Landform Research

ASSESSMENT OF VEGETATION

STAGE 3 BINDOON HILL GRAVEL SUPPLY 22 May 2022

LOT 7 TOY ROAD BINDOON

Background

There has been gravel extraction from portion of Lot 7 Toy Road Bindoon since 2000.

The resource has been divided into three stages of which the western Stages 1 and 2 have been approved for excavation since 2000.

Excavation approvals to this time have been limited to the western two thirds of the resource with excavation being confined to the western end of the resource.

Clearing Permit CPS 5843/3 was approved for Stages 1 and 2, and in 2020 the approval time of the Permit was extended by DWER to 1 February 2029.

An application for Development Approval has been lodged with the Shire of Chittering for renewal of excavation on Stages 1 and 2 and also on Stage 3.

Previous studies have assessed the vegetation on Stages 1 and 2 and those assessments were used to inform the Clearing Permit.

This study is therefore confined to Stage 3 as clearing is approved across Stages 1 and 2 (CPS 5843/3)

Aims of the Survey

Conduct a flora and vegetation survey.

- Map the 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.

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 vegetation. Lindsay has been visiting the site since before 2000 and is on site at least once per year and has observed the vegetation on many occasions.
Available published information	No	Some published information is available for this site because the natural community has been cleared a number of times in the past, with the latest appearing to be around 1960's from Google Earth and other mapping sources such as Bing and Landgate. However with the disturbed nature of the site desktop information on the original vegetation complexes is of less use.
Timing of the Survey	Slight	The survey was conducted in Autumn on 10 May 2022, but all species were readily identifiable. 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 areas that every species has likely been recorded.
Vegetation Condition	No	The vegetation consists of exotic grass ground covers.
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, but may be required prior to the application for a Clearing Permit if that is delayed for more than 5 years.

Drone photo towards the east across Stage 3

Acacia saligna perennial feed showing spread by self seeding

Site Description

The gravel resource lies on a remnant of a Tertiary erosion surface at an elevation that ranges from 250 metres in the west and east of the excavation area to 282 metres in the central north. From the plateau remnant the land drops away to the south to the Brockman River.

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

The soil system is classified as Yalanbee (Y) in Smolinski, 1998*, Soils of the Chittering Area, South West Forest Region, Western Australia,* Department of Agriculture WA.

> *"Yalanbee - Gently undulating landscape dominated by fine laterite sandy gravels and loamy gravels."*

The typical profile of the deposit is very shallow grey brown sandy gravel, yellow brown pisolitic gravels of the Yalanbee type overlying coarser darker and red brown pisolotic laterite duricrust rock. Under the duricrust is a variable depth of gibbsite rich pallid subsoils developed on the deeply weathered rocks of the Chittering Metamorphic Belt.

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.

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.

The site was originally Jarrah Marri Forest. No Wandoo or Powderbark Wanndoo is present on the laterite plateau but occurs on the breakaway slopes around the edges of the laterite.

Stages 1, 2 and 3 are cleared to parkland pasture, with scattered clumps of regrowth *Corymbia* (*Eucalyptus calophylla)* and occasional scattered regrowth of *Eucalyptus marginata*. There is almost no other native species.

Acacia saligna growth has occurred in the west, after having been planted as a stock feed across all three stages to provide feed during times of low pasture resources. It is now self seeding in other locations and has been temporarily retained as a perennial cattle stock feed.

Clearing of the property occurred in the 1960's, based on information from the current landowner, and that aligns with the observed vegetation.

In the west on Stage 1, the only understorey was occasional *Acacia pulchella* in one small area in the west of site. This vegetation contained scattered *Hibbertia rupicola*.

There are occasional mature trees and *Dryandra* (*Banksia sessilis*) where the vegetation is in better condition near the northern boundary of Lot 7 self seeding from the adjoining remnant vegetation. This vegetation generally lies within the 20 metre excavation buffer zone and is therefore not considered for excavation.

The remainder of the site has no remnant native understorey species.

Stage 3 Vegetation

The vegetation of Stage 3 is parkland pasture mainly with clumps of Marri, *Corymbia (Eucalyptus) calophylla* with occasional Jarrah, *Eucalyptus marginata.*

There is a clump of *Acacia pulchella* in the south eastern corner of Stage 2. Apart from that there were two plants of *Allocasuarina fraseriana*, 5 plants of *Hakea prostrata*, three plants of *Jacksonia sternbergiana* and 1 plant of *Dichopogon capillipes*.

Within each clump of trees is one or more large trunked tree with regrowth trees around it and spreading outwards in an age pattern.

What has occurred is that when the land was cleared the large trees were retained as single trees or very small clumps. From that time the large trees seeded, and germination and regrowth has spread outwards. That has meant that in the clumps of trees the age of the trees reduces outwards to small seedlings on the edge.

Compare the aerial photograph from 2007 to the current aerial photograph. Also note that the costeans dug to test the gravel are all visible in 2007 and yet today they have trees in them up to five metres high.

Large Marri tree with regrowth seeded smaller trees extending the clump

Large tree retained with the extensive regrowth from seedlings

Regrowth of Marri seedings in gravel test costean. The trees are not present in the 2007 aerial photograph

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), Baudins 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.

Table 2 Table of trees with trunk diameter > 500 mm in Stage 3

No	Species	Diameter	Easting	Northing	Comment
1	Marri	1300 mm	418 819	6533 733	
2	Marri	1400 mm	418 775	6533702	
3		1200 mm	418 780	6533 702	Dead Tree
4	Marri	900 mm	418 771	6533 690	
5	Jarrah	1100 mm	418 772	6533 690	Maybe has hollows suitable for Cockatoos. No evidence of chewing or use.
6	Jarrah	800 mm	418 772	6533 687	Semi dead. Likely hollows that are too small for Cockatoos. No evidence of chewing or use.
7	Jarrah	1700 mm	418 737	6533 687	Hollows likely suitable for Cockatoos. No evidence of chewing or use.
8	Marri	1400 mm	418 690	6533 702	
9	Marri	1300 mm	418 708	6533 732	
10	Marri	600 mm	418 694	6533 744	
11	Marri	800 mm	418 689	6533 747	
12	Marri	1300 mm	418 630	6533 729	
13	Marri	1500 mm	418 616	6533 677	
14	Marri	1300 mm	418 609	6533 663	
15	Marri	1100 mm	418 558	6533 635	

16	Marri	1100 mm	418 540	6533 663	
17	Marri	1300 mm	418 525	6533 719	
18	Marri	1400 mm	418 525	6533 702	
19	Marri	1300 mm	418 519	6533 651	
20	Marri	1200 mm	418 496	6533 625	
21	Marri	1400 mm	418 496	6533 608	
22	Marri	1000 mm 850 mm	418 407	6533 525	Multi-stemmed
23A	Jarrah	1700 mm	418 337	6533 494	Burnt out large trunk. Located on Stage 2.
24A	Jarrah	1200 mm	418 360	6533 492	Located on Stage 2.
25A	Jarrah	1300 mm	418 368	6533 491	Located on Stage 2.
26	Jarrah	2500 mm	418 489	6533 556	Multi-stemmed, Hollow that may be too large for use.
27	Jarrah	1600 mm	418 491	6533 583	Hollows that look small but may be suitable.
28	Marri	800 mm	418 555	6533 529	
29	Marri	850 mm	418 563	6533 534	
30	Marri	1100 mm	418 579	6533 482	
31	Marri	1100 mm	418 683	6533 468	On fence in the buffer zone
32	Marri	700 mm	418 716	6533 555	
33	Marri	250 mm – 750 mm	418 794	6533 501	Multi- stemmed
34	Marri	500 mm and less	418 883	6533 460	Multi- stemmed
35		1200 mm	418 895	6533 555	Large dead tree with potential hollows
36	Marri	< 500 mm	418 908	6533 578	Multi-stemmed with 800 mm below the individual stems
37	Marri	< 500 mm	418 596	6533 615	Multi-stemmed with 850 mm below the individual stems
38	Marri	1200 mm	418 910	6533 643	
39	Marri	1700 mm	418 914	6533 653	Mainly dead
40	Marri	550 mm	418 930	6533 666	
41	Marri	1100 mm	418 925	6533 669	Multi-stemmed with 1100 mm below the individual stems
42	Marri	550 mm	418 900	6533 786	
43	Marri	< 500 mm	418 892	6533 681	Base of multi stemmed tree is 1200 mm
44	Marri	600 mm	418 881	6533 683	
45	Marri	600 mm	418 876	6533 670	
46	Marri	850 mm	418 889	653647	
47	Marri	900 mm	418 894	6533 647	
48	Marri	850 mm	418 941	6533 712	

49	Marri	700 mm	418 918	6533 774	
50	Marri	700 mm	419 175	6533 438	Lies outside the excavation area

Cluster of large trees at 4, 5, 6

Large old tree (37) with large hollows

Conclusions

The land is parkland pasture with almost all the trees Marri *Corymbia (Eucalyptus) calophylla* and occasional Jarrah *Eucalyptus marginata*, over pasture.

At clearing in the 1960's large trees were retained and have self seeded leading to seeding and regrowth of progressively young trees around the edges of the clumps and enlargement of the clumps over the years.

The land is agricultural land and as such it is possible for the landholder to clear regrowth trees up to 20 years old to return the land to its state 20 years ago under *the Prescribed Clearing Provision (14)* for Agricultural Purposes. *Environmental Protection (Clearing of Native Vegetation) Regulations 2004.*

As the *Acacia saligna* is a planted perennial crop it can be cleared under *Prescribed Clearing Provision (14)* as it is intentionally planted.

Maintenance of fences, fire breaks and the clearing of native vegetation will require a Clearing Permit.

Apart from the Prescribed Clearing Provisions listed in the Clearing Regulations, all other clearing should be referred to the Department of Water Environment Regulation for a Clearing Permit prior to any disturbance.

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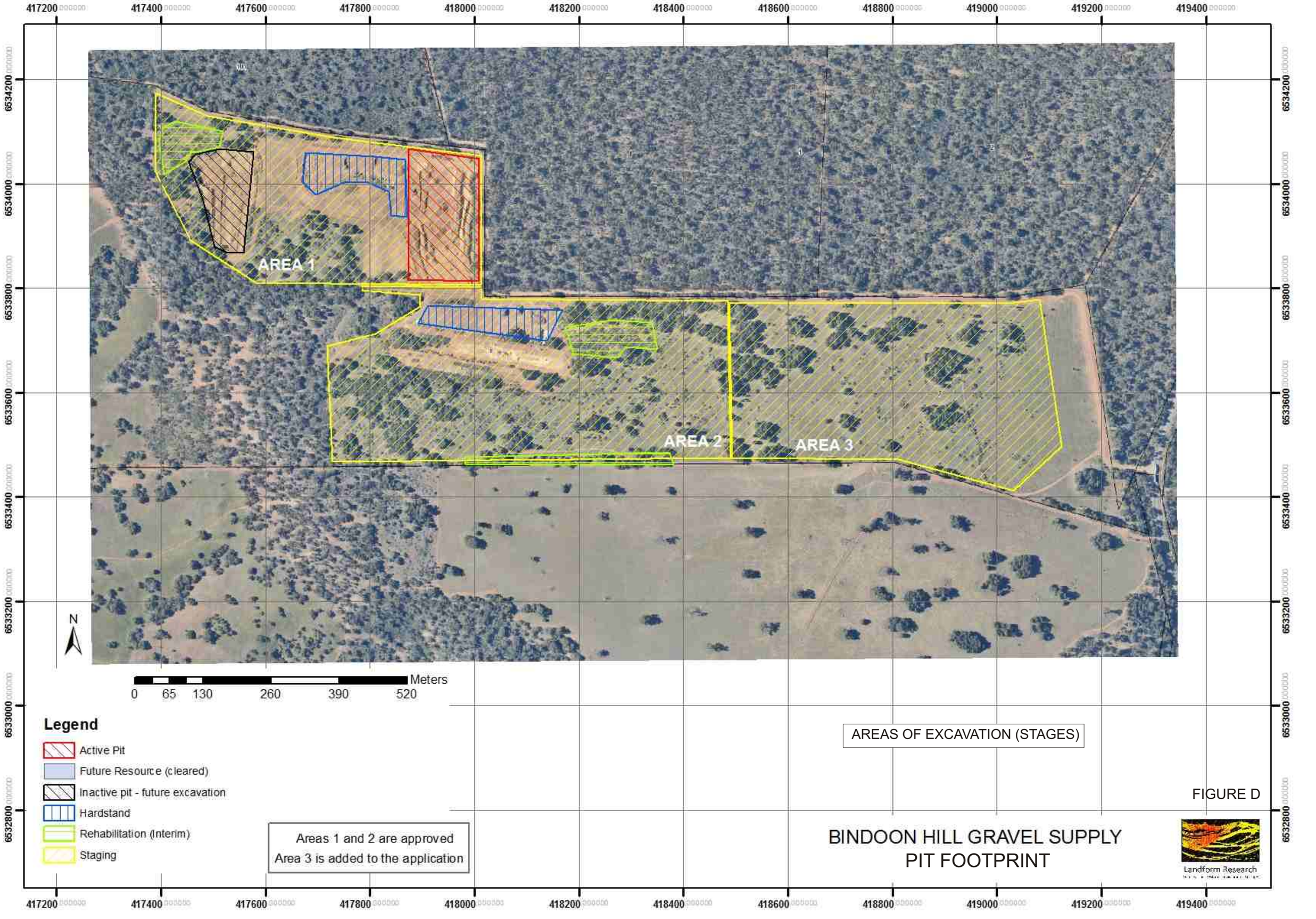

AREAS OF EXCAVATION (STAGES)

FIGURE D

BINDOON HILL GRAVEL SUPPLY
PIT FOOTPRINT

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2007

0 100m

2007 VEGETATION ON STAGE 3 - PROPOSED EXTRACTION LOT 7

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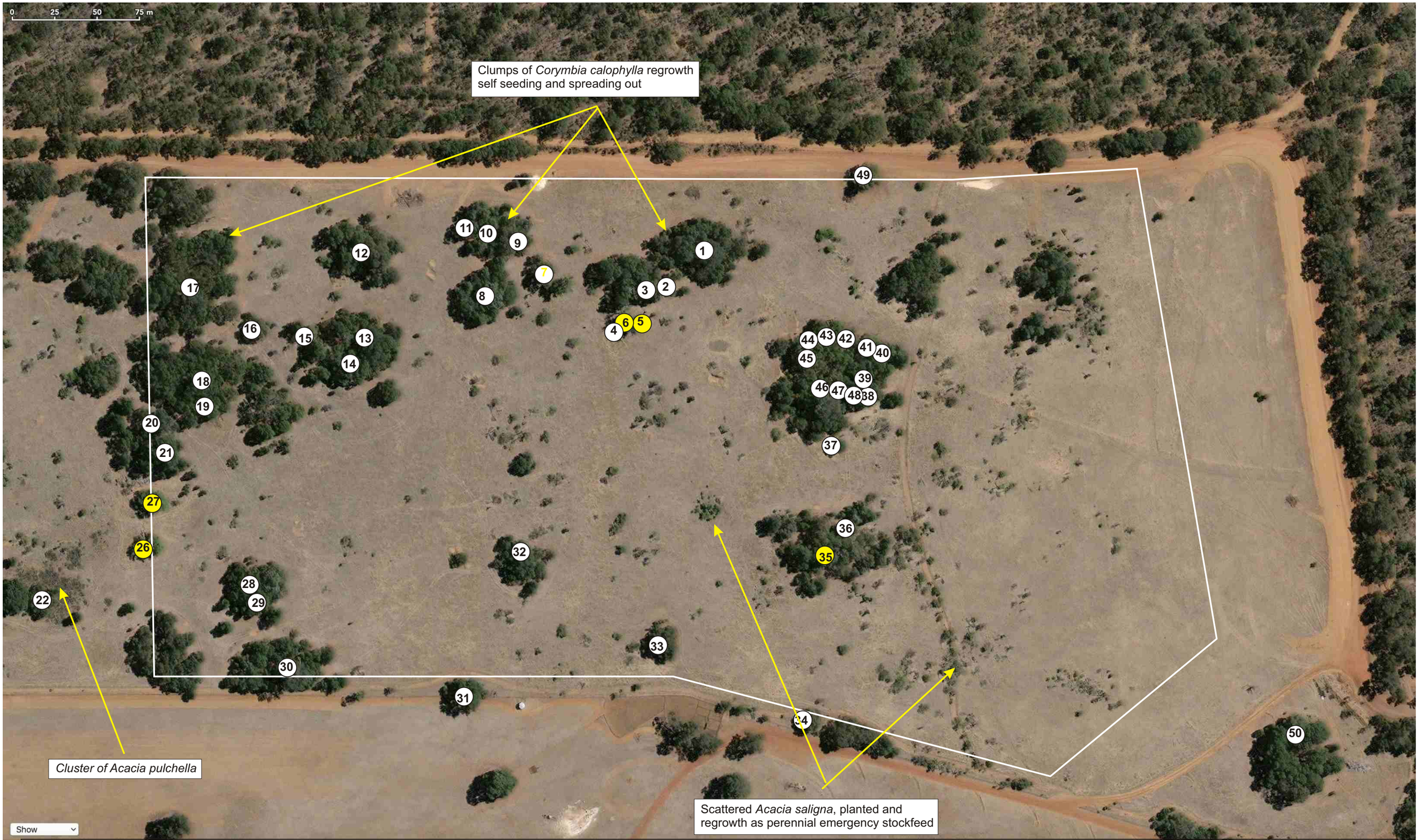

23 24 25 Trees 22, 23, 24 and 25 are in Stage 2, covered by Clearing Permit CPS 5843.
Trees 20, 26 and 27 may also be included in CPS 5843
Trees 30, 31, 34 49 and 50 lie outside the excavation .

0 100m

VEGETATION ON STAGE 3 - PROPOSED EXTRACTION LOT 7

23 Tree > 500 mm trunk diameter

23 Tree > 500 mm trunk diameter with possible hollows suitable for cockatoos

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