Supporting documentation for a Clearing Permit Application For a Proposed Gravel Pit Extension Hyden Norseman Road, Forrestania West.

Prepared for the Shire of Kondinin
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Ecoedge

PO Box 1180 Bunbury WA 6231
enquiries@ecoedge.com.au

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1 Introduction

This information is prepared, on behalf of the Shire of Kondinin in support of a clearing permit application for the clearing of 2.51 hectares (ha) of vegetation along the Hyden-Norseman Road. It provides a summary of flora and vegetation, and fauna values identified at the site; an over view of measures to mitigate impacts of proposed clearing and an assessment of the proposal against the ten principles for clearing native vegetation under Schedule 5 of the *Environmental Protection Act 1986.*

2 Background

In June 2018, Ecoedge was engaged by the Shire of Kondinin (the Shire) to prepare a clearing permit application and associated supporting documentation for clearing of approximately 2.51 hectares (ha) of native vegetation within a proposed extension to a gravel pit along the Hyden-Norseman Road. The gravel pit is 2.58 ha in size and is located approximately 2.85 Straight Line Kilometres (SLK) ENE of the Marvel Loch Forrestania Cross Roads and 2.5 km SE of the Lake Cronin Nature Reserve (the 'Survey Area') (**Figure 1**). The proposed extension to the gravel pit is required in order to provide for the future ongoing road maintenance works within the Shire.

The proposed clearing footprint is shown in **Figure 2**. It is intended that the clearing will be implemented in 2 - 3 stages in conjunction with a revegetation plan.

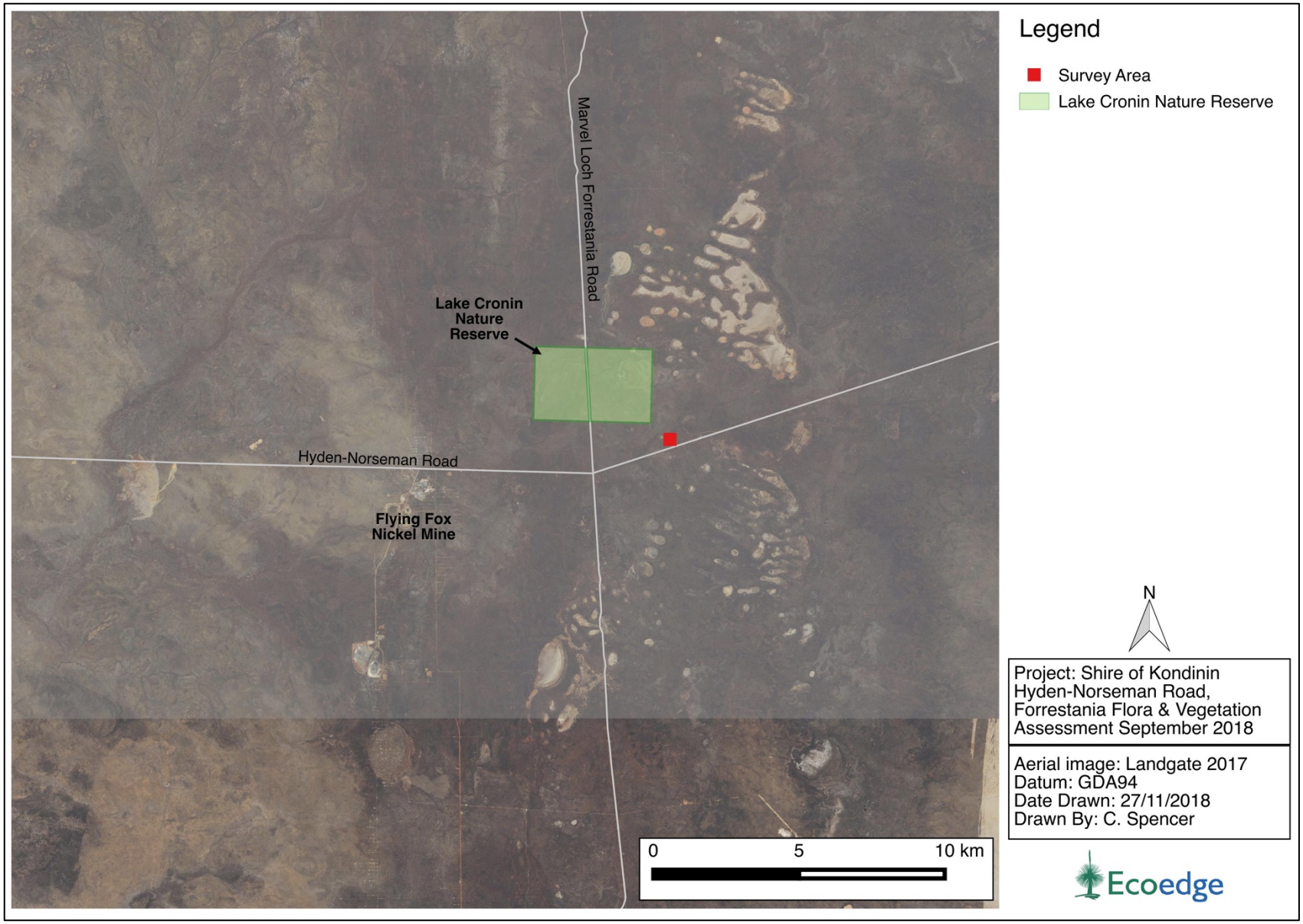

Figure 1. Location of the Survey Area.

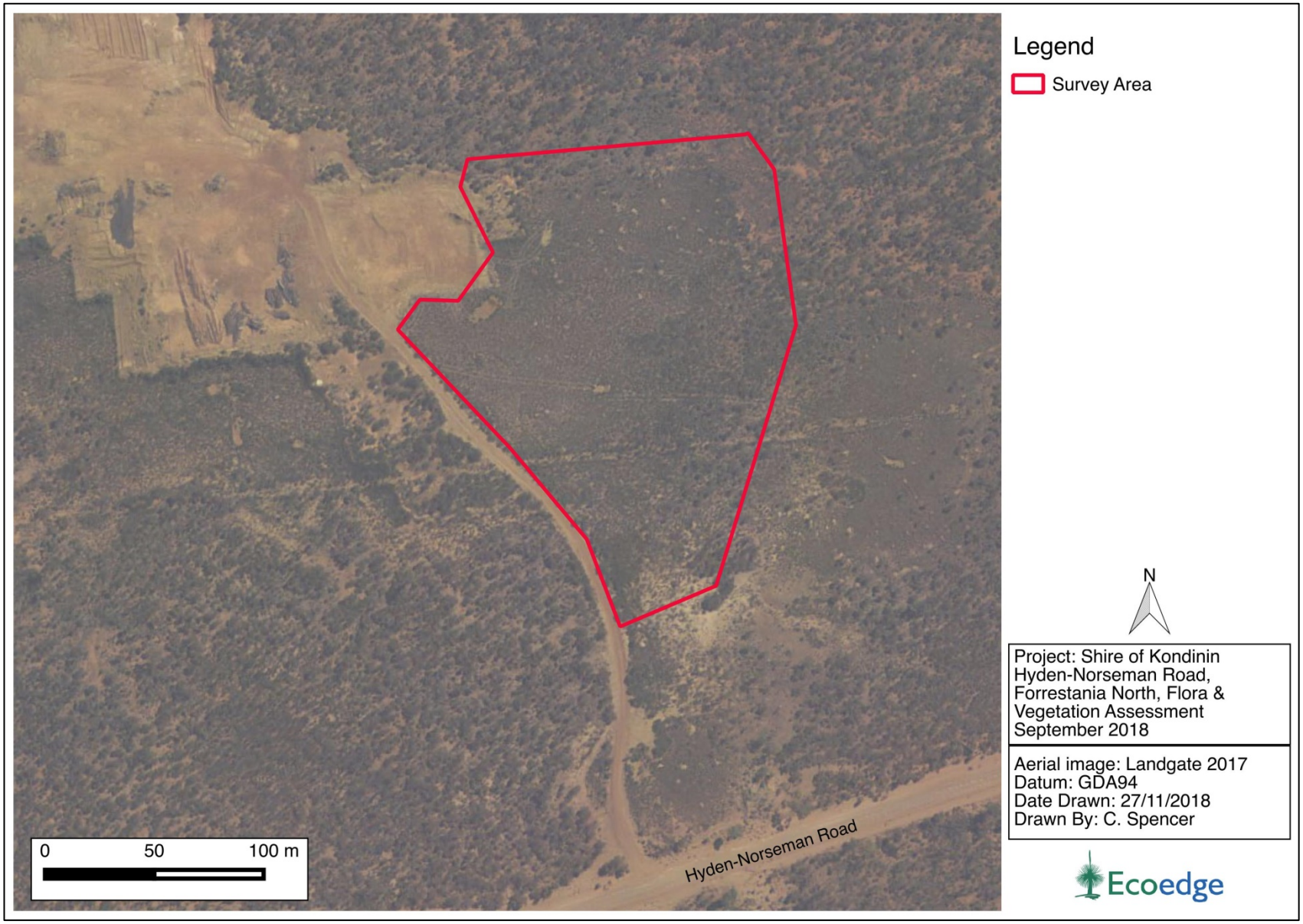

Figure 2. Proposed clearing area.

3 Flora and Vegetation

3.1 Desktop Assessment

The Survey Area is situated within the Southern Cross (COO2) sub-region of the Coolgardie biogeographic region, as defined in the Interim Biogeographical Regionalisation for Australia (IBRA) (Commonwealth of Australia, 2016).

The vegetation within the Survey Area was mapped by Beard as Association 511 'Medium woodland; salmon gum and morrel' (Beard, 1972). This vegetation association is mapped as having 88.26% of its original extent remaining, but is poorly represented in the Department of Biodiversity, Conservation and Attractions (DBCA) conservation estate, with 3.12% in formal and informal reserves (Government of Western Australia, 2018).

The Survey Area is located within an ESA associated with the DBCA managed Lake Cronin Nature Reserve. The southern boundary of Lake Cronin is approximately 2.5 km northwest of the Survey Area (**Figure 1**).

The Survey Area occurs entirely within a large tract of intact native bushland, the closest boundary to the edge of this bushland is located approximately 36 km to the west.

3.2 Vegetation Units

An assessment of vegetation within the Survey Area was undertaken by Ecoedge in September 2018 (Ecoedge, 2019). Two vegetation units were identified and described below. Both units were assessed to be in Very Good condition.

1. Mallee Woodland

Low woodland to open woodland of *Eucalyptus calycogona* subsp. *calycogona* or *E. tephroclada* over *Acacia erinacea*, *A. mackeyana*, *A. merrallii*, *Cryptandra* spp., *Melaleuca* spp. and *Thryptomene kochii* on yellow sandy loam.

2. Shrubland

Shrubland/open shrubland including *Acacia assimilis* subsp. *assimilis*, *Allocasuarina spinosissima*, *Hakea erecta*, *H. francisiana*, *Melaleuca* spp., *Phebalium tuberculosum* and *Thryptomene kochii* on yellow sandy loam over gravel. The shrubland is the dominant vegetation unit in the proposed clearing area, comprising two ha of the 2.51 ha of vegetation.

Neither of the vegetation units were recognised as being a State or Federally listed Threatened or Priority ecological community.

The Project Area was mapped to occur within Beard's Vegetation Association 511 "Medium woodland; salmon gum & morrel" mapped for the Survey Area. However, neither of the mapped vegetation units correlate well with this association. This may be explained by Beard's 1:250,000 scale of mapping which cannot account for small scale variations in vegetation. It is suggested that the units better correlate with either Beard Association 2048 'Shrublands; scrub-heath in the Mallee Region' or Association 519 'Shrublands; mallee scrub, *Eucalyptus eremophila'*. These Associations are mapped adjacent to Association 511. Both of these significantly exceeds the desired minimum 30% retention targets stated by the Commonwealth government and the EPA (Environment Australia, 2001; EPA 2000) with over 99% of their extent remaining.

3.3 Flora

Thirty-three species of vascular flora were identified in the Survey Area. No Threatened or Priority flora, or other conservation-significant species were found.

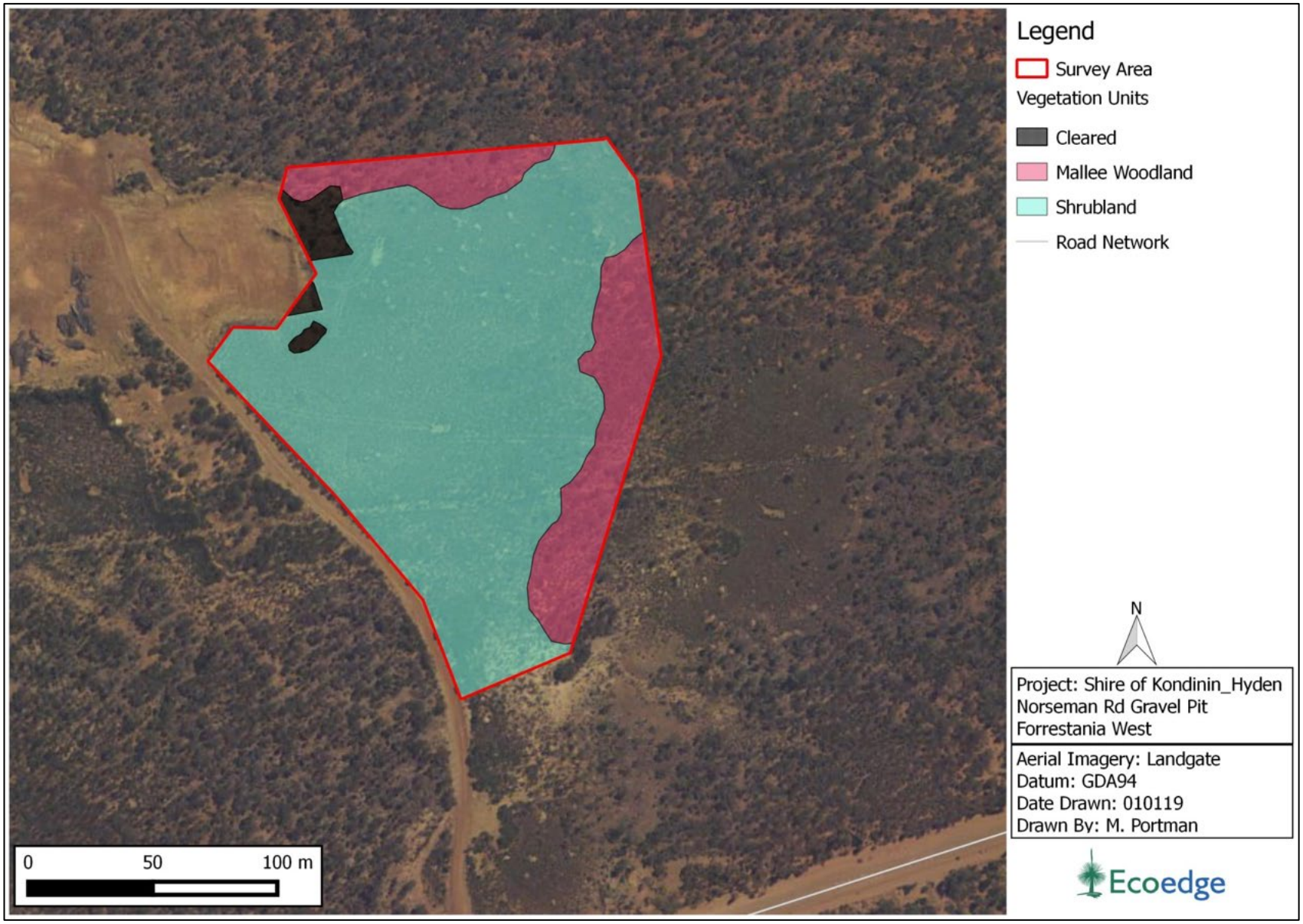

Figure 3. Vegetation Units of the Survey Area

4 Fauna

A Level 1 Fauna Survey and targeted search for black cockatoo habitat / site use was undertaken by Greg Harewood (Zoologist) in October 2018 (Harewood, 2019). The species of main concern within the Survey Area was the Carnaby's black cockatoo[1] (CBC). The field survey was carried out on 2 October 2018. Information pertaining to the fauna survey is summarised below.

4.1 Carnaby's black cockatoo

Breeding habitat

The subject site contained no trees fitting the criteria of being CBC breeding habitat (i.e. suitable trees with a diameter at breast height >30cm) with almost all the specimens present being relatively small, mallee type specimens.

Foraging habitat

No evidence of CBC foraging was observed during the field survey.

Several known and potential foraging habitat flora species were identified within the Project Area. It was estimated that the total quality foraging habitat area comprised no more than 1.0 ha.

Based on available mapping there is about 5,000 ha of remnant native vegetation within 10 km of the subject site. Much of this is likely to represent CBC foraging habitat of some type though it should be noted that the subject site is located near the inland/eastern limit of the Carnaby's black cockatoo's range and they probably only occur infrequently even in areas of ideal habitat.

Roosting habitat

The subject site contained no habitat suitable for use as a roost site by CBC.

4.2 Other Conservation Significant Fauna

No fauna species of conservation significance were positively identified as utilising the subject site. Based on habitats present, several species may possibly occur at times though their current status on-site and/or in the general area was difficult to determine.

5 Requirement for a Clearing Permit

The proposed clearing activities were assessed against the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (the Clearing Regulations) and exemptions under Part V of the *Environmental Protection Act 1986* (EP Act), and against the Principles for clearing native vegetation under Schedule 5 of the EP Act.

[1] Carnaby's cockatoo (*Calyptorhynchus latirostris*), listed as Endangered under both the WC Act and EPBC Act.

A clearing permit is required as there is no valid exemption for the proposed clearing under the EP Act or under the Clearing Regulations.

6 Actions taken to limit impacts from the Proposal

Avoidance

The Shire has sought gravel from alternative sources and determined that this approach is the best of the available limited options.

Much of the potential sources of gravel in the vicinity of the Hyden-Norseman Road is the subject of mine tenements which limits alternative options for the supply of gravel.

The nearest farm based gravel pit is approximately 50 km away from the gravel pits and is not considered economically feasible.

Mitigation

The Shire propose to mitigate impacts of the proposal via revegetation of the site following extraction activities in accordance with the attached management plan.

The proposed revegetation activities will mitigate impacts of clearing in the following ways.

- The revegetation activities mean that the proposed clearing will not result in a permanent loss of vegetation at site and that there will be no net loss of vegetated areas.
- The revegetated area will restore the overall functioning of the ecological linkage / corridor for the migration of fauna and flora.
- Revegetation processes will mitigate potential impacts to infiltration and drainage caused by extraction activities. The exposed clay layer will be ripped and covered with overburden, top soil and mulch. This will slow water flow and facilitate localised water infiltration.
- Restored vegetation and proposed weed control activities will impede potential recolonisation of cleared areas by weeds.

6.1 Revegetation Plan

A summary of the revegetation plan is outlined as follows.

The aim of revegetation plan is that vegetation at the site is self-sustaining and broadly representative of the pre-clearing vegetation unit represented at site within five years of the completion of revegetation. Proposed revegetation methods include reuse of topsoil, direct seeding and planting of seedlings to achieve the following minimum revegetation targets (**Tables 1, 2 and 3**).

Table 1. Project Area revegetation completion criteria.

Criterion	Baseline floristic data	Five year completion targets	Five year completion criteria	Comments
A	Total species richness • 33 species	Minimum Project Area species richness is 33% of total species richness (or 60% of commercially available species)	A minimum of 11 species occurring within the Project Area.	A 33% species richness is considered achievable. Only 19 species in the Project Area are potentially commercially available as seedling based on assessment of their current availability of seedlings, seed and general ease of propagation. This fraction is the only part for which the Shire has any control over.
C	Percentage cover environmental weeds both minor and major competitive species • <1%	Total combined weed cover should not exceed 10% baseline data.	The revegetation site should have no more than 10% cover of either minor and major environmental weeds	It is possible that there will be some colonisation of the site by environmental weeds following site works due to the high level of disturbance. The 10% cover target is applied to this criterion as it may be hard to guarantee complete control of all weeds, especially if they cannot be controlled by selective herbicides.
C	Declared Pest Plants • Nil	Total number of Declared Pest plants should not exceed baseline data.	No Declared Pest plants recorded across the Project Area.	

Table 2. Mallee Woodland vegetation unit completion criteria.

Criterion	Baseline floristic data (Table 6)	Five year completion targets	Five year completion criteria	Comments
A	Total tree species richness • 2 species	Minimum tree species richness is 100% of total tree species richness.	A minimum of 2 species occurring within the Mallee Woodland vegetation unit.	A 100% tree species richness is considered achievable. Both species in **Table 2** are potentially commercially available as seedling based on assessment of their current

Criterion	Baseline floristic data (Table 6)	Five year completion targets	Five year completion criteria	Comments
				availability of seedlings, seed and general ease of propagation. These can be planted by the Shire as seedlings.
B	Tree density 200 stems/ha	Minimum plant density (s/ha) is 50% of commercially available shrubs.	A minimum of 100 s/ha per commercially available species established per hectare. (0.51 x 100 = 51 trees)	A 50% tree density target is considered achievable. Extraction activities are likely to impact on long-term successful regeneration of eucalypt species. The altered substrate may both lower in nutrients and shallower making it more suited to development of shrubs.
B	Shrub density 2500 stems/ha	Minimum shrub density (p/ha) is 40 % of baseline data.	A minimum of 1000 native plant stems established per hectare. (0.5 x 1000 = 510 stems)	A 40% target is considered achievable. The low rainfall combined with long hot summers make the success of planted seedlings hard to predict. The sites isolation makes watering of seedlings impractical.

Table 3. Shrubland vegetation unit completion criteria.

Criterion	Baseline floristic data (Table 6)	Five year completion targets	Five year completion criteria	Comments
A	Total species richness • 30 species	Minimum Project Area species richness is 33% of total species richness (or 60% of commercially available species)	A minimum of 10 species occurring within the Shrubland vegetation unit.	A 33% species richness is considered achievable. Only 16 species in Table 2 are potentially commercially available as seedling based on assessment of their current availability of seedlings, seed and general ease of propagation. This fraction is the only part for which the Shire has any control over.
B	shrub density • 5000 p/ha per species	Minimum shrub density (p/ha) is 20 % of baseline data.	A minimum of 1000 native plant stems established per hectare. (2 x 1000 = 2000 stems)	A 20% target is considered achievable for the Shire. The low rainfall combined with long hot summers make the success of planted seedlings hard to predict. The sites isolation makes watering of seedlings impractical.

7 Assessment against Clearing Principles

The proposed clearing has been assessed against the ten clearing principles (**Table 4**). Information for this assessment in regards to flora values has been taken from Ecoedge (2019), and in regards to fauna values has been taken from Harewood (2019).

Table 4. Assessment of the Proposal against Clearing Principles

Clearing Principle	Response
(a) it comprises a high level of biological diversity; or	Not at variance, only 33 native flora species where identified across the 2.58 ha survey area. This species richness is low compared to other comparable areas, for example Wheatbelt woodlands typically have 30+ species per 100 m2 (Harvey & Keighery 2012) and according to one study flora species richness in the Mallee biogeographic region, which is located to the south of the Coolgardie biogeographic region, ranges from 17 to 48 species per 1000 m² (Van Der Moezel & Bell, 1989).
(b) it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia; or	Not at variance. The Project Area is not considered to contain significant habitat for Carnaby's black cockatoo or any other fauna species.
(c) it includes, or is necessary for the continued existence of, rare flora; or	Not at variance. No Threatened, Priority flora or other flora of conservation significance was found within the Survey Area.
(d) it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community; or	Not at variance
(e) it is significant as a remnant of native vegetation in an area that has been extensively cleared; or	Not at variance
(f) it is growing in, or in association with, an environment associated with a watercourse or wetland; or	Not at variance
(g) the clearing of the vegetation is likely to cause appreciable land degradation; or	Not at variance
(h) the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area; or	Not at variance
(i) the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water; or	Not at variance
(j) the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	Not at variance

8 Conclusion

The Shire of Kondinin proposes to clear approximately 2.51 ha of native vegetation in order to make an extension to an existing gravel pit along the Hyden-Norseman Road, approximately 2.85 km ENE of the Marvel Loch Forrestania Cross Roads. This gravel pit is required to provide for the future and ongoing road maintenance works within the Shire.

The proposal is not likely to be at variance with any of the ten principles for clearing native vegetation under Schedule 5 of the *Environmental Protection Act 1986.*

The proposed clearing is unlikely to have a significant impact on local, regional and National vegetation and flora values given the absence of Threatened and Priority flora and vegetation and the relatively small extent of proposed clearing within a significantly broader extent of intact and well represented native vegetation. It is further recommended that the potential impacts of the proposal will be mitigated via the staged rehabilitation of the cleared areas by revegetation activities.

9 References

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