

Supporting documentation for a Clearing Permit Application For the East Road Gravel Pit, Kent.



Prepared for the Shire of Kent
March 2019



PO Box 9179, Picton WA 6229
enquiries@ecoedge.com.au

Contents

1	Introduction	3
2	Flora and vegetation	3
2.1	Desktop assessment	3
2.2	Field survey	4
3	Fauna.....	9
3.1	Carnaby’s black cockatoo.....	9
3.2	Other conservation significant fauna	9
4	Requirement for a clearing permit	9
5	Actions taken to limit impacts from the proposal.....	10
5.1	Avoidance.....	10
5.2	Mitigation.....	10
5.2.1	Revegetation plan	11
6	Assessment against clearing principles	14
7	Conclusion.....	17
8	References	18

1 Introduction

In June 2018, Ecoedge was engaged by the Shire of Kent (the Shire) to prepare a clearing permit application and associated supporting documentation for clearing of approximately 1.6 hectares (ha) of native vegetation within a proposed extension to a gravel pit. The gravel pit is located approximately 2.3 kilometres east of the Newdegate-Pingrup Road intersection on the south side of East Road (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.

This document provides a summary of flora, vegetation, and fauna values identified at the site; an over view of measures to mitigate impacts of the 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*.

The proposed clearing footprint is shown in **Figure 2**.

2 Flora and vegetation

2.1 Desktop assessment

The Survey Area is situated within the Western Mallee (MAL2) sub-region of the Mallee biogeographic region, as defined in the Interim Biogeographical Regionalisation for Australia (IBRA) (Commonwealth of Australia, 2016). Only 36.94% of the vegetation within this sub-region remains, (Government of Western Australia, 2018).

The vegetation within the Survey Area was mapped by Beard as Association 380 'Shrublands; scrub-heath on sandplain' (Beard, 1972). This vegetation association is mapped as having 60.64% of its original extent remaining and is reasonably represented in the Department of Biodiversity, Conservation and Attractions (DBCA) conservation estate, with 40.01% in formal and informal reserves (Government of Western Australia, 2018). The extent remaining of this association exceeds the desired minimum 30% retention targets stated by the Commonwealth government and the EPA (Environment Australia, 2001; EPA, 2000).

The proposed gravel pit occurs within a corridor of vegetation approximately 200 m wide that runs east and west along East Road for a total of about 14.5 kilometres. This corridor is locally significant as it provides a key linkage for many isolated patches of bushland that are located in the near vicinity north and south of it. To a lesser extent it is also regionally important in that it is part of interconnected east-west and north-south corridors of vegetation that link some of the major nature reserves in the region.

There are no mapped ESAs in close proximity to the Survey Area. The closest is approximately 9.4 kilometres NW of the Survey Area.

2.2 Field survey

An assessment of vegetation within the Survey Area was undertaken by Ecoedge in September 2018 (Ecoedge, 2019).

Vegetation units

Two vegetation units were identified and are described below (**Figure 3**). Both of these units are for the most part in Excellent Condition.

Table 1. Description of vegetation units within the Survey Area.

Unit	Description
<i>Eucalyptus eremophila</i> Mallee Woodland	Mallee woodland of <i>Eucalyptus eremophila</i> over <i>Melaleuca pungens</i> tall shrubs over <i>Austrostipa elegantissima</i> scattered grass and clay loam in a drainage line
<i>Eucalyptus pleurocarpa</i> Mallee Woodland	Mallee woodland of <i>Eucalyptus pleurocarpa</i> over variable shrubland that includes <i>Adenanthos flavidiflorus</i> , <i>Banksia armata</i> , <i>B. cirsioides</i> , <i>B. meisneri</i> subsp. <i>meisneri</i> , <i>Bossiaea preissii</i> , <i>Lysinema pentapetalum</i> and <i>Xanthorrhoea nana</i> on yellow sand

The *Eucalyptus eremophila* Mallee Woodland unit occupies only a small area at the NW corner of the Survey Area. Neither of the vegetation units resembles a Threatened or Priority ecological community.

Flora

Fifty-seven species of vascular flora, including two state priority listed species, were identified in the Survey Area. The location of the priority listed flora within the proposed clearing area is shown in **Figure 4** and is briefly described in **Table 2**.

Table 2. Conservation status of priority flora

Species	Conservation Status	Comment
<i>Verticordia coronata</i>	(P3)	Two patches of plants in the Survey Area: ca 5 plants and ca 1 plant, (Figure 4). Represented by 38 records in DBCA databases. Population at East Road would be regarded as being at the northern extent of its range.
<i>Acacia obesa</i>	(P3)	One patch of two plants (Figure 4). Represented by 20 records in DBCA databases. Its range extends from Dumbleyung to Lake Magenta Reserve north to Hyden.

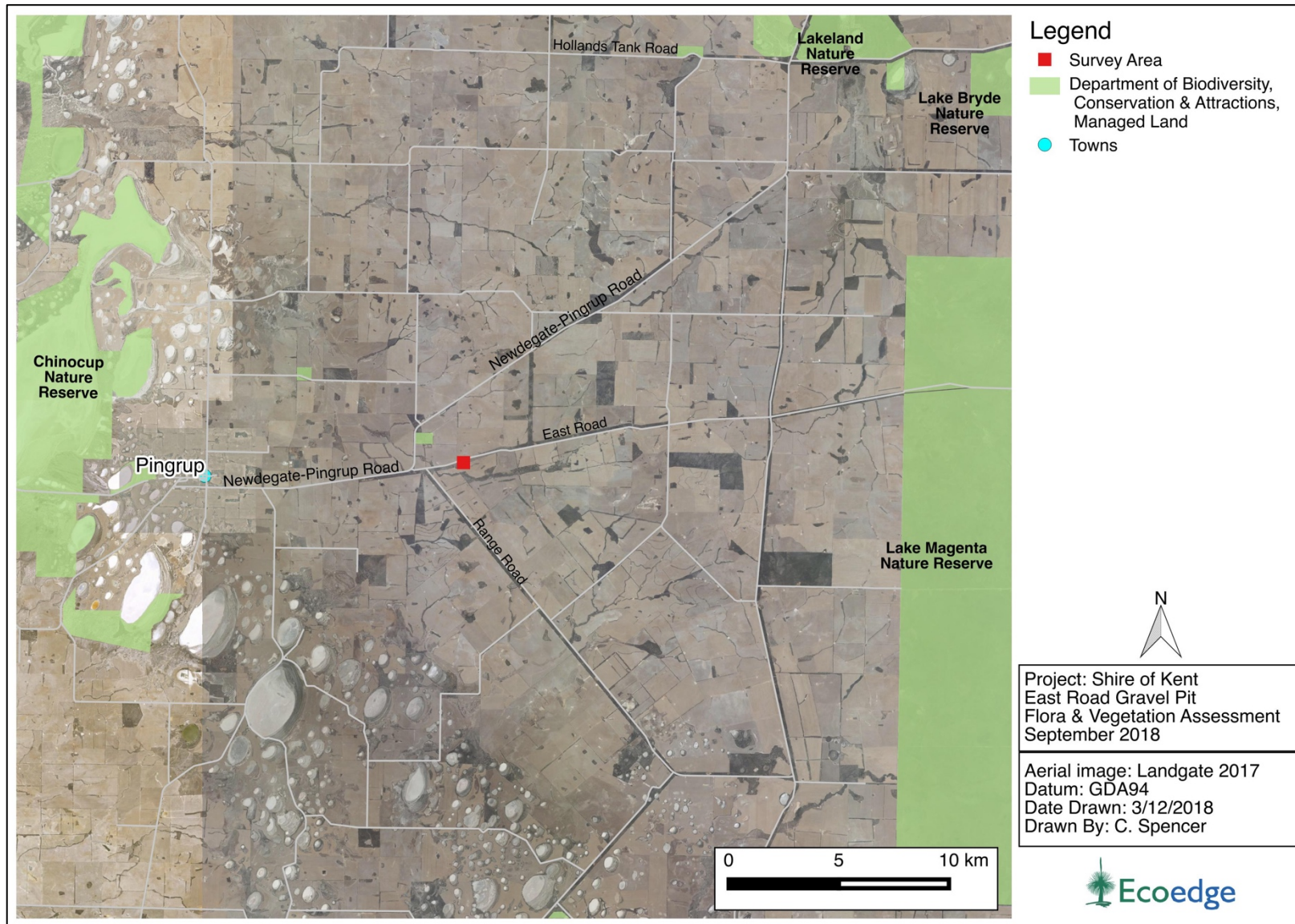


Figure 1. Location of the Survey Area.

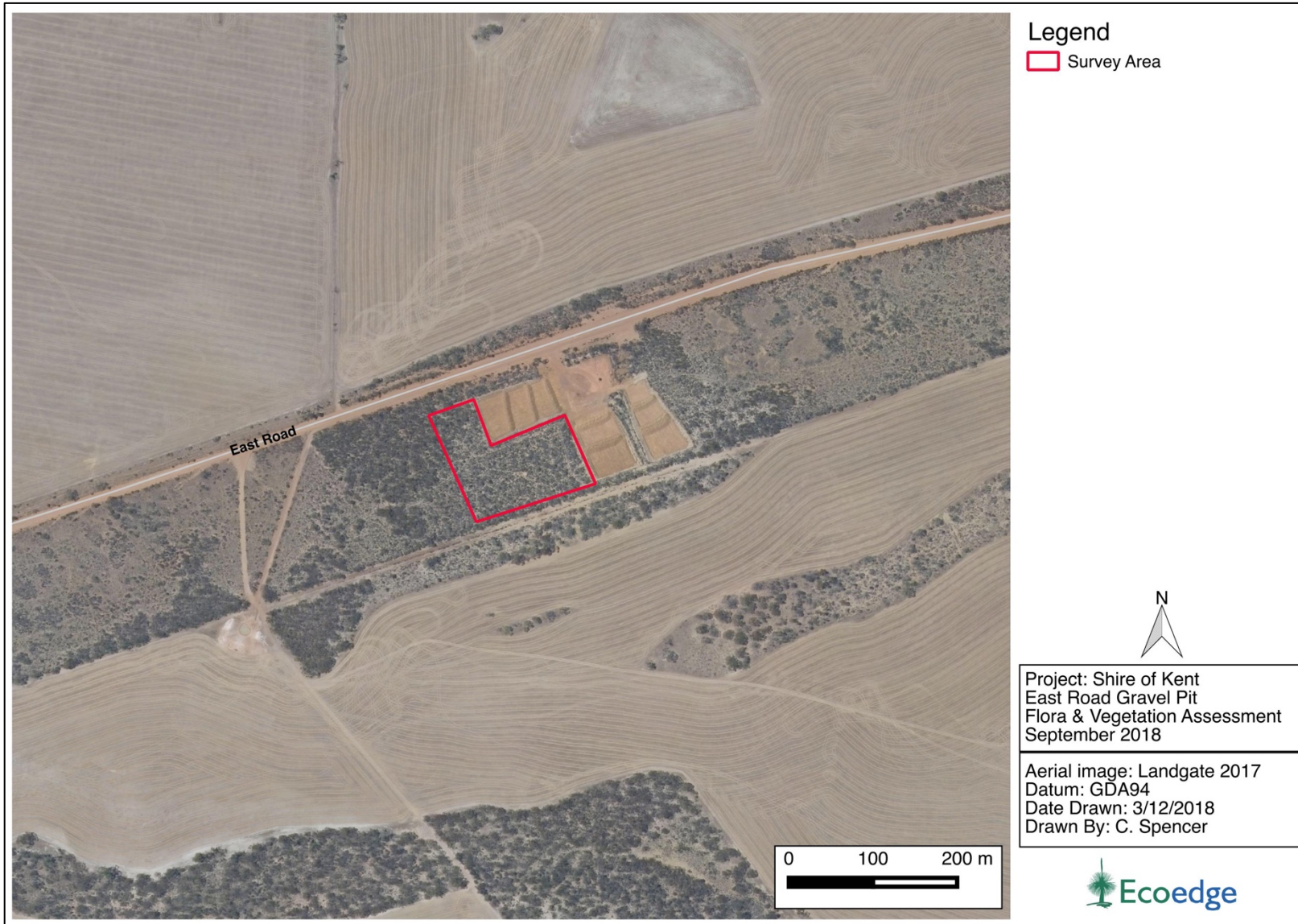


Figure 2. Proposed clearing area.

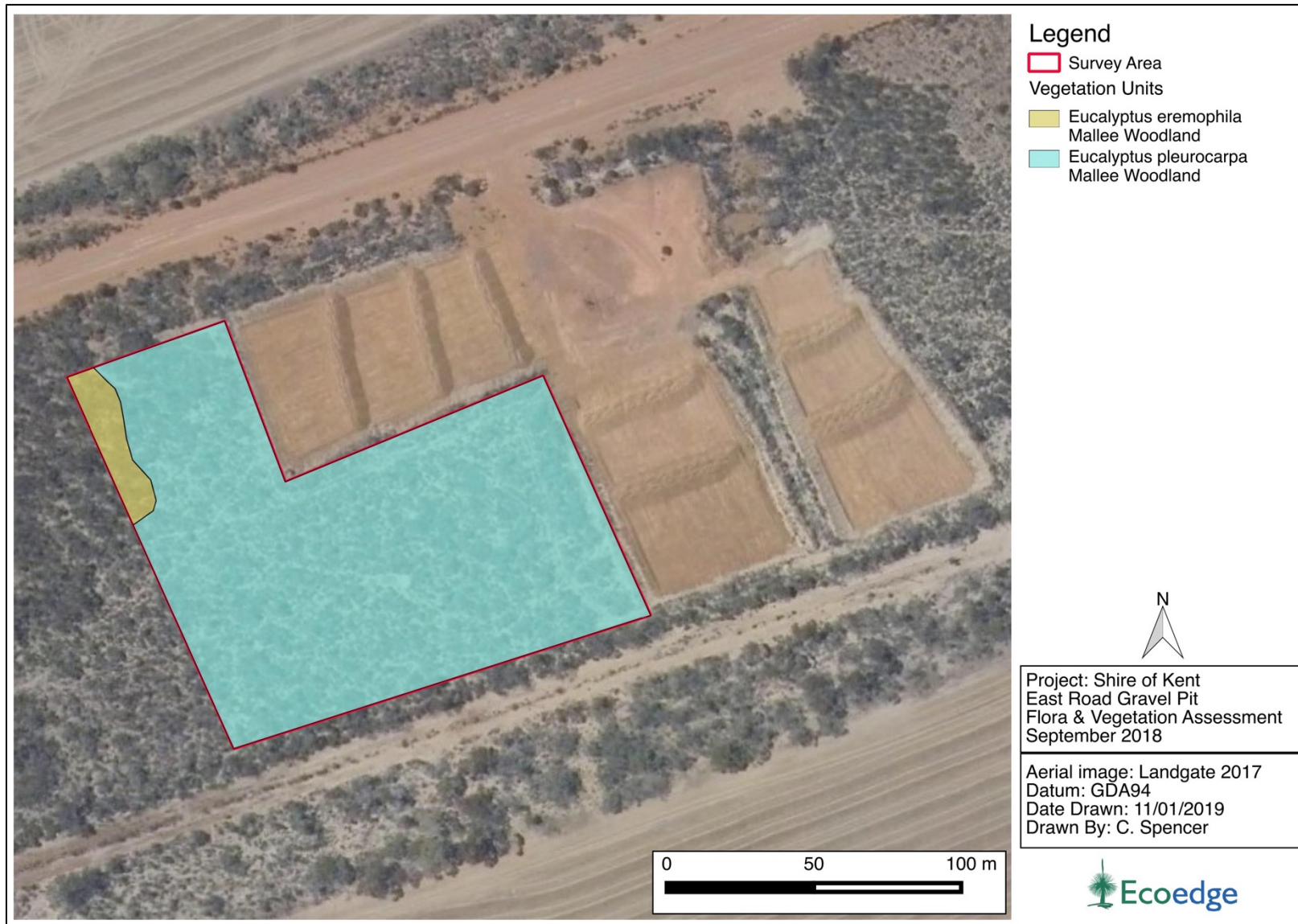


Figure 3. Vegetation units within the Survey Area

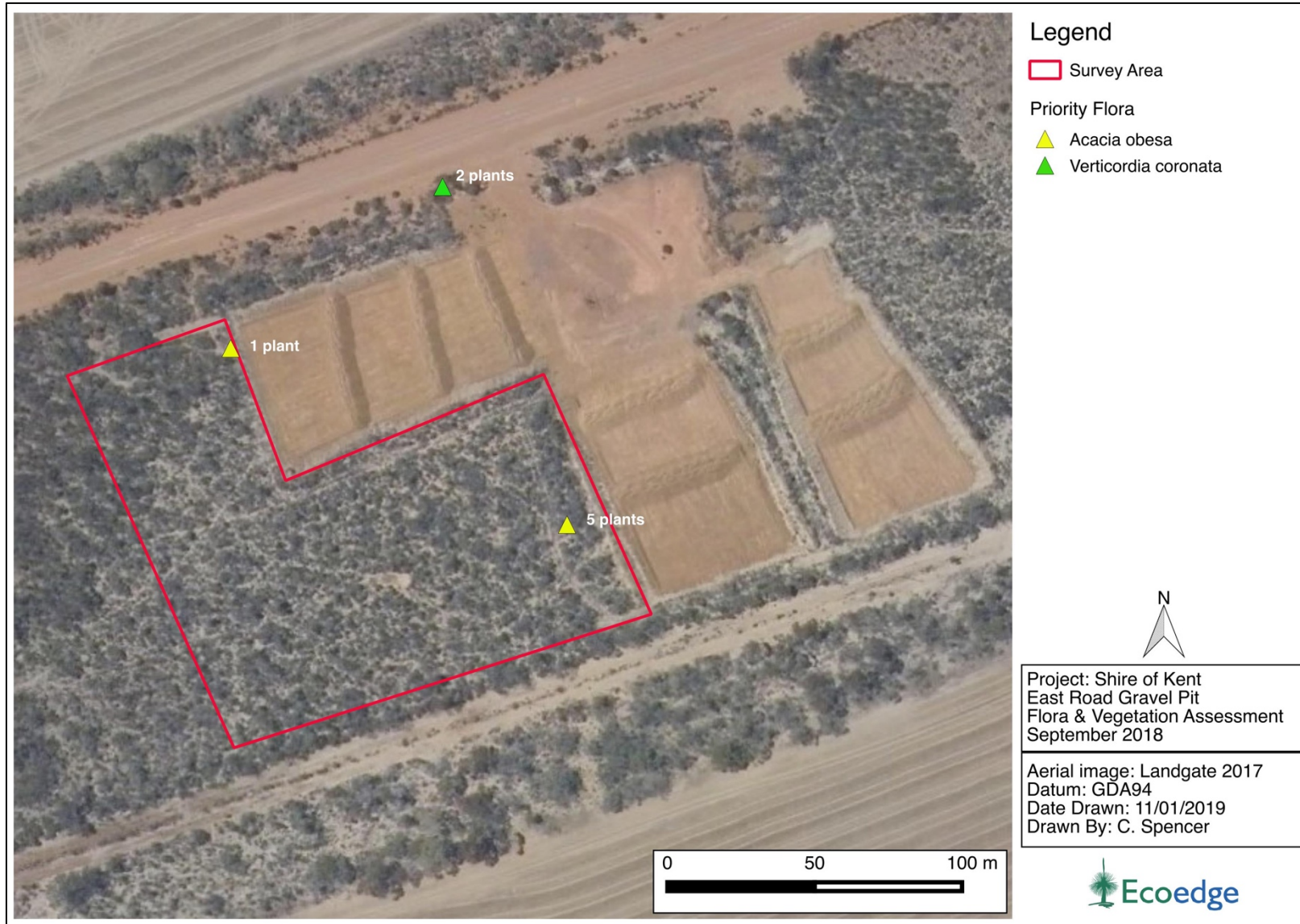


Figure 4. The location of potential Priority-listed flora within the Survey Area.

3 Fauna

A Level 1 Fauna Survey and a Level 2 Assessment for black cockatoo habitat / site use (EPA 2016b) 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 cockatoo¹ (CBC). Information pertaining to the fauna surveys is summarised below.

3.1 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 and with potential breeding hollows) 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 1.5 ha.

Roosting habitat

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

Based on available mapping there is about 2,500 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, and potential breeding and foraging habitat, 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.

3.2 Other conservation significant fauna

No evidence of any of the conservation significant fauna species identified during the literature review was observed. This includes secondary evidence of some fauna species such as malleefowl mounds, tracks, scats and feathers. However, this does not eliminate the potential for some species to still occur, if only infrequently.

4 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.

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

¹ Carnaby's cockatoo (*Calyptorhynchus latirostris*), listed as Endangered under both the *Wildlife Conservation Act 1950* and *Environmental Protection and Biodiversity Conservation Act 1999*.

5 Actions taken to limit impacts from the proposal

5.1 Avoidance

The Shire has sought gravel from alternative sources in an effort to avoid clearing of vegetation, but this has proved unsuccessful.

It has approached farmers to use cleared agricultural land for these purposes in reasonable proximity to road construction activities but the farmers were unwilling to relinquish their land for these purposes. They have also considered use of gravel from existing farm-based pits, but these are located too far from proposed road-work areas and were considered financially unviable.

Where possible the Shire will avoid clearing of Priority listed flora occurring within the proposed clearing area. However, this will generally only be practical for the population of *V coronata* and *A obesa* occurring near the boundary of gravel pit. The plants will be clearly demarcated in the field and an appropriate buffer of at least two metres will be provided around the plants.

The patch of 5 *V coronata* plants growing within the middle of the proposed gravel pit will likely have to be cleared, subject to obtaining appropriate clearing approvals from the DWER.

5.2 Mitigation

The Shire propose to mitigate impacts of the proposal via revegetation of the site following extraction activities in accordance with the attached revegetation plan (Ecoedge, 2019b).

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.

An overview of the revegetation approaches and completion criteria revegetation plan is provided herein.

5.2.1 Revegetation plan

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 commencement of the project. Proposed revegetation methods include reuse of topsoil, direct seeding and planting of seedlings to achieve the revegetation targets presented in **Tables 3, 4 and 5**.

Table 3. Project Area completion criteria.

Criterion	Baseline floristic data (Table 6)	Five year completion targets	Five year completion criteria	Comments
A	Total species richness <ul style="list-style-type: none"> • 57 species • 10 most likely to be commercially available 	Minimum Project Area species richness is 50% of commercially available species	A minimum of 5 species occurring within the Project Area.	This level of species richness is considered achievable based on 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(i)	Percentage cover environmental weeds both minor and major competitive species <ul style="list-style-type: none"> • <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(ii)	Declared Pest Plants <ul style="list-style-type: none"> • Nil 	Total number of Declared Pest plants should not exceed baseline data.	No Declared Pest plants recorded across the Project Area.	A list of Declared Pest plants in the Shire of Kent is available on the Department of Primary Industries and Regional Development website.

Table 4. *Eucalyptus eremophila* Mallee Woodland vegetation unit completion criteria.

Criterion	Baseline floristic data (Table 6)	Five year completion targets	Five year completion criteria	Comments
A	<p><i>E eremophila</i> Mallee Woodland tree species richness</p> <ul style="list-style-type: none"> • 1 species • 1 commercially available 	Tree species richness is 100% of total tree species richness.	One tree species occurring within the vegetation unit.	A 100% tree species richness is considered achievable. The species is considered commercially available as seedling based on assessment of their current availability of seedlings, seed and general ease of propagation. These can be planted by the Shire as seedlings.
B(i)	Tree density 400 stems/ha	Minimum plant density (s/ha) is 50% of commercially available tree density.	A minimum of 200 s/ha per commercially available tree species established per hectare. $0.05 \times 200 = 10$ stems	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 be both lower in nutrients and shallower making it more suited to development of shrubs.
B(ii)	Other plant density (grass, sedge, shrubs etc) 2500 stems/ha	Minimum other plant density (p/ha) is 40 % of baseline data.	A minimum of 1250 native plant stems established per hectare. $0.05 \text{ ha} \times 1250 = 62.5(63)$ stems	A 50% 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 5. *Eucalyptus pleurocarpa* Mallee Woodland vegetation unit completion criteria.

Criterion	Baseline floristic data (Table 6)	Five year completion targets	Five year completion criteria	Comments
A	<p><i>E pleurocarpa</i> Mallee Woodland tree species richness</p> <ul style="list-style-type: none"> • 1 species • 1 commercially available 	Tree species richness is 100% of total tree species richness.	One tree species occurring within the vegetation unit.	A 100% tree species richness is considered achievable. The species is considered commercially available as seedling based on assessment of their current availability of seedlings, seed and general ease of propagation. These can be planted by the Shire as seedlings.
B(i)	Tree density 400 stems/ha	Minimum plant density (s/ha) is 50% of commercially available tree density.	A minimum of 200 s/ha per commercially available tree species established per hectare. $1.5 * 200 = 250$ stems	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 be both lower in nutrients and shallower making it more suited to development of shrubs.
B(ii)	Other plant density (grass, sedge, shrubs etc) <ul style="list-style-type: none"> • 5000 p/ha 	Minimum plant density (p/ha) is 20 % of baseline data.	A minimum of 1000 native plant stems established per hectare. $(1.5 * 1000 = 1500)$ 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.

6 Assessment against clearing principles

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 6. Assessment of the Proposal against Clearing Principles

Clearing Principle	Response														
(a) it comprises a high level of biological diversity ; or	<p>Unlikely to be at variance.</p> <p>There is limited information to make a make a definitive statement about the level of biodiversity within the Survey Area. It is however suggested that it comprises a moderate level of biological diversity when compared with other comparable sized areas within the area of the Wheatbelt woodlands and the Mallee Biogeographic Region. A comparison of species richness ranges in Table 7 indicates a Project Area flora species richness about midway between the Wheatbelt Eucalypt Woodlands and the Mallee Biogeographic region species richness ranges.</p> <p>Table 7. Comparative species richness</p> <table border="1" data-bbox="824 866 1897 1150"> <thead> <tr> <th data-bbox="824 866 1093 908">Survey</th> <th data-bbox="1093 866 1632 908">Vegetation Unit</th> <th data-bbox="1632 866 1897 908">Species richness</th> </tr> </thead> <tbody> <tr> <td data-bbox="824 908 1093 991" rowspan="2">Ecoedge,2019</td> <td data-bbox="1093 908 1632 949"><i>E pleurocarpa</i> Mallee Woodland unit</td> <td data-bbox="1632 908 1897 949">55 / 15000 m²</td> </tr> <tr> <td data-bbox="1093 949 1632 991"><i>E eremophila</i> Mallee Woodland unit</td> <td data-bbox="1632 949 1897 991">13 / 500 m²</td> </tr> <tr> <td data-bbox="824 991 1093 1074">(Harvey & Keighery, 2012)</td> <td data-bbox="1093 991 1632 1074">Wheatbelt Eucalypt woodlands</td> <td data-bbox="1632 991 1897 1074">6.3 – 48.3 / 100m²</td> </tr> <tr> <td data-bbox="824 1074 1093 1150">(Van Der Moezel & Bell, 1989)</td> <td data-bbox="1093 1074 1632 1150">Mallee biogeographic region</td> <td data-bbox="1632 1074 1897 1150">17 to 48 / 1000 m²</td> </tr> </tbody> </table> <p>Overall the vegetation association in which the survey area occurs forms part of a well represented Beard Vegetation Association 380.</p> <p>The Survey area contains two priority 3 listed species which increases the value of the biodiversity within the Survey Area.</p>	Survey	Vegetation Unit	Species richness	Ecoedge,2019	<i>E pleurocarpa</i> Mallee Woodland unit	55 / 15000 m ²	<i>E eremophila</i> Mallee Woodland unit	13 / 500 m ²	(Harvey & Keighery, 2012)	Wheatbelt Eucalypt woodlands	6.3 – 48.3 / 100m ²	(Van Der Moezel & Bell, 1989)	Mallee biogeographic region	17 to 48 / 1000 m ²
Survey	Vegetation Unit	Species richness													
Ecoedge,2019	<i>E pleurocarpa</i> Mallee Woodland unit	55 / 15000 m ²													
	<i>E eremophila</i> Mallee Woodland unit	13 / 500 m ²													
(Harvey & Keighery, 2012)	Wheatbelt Eucalypt woodlands	6.3 – 48.3 / 100m ²													
(Van Der Moezel & Bell, 1989)	Mallee biogeographic region	17 to 48 / 1000 m ²													

Clearing Principle	Response
	<p>The assessment of fauna habitat at site by Harewood, 2019 suggested a low fauna biodiversity given the relatively small area and because much of the habitat present at site is common and widespread.</p>
<p>(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</p>	<p>Not at variance. The Project Area is not considered to contain significant habitat for Carnaby's black cockatoo or any other fauna species. Fauna habitats present within the subject site were considered common and widespread in the general area, the extent of clearing is very small and the faunal assemblage present is very unlikely to be different to that found in similar habitats located elsewhere in the immediate vicinity.</p>
<p>(c) it includes, or is necessary for the continued existence of, rare flora; or</p>	<p>Not at variance. The site does not contain any Threatened or rare flora.</p>
<p>(d) it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community; or</p>	<p>Not at variance.</p>
<p>(e) it is significant as a remnant of native vegetation in an area that has been extensively cleared; or</p>	<p>May be at variance.</p> <p>The proposal occurs within a corridor of roadside vegetation in the Western Mallee Sub-region of the Mallee Interim Biogeographic Region which has been predominantly cleared for agriculture. Only 36.94% of the vegetation within this sub-region remains, (Government of Western Australia, 2018).</p> <p>Whilst the project may be at variance with this principle the impact will be largely temporary in nature will be mitigated via the implementation of a revegetation plan.</p>
<p>(f) it is growing in, or in association with, an environment associated with a watercourse or wetland; or</p>	<p>Not at variance</p>
<p>(g) the clearing of the vegetation is likely to cause appreciable land degradation; or</p>	<p>Not at variance</p>
<p>(h) the clearing of the vegetation is likely to have</p>	<p>Not at variance</p>

Clearing Principle	Response
an impact on the environmental values of any adjacent or nearby conservation area; or	
(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

7 Conclusion

The Shire of Kent proposes to clear approximately 1.6 ha of native vegetation in order to extend an existing gravel pit on the south side of East Road for ongoing road maintenance purposes in the region. A summary of the significance of impacts of this proposal in regards to variances and potential variances to the clearing principles listed in **Table 6** is presented below.

Clearing principle a). Unlikely to be at variance. The impact is not likely to be significant on the overall biodiversity in the region. The scale of clearing is relatively small and the vegetation to be cleared forms part of well represented Beard vegetation association: Association 380 'Shrublands; scrub-heath on sandplain'. The impacts will also be mitigated via a formal revegetation program, which together with natural regenerative processes should see the area rehabilitated to reasonably representative of pre-clearing vegetation.

The Shire will also seek to protect Priority listed flora from impacts of clearing, where practically possible. This means that the patches of *Acacia obesa* (2 plants) and *Verticordia coronata* (1 plant in the NE corner) will be protected from impacts. However, the clearing would see the removal of five *V coronata* plants in the SE of the Project Area (**Figure 4**).

Clearing principle (e). May be at variance. This is due to the proposed clearing occurring within an area largely already cleared for agriculture.

It is recommended however that the potential impacts of the proposal will be of a temporary nature and reasonably mitigated via the implementation of a revegetation plan. The plan seeks to have the vegetation at the site self-sustaining and broadly representative of pre-clearing vegetation units within five years of clearing. This will be achieved via staged rehabilitation of the cleared area through the timely use of top soil, direct seeding and planting of seedlings.

8 References

- Beard, J.S. (1972). *Vegetation Survey of Western Australia. 1:250 000 Series. The Vegetation of the Bremer Bay and Newdegate Area. Map and Explanatory Memoir.* Vegmap Publications, Applecross.
- Commonwealth of Australia (2016). *Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Sub-regions).* Department of the Environment and Energy. <https://data.gov.au/dataset/interim-biogeographic-regionalisation-for-australia-ibra-version-7>
- Department of Environment Regulation (2014). *A Guide to the Exemptions and Regulations for Clearing Native Vegetation Under Part V of the Environmental Protection Act 1986.* Department of Environment Regulation. Perth, Western Australia.
- Department of Environment, Water, Heritage and the Arts (1999). *Environment Protection and Biodiversity Conservation Act 1999.* Department of Environment, Water, Heritage and the Arts. Canberra, Australian Capital Territory.
- Ecoedge (2019). *Reconnaissance and Targeted Flora and Vegetation Survey at the East Road Gravel Pit.* Unpublished report to the Shire of Kent.
- Ecoedge (2019b). *Revegetation Plan for the East Road Gravel Pit.* Unpublished report to the Shire of Kent.
- Environment Australia (2001). *National objectives and targets for biodiversity conservation 2001–2005.* <http://www.environment.gov.au/resource/national-objectives-and-targets-biodiversity-conservation-2001%E2%80%932005>
- Environmental Protection Authority (2000). *Environmental Protection of Native Vegetation in Western Australia, Clearing of Native Vegetation, with particular reference to the Agricultural Area. Position Statement No. 2.* Environmental Protection Authority. Perth, Western Australia.
- Government of Western Australia (2004). *Environmental Protection (Clearing of Native Vegetation) Regulations 2004.*
- Government of Western Australia (2018). *Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017.* Department of Biodiversity Conservation and Attractions. Perth, Western Australia. <https://catalogue.data.wa.gov.au/dataset/3d8c36a4-1863-4eee-9b7b-bcc33973987f/resource/b7bd60c2-bff6-4637-b213-ae4706412c7/download/vegetationstatisticsstatewide2017fullreport.zip>

Harewood (2019). *Fauna Habitat Assessment Proposed East Road Borrow Pit*. Unpublished report to the Shire of Kent.

Harvey, J.M. and Keighery G.J. (2012). Benchmarking Wheatbelt Vegetation. Classification and Description of Eucalypt Woodlands. Wheatbelt Baseline Project, Wheatbelt Natural Resource Management Region and Department of Environment and Conservation. Perth

Van Der Moezel P.G. and Bell D.T. (1989). Plant species richness in the Mallee Region of Western Australia in the *Australian Journal of Ecology*, Volume 14, Issue 2. Abstract Accessed 7/01/2019. <https://onlinelibrary.wiley.com/toc/14429993a/14/2>.