-dominated understorey,
- regrowth areas of the Karri forest,
- Bullich swamp forest,
- Paperbark (Melaleuca spp.) swamp.

Critical habitat outlined in Quokka *Setonix brachyurus* Recovery Plan (DEC 2013)

Habitat critical to the survival of the quokka has been well defined for the northern jarrah forest subpopulation (Hayward *et al.* 2008) and comprises *Taxandria linearifolia* swamps. Quokkas are thought to occur as, or previously occurred as, metapopulations dispersing from swamp to swamp over time as vegetation structure changes with time since fire (Hayward *et al.* 2005). Habitat critical to survival includes areas of natural vegetation where the understorey is sufficiently thick and complex to provide a predation refuge close to more open, recently burnt vegetation which is used as a food source. Habitat changes seasonally, in wetter months after wetlands become inundated the quokkas core home range shifts toward the periphery of the swamp, leaving the quokka more exposed to predation (Hayward *et al*. 2004). When this habitat is altered, and in the presence of feral predators, the carrying capacity of a site may also be reduced (Kinnear *et al.* 2002).

The habitat critical to survival for the south coast subpopulation includes a wider range of vegetation types (floristically and structurally) than in the northern jarrah forest, including swamps, riparian areas, incised gullies and dense coastal heath (de Tores *et al*. 2007). Specifically, in the Two Peoples Bay area habitat critical to survival is known to comprise of coastal heath and thickets (*Eucalyptus staeri, Allocasuarina fraseriana, Hakea elliptica* with *Melaleuca striatum, Anarthria scabrum*); swamps (*Taxandria juniperina, T. linearifolia, Melaleuca lanceolata* with *Hakea nitida, Beaufortia sparsa* and *Gahnia trifida*); and riparian systems (*Eucalyptus megacarpa, Banksia littoralis, Lepidosperma* spp.) (DSEWPaC 2012).

Habitat occupied at the Swan Coastal Plain site at Muddy Lakes consists of fringing wetland vegetation of dense bulrush (*Typha orientalis)*/pale rush (*Juncus pallidus)* sedgeland with other sedges including jointed rush (*Baumea articulata)*, *Typha domingensis* and coast sword-sedge (*Lepidosperma gladiatum)* (Keighery *et al.* 2002).

Specific information regarding habitat critical to survival in other subpopulations is not documented.

Information pertaining to important populations are incomplete but the Rottnest Island subpopulation likely reflects a level of adaptive difference evolved in response to the environmental conditions (Alacs *et al.* 2011) absent from mainland populations and is thus considered important. The northern jarrah and southern forests may be important with unique differences between them (P. Spencer and K. Bain pers. comm.). Given the limited population size, genetic differences and fragmentation of subpopulations, all populations should be considered important until more information is available.

3.2.4. Assessment of significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- **lead to a long-term decrease in the size of an important population of a species**

CFM: The population of CFM where it intersects with the project footprint is not likely to be considered an important population of the species. Most impacts will be during the construction period as flow will be resumed once the bridge has been removed and replaced. Whilst some individuals occur a CFM Management Plan will be prepared to ensure that impacts to CFM during the construction period are negligible. The work will not lead to long-term decrease in the size of the population within the Collie River.

Chuditch and Quokka: These taxa were not identified from the site. If Chuditch or Quokka were to occur it would be only supporting habitat and a degraded part of a much larger habitat patch. The clearing of up to 0.091 ha of potential marginal habitat (excluding the riverbed and cleared area) would not impact these taxa.

- **reduce the area of occupancy of an important population**

CFM: The CFM Management Plan will ensure that impacts to CFM during the construction period are negligible and replacement of the bridge will not impact the medium or long term habitat available to CFM. The work will not reduce the area of occupy of the population within the Collie River or in the vicinity of the Collie River Bridge.

Chuditch and Quokka: These taxa were not identified from the site and the proposed action would only clear a minor portion of marginal, supporting habitat. The clearing of up to 0.091 ha would not reduce the area of occupancy of these taxa.

- **fragment an existing important population into two or more populations**

CFM: As the river flows will be maintained and resumed after bridge replacement, the Collie River population of CFM will not become fragmented.

Chuditch and Quokka: The minor works proposed would not fragment any local populations or habitat of these relatively mobile species.

- **adversely affect habitat critical to the survival of a species**

CFM: The available habitat to CFM where it intersects with the project footprint is in the order of 250m^2 or less and being such a small area being subject to temporary impacts and being managed through of the implementation of a CFM Management Plan, impacts to CFM will be negligible.

Chuditch and Quokka: As noted these taxa were not identified from the site and the proposed action would only clear a minor portion of marginal habitat. The clearing would include up to 0.091 ha of degraded potential habitat that would not be considered habitat critical to the survival of each species.

- **disrupt the breeding cycle of an important population**

CFM: The CFM Management Plan will include relocation of CFM and ensure that the breeding cycle of CFM is not impacted adversely. CFM breed in winter (June-August) with glochidia released from females in strings of mucus during late August to December/early January. Works will be undertaken during periods of low flow (summer) and culverts will be constructed to maintain flow. No impacts to the breeding cycle are anticipated.

Chuditch and Quokka: The minor works proposed would not impact any local breeding Chuditch or Quokka.

- **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

CFM: As noted the CFM impacted will be circa 250m^2 or less, and temporary. The proposed action will therefore not adversely affect habitat to a level that CFM will decline.

Chuditch and Quokka: As noted these taxa were not identified from the site and the proposed action would only clear a minor portion of marginal habitat. The clearing would include up to 0.091 ha of degraded potential habitat that would not be significant to any local animals let alone the species, due to the animals' relatively large home ranges.

- **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**

CFM, Chuditch and Quokka: The proposed action will not impact the incidence of invasive species or affect CFM, Chuditch and Quokka or habitat. Foxes, dogs and cats (key species implicated with predation and species decline) already have access to the site, as it is unfenced and already relatively open being highly disturbed.

- **introduce disease that may cause the species to decline, or**

CFM, Chuditch and Quokka: The proposed action is not likely to introduce the disease that will impact CFM, Chuditch or Quokka. 'Dieback caused by the root-rot fungus *Phytophthora cinnamomi*' is listed as a key threatening processes under the EPBC Act. Since its listing, further research has determined that *Phytophthora cinnamomi* (PC) is a water mould and not a fungus. Forty per cent of native plant species are considered susceptible to the disease including many from the Proteaceae (banksias and hakeas), Ericaceae (snottygobble), Myrtaceae (eucalypts) and Xanthorrhoeaceae (grass trees) families [1].Indicator species were not noticed within the proposed impact area. The site has had a history of disturbance and access, and it is likely that PC may have already been introduced though disease expression has not been surveyed for.

Even with introduction of PC residual impacts to Chuditch and Quokka at a local or species level would be likely nil. No other diseases are considered likely to be introduced that would cause a decline in CFM, Chuditch or Quokka.

- **interfere substantially with the recovery of the species.**

CFM: The proposed action is not likely to interfere substantially with local CFM or otherwise.

Chuditch and Quokka: As noted these taxa were not identified from the site only the proposed action would only clear a minor portion of marginal habitat. The clearing of up to 0.091 ha of degraded potential habitat would not interfere with the of these species.

Based on the assessment above the proposed action is not likely to have a significant impact on the Vulnerable species (CFM, Chuditch or Quokka) under the EPBC Act based on the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (DAWE 2013).

3.3. CRITICALLY ENDANGERED OR ENDANGERED SPECIES

3.3.1. Woylie (*Bettongia penicillata ogilbyi*)

Multiple translocation sites for Woylies exist in the southwest, including within Wellington National Park, located to the east of the Survey Area. Multiple monitoring records of Woylies occur within 6 km of the Survey Area due to the proximity of the translocation site, with the closest being ~3 km from the Survey Area (DBCA, 2025b). The Survey Area does not contain habitat consistent with current Woylie occurrences, consisting of dense myrtaceous shrubland. The Survey Area does provide Eucalypt woodland; however, the understorey is degraded, and predators are not excluded from the site. Where predators have not been excluded, Woylies have previously been associated with locations containing *Gastrolobium* thickets, providing protection from predators such as foxes through secondary poisoning of naturally occurring monofluroacetic acid, which woylies are highly tolerant to (Christensen & Leftwich, 1980; Short et al., 2005; Yeatman & Groom, 2012). Thickets of this species were not evident within the Survey Area. The site may

[1] DBCA website (https://www.dbca.wa.gov.au/management/threat-management/plant-diseases/phytophthora-dieback) accessed March 2024

contain supporting habitat but is unlikely to form an area of important habitat for the species. The site does, however, provide linkage between other areas that may contain suitable habitat.

Critical habitat outlined in the National Recovery Plan for the Woylie (*Bettongia penicillata ogilbyi*) (DEC 2012)

Although habitat suitable for the woylie varies across its current range, a number of key habitat requirements appear to be essential for the persistence of the species within this range. Woylies may persist in the following habitats where there is adequate introduced predator (fox and cat) control or exclusion:

- tall eucalypt forest and woodland;
- dense myrtaceous shrubland; or,
- kwongan (proteaceous) or mallee heath.

All habitat meeting the above key requirements within the current range, which is either known to be occupied by woylies or to have the identified potential to be occupied by woylies, is considered habitat critical to the survival of the species.

3.3.2. Western Ringtail Possum *(Pseudocheirus occidentalis)*

The Western Ringtail Possum Recovery Plan (DPAW 2017) does not define 'population' but 'populations', with populations occurring within the Swan Coastal Plain, Southern Forest and South Coast management zones. The Proposed Action falls outside of these mapped management zones. The closest is the Swan Coastal Plan Management Zone. The management zones broadly align with the bioregions identified in the Interim Biogeographic Regionalisation for Australia (IBRA) regions. IBRA classifies Australia's landscapes into 89 large geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information (DE, 2017).

To provide a better understanding of populations and numbers of WRP, Biota (2020)[2] undertook a regional survey of WRP which estimated a combined number of over 20,000 WRP within the areas surveyed, from three regional populations - Swan Coastal Plain, the Southern Forest and South Coast management zones. Population estimates within the Swan Coastal Plain management zone survey areas were 9,270 individuals.

Critical habitat outlined in Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan (DPAW 2017)

Habitat critical to survival of western ringtail possums is not well understood and is therefore based on the habitat variables observed where western ringtail possums are most recorded. These appear to vary between key management zones. The common themes however are high nutrient foliage availability for food, suitable structures for protection/nesting, and canopy continuity to avoid/escape predation and other threats. Long-term survival of the species requires linkages between suitable habitat patches and as such habitat critical to survival incorporates this. Vegetation communities critical to the species include long unburnt mature remnants of peppermint (*Agonis flexuosa*) woodlands with high canopy continuity and high foliage nutrients (high in nitrogen and low toxin levels); jarrah (*Eucalyptus marginata*) / marri (*Corymbia calophylla*) forests and woodlands with limited anthropogenic disturbance (unlogged or lightly logged, and a low intensity and low frequency fire history), that are intensively fox-baited and have low indices of fragmentation; coastal heath, jarrah/marri woodland and forest, peppermint woodlands, myrtaceous heaths and shrublands, Bullich (*Eucalyptus megacarpa*) dominated riparian zones and karri forest. Any habitat where western ringtail possums occur naturally are considered critical and worthy of protection. Total population size of the species is unknown but has been estimated to be less than 8,000 mature individuals in the wild, with a decreasing trend. The home range of the western ringtail possum is reported on average to be less than five hectares (Jones 2001). Home ranges in peppermint dominated habitat are generally less than two hectares and average 0.4 ha and 0.3 ha for females and males respectively (Jones et al. 1994b). Densities as high as 20 possums per hectare have

[2] Biota (2020). Regional Population Assessment of the Western Ringtail Possum. Unpublished report for Main Roads Western Australia.

been determined in some remnants of the Busselton peppermint stands compared to about four adults per hectare in the jarrah forest (Jones 2004).

3.3.3. Assessment of significant impact criteria

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- **lead to a long-term decrease in the size of a population**

Woylie and WRP: These taxa were not identified from the site, including following two nights of targeted WRP survey and scat searches. The WRP dreys were located approximately 50 m upstream in habitat that is better quality for WRP (connected midstorey with abundant Peppermint) than that within the proposed impact area If any populations of these species were to occur it would be only supporting habitat and a degraded part of a much larger habitat patch. The clearing of up to 0.091 ha of potential marginal habitat (excluding the riverbed and cleared area) would cause a long-term decrease in the size of any local populations.

- **reduce the area of occupancy of the species**

Woylie and WRP: These taxa were not identified from the proposed impact area and the proposed action would only clear a minor portion of marginal, supporting habitat. The clearing of up to 0.091 ha would not reduce the area of occupancy of these species.

- **fragment an existing population into two or more populations**

Woylie and WRP: The minor works proposed would not fragment any local populations or habitat of these relatively mobile species.

- **adversely affect habitat critical to the survival of a species**

Woylie and WRP: As noted these taxa were not identified from the site only the proposed action would only clear a minor portion of marginal habitat. The clearing would include up to 0.091 ha of degraded potential habitat that would not be considered habitat critical to the survival of each species.

- **disrupt the breeding cycle of a population**

Woylie and WRP: The minor works proposed would not impact any local breeding Woylie or WRP. The WRP dreys were located approximately 50 m upstream in habitat that is better quality for WRP (connected midstorey with abundant Peppermint) than that within the proposed impact area.

- **modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

Woylie and WRP: As noted these taxa were not identified from the site and the proposed action would only clear a minor portion of marginal habitat. The clearing would include up to 0.091 ha of degraded potential habitat that would not be significant to any local animals. The proposed action would not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that these species are likely to decline at a local population level, or impact the animals at a species level.

- **result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat**

Woylie and WRP: The proposed action will not directly increase the risk of invasive species utilising the site. Foxes, dogs and cats (key species implicated with predation and species decline) already have access to the site, as it is unfenced and already relatively open being highly disturbed.

- **introduce disease that may cause the species to decline, or**

The site has had a history of disturbance and access, and it is likely that PC may have already been introduced though disease expression has not been surveyed for. Even with introduction of PC residual impacts to Woylie and WRP at a local or species level would be likely nil. No other diseases are considered likely to be introduced that would cause a decline in Woylie or WRP.

- **interfere with the recovery of the species.**

As noted these taxa were not identified from the site only the proposed action would only clear a minor portion of marginal habitat. The clearing of up to 0.091 ha of degraded potential habitat would not interfere with the of these species.

Based on the assessment above the proposed action is not likely to have a significant impact on any Endangered and Critically Endangered species (Woylie and WRP) under the EPBC Act based on the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (DAWE 2013).

4. RECOMMENDATIONS

Based on the proposed impacts and assessments above, the following recommendations are made:

- The proposed action is highly unlikely to need to be referred to DCCEEW for potential impacts to Chuditch, FRTBC, Quokka (Vulnerable), Baudin's cockatoo, Carnaby's cockatoo, WRP (Endangered) or Woylie (Critically Endangered).
- Potential impacts on CFM as assessed are contingent on the implementation of a CFM Management Plan to mitigate and management impacts to CFM, including the requirement for manual relocation of any CFM individuals to outside of the temporary impact footprint near the bridge and ensuring water flow is maintained.
- The onus is on the proponent to refer the action to DCCEEW for assessment under the EPBC Act if required. A pre-referral meeting should be carried out with DCCEEW to confirm that the proposed impacts are under relevant significant impact thresholds and to ensure that the proposed action aligns with DCCEEW assessment requirements.

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