



Landform Research

ASSESSMENT OF VEGETATION PROPOSED GRAVEL EXCAVATION – OLD PINE PLANTATION LOT 40, GREAT NORTHERN HIGHWAY, CHITTERING

10 June 2022

1.0 Background

Lot 40 Great Northern Highway, Chittering has been planted to pines which have recently been harvested.

As there is a gravel resource on the portion of Lot 40, it makes sense that the gravel is extracted prior to the land being returned to productive pasture. An application for Development Approval for gravel extraction has been applied for to the Shire of Chittering.

A few scattered Eucalypts, mainly *Corymbia calophylla* germinated and grew whilst the pine plantation was in place and these remain on the subject land. Also present on site or adjoining are 14 Black Cockatoo Habitat trees with a chest diameter of > 500 mm. These predate the pine plantation which was planted around them.

Being larger, those trees have greater potential to develop hollows and so are proposed to be retained. In all there are approximately 40 regrowth Eucalypt trees on the 19.2 hectares of proposed clearing. These trees are proposed to be retained. In addition it is proposed to plant 200 local native Eucalypt trees to compensate for the removal of the 40 regrowth trees.

There are also some Marri seedlings approximately 12 plus months old that have germinated since clearing, mostly self seeding from under the existing trees.

It is believed that the 40 trees constitute < 1 hectare in area and their removal is possible under the Clearing Referral Exemptions, under the “Very Low Impact Guidelines” of the *Environmental Protection (Clearing of Native Vegetation Regulations 2004)*.

The regrowth trees germinated and grew within the life of the pine plantation, are limited in area and number, and there is no understorey.

2.0 Aims of the Survey

- Conduct a flora and vegetation survey.
- Map any vegetation communities.
- Conduct a targeted search for potentially significant species.

- Provide a list of flora species that occur on the subject land.
- Determine the quality of the vegetation.

Assess the remnant vegetation for trees identified as being potentially significant to Black Cockatoos;

- Trunk diameter > 500 mm
- Potential for nesting hollows
- Whether hollows have been used by Black Cockatoos.

3.0 Survey Description

Lindsay Stephens of Landform Research reviewed the vegetation on Stage 3 on 10 May 2022.

During the survey the site was walked in an anticlockwise circle with every tree being examined.

All native species observed during the survey were identified and the original vegetation was considered. A definitive study of the exotic species was not warranted and not conducted as the land is parkland pasture.

Because of the disturbed nature of the site and type of species no sample plots were required.

The nature of the land meant that there were no significant constraints on the survey or the survey effort.

Table 1: Survey – Potential Constraints

Survey	Potential Constraint	Comment
Competency of the assessor	No	The vegetation study was completed by Lindsay Stephens of Landform Research who holds appropriate botanical qualifications and experience with Jarrah Marri Forest and local vegetation. Lindsay has observed the vegetation on at least three occasions at different times of the year.
Available published information	No	No published information is available for this site because the natural community has been cleared for plantation. However with the disturbed nature of the site desktop information on the original vegetation complexes is of less use. The site has only one species, <i>Corymbia calophylla</i> .
Timing of the Survey	Slight	The survey was conducted in Autumn on 10 May 2022. All species were readily identifiable and as noted above only one native species was present, over pasture. No groundcovers are likely because the ground cover is completely replaced by pasture that is subject to grazing by cattle. The density and number of exotic pasture species mean that there is little chance of small and herbaceous native species being present.
Adequacy of the survey	No	The site was surveyed by walking across the site and back, ensuring that any native tree was reviewed. The open nature of

		the site means that every species has likely been recorded. Every tree on site was inspected and measured if likely to be >500 mm. Those less than 500 mm were not recorded.
Vegetation Condition	No	The vegetation consists of exotic grass ground cover under isolated <i>Corymbia calophylla</i> .
Sources of plant identification	No	Published works, previous surveys, knowledge of the assessor, were used to identify species. A number of ground photographs and drone photographs were taken. As the local native species were all identified in the field no pressed specimens were required.
Follow up work required.	No	Not required at this stage.

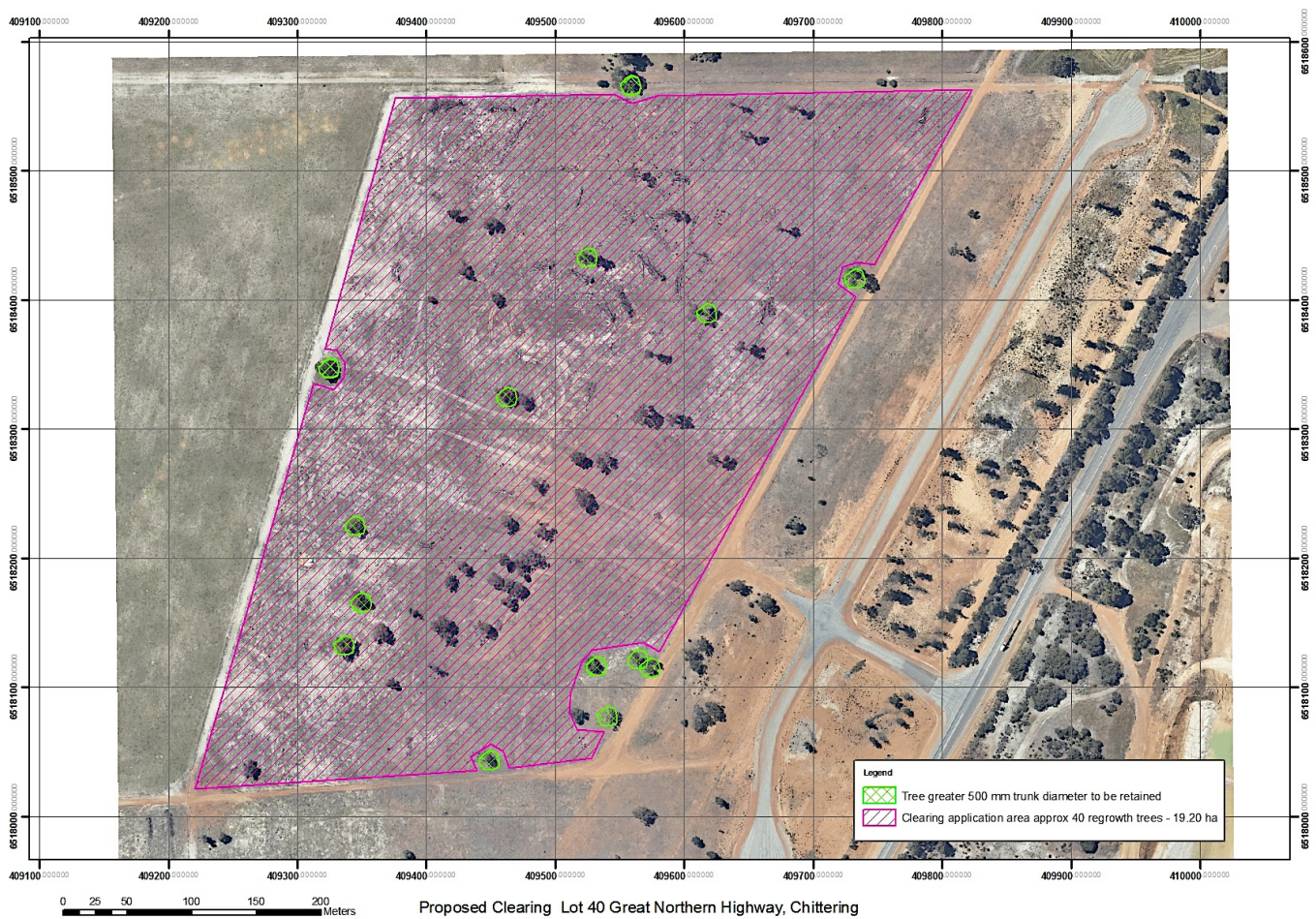


Figure 1 Location of trees >500 mm chest diameter. To be excluded from excavation

4.0 Site Description

The gravel resource lies on a remnant of a Tertiary erosion surface at an elevation that ranges from 194 metres in the south western corner to 220 metres in the central northeast.

Laterite soils and gravels cover the surface and represent the remnants of an ancient soil horizon developed on schists, gneisses and granites of the Chittering Metamorphic Belt.

The typical profile of the deposit is very shallow grey brown sandy gravel, yellow brown pisolitic gravels with an intermittent sheet of overlying sand 0 – 0.5 metres thick.

The typical soil profile is a grey brown loamy gravel and loamy gravel soil over yellow brown pisolitic gravels and laterite duricrust. The underlying duricrust varies from 0.5 to 1 metres in thickness. Under the duricrust is a variable depth of gibbsite rich pallid subsoils developed on the deeply weathered rocks of the Underlying Mesozoic sediments.

The soil system is classified as being on the boundaries of Mogumber (Mb), Karamal (Ka) and Coolakin (Cek) in Smolinski, 1998, *Soils of the Chittering Area, South West Forest Region, Western Australia, Department of Agriculture WA*. These are broad agricultural groupings that can vary locally, as is the situation here.

In reality the soils are relatively even across the resource, and in the field are laterite sandy gravels over duricrust with a variable sheet of overlying leached white sand

The reconstructed soils, at the completion of excavation, will be a blend of gravel and gibbsite rich materials to form manufactured gravelly loam soils of good water and nutrient holding capacity.



Figure 2 Subject land, view to the north west

5.0 Description of the vegetation

According to Heddle EM, OW Loneragan and JJ Havel, 1978, contained in; *Vegetation Mapping for the Atlas of Natural Resources, Darling System Western Australia*, Department of Conservation and Environment, the vegetation complex was originally “Yallanbee Complex in Low Rainfall Woodland of *Eucalyptus wandoo*-*E. accedens* and less consistently an open forest of *E. marginata* and *E. calophylla*. Dominant vegetation Types M and less consistently H and G”.

In Mattiske E M and Havel J J, 1998, Vegetation Complexes – Perth 1 : 250,000 Perth Sheet the vegetation is listed as “Yallanbee Complex described as Woodland of *Eucalyptus wandoo*-*E. accedens* less consistently open forest of *E. marginata* subsp *thalassica*-*Corymbia calophylla* on laterite uplands and breakaway landscapes in arid and periarid areas.

The site was originally Marri with some Jarrah Forest. No Wandoo or Powderbark Wandoo is present on site or nearby.

The land was cleared for pine plantation, and in recent years that has also been cleared. At planting of the pines the land was pasture with the larger trees were retained. All other species had been removed.

During the growth of the pines a few Marri germinated and grew and those trees are what remains on site today, together with 14 larger trees that are thought to have been present prior to the planting of pines. It is possible that some Marri germinated under the pines and because of edge effects, with greater light and soil moisture availability, have been able to grow fast enough to reach a chest diameter of 500 mm.

Following the clearing of the pines there has been scattered to isolated self seeding from the existing trees that has lead to seedling growth of 0 – 2 years in age.

There is only one species of native plant *Corymbia calophylla* present on site and no Threatened or Priority species or vegetation communities.



Figure 3 Subject land, view to the west



Figure 4 Subject land, view to the south west



Figure 5 View to the south west



Figure 6 Multistemmed Marri *Corymbia calophylla*, with some stems > 500 mm

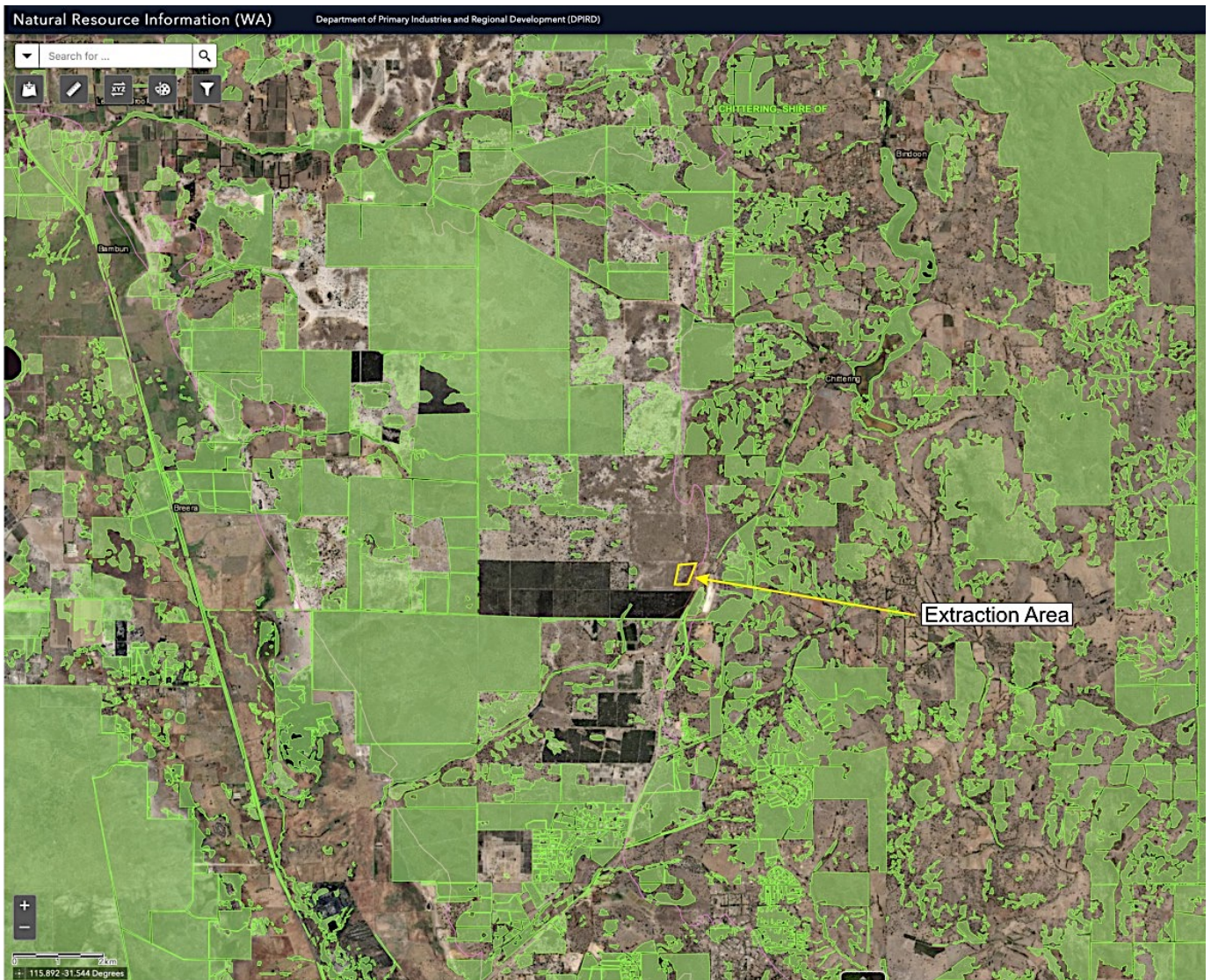


Figure 7 Extraction site located on cleared land and extent of local remnant vegetation

6.0 Significance of the Vegetation on site.

EPA Position Statement No 2, December 2000, Environmental Protection of Native Vegetation in Western Australia, specifically targets the retention of native vegetation in the Agricultural Areas in 4.1, Clearing in the agricultural areas for agricultural purposes. In 4.3, Clearing in other areas of Western Australia, it is unclear what "other areas" refers to, but may refer to retention of a 30% threshold in non agricultural areas.

Section 4.3 Clearing in other areas of Western Australia, (EPA Position Statement No 2, December 2000) expects that clearing will not take vegetation types below the 30% of the pre-clearing vegetation as recommended by ANZECC, 1999, National Framework for the Management and Monitoring of Australia's Native Vegetation. The National Objectives and Targets for Biodiversity Conservation 2001 - 2005 (Commonwealth of Australia 2001) also recognise 30% as the trigger value.

The threshold for constrained areas such as the Perth Metropolitan Region is placed at 10% by Government, (CPS 2682/1, and EPA Guidance No 10 Level of Assessment for proposals affecting natural areas within the System 6 region and Swan Coastal Plain portion of the System 1 Region page 9).

Bush Forever 2000 used a cut off of 10% for the Perth Metropolitan Area as a guidance to the significance of the vegetation complexes. The Western Australian Government's Urban Bushland Strategy recognised a minimum of 10% of Pre-European distribution of vegetation complexes, and the Regional Forests Agreement Process recognised 15%.

The only native species recorded on site is *Corymbia calophylla*.

The vegetation on site consists of regrowth trees and 14 trees larger than 500 mm chest diameter. No trees have observable hollows and certainly none large enough for Black Cockatoo nesting.

Even so the 14 larger trees are to be excluded from clearing and gravel extraction.

If the pines were replanted there would be an exemption under the Clearing Regulations to clear the native plants to make way for the pines. In this situation, where the pines are not to be replanted than that removal of native species is not permitted unless under Clearing Regulations.

The Vegetation Complex, Yallanbee 6 has 16.25% remaining of which just 1% are in secure land tenure.

Yallanbee 6 Vegetation Complex is shown in the Shire of Chittering Local Biodiversity Strategy, 2010, as having a pre-European extent of 2,7,581 hectares and a current area of 4,482 hectares or 1% in secure tenure. For the whole of the Shire of Chittering 38% of the Pre-European Vegetation was remaining in 2016 (CPS 6678 Decision Report).

On the other hand, at the time of the mapping for the Shire of Chittering Local Biodiversity Strategy, the subject land would have been classified as Pine Plantation and therefore not counted in the area of remaining vegetation. That is the removal of the scattered regrowth trees will not impact on the % of Yallanbee 6 vegetation remaining.

Moreover, the same vegetation complex, Yalanbee 6 is widespread east of the Swan Coastal Plain, in the Gingin Scarp and northern Darling Range. Yalanbee 6 extends from north of Bindoon to nearly Boyup Brook in the south. Murray 2 extends from north of Bindoon well to the south, but not quite as far as Boyup Brook. Moondah is restricted to valleys of the Gingin Scarp to the west and north west.

Locally there is significant remnant vegetation in Excellent Condition all around the subject land. Locally therefore the taking of the trees will not cause a significant impact.

Within the wider region Matiske Vegetation Complex recorded that Yallanbee 6 had a Pre-European Extent of vegetation as 198,396 hectares and a cover at 2016 of 93,230 hectares or 47% remaining, (CPS 6678 Decision Report) and 21% represented in Government managed lands.

With the exception of the Gingin Complex, all other vegetation complexes on the Dandaragan Scarp have well over 30% of Pre-European vegetation remaining. This site lies within the Mogumber Complex South which in 2018 had 38.6% of the Pre-European extent remaining (CAR Reserve Analysis, DBCA 2019).

Based on Heddle Vegetation Complex Yalanbee, the Pre-European extent and extents at 2016 were 158,392 hectares and 82,350 hectares or 52% remaining.

Bearing in mind that all the above figures would have counted the subject land, which was under pine plantation, as being represented in the already cleared land, there will be no impact on the recorded vegetation representation.

7.0 Trees > 500 mm Chest Diameter

Trees with trunk diameter > 500 mm and trees with hollows suitable for black cockatoo use are listed under the EPBC Act 1999, 2017 *Draft Guidelines for three threatened black cockatoo species; Carnaby's cockatoo (endangered), Baudin's cockatoo (Vulnerable) and red-tailed black cockatoo* and 2012 EPBC Act *Referral Guidelines for three threatened black cockatoo species* as being of significance to the breeding of black cockatoos.

Trees of that size or trees with suitable hollows for breeding normally are recommended to be referred to the Commonwealth for assessment if they are to be cleared.

Smaller trees that do not meet that criteria are not normally recommended to be referred to the Commonwealth unless there is significant feeding habitat.

There is a bilateral agreement in place between the State and the Commonwealth covering referrals to the Commonwealth under the State Clearing regime.

On the basis of the referral guidelines it is likely that any trees that are proposed to be cleared of > 500 mm trunk diameter should be considered for referral to the Commonwealth.

Apart from the Prescribed Clearing provisions as listed under the Conclusions below, all other clearing should be referred to the Department of Water Environment Regulation for a Clearing Permit prior to any disturbance.

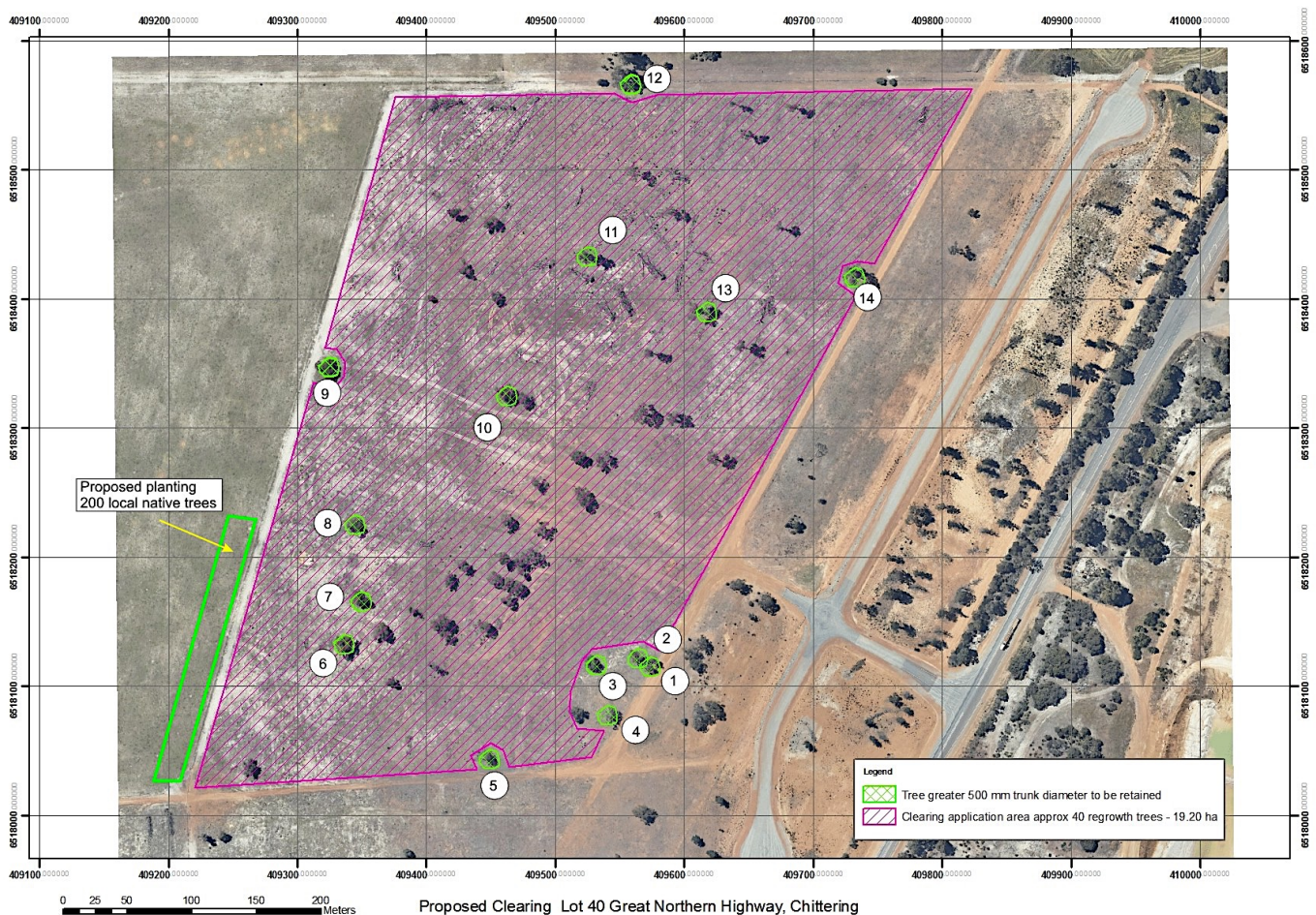


Figure 8 Location of habitat trees to be retained and proposed revegetation

Table 2 Table of trees with trunk diameter > 500 mm to be protected

No	Species	Diameter	Easting	Northing	Comment
1	Marri	600 mm	409 573	6518 119	
2	Marri	500 mm	409 563	6518 126	
3	Marri	700 mm	409 529	6518 120	
4	Marri	600 mm	409 542	6518 077	
5	Marri	600 mm	409 447	6518 045	
6	Marri	multistem	409 343	6518 130	multistem
7	Marri	700 mm	409 351	6518 169	multistem
		600 mm			
8	Marri	700 mm	409 343	6518 223	
9	Marri	700 mm	0409 325	6518 341	multistem
		700 mm			
10	Marri	600 mm	409 465	6518 326	multistem
		700 mm			
11	Marri	700mm	409 530	6518 433	
12	Marri	1150 mm	409 559	6518 571	
13	Marri	650 mm	409 614	6518 390	
14	Marri	700 mm	409 735	6518 417	

8.0 Conclusions - Clearing Principles

The removal of around 40 trees with an estimated 10 metre canopy diameter equates to around 47.3 m² per tree or 1,891.2 m² or 0.19 hectares, well below the 1.0 hectares for a significant amount of clearing. That level of canopy diameter will also account for the regrowth seedlings.

Bearing in mind that all the above figures would have counted the subject land, which was under pine plantation, as being represented in the already cleared land, there will be no impact on the recorded vegetation representation.

The subject land is classified as cleared within all assessments of the Pre-European area of remnant vegetation and therefore there will be no impact on the published or existing remnant native vegetation complexes.

The subject land could be cleared if pines were to be replanted and the plantation continued.

All trees with a chest diameter of 500 mm or greater will be retained.

There is only one species of native plant *Corymbia calophylla* present on site and no Threatened or Priority species or vegetation communities.

9.0 Thresholds for Registration of Clearing – Clearing Permit Exempt

The proposed clearing is compatible with all Clearing Principles and compatible with the Clearing Referral Exemptions under the “Very Low Impact Guidelines” of the *Environmental Protection (Clearing of Native Vegetation Regulations 2004)*.

Table 3 Assessment against the Guidelines for Registration of Clearing

Criteria for Registration	
Area to be cleared is < 1.0 hectare	The area proposed to be cleared is 0.19 hectares
The vegetation complex should have > 30% remaining	This site lies within the Mogumber Complex South which in 2018 had 38.6% of the Pre-European extent remaining (CAR Reserve Analysis, DBCA 2019). Based on Heddle Vegetation Complex Yalanbee, the Pre-European extent and extents at 2016 were 158,392 hectares and 82,350 hectares or 52% remaining.
There should be > 30% vegetation complex remaining within a 5 km radius.	The land as being cleared is part of an old pine plantation. The proposed clearing lies in an area with widespread retention of native vegetation constituting much >30% of the Pre-European native vegetation Figure 7.
Other Criteria considered	
Quality of the vegetation	There is only one species, <i>Corymbia calophylla</i> over pasture. Around 40 regrowth trees are proposed to be cleared in 19.20 hectares. The removal of the trees could occur under the Clearing Regulations if the pines were replanted. As the site is to be excavated for gravel, a review to the applicability of the Clearing Regulations is required. Some trees can legally be removed under farm management as they are > 50 metre spacings.
Black Cockatoo habitat	All trees of > 500 mm chest diameter are to be retained.
Compensation	200 local native trees suitable for Black Cockatoo feeding habitat are to be planted.
Controls	Will be controlled under a Condition on Development Approval on the Extractive Industry through the Shire of Chittering.

Lindsay Stephens

Lindsay Stephens BSc Geology), MSc (Plant Ecology)
Mem Aus Geomechanics Soc – MEIANZ – F IQA - MAIG

1/49 Birdwood Avenue, Como WA 6152
Tel 9474 3978, landform@iinet.net.au