

Vegetation Assessment Report

Menangle Park Planning Proposal

Dahua Group Australia

29 July 2021

Final



Report No. 17072RP23

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

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Glossary

Abbreviation	Meaning
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BBAM	BioBanking Assessment Method (replaced by BAM)
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BVT	Biometric Vegetation Type
CEEC	Critically Endangered Ecological Community
CKPOM	Campbelltown Comprehensive Koala Plan of Management
Council	Campbelltown City Council
DA	Development Application
DAWE	Commonwealth Department of Agriculture, Water and the Environment
dbh	diameter at breast height
DECC	NSW Department of Environment and Climate Change (now EES)
DECCW	NSW Department of Environment and Climate Change and Water (now EES)
DEWHA	Commonwealth Department of Environment, Heritage, Water and the Arts (now DAWE)
EEC	Endangered Ecological Community
EES	Environment, Energy and Science Group
GIS	Geographic Information System
ha	hectares
km	kilometres
KMA	Koala Management Area
KPOM	Koala Plan of Management
KUTS	Koala Use Tree Species (as detailed in Schedule 2 of the Koala SEPP 2021)
LGA	Local Government Area
LLS Act	NSW <i>Local Land Services Act 2013</i>
m	metres
NSW	New South Wales
PKFTs	Preferred Koala Feed Trees as detailed in the CKPOM
PCT	Plant Community Type
proponent	Dahua Group Australia
Study Area	Defined in Figure 1
TEC	Threatened Ecological Community

Executive Summary

S1 Purpose

Cumberland Ecology was engaged by Dahua Group Australia (the 'applicant') to provide a Vegetation Assessment Report (VAR) to support the Menangle Park Planning Proposal (Department Ref: PP_2020_CAMPB_003_00). The VAR is required to ensure the Planning Proposal for the urban release area (URA) is consistent with the *State Environmental Planning Policy (Koala Habitat Protection) 2021* and Campbelltown's approved Comprehensive Koala Plan of Management (CKPOM). This Vegetation Assessment Report (VAR) has been prepared by Cumberland Ecology to support this response to Gateway Condition 1(g).

The aim of the Koala SEPP 2021 is to "encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline". Since March 2021 the Koala SEPP 2021 applies across the Campbelltown Local Government Area replacing the repealed *State Environmental Planning Policy 44 (Koala Habitat Protection)* (SEPP 44). Accordingly, Dahua has been required to consider and address the Planning Proposal's consistency with the Koala SEPP 2021.

Under the Koala SEPP 2021 proposals for new development (under a Development Application (DA)) must be assessed against the applicable Koala Plan of Management. In this instance, Campbelltown's approved Comprehensive Koala Plan of Management (CKPOM).

The CKPOM defines 'Core Koala Habitat' as "*an area of land with a resident population of koalas, evidenced by attributes such as breeding females and recent sightings of and historical records of a population*". 'Potential koala habitat' is defined as "*areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component*". To assess whether future development envisaged under the Planning Proposal would adversely impact on core or potential koala habitat, the study undertaken by Cumberland Ecology included a desktop study and extensive site surveys across the Planning Proposal site.

S2 Findings

The URA is in old farmland and most land proposed for future urban development is cleared. No core koala habitat occurs within the URA. No koala shelter tree species listed by the CKPOM occur on site. Some patches of forest and woodland with potential koala habitat occur.

No future DA in Menangle Park will impact core koala habitat. None will require clearing of connected corridors of forest or woodland.

The investigation mapped koala feed trees within areas of native vegetation that remains on the URA. These include the following communities with Critically Endangered Ecological Community (CEEC) and Endangered Ecological Community (EEC) status under the NSW Biodiversity Conservation Act 2016 and or the Commonwealth Environment Protection and Biodiversity Conservation Act 1999:

- Shale Plains Woodland;

- Shale Hills Woodland;
- Shale Hills Woodland (derived native grassland);
- Elderslie Banksia Scrub Forest;
- River-flat Eucalypt Forest;
- Swamp Oak Floodplain Forest;
- River Oak Riparian Woodland; and
- Freshwater Wetlands.

The surveys covered 75% of the site and mapped 2,529 native trees, of which 2,152 were classified as Koala Use Trees Species (KUTS) under the Koala SEPP 2021. These include an estimated 455 Preferred Koala Feed Trees (PKFTs) under the CKPOM, which were solely comprised of *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus moluccana* (Grey Box).

A range of forest and woodland patches occur in the URA. The largest most continuous areas of KUTS and PKFTs are in or adjacent to riparian corridors. The forest and woodland that form 'potential koala habitat' are mainly River-flat Eucalypt Forest and some patches of Cumberland Plain Woodland.

The largest most continuous areas of KUTS and PKFTs will be conserved. They are in the Howes Creek and Nepean River open space corridors and will be retained and managed in perpetuity under the planning framework proposed. Within these open space corridors, extensive vegetation restoration will occur, with potential for substantial increases in the cover of PKFTs. Additionally, areas of Elderslie Banksia Scrub Forest and River-flat Eucalypt Forest communities comprising KUTS and PKFTs will be contained within new RE1 – Public Recreation zoned open space areas to be protected in perpetuity under Vegetation Management Plans. This new zoning approach represents a significant improvement on the existing zoning framework for Menangle Park, ensuring greater alignment with the provisions of the Koala SEPP 2021 and the CKPOM.

The most substantial areas of potential koala habitat will be retained and protected in planned open space zones. Where limited patches of potential koala habitat are required to be impacted by development, DAS requiring such clearance will need to be supported by a Koala Activity Assessment Report (KAAR), consistent with the methodology outlined in the CKPOM. The KAARs will need to demonstrate how disturbance of KUTS and PKFTs can be avoided and/or suitably identify why impacts will not adversely denigrate local koala populations or habitat areas.

Owing to the lack of evidence observed on site and lack of recordings of koala populations in Menangle Park over the past two decades, it is considered highly unlikely that the potential koala habitat areas currently support, or would be capable of supporting, such populations into the future.

The Planning Proposal is consistent with the Koala SEPP 2021 and CKPOM as it:

- Includes additional public open space and designated E2 - Environmental Protection zoned areas to protect potential koala habitat areas in perpetuity; representing a significant improvement on the current zoning framework;

- Retains the overwhelming majority of potential koala habitat areas in the riparian corridors along Howes Creek and the Nepean River, providing native vegetation corridors that could be utilised by local koala populations cited further to the south-east within the Dharawal National Park; and
- Is supported by an updated Structure Plan which contains developable areas to be predominantly cleared areas of the site and has had thorough consideration of ongoing environmental investigations including the results of this VAR and previous biodiversity studies.

Areas of potential koala habitat within the proposed future developable areas are limited and fragmented. There is no substantial connectivity to other such habitat. Future development within the designated residential, business or industrial zoned lands will not significantly impact koala populations or core habitat.

1. Introduction

1.1. Purpose

Cumberland Ecology has been requested by Dahua Group Australia (the 'client') to provide a Vegetation Assessment Report (VAR) to support the Menangle Park Planning Proposal (Department Ref: PP_2020_CAMPB_003_00). It is understood that the VAR is required to ensure the Planning Proposal is consistent with the *State Environmental Planning Policy (Koala Habitat Protection) 2021* and Campbelltown's approved Comprehensive Koala Plan of Management (Phillips 2018).

Section 6.2.4(i) of the KPOM states: *'A planning proposal pursuant to Section 55 of the EPA Act should demonstrate consistency with this Plan (being the KPOM) so as to identify the likely impact on koala habitat and populations of the type of development to be facilitated by the rezoning'.*

Demonstrating consistency with Campbelltown's approved Comprehensive Koala Plan of Management (CKPOM) also demonstrates consistency with the *State Environmental Planning Policy (Koala Habitat Protection) 2021*. In order to show consistency with the CKPOM, Section 6.3.1 of the CKPOM states:

(i) A rezoning or DA must establish if the land being the subject of the application contains any potential koala habitat by way of a Vegetation Assessment Report (VAR); and

(ii) As a minimum, the VAR shall include:

- *a description of the tallest stratum cover as well as details of the species composition of each vegetation community*
- *a checklist of native vegetation species occurring in each vegetation patch, including any isolated paddock trees on partially cleared lands*
- *a stadia-metric survey that identifies the precise location, identity and dbh of all native vegetation proposed to be removed and/or within 20m of the proposed development footprint, including any proposed infrastructure, easements and APZs*
- *a map of where (P)KFTs and shelter trees were recorded.*

Section 6.4.8 of the CKPOM relevant to planning proposals states:

(ii) for the purposes of Section 6.4.2 of the Plan, Council may exercise discretion subject to the application demonstrating to the satisfaction of Council that that retention of (P)KFTs > 200mm DBH has been maximised and that the proposed tree removal will not prejudice the overall vision, aims and objectives of the Plan

In accordance with the CKPOM, for the purposes of mapping and determining Preferred Koala Feed Trees (PKFTs), this report defines PKFTs as those listed in Appendix E of the CKPOM that occur within the Study Area and have a diameter-at-breast-height (DBH) of >200mm.

Table 1 details the location of each of the above VAR requirements within this report.

Table 1 Compliance Table – VAR Requirements under Campbelltown CKPOM

Requirement	Report Location
Description of the tallest stratum cover as well as details of the species composition of each vegetation community	Chapter 3
A checklist of native vegetation species occurring in each vegetation patch, including any isolated paddock trees on partially cleared lands	Appendix A details species composition of BBAM quadrats undertaken within vegetation patches. Appendix B and C detail species composition of BAM plots undertaken within vegetation patches. Chapter 4 details the location of quadrats/plots with reference to figures included in the VAR, and composition of canopy species in patches without BBAM quadrats or BAM plots. Quadrat/plot locations are shown in Figures 4 – 6 . The species composition of scattered native paddock trees is detailed in Table 6 in Chapter 5 and Figures 7 – 9 .
A stadia-metric survey that identifies the precise location, identity and dbh of all native vegetation proposed to be removed and/or within 20m of the proposed development footprint, including any proposed infrastructure, easements and APZs	A stadia-metric survey of all native vegetation was conducted as detailed in Section 2.2.3 . The results of the Stadia-Metric Survey relevant to PKFTs and shelter trees are detailed in Chapter 5 , with the locations shown in Figures 7 - 9 .
A map of where (P)KFTs and shelter trees were recorded.	All PKFTs (including shelter trees) recorded within the Study Area are shown in Figures 7 - 9 .

The area subject to this VAR is referred to as the Study Area throughout this report and is shown in **Figure 1** as the “Planning Proposal Boundary”. Note, the Study Area includes areas of vegetation to be retained in future proposed conservation areas such as the central riparian corridor along Howes Creek, in which Stadia Metric Surveys were not undertaken as they are not within 20 m of the proposed development footprint.

1.2. State Environmental Planning Policy (Koala Habitat Protection) 2021

State Environmental Planning Policy (Koala Habitat Protection) 2021 (Koala SEPP 2021) applies to the Campbelltown Local Government Area (LGA) as of 17 March 2021. It replaces the *State Environmental Planning Policy (Koala Habitat Protection) 2020*, reverting to for the most part, the changes legislated by *State Environmental Planning Policy (Koala Habitat Protection) 2019*, which replaced the older *State Environmental Planning Policy No. 44 – Koala Habitat Protection* (SEPP 44), and proposed a number of changes to the older legislation.

The Koala SEPP 2021 includes a new definition of ‘core koala habitat’. The list of tree species used by koalas listed under Koala SEPP 2021 has also been expanded from 10 under SEPP 44, to 123 under the Koala SEPP 2021, across nine distinct regions of NSW. The regions are known as Koala Management Areas (KMAs). Tree

species detailed in Schedule 2 of Koala SEPP 2021 utilised by koalas as habitat are referred to as Koala Use Tree Species (KUTS).

Under the Koala SEPP 2021 a Development Application (DA) must assess the impacts of the development on koalas where there is no Koala Plan of Management (KPOM) in place with the preparation of a Koala Assessment Report (KAR). A KAR is only required if the property the development is proposed to take place on is greater than one hectare, or adjacent land holdings by the same land holder combined exceed one hectare, and Core Koala Habitat is present. If a KPOM is in place a DA is required to demonstrate consistency with the KPOM.

Core Koala habitat is described in the Koala SEPP 2021 as:

- (a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or*
- (b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.*

Highly suitable habitat is defined within the fact sheet for DAs under the Koala SEPP 2021 (DPIE 2021) as a vegetation patch in which 15% of the canopy trees are species listed as habitat species (i.e. KUTS) in Schedule 2 of the SEPP.

Historical koala occupation of an area according to the fact sheet for DAs under the Koala SEPP 2021 (DPIE 2021) is determined by considering koala records within the last 18 years, within the following maximum distances from the external boundary of the site area:

- 2.5 kilometres of the site (for North Coast, Central Coast, Central Southern Tablelands, South Coast KMAs);
- 5 kilometres of the site (for Darling Riverine Plains, Far West, North West Slopes, Riverina, Northern Tablelands KMAs); and
- 'Recorded' means recorded in the form of BioNet records. Note BioNet records with a locational accuracy of more than 1,000 metres are not to be considered under the SEPP.

The Study Area is within the Central Coast KMA and there are several records of koala in BioNet within 2.5 km of the Study Area, which have been recorded within the last 18 years. The majority of vegetation within the Study Area is within 2.5 km of these records, and is considered to be Highly Suitable Habitat by canopy species composition, i.e. it is dominated by *Casuarina glauca*, *Eucalyptus crebra*, *Eucalyptus moluccana*, and *Eucalyptus tereticornis*, which are all KUTS. As such, proposed removal of vegetation in any area with greater than 15% KUTS in the Study Area is likely to trigger the requirement for a DA to need a consistency assessment to demonstrate consistency with the CKPOM. This includes the majority of the vegetation in the Study Area with the exception of exotic dominated areas, areas of Elderslie Banksia Scrub and River Oak Riparian Woodlands, or areas without a woody canopy.

1.3. Campbelltown Comprehensive Koala Plan of Management (CKPOM)

The CKPOM utilises the definitions of koala habitat from the repealed SEPP 44. These definitions are:

"Core koala habitat" means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.

"Potential koala habitat" means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.

Trees listed in Appendix E of the CKPOM with a DBH >200mm are referred to as PKFTs.

2. Methods

2.1. Desktop Study

Potential Koala Habitat as defined in the CKPOM was mapped by Cumberland Ecology across the Study Area based on the presence in vegetation patches of occurrences of greater than 15% PKFTs (**Figure 2**). The Potential and Core Koala Habitat originally identified by the CKPOM within the LGA and Study Area is shown in **Figure 3**.

Koala records from the last 18 years (dating from the 21st July 2003) were obtained from within a 5 km radius of the Study Area using the Environment, Energy and Science (EES) BioNet Atlas (EES 2021). A review of these records (**Figure 2**) shows no koalas have been recorded within the Study Area within the last 18 years. Koalas have not been recorded within the Study Area by Cumberland Ecology despite fauna surveys across the site including Spot Assessment Technique (SAT) surveys in some areas for koala scats, and other survey methods including spotlighting and visual inspection of trees for hollows/fauna habitat. As such, no areas of Core Koala Habitat under the CKPOM have been mapped as occurring within the Study Area. This is consistent with the mapping within the CKPOM, which does not map any Core Koala Habitat within the Menangle Park locality.

2.2. Surveys

Surveys undertaken which are relevant to the results presented in this VAR are detailed under the below headings.

2.2.1. BBAM Surveys

A total of 37 BBAM plots and transects were conducted within the Study Area. BBAM plots were undertaken within the Study Area by a botanist in September and October 2016, October 2017, and April 2019.

The locations of BBAM plots and transects were recorded using a GPS. The location of BBAM plots and transects are shown in **Figures 4 - 6** and their association with specific vegetation patches. Plot locations were selected randomly in areas representative of the varying conditions of the vegetation within the Study Area. The BBAM plots include a 50 m transect, a 20 x 50 m plot in which habitat values are recorded and a 20 x 20 m flora survey plot.

The following data was collected at each of the BBAM plot and transect locations:

- Native species richness recorded within each stratum of a 20 x 20 m plot;
- Native over-storey projected foliage cover recorded at 10 points along a 50 m transect;
- Native mid-storey projected foliage cover recorded at 10 points along a 50 m transect;
- Native groundcover projected foliage cover recorded at 10 points along a 50 m transect for three life forms (shrubs, grasses and other);
- Weed species projective foliage cover expressed as a percentage of over-storey, mid-storey and ground cover along a 50 m transect;
- Number of trees with hollows where entrance width is over 5 cm and hollow is at least 1 m above ground within the 20 x 50 m plot;

- The percentage of regenerating canopy species within the vegetation zone; and
- The total length in metres of fallen logs over 10 cm in diameter within the 20 x 50 m plot.

In addition, native plant species richness within a 20 x 20 m plot and full floristic data was also collected to enable classification of each vegetation zone to the best-fit Plant Community Type (PCT).

The results of BBAM Surveys are detailed in **Appendix A**.

2.2.2. BAM Surveys

Seventeen BAM plots were undertaken within the Study Area on the 2nd and 3rd September 2020 (results detailed in **Appendix B** and location shown on **Figures 4 - 6**), and an additional four BAM plots were undertaken on the 22nd of June 2021 (results detailed in **Appendix C** and location shown on **Figures 4 - 6**).

BAM requires the establishment of a 20 x 50 m plot with an internal 20 m x 20 m plot. The following data was collected within the plot:

- Composition for each growth form group by counting the number of native plant species recorded for each growth form group within a 20 m x 20 m floristic plot;
- Structure of each growth form group as the sum of all the individual projected foliage cover estimates of all native plant species recorded within each growth form group within a 20 m x 20 m floristic plot;
- Cover of 'High Threat Exotic' weed species within a 20 m x 20 m floristic plot;
- Assessment of function attributes within a 20 m x 50 m plot, including:
 - Count of number of large trees;
 - Tree stem size classes, measured as 'diameter at breast height over bark' (DBH);
 - Regeneration based on the presence of living trees with stems <5 cm DBH;
 - The total length in metres of fallen logs over 10 cm in diameter;
- Assessment of litter cover within five 1 m x 1 m plots evenly spread within the 20 m x 50 m plot; and
- Number of trees with hollows that are visible from the ground within the 20 m x 50 m plot.

2.2.3. Stadia Metric Surveys

Stadia Metric Surveys were undertaken within the Study Area of trees by Craig and Rhodes in July 2021. A tree was defined as a perennial plant with at least one self-supporting stem which:

- Has a height of more than three (3) metres, or
- Has an outside circumference of at least 500mm at ground level; or
- Has a branch and foliage crown spread of at least 4 metres.

Craig & Rhodes undertook detailed survey of trees using RTK GPS and Robotic Total Stations. All trees were surveyed using the Craig & Rhodes site-wide survey control network that is based on GDA94 Zone 56 MGA coordinates and AHD height datum.

Surveyed tree data was then downloaded, decoded & reduced using Landmark Survey Software.

The data was then provided to Cumberland Ecology in the following files; CSV, DXF & KML containing tree data in the following format: Tree Number/Easting/Northing/Height/Canopy spread/Trunk diameter (ground)/Trunk diameter (chest)/Multi stem status.

Cumberland Ecology botanists and ecologists resurveyed each tree and identified the species on the 13th to 16th, and the 20th to the 21st of July 2021. The dataset from Craig & Rhodes included instances of exotic species and dead trees. These individuals have been excluded from the dataset. For the purposes of this assessment the term “native” was defined as per the NSW *Local Land Services Act 2013* (LLS Act), i.e. “A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible”. As such, some individuals of planted species native to Australia, but not indigenous to NSW, were excluded from the dataset presented in this report.

2.3. Limitations

The Stadia Metric Survey of the Study Area was not able to be completed by Craig & Rhodes due to the cessation of ‘construction work’ within NSW in July 2021 by order of the NSW State Government, due to an outbreak of Covid-19. It was the decision of Craig & Rhodes that activities their company was required to undertake to complete the surveys would be categorised as ‘construction work’. Craig & Rhodes estimate that approximately 75% of the Study Area was surveyed.

It is expected that regardless of the lack of completed Stadia Metric Surveys this report provides sufficient detail of the potential koala habitat present within the Study Area to allow Council to assess the consistency of the Planning Proposal with the CKPOM. Most land that was not surveyed is in the north-western portion of the Study Area that is on the western side of the railway line. This area is not proposed to be rezoned under the Planning Proposal (i.e. no change to impact).

3. Vegetation Community Descriptions

3.1. Introduction

The vegetation of the Study Area has been largely cleared as a result of historical agricultural practices. Fragmented areas of native vegetation are scattered throughout the Study Area, most of which has been substantially modified due to grazing and/or other agricultural land practises. Areas of native vegetation are primarily present within or adjacent to riparian corridors, as isolated patches of woodland or as grassland bounded by exotic dominated agricultural lands. Patches of scattered mature remnant eucalypt trees are also present throughout the Study Area, all of which have significantly modified understoreys.

Ten locally-defined vegetation communities have been identified within the Study Area as identified in **Table 2**. Descriptions of the communities are provided below and their distribution within the Study Area is shown on Cumberland Ecology mapping of the Study Area provided in **Figure 1**. The vegetation within the Study Area is made up of a number of remnant and non-remnant vegetation communities. Where possible, vegetation community names follow names within DECCW (2007).

Table 2 lists the vegetation communities occurring within the Study Area, the equivalent DECCW (2007) map unit, the PCT and associated Biometric Vegetation Type (BVT), and the area of occupancy. The majority of the woody vegetation is made up of Cumberland Plain Woodland (both Shale Hills Woodland and Shale Plains Woodland), with patches of Acacia Regrowth, Elderslie Banksia Scrub Forest, River-flat Eucalypt Forest, and Swamp Oak Floodplain Forest. The remaining areas are generally comprised of exotic vegetation along with areas of Freshwater Wetland and artificial farm dams with fringing vegetation.

Table 2 Vegetation Communities Present within the Study Area

Vegetation Community	DECCW (2007) Map Unit	PCT/BVT	BC Act Status
Shale Plains Woodland	10 – Shale Plains Woodland	849/ HN528	CEEC
Shale Hills Woodland	9 – Shale Hills Woodland	850/ HN529	CEEC
Shale Hills Woodland (derived native grassland)	9 – Shale Hills Woodland	806/ HN627	CEEC
Elderslie Banksia Scrub Forest	37 – Elderslie Banksia Scrub Forest	774/ HN635	CEEC
River-flat Eucalypt Forest	12 – Riparian Forest	835/ HN526	EEC
	11 – Alluvial Woodland		
Swamp Oak Floodplain Forest	11 – Alluvial Woodland	2687/ HN674	EEC
River Oak Riparian Woodland	12 – Riparian Forest	1105/ HN574	-
Freshwater Wetlands	36 – Freshwater Wetlands	1071/ HN630	EEC
Acacia Regrowth	-	-	-
Exotic Vegetation	-	-	-
Dam	-	-	-

3.1.1. Shale Plains Woodland

TEC: Cumberland Plain Woodland in the Sydney Basin Bioregion

BC Act Status: CEEC

PCT/ BVT: 849/ HN528

This community occurs as scattered patches of varying sizes within the Study Area, with the largest patches located around the Howes Creek riparian corridor and in the northwest corner of the Study Area. Within the Study Area, Shale Plains Woodland primarily occurs as small, isolated patches surrounded by exotic vegetation (see **Figure 1**).

The canopy of the community is comprised of mature *Eucalyptus tereticornis* (Forest Red Gum) and/or *Eucalyptus moluccana* (Grey Box) trees. The community lacks a substantial shrub layer in most areas but does contain scattered regrowth *Eucalyptus tereticornis* (Forest Red Gum) and/or *Eucalyptus moluccana* (Grey Box) trees, *Acacia decurrens* (Black Wattle) and the exotic *Olea europaea* subsp. *cuspidata* (African Olive) and *Lycium ferocissimum* (African Boxthorn). The groundcover of the community is comprised primarily of exotic herbs and grasses with native species scattered throughout. The most prevalent native species present are *Microlaena stipoides* (Weeping Grass), *Oxalis perennans*, *Einadia trigonos* (Fishweed) and *Cotula australis* (Common Cotula). Exotic species include *Cyclospermum leptophyllum* (Slender Celery), *Facelis retusa* (Annual Trampweed), (Fireweed), *Bromus catharticus* (Prairie Grass) and *Ehrharta erecta* (Panic Veldtgrass). An example of this vegetation community is shown in **Photograph 1**.

Photograph 1 - Shale Plains Woodland in the north of the Study Area



3.1.2. Shale Hills Woodland

BC Act Status: CEEC

PCT/ BVT: 850/ HN529

This community occurs as scattered patches of varying sizes within the Study Area, with the largest patches located along Cummins Road and adjacent to Menangle Road in the south east of the Study Area. One area of the community located along Cummings Road provides connectivity to adjacent areas of the same community located within residential areas outside of the Study Area (see **Figure 1**).

The canopy of this community consists of mature *Eucalyptus crebra* (Narrow-leaved Ironbark) with a mid-storey comprised of regrowth *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum) and *Acacia decurrens* (Black Wattle). The shrub layer contains regrowth of the canopy and mid-storey, along with the native *Bursaria spinosa* (Blackthorn) of exotics *Olea europaea* subsp. *cuspidata* (African Olive) and *Lycium ferocissimum* (African Boxthorn). The groundcover of this community is dominated by exotic species with scattered native species present scattered throughout in small numbers. Native herbs and grasses present include *Cotula australis* (Common Cotula), *Euchiton sphaericus*, *Wahlenbergia gracilis* (Sprawling Bluebell), *Oxalis perennans*, *Eragrostis leptostachya* (Paddock Lovegrass) and *Microlaena stipoides* (Weeping Grass). Dominant exotic groundcovers include *Cerastium glomeratum* (Mouse-ear Chickweed), *Sida rhombifolia*

(Paddy's Lucerne), *Ehrharta erecta* (Panic Veldtgrass) and *Lolium perenne* (Perennial Ryegrass). An example of this vegetation community is shown in **Photograph 2**.

Photograph 2 - Shale Hills Woodland within the west of the Study Area



3.1.3. Shale Hills Woodland derived native grassland

BC Act Status: CEEC

PCT/ BVT: 806/ HN627

Shale Hills Woodland derived native grassland is present within the Study Area as an isolated patch surrounded by exotic grasslands located on a hill in the southeast of the Study Area (see **Figure 1**). This community has a relatively high cover of native species and a high native species richness which includes native grasses such as *Microlaena stipoides* (Weeping Grass), *Aristida ramosa* (Purple Wiregrass), *Austrostipa scabra*, *Bothriochloa decipiens* (Red Grass) and *Sporobolus creber* (Western Rat-tail Grass). Exotic species present include *Briza subaristata*, *Verbena bonariensis* (Purpletop), *Plantago lanceolata* (Lamb's Tongue) and *Hypericum perforatum* (St. John's Wort). An example of this vegetation community is shown in **Photograph 3**.

Photograph 3 - Shale Hills Woodland derived native grassland in the southeast of the Study Area



3.1.4. Elderslie Banksia Scrub Forest

BC Act Status: CEEC

PCT: 774/ HN635

Within the Study Area, Elderslie Banksia Scrub Forest is present as small, isolated patches that are surrounded mostly by previously cleared lands. The largest patch of the community is located in the centre of the Study Area (see **Figure 1**).

This community either consists of a canopy and mid-storey comprised of mature and regrowth *Angophora subvelutina* (Broad-leaved Apple) or *Banksia integrifolia* (Coast Banksia), but not both. The shrub layer is comprised of the native *Duboisia myoporoides* (Corkwood), regrowth *Angophora subvelutina* and *Kunzea ambigua* (Tick Bush). Dominant exotic shrubs include *Olea europaea* subsp. *cuspidata* (African Olive) and *Lycium ferocissimum* (African Boxthorn). The groundcover in areas is dominated by native species and in other areas is dominated by exotic species. Common native groundcover species include *Pteridium esculentum* (Common Bracken), *Hydrocotyle laxiflora* (Stinking Pennywort), *Einadia trigonos* (Fishweed) and *Microlaena stipoides* (Weeping Grass). Common exotic groundcovers include *Sida rhombifolia* (Paddy's Lucerne), *Ehrharta erecta* (Panic Veldtgrass), *Acetosella vulgaris* (Sorrel) and *Eragrostis curvula* (African Lovegrass). An example of this vegetation community is shown in **Photograph 4**.

Photograph 4 - Elderslie Banksia Scrub Forest in the centre of the Study Area



3.1.5. River-flat Eucalypt Forest

BC Act Status: EEC

PCT/ BVT: 835/ HN526

River-flat Eucalypt Forest is present primarily within or adjacent to the riparian corridors of the Study Area. Areas of the community within riparian corridors also contain the largest patches of the community (see **Figure 1**).

The canopy of this community is comprised of mature *Eucalyptus tereticornis* (Forest Red Gum) trees. The mid-storey contains mature *Casuarina glauca* (Swamp Oak) and regrowth *Eucalyptus tereticornis* (Forest Red Gum), which are also present as regrowth in the shrub layer together with *Melaleuca linearifolia* (Flax-leaved Paperbark). Exotic shrubs include *Olea europaea* subsp. *cuspidata* (African Olive). Common native groundcover species include *Microlaena stipoides* (Weeping Grass), *Isolepis prolifer*, *Persicaria decipiens* (Slender Knotweed) and *Cynodon dactylon* (Couch Grass). Common exotic groundcover species includes *Ehrharta erecta* (Panic Veldtgrass) and *Asparagus asparagoides* (Bridal Creeper). An example of this vegetation community is shown in **Photograph 5**.

Photograph 5 - River-flat Eucalypt Forest in Park L in the centre of the Study Area



3.1.6. Swamp Oak Floodplain Forest

BC Act Status: EEC

PCT/ BVT: 1800/ HN674

Swamp Oak Floodplain Forest is present in areas adjacent to riparian corridors within the Study Area with the largest patches of the community present along the Howes Creek riparian corridor in the centre of the Study Area (see **Figure 1**).

The canopy and mid-storey are comprised entirely of the native *Casuarina glauca* (Swamp Oak). The exotic shrub *Olea europaea* subsp. *cuspidata* (African Olive) is present in some areas. Common native groundcover species include *Cynodon dactylon* (Couch Grass), *Paspalum distichum* (Water Couch) and *Isolepis inundata*. Exotic groundcovers include *Asparagus asparagoides* (Bridal Creeper), *Ehrharta erecta* (Panic Veldtgrass), *Plantago lanceolata* (Lamb's Tongue) and *Cirsium vulgare* (Spear Thistle). An example of this vegetation community is shown in **Photograph 6**.

Photograph 6 -Swamp Oak Floodplain Forest within the Howes Creek Corridor in the Study Area



3.1.7. Freshwater Wetlands

BC Act Status: EEC

PCT/ BVT: 1071/ 630

Freshwater Wetlands are only present within the low-lying riparian corridors of the Study Area (see **Figure 1**).

The canopy and mid-storey layers of this community within the Study Area are mostly absent, with the exception of a few regrowth native *Casuarina glauca* (Swamp Oak). The shrub layer is comprised of regrowth native *Casuarina glauca* (Swamp Oak) along with exotic shrubs *Ligustrum lucidum* (Large-leaved Privet), *Olea europaea* subsp. *cuspidata* (African Olive) and *Ligustrum sinense* (Small-leaved Privet) in places. The majority of the groundcover is comprised of native species including *Phragmites australis* (Common Reed), *Carex appressa* (Tall Sedge), *Juncus usitatus* (Common Rush) and *Cynodon dactylon* (Couch Grass). Common exotic species within the ground stratum include *Cyperus eragrostis* (Umbrella Sedge), *Paspalum dilatatum* (Paspalum), and *Rubus fruticosus* spp. agg. (Blackberry). An example of this vegetation community is shown in **Photograph 7**.

Photograph 7 - Freshwater Wetlands in the Howes Creek Corridor in the centre of the Study Area



3.1.8. River Oak Riparian Woodlands

BC Act Status: Not listed

PCT/ BVT: 1105/ HN574

River Oak Riparian Woodland is present along the southern boundary of the Study Area in areas adjacent to the Nepean River (see **Figure 1**).

This community has a canopy layer comprised entirely of *Casuarina cunninghamiana* (River Oak) and a mid-storey containing regrowth *Casuarina cunninghamiana* and the exotic species *Ligustrum lucidum* (Large-leaved Privet) and *Ligustrum sinense* (Small-leaved Privet). The shrub layer is dominated by the exotics *Ligustrum lucidum* and *Ligustrum sinense*, but also contains scattered native shrubs consisting of *Kunzea ambigua* (Tick Bush), *Casuarina cunninghamiana* and *Melicytus dentatus* (Tree Violet). The majority of the groundcover is comprised of exotic herbs and grasses including *Eragrostis curvula* (African Lovegrass), *Ehrharta erecta* (Panic Veldtgrass), *Plantago lanceolata* (Lamb's Tongue), *Senecio madagascariensis* (Fireweed) and *Cyclosporum leptophyllum* (Slender Celery). The most common native groundcover species include *Dichondra repens* (Kidney Weed), *Oxalis perennans*, *Microlaena stipoides* (Weeping Grass) and *Austrostipa verticillata* (Slender Bamboo Grass).

An example of this community is shown in **Photograph 8**.

Photograph 8 - River Oak Riparian Woodlands in the south of the Study Area



3.1.9. Acacia Regrowth

BC Act Status: Not listed

PCT/ BVT: 849 or 774/ HN528 or HN635

Acacia Regrowth is present as small, isolated patches in the centre of the Study Area generally (see **Figure 1**).

This community is comprised of a mid-storey dominated by *Acacia decurrens* (Black Wattle). Shrub species present include the native *Duboisia myoporoides* (Corkwood) and regrowth *Acacia decurrens* (Black Wattle). The groundcover is dominated by exotic herbs and grasses including *Eragrostis curvula* (African Lovegrass), *Cynodon dactylon* (Couch Grass) and *Senecio madagascariensis* (Fireweed). The most dominant native groundcover within this community is *Microlaena stipoides* (Weeping Grass).

Historically, the vegetation of this community was likely Cumberland Plain Woodland. . As a result of previous land uses, the community within the Study Area is highly degraded, lacks a canopy and contains a low native species richness comprised largely of pioneer species common to a number of vegetation communities known to occur in the locality.

An example of this vegetation community is shown in **Photograph 9**.

Photograph 9 - Acacia Regrowth within the centre of the Study Area



3.1.10. Exotic Vegetation

BC Act Status: Not listed

PCT: None

Exotic Vegetation is present throughout the Study Area. The community is dominated by either exotic pasture grasses, dense patches of *Olea europaea* subsp. *cuspidata* (African Olive) and/or *Ligustrum lucidum* (Broad-leaf Privet), or scattered isolated canopy trees with an exotic dominated understorey. Man-made structures have also been included in this community due to their limited ecological value. Common exotic grasses occurring throughout this community include *Bromus molliformis* (Soft Broome), *Briza subaristata* and *Poa annua* (Winter Grass). Native grasses are present but comprise less than 25% the native groundcover in nearly all areas. Native grasses present include *Microlaena stipoides* (Weeping Grass) and *Paspalum distichum* (Water Couch).

Areas containing dense patches of *Olea europaea* subsp. *cuspidata* and/or *Ligustrum lucidum* do have native groundcovers present, albeit in small numbers. Native species include *Dichondra repens* (Kidney Weed) and *Crassula sieberiana* (Australian Stonecrop). Exotic species comprise most of the groundcover in such areas and include *Anagallis arvensis* (Scarlet Pimpernel) and *Senecio madagascariensis* (Fireweed) along with regrowth *Olea europaea* subsp. *cuspidata* and *Ligustrum lucidum*.

Scattered canopy trees are present in small numbers and have no connectivity to nearby areas of woodland. The understorey of such canopy trees is dominated by exotic shrubs such as *Olea europaea* subsp. *cuspidata*, and contain a heavily degraded ground stratum due to previous land uses.

Examples of this vegetation community are shown in **Photographs 10** and **11**.

Photograph 10 - Exotic Vegetation dominated by *Olea europaea* subsp. *cuspidata* (African Olive) in the north of the Study Area



Photograph 11 - Exotic Vegetation dominated by exotic grasses in the centre of the Study Area 11)



4. Native Vegetation Species

For the purposes of describing the species composition of vegetation patches within the Study Area vegetation mapping for the Study Area has been divided into numbered patches/polygons, which are shown in **Figures 4 - 6**. The vegetation mapping presented utilised the vegetation mapping presented with the Biodiversity Assessment Report (dated November 2018) prepared by Cumberland Ecology to support the Planning Proposal. Patches in which a full 20x20m floristics plot (BBAM Quadrats and BAM Plots) detailing species composition are detailed in **Table 3** below. Species composition data for these BBAM Quadrats and BAM Plots is provided in **Appendices A-C**.

The canopy species present in patches in which a floristics plot has not been undertaken (as recorded during Stadia Metric Surveys detailed in **Chapter 5** and shown in **Figures 7 - 9**) are provided below in **Table 4**. Patches in which floristic plots and stadia metric surveys have not been undertaken are detailed in **Table 5**, for which **Chapter 3** vegetation descriptions can be referred to for a general description of flora species likely to be present. Data for these patches is absent either due to them being in the approximately 25% of the Study Area not covered during the Stadia Metric Survey, the fact that they comprise exotic species only, because they occur in areas which have already been cleared under existing DAs approved within the Study Area, or they are in conservation areas in which vegetation is proposed to be retained. Some patches in **Figure 7-9** are without tree data due to being in the 25% of areas not surveyed, predominately areas of Cumberland Plain Woodland and River-flat Eucalypt forest, which are dominated by PKFTs and as such are shown as Potential Koala Habitat in **Figure 2**. As the Potential Koala Habitat mapping is based on the presence of greater than 15% PKFTs it is not expected that the lack of stadia metric data for some areas changes the outcome of the VAR in regards to the accuracy of assessing future assessment requirements for subsequent DAs of the Planning Proposal.

Table 3 Location of BBAM and BAM Quadrats/Plots within vegetation patches

Patch ID	Quadrat/Plot ID	Name	Species Composition Data Location
1	Q4	Derived Native Grassland	Appendix A
6	Plot 1	Acacia Regrowth	Appendix C
6	Q23	Acacia Regrowth	Appendix A
8	Plot 9	Exotic Vegetation	Appendix B
8	Plot 2	Exotic Vegetation	Appendix B
8	Plot 11	Exotic Vegetation	Appendix B
8	Plot 8	Exotic Vegetation	Appendix B
8	Plot 10	Exotic Vegetation	Appendix B
8	Plot 4	Exotic Vegetation	Appendix B
8	Plot 3	Exotic Vegetation	Appendix B
8	Plot 12	Exotic Vegetation	Appendix B
8	Plot 13	Exotic Vegetation	Appendix B
8	Plot 15	Exotic Vegetation	Appendix B
8	Plot 5	Exotic Vegetation	Appendix B
8	Plot 16	Exotic Vegetation	Appendix B

Patch ID	Quadrat/Plot ID	Name	Species Composition Data Location
8	Plot 6	Exotic Vegetation	Appendix B
8	Plot 7	Exotic Vegetation	Appendix B
8	Plot 14	Exotic Vegetation	Appendix B
8	Plot 17	Exotic Vegetation	Appendix B
8	Q27	Exotic Vegetation	Appendix A
8	Q28	Exotic Vegetation	Appendix A
8	Q29	Exotic Vegetation	Appendix A
8	Q30	Exotic Vegetation	Appendix A
8	Q2	Exotic Vegetation	Appendix A
8	Q7	Exotic Vegetation	Appendix A
8	Q5	Exotic Vegetation	Appendix A
8	Q8 20x20	Exotic Vegetation	Appendix A
8	Q9 20x20	Exotic Vegetation	Appendix A
11	Q2	Freshwater Wetlands	Appendix A
12	Q1	Freshwater Wetlands	Appendix A
13	Q3	Freshwater Wetlands	Appendix A
16	Q12	River Flat Eucalypt Forest	Appendix A
17	Q11	River Flat Eucalypt Forest	Appendix A
19	Plot 3	River Flat Eucalypt Forest	Appendix C
27	Q24	River Oak Riparian Woodland	Appendix A
31	Q25	River Oak Riparian Woodland	Appendix A
32	Q4	Swamp Oak Floodplain Forest	Appendix A
37	Q7	Swamp Oak Floodplain Forest	Appendix A
39	Q5	Swamp Oak Floodplain Forest	Appendix A
39	Q6	Swamp Oak Floodplain Forest	Appendix A
44	Q8	Elderslie Banksia Scrub Forest	Appendix A
46	Q9	Elderslie Banksia Scrub Forest	Appendix A
48	Q10	Elderslie Banksia Scrub Forest	Appendix A
51	Plot 1	Shale Plains Woodland	Appendix B
51	Q19	Shale Plains Woodland	Appendix A
52	Plot 4	Shale Plains Woodland	Appendix C
55	Q3	Shale Plains Woodland	Appendix A
56	Plot 2	Shale Plains Woodland	Appendix C
56	Q6	Shale Plains Woodland	Appendix A
67	Q20	Shale Plains Woodland	Appendix A

Patch ID	Quadrat/Plot ID	Name	Species Composition Data Location
73	Q21	Shale Plains Woodland	Appendix A
76	Q18	Shale Plains Woodland	Appendix A
79	Q16	Shale Plains Woodland	Appendix A
82	Q17	Shale Plains Woodland	Appendix A
82	Q22	Shale Plains Woodland	Appendix A
88	Q14	Shale Hills Woodland	Appendix A
89	Q13	Shale Hills Woodland	Appendix A
90	Q15	Shale Hills Woodland	Appendix A
N/A	Q26	Derived Native Grassland	Appendix A
N/A	Q1	Freshwater Wetlands	Appendix A

Table 4 Canopy composition of patches without floristic plot data – Stadia Metric Survey results

Patch ID	Vegetation Community	Canopy/Woody Species Present
2	Acacia Regrowth	<i>Bursaria spinosa</i>
4	Acacia Regrowth	<i>Acacia decurrens</i> , <i>Brachychiton populneus</i> , <i>Acacia implexa</i>
14	River Flat Eucalypt Forest	<i>Callistemon salignus</i> , <i>Eucalyptus tereticornis</i>
21	River Flat Eucalypt Forest	<i>Casuarina glauca</i> , <i>Melaleuca linariifolia</i>
29	River Oak Riparian Woodland	<i>Casuarina cunninghamiana</i>
33	Swamp Oak Floodplain Forest	<i>Casuarina glauca</i>
40	Swamp Oak Floodplain Forest	<i>Casuarina glauca</i>
47	Elderslie Banksia Scrub Forest	<i>Acacia decurrens</i>
49	Elderslie Banksia Scrub Forest	<i>Angophora subvelutina</i>
50	Elderslie Banksia Scrub Forest	<i>Angophora subvelutina</i>
57	Shale Plains Woodland	<i>Eucalyptus tereticornis</i>
61	Shale Plains Woodland	<i>Eucalyptus tereticornis</i>
72	Shale Plains Woodland	<i>Eucalyptus moluccana</i> , <i>Eucalyptus tereticornis</i>
74	Shale Plains Woodland	<i>Eucalyptus moluccana</i>
75	Shale Plains Woodland	<i>Eucalyptus moluccana</i>
78	Shale Plains Woodland	<i>Eucalyptus tereticornis</i>
80	Shale Plains Woodland	<i>Acacia implexa</i> , <i>Eucalyptus tereticornis</i> , <i>Eucalyptus moluccana</i>
89	Shale Hills Woodland	<i>Eucalyptus crebra</i> , <i>Eucalyptus tereticornis</i>

Table 5 Vegetation Community corresponding to patches without floristic plot data or Stadia Metric survey results

Patch ID	Vegetation Community	Patch ID	Vegetation Community
2	Acacia Regrowth	45	Elderslie Banksia Scrub Forest
3	Acacia Regrowth	53	Shale Plains Woodland
5	Acacia Regrowth	54	Shale Plains Woodland
7	Dam	58	Shale Plains Woodland
9	Freshwater Wetlands	59	Shale Plains Woodland
10	Freshwater Wetlands	60	Shale Plains Woodland
15	River Flat Eucalypt Forest	62	Shale Plains Woodland
18	River Flat Eucalypt Forest	63	Shale Plains Woodland
20	River Flat Eucalypt Forest	64	Shale Plains Woodland
22	River Flat Eucalypt Forest	65	Shale Plains Woodland
23	River Flat Eucalypt Forest	66	Shale Plains Woodland
24	River Flat Eucalypt Forest	68	Shale Plains Woodland
25	River Flat Eucalypt Forest	69	Shale Plains Woodland
26	River Oak Riparian Woodland	70	Shale Plains Woodland
28	River Oak Riparian Woodland	71	Shale Plains Woodland
30	River Oak Riparian Woodland	77	Shale Plains Woodland
34	Swamp Oak Floodplain Forest	81	Shale Plains Woodland
35	Swamp Oak Floodplain Forest	83	Shale Hills Woodland
36	Swamp Oak Floodplain Forest	84	Shale Hills Woodland
38	Swamp Oak Floodplain Forest	85	Shale Hills Woodland
41	Swamp Oak Floodplain Forest	86	Shale Hills Woodland
42	Swamp Oak Floodplain Forest	87	Shale Hills Woodland
43	Swamp Oak Floodplain Forest		

5. Stadia Metric Survey Results

The results of the Stadia Metric Survey of the Study Area for PKFTs are presented in **Table 6** below (on the next page). Locations of PKFTs included as part of the surveys are shown in **Figures 7 -9**.

Table 6 Stadia Metric Survey Results

Number	Easting	Northing	Spread (m)	Dbh (m)	H (m)	Multi-stem	Species	KUTS	PKFT	Figure Number
T20578	292650.629	6224501.964	20	1	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20714	292767.309	6224532.992	20	1.2	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20715	292810.048	6224537.958	8	0.6	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20717	292704.164	6224472.54	8	0.3	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20718	292700.941	6224475.099	16	0.6	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20782	292524.599	6224103.862	10	0.6	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20801	292480.091	6224142.547	5	0.25	7	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20802	292482.611	6224144.552	5	0.35	7	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20813	292546.285	6224143.477	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20817	292542.459	6224131.42	6	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20818	292538.081	6224128.183	6	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20823	292537.815	6224154.146	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20825	292543.406	6224151.431	6	0.5	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20842	292537.554	6224127.875	8	0.4	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20844	292551.796	6224120.909	5	0.4	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20845	292547.975	6224121.78	6	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20849	292553.439	6224128.813	6	0.3	9		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20851	292558.376	6224129.797	8	1.1	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20854	292558.549	6224123.126	10	0.5	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20855	292559.569	6224123.564	8	0.5	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20856	292560.25	6224124.389	8	0.5	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20857	292561.888	6224125.974	6	0.3	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20865	292564.17	6224128.175	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20866	292566.365	6224132.923	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20867	292566.296	6224138.679	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20868	292566.364	6224139.868	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20869	292566.983	6224140.908	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20871	292574.202	6224128.74	6	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20873	292574.405	6224134.424	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20874	292556.597	6224138.7	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20875	292559.255	6224140.503	8	0.35	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20877	292560.983	6224140.632	6	0.3	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20879	292553.426	6224148.299	10	0.5	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20880	292534.777	6224160.732	6	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21004	292602.298	6224233.344	10	0.5	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21081	292600.118	6224217.815	8	0.4	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21092	292616.33	6224209.733	10	0.5	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21128	292767.175	6224527.332	12	0.4	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21130	292781.74	6224481.3	8	0.3	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21131	292781.738	6224485.42	8	0.4	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21132	292783.775	6224485.015	8	0.4	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21133	292785.988	6224475.352	8	1.1	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21138	292729.576	6224459.547	18	1.2	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21139	292704.398	6224462.716	15	0.7	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21140	292703.653	6224472.644	8	0.4	30	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21141	292700.277	6224471.065	8	0.4	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21142	292700.228	6224468.667	8	0.4	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21143	292700.805	6224474.647	16	0.6	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21144	292687.425	6224472.782	12	0.6	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21145	292678.856	6224470.112	12	0.6	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21146	292668.76	6224472.355	14	0.6	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21147	292664.602	6224480.399	12	0.6	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21151	292661.859	6224483.121	12	0.4	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21152	292653.416	6224475.825	12	0.6	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21156	292651.021	6224499.91	14	0.8	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21460	292602.552	6224135.72	6	0.25	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21461	292602.49	6224140.841	6	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21464	292590.651	6224150.856	4	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21465	292590.615	6224153.244	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21467	292590.827	6224156.067	0	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21471	292589.444	6224160.548	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21476	292599.021	6224151.754	6	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21478	292602.236	6224153.955	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21480	292587.546	6224139.693	0	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21481	292618.152	6224146.211	10	0.5	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21492	292627.814	6224145.742	5	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21504	292617.976	6224171.461	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21507	292613.626	6224162.631	5	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21510	292606.877	6224158.925	8	0.6	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8

Number	Easting	Northing	Spread (m)	Dbh (m)	H (m)	Multi-stem	Species	KUTS	PKFT	Figure Number
T20578	292650.629	6224501.964	20	1	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20714	292767.309	6224532.992	20	1.2	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20715	292810.048	6224537.958	8	0.6	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21519	292602.731	6224146.682	8	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21524	292599.046	6224151.618	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21525	292602.259	6224154.022	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21529	292606.798	6224158.581	6	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21530	292571.039	6224166.058	10	0.6	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21531	292646.892	6224155.862	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21543	292630.187	6224147.462	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21547	292631.82	6224138.379	7	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21563	292630.143	6224130.695	4	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21569	292633.19	6224126.893	6	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21570	292635.953	6224128.223	6	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21571	292636.653	6224124.316	8	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21573	292643.198	6224128.578	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21575	292639.842	6224133.607	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21584	292598.303	6224165.649	8	0.6	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21585	292610.375	6224172.935	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21586	292613.651	6224176.008	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21587	292618.277	6224176.662	8	0.3	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21590	292642.765	6224144.114	5	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21591	292643.539	6224142.337	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21617	292660.071	6224156.819	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21631	292667.687	6224158.562	4	0.35	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21632	292665.341	6224142.684	4	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21633	292665.171	6224141.834	8	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21644	292646.574	6224135.005	0	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21645	292646.002	6224134.441	8	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21646	292646.609	6224137.762	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21647	292649.668	6224131.144	10	0.5	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21650	292653.692	6224107.741	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21653	292656.925	6224107.501	4	0.3	5	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21656	292659.287	6224108.027	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21659	292482.367	6224146.527	4	0.25	6	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21692	292510.38	6224166.745	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21700	292520.95	6224166.244	6	0.9	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21707	292550.82	6224165.624	6	0.25	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21712	292527.169	6224163.185	10	0.5	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21715	292560	6224180.718	12	0.6	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21716	292551.498	6224176.71	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21717	292540.052	6224180.901	12	0.6	15		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21718	292539.496	6224176.074	5	0.25	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21724	292542.741	6224167.357	6	0.4	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21726	292549.486	6224162.954	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21737	292550.676	6224111.456	8	0.4	9		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21740	292566.391	6224093.87	8	0.9	10	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21741	292576.342	6224091.474	8	0.6	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21742	292588.253	6224097.614	8	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21743	292589.407	6224090.163	8	0.7	7	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21745	292582.848	6224105.78	10	0.55	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21748	292569.848	6224121.889	12	0.7	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21751	292568.362	6224122.116	4	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21752	292560.257	6224119.649	5	0.3	6	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21753	292575.768	6224118.518	5	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21754	292577.417	6224122.137	5	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21758	292579.357	6224115.916	4	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21759	292580.404	6224118.974	4	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21761	292586.476	6224118.377	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21763	292588.047	6224118.536	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21766	292588.272	6224116.801	6	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21774	292594.744	6224116.888	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21776	292583.954	6224127.949	16	0.7	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21779	292600.131	6224115.339	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21781	292601.137	6224115.335	0	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21783	292604.494	6224113.494	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21786	292598.728	6224119.865	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21788	292603.598	6224119.548	8	0.35	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21794	292600.372	6224127.794	8	0.35	13		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21800	292618.395	6224114.311	8	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21803	292613.903	6224111.831	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21804	292612.571	6224111.811	8	0.4	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8

Number	Easting	Northing	Spread (m)	Dbh (m)	H (m)	Multi-stem	Species	KUTS	PKFT	Figure Number
T20578	292650.629	6224501.964	20	1	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20714	292767.309	6224532.992	20	1.2	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20715	292810.048	6224537.958	8	0.6	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21805	292623.027	6224111.028	10	0.5	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21809	292629.037	6224113.666	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21811	292629.241	6224111.531	6	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21814	292631.766	6224113.081	8	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21817	292632.705	6224118.313	5	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21818	292631.588	6224119.308	0	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21821	292638.633	6224118.06	6	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21822	292636.846	6224114.513	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21824	292638.57	6224115.19	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21830	292644.109	6224108.363	14	0.7	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21831	292644.825	6224111.245	7	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21835	292642.554	6224118.144	6	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21836	292641.677	6224121.212	6	0.25	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21837	292645.912	6224122.601	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21886	292535.654	6223833.853	6	0.3	15		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21888	292534.663	6223834.264	8	0.4	15		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21904	292701.2876	6224118.991	12	0.75	14	M	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21906	292697.4948	6224118.915	8	0.35	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21909	292694.113	6224123.391	12	0.6	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21912	292689.2583	6224124.487	8	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21913	292707.1668	6224117.252	10	0.45	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21920	292722.4372	6224188.54	10	0.45	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21921	292721.519	6224189.341	8	0.55	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21922	292724.36	6224193.785	10	0.4	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21923	292725.7568	6224195.964	6	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21924	292728.1304	6224195.356	12	0.75	13		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21927	292725.9679	6224197.226	10	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21928	292714.115	6224187.117	7	0.8	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21929	292714.4264	6224188.952	8	0.45	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21930	292710.1427	6224192.081	6	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21931	292711.8539	6224194.119	7	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21933	292720.26	6224200.706	7	0.45	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21934	292719.7193	6224198.688	8	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21935	292720.7221	6224200.887	6	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21936	292721.463	6224204.14	12	0.6	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21958	292706.7276	6224215.785	12	0.6	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21965	292699.4989	6224230.871	10	0.45	10	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21966	292685.5127	6224224.081	8	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21967	292676.8976	6224226.35	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21968	292674.2256	6224232.354	10	0.45	10	M	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21976	292667.829	6224142.901	14	0.35	10	M	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21979	292674.599	6224159.019	12	0.55	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21987	292672.8248	6224130.789	14	0.5	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21989	292658.2424	6224125.141	12	0.6	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21990	292655.4906	6224126.859	10	0.25	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21992	292653.4578	6224126.765	10	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T21993	292651.3407	6224128.282	10	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22011	292665.6774	6224121.803	16	0.7	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22019	292653.0076	6224112.724	16	0.8	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22020	292682.1849	6224123.449	8	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22022	292678.1006	6224110.138	14	0.55	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22035	292668.5117	6224106.586	16	0.5	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22036	292664.4194	6224107.084	8	0.35	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22037	292665.4831	6224108.296	14	0.6	13		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22038	292664.8485	6224110.291	8	0.3	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22040	292692.1927	6224103.685	12	0.4	11		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22056	292659.3685	6224170.74	8	0.55	11		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22057	292658.5768	6224165.455	8	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22058	292653.9501	6224169.177	12	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22060	292621.7319	6224176.957	10	0.3	10	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22061	292618.3861	6224176.252	12	0.45	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T22078	292563.0878	6224153.096	20	0.9	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T30000	293013.2962	6222491.422	10	0.4	11		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30115	293033.1144	6223071.089	8	0.45	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30119	293030.9965	6223070.818	8	0.4	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30120	293028.9962	6223069.885	10	0.45	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30212	292977.068	6222985.439	6	0.3	15		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 9
T30239	292999.194	6223098.25	8	0.35	15		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30241	292994.267	6223100.887	16	0.75	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9

Number	Easting	Northing	Spread (m)	Dbh (m)	H (m)	Multi-stem	Species	KUTS	PKFT	Figure Number
T20578	292650.629	6224501.964	20	1	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20714	292767.309	6224532.992	20	1.2	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20715	292810.048	6224537.958	8	0.6	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T30244	293029.513	6223025.589	10	0.6	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30246	292981.756	6223030.512	10	0.65	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30299	292044.961	6223182.415	12	0.45	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30445	292238.494	6222802.199	6	0.3	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T30446	292229.282	6222801.11	8	0.35	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5019	292478.877	6223950.818	4	0.6	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5043	292504.525	6223930.798	6	0.3	7		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5081	293012.621	6222493.511	10	0.4	11		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5270	292445.7227	6223858.843	12	0.6	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5278	292441.9017	6223851.08	3	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5280	292442.0181	6223849.002	3	0.3	5.5	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5306	292454.9748	6223812.68	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5308	292460.2687	6223808.959	3	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5310	292477.1146	6223806.48	8	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5311	292468.3512	6223792.952	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5312	292459.2816	6223803.777	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5341	292458.5856	6223901.568	5	0.4	0	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5342	292458.2558	6223902.307	5	0.4	0	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5345	292467.7948	6223900.943	7	0.4	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5346	292467.8075	6223900.94	7	0.4	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5347	292467.8208	6223900.941	7	0.4	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5348	292467.8262	6223900.943	7	0.4	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5351	292462.3784	6223911.861	6	0.4	0	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5352	292462.3837	6223911.85	6	0.4	0	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5356	292463.5423	6223915.735	6	0.6	0	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5358	292468.9954	6223909.703	6	0.5	0	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5375	292494.6667	6223896.189	8	0.5	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5386	292485.0443	6223849.649	5	0.3	7		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5397	292458.5316	6223864.372	6	0.3	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5418	292470.6756	6223886.445	6	0.3	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5419	292470.6674	6223886.444	6	0.3	8	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5420	292603.545	6224099.937	8	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5421	292605.637	6224099.641	6	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5422	292607.379	6224098.337	8	0.45	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5424	292609.968	6224102.209	4	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5427	292615.243	6224104.925	6	0.4	7	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5428	292616.051	6224103.087	7	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5437	292626.973	6224096.193	8	0.5	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5438	292626.443	6224089.791	8	0.6	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5444	292632.839	6224089.416	8	0.45	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5446	292634.227	6224088.875	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5448	292635.014	6224094.186	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5458	292638.86	6224097.027	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5465	292645.259	6224094.905	8	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5470	292649.262	6224095.333	8	0.35	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5471	292651.076	6224095.855	5	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5472	292651.473	6224096.996	4	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5485	292659.151	6224093.664	8	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5487	292656.48	6224096.197	6	0.35	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5497	292676.701	6224102.594	5	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5504	292678.652	6224085.793	8	0.45	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5540	293078.074	6222489.448	8	0.5	15	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5541	293075.024	6222469.077	8	0.4	20	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5542	293077.992	6222467.803	6	0.3	20	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5543	293078.467	6222467.635	6	0.3	20	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5544	293077.569	6222466.126	6	0.4	20	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5545	293072.886	6222472.032	6	0.25	10	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5546	293071.111	6222471.551	6	0.3	15	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5547	293071.789	6222473.315	6	0.3	15	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5548	293068.271	6222466.58	6	0.4	15	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5549	293094.038	6222463.055	10	0.4	20	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5554	293032.322	6222490.031	14	0.5	15	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5555	293037.272	6222491.871	8	0.3	10	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 9
T5746	293884.45	6225754.121	24	1.4	25	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5747	293868.992	6225754.732	14	0.9	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5748	293756.837	6225754.795	24	1.3	22	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7

Number	Easting	Northing	Spread (m)	Dbh (m)	H (m)	Multi-stem	Species	KUTS	PKFT	Figure Number
T20578	292650.629	6224501.964	20	1	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20714	292767.309	6224532.992	20	1.2	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20715	292810.048	6224537.958	8	0.6	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T5749	293764.332	6225756.644	5	0.25	12	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5750	293808.164	6225761.095	8	0.65	14	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5751	293806.19	6225750.388	14	1.4	16	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5752	293728.514	6225754.51	8	0.6	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5754	293745.606	6225799.916	8	1.2	22	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5763	293681.714	6225782.576	8	0.5	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5764	293678.467	6225780.756	4	0.25	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5765	293681.9	6225791.752	5	0.25	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5767	293701.743	6225762.55	8	0.35	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5768	293769.314	6225775.66	5	0.4	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5769	293691.6	6225760.252	8	0.7	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5770	293684.98	6225763.882	6	0.3	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5771	293684.538	6225763.408	6	0.22	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5772	293684.014	6225763.729	8	0.3	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5773	293684.579	6225764.527	10	0.7	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5774	293682.428	6225763.107	8	0.5	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5775	293676.797	6225766.226	5	0.5	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5776	293672.825	6225770.673	5	0.4	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5777	293671.953	6225770.297	6	0.6	13	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
T5778	293670.181	6225771.8	7	0.45	13	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5779	293667.954	6225772.626	6	0.45	13	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5780	293666.816	6225773.218	8	0.6	13	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5792	293860.537	6225992.009	6	0.35	15	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5793	293858.722	6225985.036	6	0.9	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5794	293860.679	6225985.887	10	0.7	16	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5795	293863.663	6225983.805	8	0.6	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5797	293865.88	6225976.456	10	0.5	16	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5800	293869.468	6225971.379	5	0.3	16	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5801	293867.62	6225963.846	6	0.45	18	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5802	293870.284	6225964.91	8	0.5	18	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5803	293870.983	6225965.22	8	0.4	16	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5805	293873.983	6225971.637	5	0.25	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5808	293882.497	6225968.34	6	0.22	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5809	293884.016	6225968.68	6	0.25	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5810	293881.33	6225965.048	8	0.3	16	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5814	293885.791	6225965.864	7	0.3	16	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5818	293890.233	6225963.584	6	0.3	16	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5823	293866.086	6225987.296	6	0.25	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5826	293876.275	6225984.293	6	0.6	16	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5829	293882.768	6225979.345	4	0.25	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5843	293893.185	6225970.796	8	0.25	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5847	293892.053	6225967.252	5	0.25	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5857	293888.669	6225974.073	6	0.25	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5860	293877.92	6225971.181	5	0.25	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5864	293876.868	6225974.922	5	0.24	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5867	293892.726	6225961.054	6	0.23	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5869	293896.35	6225961.477	5	0.25	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5870	293894.492	6225963.009	6	0.3	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5873	293899.765	6225961.634	6	0.3	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5875	293902.622	6225959.502	8	0.4	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5876	293903.25	6225960.314	4	0.3	15	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5890	293906.404	6225971.514	6	0.3	13	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5891	293906.141	6225972.03	6	0.3	7	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5892	293910.837	6225970.858	5	0.4	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5894	293910.357	6225965.708	6	0.4	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5897	293916.415	6225967.411	6	0.35	12	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5898	293916.721	6225967.758	5	0.25	6	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5899	293917.245	6225967.537	6	0.3	13	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
T5904	293912.827	6225945.732	7	0.4	14	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10217	293614.517	6225843.083	10	0.5	15		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10226	293656.54	6225990.233	5	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10243	293604.199	6226052.645	4	0.3	5	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10273	293608.708	6226120.515	10	0.4	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10288	293635.498	6226133.041	6	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10367	294005.723	6225832.748	4	0.25	10	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10370	294002.03	6225831.232	6	0.4	5	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7

Number	Easting	Northing	Spread (m)	Dbh (m)	H (m)	Multi-stem	Species	KUTS	PKFT	Figure Number
T20578	292650.629	6224501.964	20	1	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20714	292767.309	6224532.992	20	1.2	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20715	292810.048	6224537.958	8	0.6	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
TN10373	294013.294	6225851.545	6	0.21	9	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10377	293676.168	6226164.564	4	0.4	7	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10383	293668.477	6226163.467	3	0.35	6	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10384	293668.466	6226164.268	2	0.25	6	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10393	293666.671	6226153.646	3	0.24	7	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10404	293654.325	6226141.106	16	0.6	18		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10413	293640.791	6226136.039	6	0.3	9	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10428	293981.447	6225904.192	6	0.45	10		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10452	293954.156	6225876.907	4	0.25	5	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10472	293962.177	6225895.766	20	1.5	2	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10479	293962.672	6225914.966	8	0.35	12	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10480	293961.805	6225903.845	6	0.3	5	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10485	293996.247	6225861.089	6	0.3	12	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10486	293995.162	6225860.65	6	0.3	12	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10523	293998.875	6225841.088	20	1.5	2	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10534	294005.31	6225851.843	5	0.3	5	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10577	293620.652	6226001.774	5	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10578	293625.96	6226009.592	5	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10579	293634.131	6226005.643	5	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10582	293604.994	6225981.905	4	0.25	6		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10607	293521.72	6226028.512	28	1.6	25		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10608	293537.6407	6226050.997	20	1.2	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10609	293366.673	6226001.792	5	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10610	293468.3714	6225987.35	22	1.7	26		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10611	293562.7964	6226055.961	20	1	2022		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10612	293560.0132	6226061.783	20	1.1	22		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10614	293381.593	6226038.959	5	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10615	293390.824	6226040.933	8	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10616	293401.825	6226049.737	10	0.45	15		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10617	293405.207	6226053.395	5	0.3	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10632	293421.405	6226064.481	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10633	293420.498	6226063.766	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10634	293412.349	6226047.776	8	0.4	15		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10639	293496.473	6226094.275	6	0.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10641	293524.833	6226058.338	8	0.35	14		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10649	293648.7334	6226012.913	28	1.6	24		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10650	293638.245	6226018.245	15	1.2	20		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10652	293610.9117	6226033.298	24	1.2	25		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10653	293593.3125	6226078.151	14	1.3	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10654	293595.0045	6226072.364	22	1.2	22		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10656	293590.1629	6226074.617	18	0.9	18		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10657	293585.6499	6226072.862	18	1.1	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10659	293905.6948	6225592.1	6	0.4	8		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10665	293903.9086	6225582.407	15	0.8	18		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10667	293917.2387	6225568.584	10	0.95	18		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10669	293842.1353	6225477.094	18	0.8	20		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10670	293803.82	6225459.659	20	0.85	20		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10674	293338.9927	6225250.347	8	0.4	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10675	293585.8216	6226022.282	25	1.4	19		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10678	293639.8435	6226148.32	25	1.5	25		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10680	293372.7401	6226019.716	0	0.26	0		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10682	293640.3585	6226087.415	30	1.8	25	MS	<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10683	293372.4799	6226021.612	26	1.6	28		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10684	293549.9451	6226034.591	8	0.35	15		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10685	293550.5849	6226034.172	22	1.4	25		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10686	293556.7599	6225994.766	20	1.5	25		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10688	293630.5782	6225991.132	25	0.85	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10693	293573.202	6226014.461	16	1.2	20		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10696	293636.24	6226144.198	6	0.3	10		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10705	293544.329	6226152.276	5	0.25	8		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10706	293869.653	6225721.936	6	0.35	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10707	293975.06	6225748.36	14	1	20		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10712	293972.331	6225730.094	14	0.55	18		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10713	293899.349	6225580.588	12	0.7	16		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10715	293917.193	6225576.917	14	0.6	18		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10722	293873.699	6225536.796	8	0.45	12	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10723	293910.197	6225527.542	5	0.25	12		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10724	293906.279	6225517.383	6	0.3	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7

Number	Easting	Northing	Spread (m)	Dbh (m)	H (m)	Multi-stem	Species	KUTS	PKFT	Figure Number
T20578	292650.629	6224501.964	20	1	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20714	292767.309	6224532.992	20	1.2	30		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
T20715	292810.048	6224537.958	8	0.6	20		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 8
TN10728	293833.155	6225541.011	15	0.95	16		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10730	293831.324	6225476.821	8	0.5	15	MS	<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10732	293734.844	6225511.017	8	0.4	35		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10733	293734.536	6225510.7	10	0.5	12		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10740	293613.195	6225774.893	10	0.65	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10741	293599.361	6225771.415	8	0.45	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10742	293593.529	6225788.417	6	0.4	12		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10750	293642.717	6225376.522	12	0.5	15		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10753	293632.043	6225387.533	6	0.45	12		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10754	293619.643	6225302.754	0	1.4	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10755	293614.332	6225299.062	12	0.9	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10759	293612.842	6225283.242	14	0.7	15		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10760	293616.584	6225282.636	15	0.8	16		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10761	293620.482	6225280.448	14	0.6	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10763	293583.573	6225233.773	10	0.8	15		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10766	293642.18	6225162.76	20	1.1	18		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10767	293474.465	6225176.815	24	1.6	20		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10768	293454.835	6225201.666	16	0.85	16		<i>Eucalyptus tereticornis</i>	Yes	Yes	Figure 7
TN10774	293358.172	6225241.224	12	0.6	15		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10775	293352.97	6225239.794	0	0.3	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10776	293354.139	6225240.042	8	0.4	15		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10777	293348.186	6225239.641	0	0.3	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10779	293351.712	6225240.487	10	0.45	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10780	293342.781	6225236.798	6	0.35	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10781	293342.492	6225239.079	6	0.35	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10782	293334.998	6225238.429	6	0.35	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10783	293332.119	6225240.431	8	0.55	12		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10784	293330.444	6225242.601	10	0.45	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10785	293328.65	6225243.796	8	0.35	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10786	293327.057	6225243.649	8	0.4	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10787	293343.049	6225253.246	8	0.4	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10788	293337.116	6225255.828	8	0.45	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10789	293334.738	6225254.287	6	0.3	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10790	293330.964	6225255.835	8	0.35	14		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10791	293340.849	6225271.041	0	0.4	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10792	293318.065	6225242.494	6	0.3	10		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10793	293313.602	6225242.034	12	0.6	16		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10794	293306.421	6225246.356	10	0.5	15		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10795	293309.734	6225252.832	14	0.6	16		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10796	293300.548	6225266.35	0	0.25	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10797	293302.591	6225265.08	15	0.8	18		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10798	293333.948	6225299.734	0	0.35	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10799	293341.9	6225298.505	0	0.3	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10800	293345.95	6225303.731	0	0.3	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10801	293350.128	6225298.981	0	0.3	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10802	293351.792	6225300.474	0	0.4	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10803	293347	6225309.547	0	0.45	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7
TN10804	293343.189	6225306.535	0	0.35	0		<i>Eucalyptus moluccana</i>	Yes	Yes	Figure 7

6. Summary and Implications for the Planning Proposal

The URA is in old farmland and most land proposed for future urban development is cleared. No Koala population is known to occur on site and no core koala habitat occurs, though some patches of forest and woodland with potential koala habitat occur.

The surveys covered 75% of the site and mapped 2,529 native trees, of which 2,152 were classified as Koala Use Trees Species (KUTS) under the Koala SEPP 2021. These include an estimated 455 Preferred Koala Feed Trees (PKFTs) under the CKPOM, which were solely comprised of *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus moluccana* (Grey Box).

A range of forest and woodland patches occur in the URA. The largest most continuous areas of KUTS and PKFTs are in or adjacent to riparian corridors. The forest and woodland that conform 'potential koala habitat' are mainly River-flat Eucalypt Forest and some patches of Cumberland Plain Woodland. No koala shelter tree species listed by the CKPOM occur on site.

The largest most continuous areas of KUTS and PKFTs will be conserved. They are in the Howes Creek and Nepean River open space corridors and will be retained and managed in perpetuity under the planning framework proposed. Within these open space corridors, extensive vegetation restoration will occur, with potential for substantial increases in the cover of PKFTs. Additionally, areas of Elderslie Banksia Scrub Forest and River-flat Eucalypt Forest communities comprising KUTS and PKFTs will be contained within new RE1 – Public Recreation zoned open space areas to be protected in perpetuity under Vegetation Management Plans. This new zoning approach represents a significant improvement on the existing zoning framework for Menangle Park, ensuring greater alignment with the provisions of the Koala SEPP 2021 and the CKPOM.

No future DA in Menangle Park will impact core koala habitat, and none will require clearing of connected corridors of forest or woodland. The most substantial areas of potential koala habitat will be retained and protected in planned open space zones. Where limited patches of potential koala habitat are required to be impacted by development, DAs requiring such clearance will need to be supported by a Koala Activity Assessment Report (KAAR), consistent with the methodology outlined in the CKPOM.

The Planning Proposal is consistent with the Koala SEPP 2021 and CKPOM as it:

- Includes additional public open space and designated E2 - Environmental Protection zoned areas to protect potential koala habitat areas in perpetuity; representing a significant improvement on the current zoning framework;
- Retains the overwhelming majority of potential koala habitat areas in the riparian corridors along Howes Creek and the Nepean River, providing native vegetation corridors that could be utilised by local koala populations cited further to the south-east within the Dharawal National Park; and
- Is supported by an updated Structure Plan which contains developable areas to be predominantly cleared areas of the site and has had thorough consideration of ongoing environmental investigations including the results of this VAR and previous biodiversity studies.

7. References

DECCW. 2007. Cumberland Plain Vegetation Mapping. DECCW.

DPIE. 2021. Koala SEPP 2021: FAQ - development applications.

EES. 2021. BioNet Atlas. Environment, Energy and Science.

Phillips, S. 2018. Campbelltown Comprehensive Koala Plan of Management. Prepared by Biolink for Campbelltown City Council. Campbelltown City Council, Campbelltown.

APPENDIX A :

BBAM Quadrat Data 2016-2019



[illegible]

APPENDIX B :

BAM Plot Data – September 2020

Vegetation Assessment Report
Cumberland Ecology ©

BAM Growth Form Group	Family	Scientific Name	Exotic	Plot Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		
				PCT	849		849		849		849		850		849		849		849		849		849		849		849		849		849		850		849				
				Community	Shale Plains Woodland		Shale Plains Woodland		Exotic Dominated Grassland		Exotic Dominated Grassland		Shale Hills Woodland		Exotic Dominated Grassland		Exotic Dominated Grassland		Exotic Dominated Grassland		Exotic Dominated Grassland		Exotic Dominated Grassland		Exotic Dominated Grassland		Exotic Dominated Grassland		Exotic Dominated Grassland		Exotic Dominated Grassland		Shale Hills Woodland		Exotic Dominated Grassland				
				Common Name	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	
Exotic	Phytolaccaceae	<i>Phytolacca octandra</i>	*	Inkweed	0.1	1	0.1	1																															
Exotic	Plantaginaceae	<i>Plantago lanceolata</i>	*	Lamb's Tongues	0.3	100			1.0	200	10.0	2,000	1.0	500	1.0	500	2.0	500	0.1	30	0.2	300	0.5	500	1.0	500	0.2	50	1.0	500	0.5	300	0.3	100	0.3	50	0.2	30	
Exotic	Plantaginaceae	<i>Veronica arvensis</i>	*	Wall Speedwell	0.1	30	0.1	30	0.1	10																													
Exotic	Poaceae	<i>Andropogon virginicus</i>	*	Whisky Grass																													0.1	5					
Exotic	Poaceae	<i>Axonopus fissifolius</i>	*	Narrow-leafed Carpet Grass																				30.0	3,000								1.0	100					
Exotic	Poaceae	<i>Briza subaristata</i>	*		0.1	20					5.0	500	20.0	2,000	25.0	2,500	5.0	500					1.0	200	1.0	200			10.0	1,000			15.0	1,500		10.0	1,000		
Exotic	Poaceae	<i>Bromus catharticus</i>	*	Praire Grass	0.1	5	0.1	20	1.0	100			1.0	100			0.5	50									1.0	100	1.0	100	1.0	100			1.0	100			
Exotic	Poaceae	<i>Bromus hordeaceus</i>	*	Soft Brome					0.2	50																					0.1	10				1.0	100		
Exotic	Poaceae	<i>Cenchrus clandestinus</i>	*	Kikuyu Grass	10.0	1,000																									50.0	5,000							
Exotic	Poaceae	<i>Chloris gayana</i>	*	Rhodes Grass													1.0	50																					
Exotic	Poaceae	<i>Dactylis glomerata</i>	*	Cocksfoot	1.0	50																												0.2	20				
Exotic	Poaceae	<i>Ehrharta erecta</i>	*	Panic Veldtgrass	5.0	500	3.0	300																0.1	5														
Exotic	Poaceae	<i>Eleusine tristachya</i>	*	Goose Grass													0.1	2																					
Exotic	Poaceae	<i>Eragrostis cilianensis</i>	*	Stinkgrass							0.1	1																											
Exotic	Poaceae	<i>Eragrostis curvula</i>	*	African Lovegrass	1.0	50	10.0	1,000	1.0	20			1.0	20	1.0	20	0.1	30	90.0	4,000	50.0	5,000	50.0	3,000			30.0	3,000	2.0	30	20.0	2,000	1.0	20			2.0	50	
Exotic	Poaceae	<i>Hordeum leporinum</i>	*	Barley Grass			0.1	5																															
Exotic	Poaceae	<i>Lolium perenne</i>	*	Perennial Ryegrass	0.1	10	0.1	10	15.0	1,500	2.0	200	10.0	1,000			10.0	1,000	5.0	500			5.0	500	1.0	100	5.0	500	15.0	1,500	5.0	500	10.0	1,000					
Exotic	Poaceae	<i>Nassella neesiana</i>	*	Chilean Needle Grass							0.1	10												0.1	10					0.3	20			0.2	20				
Exotic	Poaceae	<i>Nassella trichotoma</i>	*	Serrated Tussock							0.2	10	1.0	50	1.0	30			0.2	20	0.3	30	0.1	5			0.2	10	0.2	20			0.2	5	1.0	30	0.2	10	
Exotic	Poaceae	<i>Paspalum dilatatum</i>	*	Paspalum	5.0	500	1.0	100	40.0	4,000	30.0	3,000	10.0	1,000	40.0	4,000	20.0	2,000	1.0	100	5.0	500	20.0	2,000	10.0	1,000	15.0	1,500	30.0	3,000	1.0	100	35.0	3,500			25.0	2,500	
Exotic	Poaceae	<i>Setaria parviflora</i>	*		2.0	200					1.0	100	1.0	100	1.0	100	1.0	100			1.0	100	1.0	100	1.0	200	1.0	100	5.0	500	1.0	100	5.0	500			1.0	100	
Exotic	Poaceae	<i>Sporobolus africanus</i>	*	Parramatta Grass					0.1	10																													
Exotic	Polygalaceae	<i>Polygala virgata</i>	*													0.1	2																0.3	6					
Exotic	Polygonaceae	<i>Rumex conglomeratus</i>	*	Clustered Dock										0.1	1																								
Exotic	Polygonaceae	<i>Rumex crispus</i>	*	Curled Dock	0.1	1																																	
Exotic	Primulaceae	<i>Lysimachia arvensis</i>	*	Scarlet Pimpernel	0.1	30	0.1	5	0.1	20	0.1	50	0.2	50	0.1	30	0.3	40			0.1	10	0.1	20	0.2	200	0.1	20	0.1	50	0.1	20	0.1	20	0.1	20	0.1	20	
Exotic	Rosaceae	<i>Rosa canina</i>	*	Dog Rose																																0.2	1		
Exotic	Rosaceae	<i>Rubus fruticosus</i>	*	Blackberry complex	4.0	50	1.0	2																															
Exotic	Rubiaceae	<i>Richardia stellaris</i>	*																						1.0	5							0.3	3					
Exotic	Rubiaceae	<i>Sherardia arvensis</i>	*	Field Madder							0.1	20	0.1	20											0.1	20													
Exotic	Solanaceae	<i>Lycium ferocissimum</i>	*	African Boxthorn			45.0	50											0.3	1												0.3	50	0.1	20				
Exotic	Solanaceae	<i>Solanum nigrum</i>	*	Black-berry Nightshade	0.1	5	0.1	3					0.1	3																									
Exotic	Verbenaceae	<i>Verbena bonariensis</i>	*	Purpletop	0.2	10	0.1	2	0.1	5			0.2	20	0.1	5	0.2	10	0.2	20				0.1	10	0.1	20	0.1	10	0.2	20	0.1	5	0.2	10	0.2	20	0.2	30
Exotic	Verbenaceae	<i>Verbena quadrangularis</i>	*		0.1	5					0.1	10												0.1	5			0.1	10	0.1	10			0.1	20	0.1	5		
Exotic	Verbenaceae	<i>Verbena rigida</i>	*	Veined Verbena																							0.1	10								0.1	5		
Exotic	Poaceae	<i>Cynodon dactylon</i>	*	Common Couch	20.0	2,000	20.0	2,000	20.0	2,000	20.0	2,000			10.0	1,000	15.0	1,500	1.0	100	20.0	2,000	10.0	1,000	10.0	1,000	20.0	2,000	5.0	500	10.0	1,000	5.0	500	10.0	1,000	30.0	3,000	

APPENDIX C :

BAM Plots – June 2021



Table 9 BAM Plot Data - June 2021

				Vegetation Community	Acacia Regrowth		Shale Plains Woodland		River Flat Eucalypt Forest		Shale Plains Woodland	
				Plot Number	1		2		3		4	
BAM Growth Form Group	Family	Scientific Name	Exo tic	Common Name	C	A	C	A	C	A	C	A
Tree (TG)	Fabaceae (Mimosoideae)	<i>Acacia decurrens</i>		Black Wattle	10.0	3	0.25	2				
Tree (TG)	Malvaceae	<i>Brachychiton populneus subsp. populneus</i>							0.5	3		
Tree (TG)	Meliaceae	<i>Melia azedarach</i>		White Cedar	10.0	10						
Tree (TG)	Myrtaceae	<i>Eucalyptus crebra</i>		Narrow-leaved Ironbark							15.0	2
Tree (TG)	Myrtaceae	<i>Eucalyptus eugenioides</i>		Thin-leaved Stringybark			20.0	2				
Tree (TG)	Myrtaceae	<i>Eucalyptus tereticornis</i>		Forest Red Gum	0.1	2	0.1	1	35.0	5	20.0	4
Shrub (SG)	Pittosporaceae	<i>Bursaria spinosa</i>		Native Blackthorn			10.0	25				
Shrub (SG)	Solanaceae	<i>Duboisia myoporoides</i>		Corkwood	2.0	6			0.5	1		
Shrub (SG)	Ulmaceae	<i>Trema tomentosa</i>		Native Peach	0.1	1						
Other (OG)	Fabaceae (Faboideae)	<i>Desmodium varians</i>		Slender Tick-trefoil							0.1	30
Other (OG)	Fabaceae (Faboideae)	<i>Glycine microphylla</i>		Small-leaf Glycine			0.1	10				

				Vegetation Community	Acacia Regrowth		Shale Plains Woodland		River Flat Eucalypt Forest		Shale Plains Woodland	
				Plot Number	1		2		3		4	
BAM Growth Form Group	Family	Scientific Name	Exo tic	Common Name	C	A	C	A	C	A	C	A
Other (OG)	Fabaceae (Faboideae)	<i>Glycine tabacina</i>		Variable Glycine			0.1	30			0.1	20
Other (OG)	Ranunculaceae	<i>Clematis aristata</i>		Old Man's Beard								
Grass & grasslike (GG)	Cyperaceae	<i>Carex inversa</i>		Knob Sedge							0.1	30
Grass & grasslike (GG)	Cyperaceae	<i>Cyperus flaccidus</i>		Lax Flat-sedge					0.2	30		
Grass & grasslike (GG)	Cyperaceae	<i>Cyperus gracilis</i>		Slender Flat-sedge					0.1	3	0.2	500
Grass & grasslike (GG)	Poaceae	<i>Austrostipa ramosissima</i>		Stout Bamboo Grass	15.0	500	5.0	200				
Grass & grasslike (GG)	Poaceae	<i>Bothriochloa macra</i>		Red Grass							1.0	100
Grass & grasslike (GG)	Poaceae	<i>Cynodon dactylon</i>		Common Couch					15.0	1,500	15.0	1,500
Grass & grasslike (GG)	Poaceae	<i>Eragrostis brownii</i>		Brown's Lovegrass								
Grass & grasslike (GG)	Poaceae	<i>Eragrostis leptostachya</i>		Paddock Lovegrass			0.1	10				

				Vegetation Community	Acacia Regrowth		Shale Plains Woodland		River Flat Eucalypt Forest		Shale Plains Woodland	
				Plot Number	1		2		3		4	
BAM Growth Form Group	Family	Scientific Name	Exo tic	Common Name	C	A	C	A	C	A	C	A
Grass & grasslike (GG)	Poaceae	<i>Microlaena stipoides</i> var. <i>stipoides</i>		Weeping Grass	10.0	1,000	30.0	3,000	45.0	4,500	15.0	1,500
Grass & grasslike (GG)	Poaceae	<i>Rytidosperma racemosum</i>		Wallaby Grass							1.0	100
Grass & grasslike (GG)	Poaceae	<i>Sporobolus creber</i>		Slender Rat's Tail Grass							1.0	100
Forb (FG)	Apiaceae	<i>Hydrocotyle laxiflora</i>		Stinking Pennywort	0.1	10						
Forb (FG)	Asteraceae	<i>Euchiton sphaericus</i>		Star Cudweed							0.1	30
Forb (FG)	Asteraceae	<i>Senecio diaschides</i>			0.2	5						
Forb (FG)	Campanulaceae	<i>Wahlenbergia communis</i>		Tufted Bluebell								
Forb (FG)	Campanulaceae	<i>Wahlenbergia gracilis</i>		Sprawling Bluebell	0.1	10					0.1	20
Forb (FG)	Chenopodiaceae	<i>Einadia hastata</i>		Berry Saltbush			0.2	20				
Forb (FG)	Chenopodiaceae	<i>Einadia polygonoides</i>		Knotweed Goosefoot			0.1	10			0.1	3
Forb (FG)	Convolvulaceae	<i>Dichondra repens</i>		Kidney Weed	0.1	10	0.1	100	0.2	200		
Forb (FG)	Crassulaceae	<i>Crassula sieberiana</i>		Australian Stonecrop							0.1	10
Forb (FG)	Oxalidaceae	<i>Oxalis perennans</i>					0.1	10			0.1	5
Forb (FG)	Plantaginaceae	<i>Veronica plebeia</i>		Trailing Speedwell	0.1	1					0.1	1

				Vegetation Community	Acacia Regrowth		Shale Plains Woodland		River Flat Eucalypt Forest		Shale Plains Woodland	
				Plot Number	1		2		3		4	
BAM Growth Form Group	Family	Scientific Name	Exotic	Common Name	C	A	C	A	C	A	C	A
Forb (FG)	Polygonaceae	<i>Rumex brownii</i>		Swamp Dock					0.1	3		
Forb (FG)	Rubiaceae	<i>Asperula conferta</i>		Common Woodruff							0.1	10
Forb (FG)	Solanaceae	<i>Solanum prinophyllum</i>		Forest Nightshade	0.3	20	0.75	30	0.3	200		
Fern (EG)	Dennstaedtiaceae	<i>Pteridium esculentum</i>		Bracken					10.0	500		
Fern (EG)	Pteridaceae	<i>Cheilanthes sieberi</i>		Rock Fern								
Exotic	Apocynaceae	<i>Araujia sericifera</i>	*	Moth Vine	0.1	1			0.5	30		
Exotic	Apocynaceae	<i>Gomphocarpus fruticosus</i>	*	Narrow-leaved Cotton Bush	0.2	2						
Exotic	Asparagaceae	<i>Asparagus asparagoides</i>	*	Bridal Creeper	0.3	50	0.5	100	2.0	150		
Exotic	Asteraceae	<i>Bidens pilosa</i>	*	Cobbler's Pegs			0.1	10				
Exotic	Asteraceae	<i>Carthamus lanatus</i>	*	Saffron Thistle			0.3	20				
Exotic	Asteraceae	<i>Cirsium vulgare</i>	*	Spear Thistle			0.1	2				
Exotic	Asteraceae	<i>Conyza sumatrensis</i>	*	Tall fleabane	0.1	5	0.1	20			0.1	10
Exotic	Asteraceae	<i>Gamochaeta americana</i>	*	Purple Cudweed							0.1	20
Exotic	Asteraceae	<i>Gamochaeta pensylvanica</i>	*	Cudweed								
Exotic	Asteraceae	<i>Gamochaeta purpurea</i>	*	Purple Cudweed							0.1	5

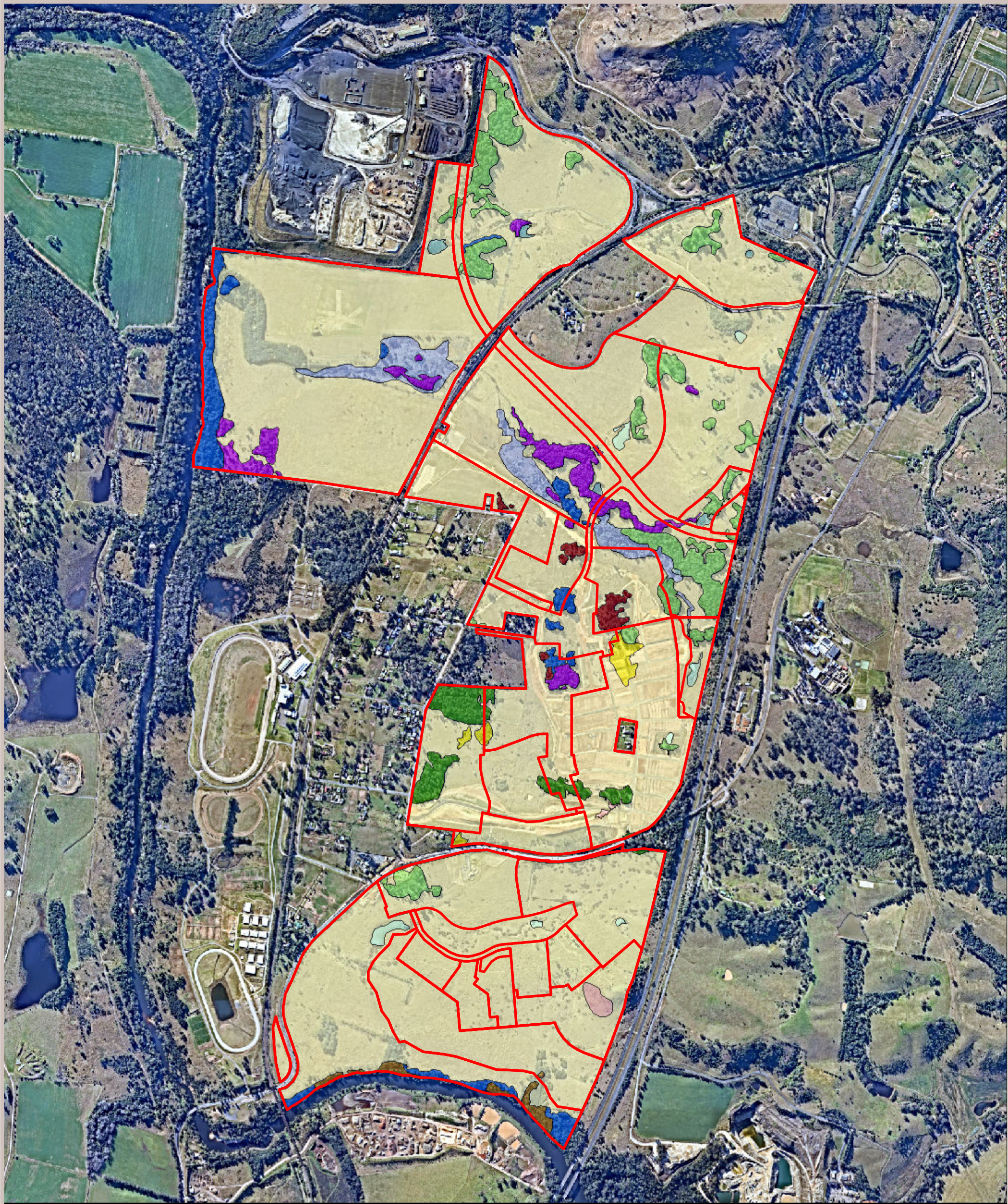
				Vegetation Community	Acacia Regrowth		Shale Plains Woodland		River Flat Eucalypt Forest		Shale Plains Woodland	
				Plot Number	1		2		3		4	
BAM Growth Form Group	Family	Scientific Name	Exo tic	Common Name	C	A	C	A	C	A	C	A
Exotic	Asteraceae	<i>Hypochaeris albiflora</i>	*	White Flatweed							0.1	5
Exotic	Asteraceae	<i>Hypochaeris radicata</i>	*	Catsear								
Exotic	Asteraceae	<i>Senecio madagascariensis</i>	*	Fireweed	0.2	20	0.1	10	0.1	10	0.5	150
Exotic	Asteraceae	<i>Sonchus asper</i>	*	Prickly Sowthistle							0.1	1
Exotic	Asteraceae	<i>Taraxacum officinale</i>	*	Dandelion					0.1	5		
Exotic	Bignoniaceae	<i>Jacaranda mimosifolia</i>	*	Jacaranda					0.3	1		
Exotic	Boraginaceae	<i>Heliotropium amplexicaule</i>	*	Blue Heliotrope	0.1	2	0.1	3				
Exotic	Cactaceae	<i>Opuntia stricta</i>	*	Common Prickly Pear					0.1	1		
Exotic	Caryophyllaceae	<i>Paronychia brasiliensis</i>	*	Chilean Whitlow Wort, Brazilian Whitlow							0.1	20
Exotic	Caryophyllaceae	<i>Petrorhagia dubia</i>	*								0.1	3
Exotic	Clusiaceae	<i>Hypericum perforatum</i>	*	St. John's Wort							0.1	5
Exotic	Crassulaceae	<i>Bryophyllum delagoense</i>	*	Mother of millions					5.0	1,000		
Exotic	Malvaceae	<i>Modiola caroliniana</i>	*	Red-flowered Mallow							0.1	3
Exotic	Malvaceae	<i>Sida rhombifolia</i>	*	Paddy's Lucerne	0.2	100	10.0	1,000	1.0	200	0.25	50

				Vegetation Community	Acacia Regrowth		Shale Plains Woodland		River Flat Eucalypt Forest		Shale Plains Woodland	
				Plot Number	1		2		3		4	
BAM Growth Form Group	Family	Scientific Name	Exo tic	Common Name	C	A	C	A	C	A	C	A
Exotic	Oleaceae	<i>Olea europaea subsp. cuspidata</i>	*	African Olive	0.2	1			25.0	30	0.3	2
Exotic	Oxalidaceae	<i>Oxalis corniculata</i>	*	Creeping Oxalis					0.1	10		
Exotic	Passifloraceae	<i>Passiflora suberosa</i>	*	Cork Passionfruit	0.1	1						
Exotic	Phytolaccaceae	<i>Phytolacca octandra</i>	*	Inkweed	0.5	20	1.0	30				
Exotic	Plantaginaceae	<i>Plantago lanceolata</i>	*	Lamb's Tongues							0.3	200
Exotic	Poaceae	<i>Briza subaristata</i>	*								0.1	10
Exotic	Poaceae	<i>Chloris gayana</i>	*	Rhodes Grass							0.1	3
Exotic	Poaceae	<i>Ehrharta erecta</i>	*	Panic Veldtgrass	2.0	200	1.0	100	5.0	500		
Exotic	Poaceae	<i>Eragrostis curvula</i>	*	African Lovegrass	75.0	5,000	55.0	4,000			50.0	5,000
Exotic	Poaceae	<i>Setaria parviflora</i>	*						0.5	50	2.0	200
Exotic	Polygonaceae	<i>Acetosa sagittata</i>	*	Rambling Dock								
Exotic	Polygonaceae	<i>Acetosella vulgaris</i>	*	Sheep Sorrel					0.1	20		
Exotic	Rosaceae	<i>Rubus fruticosus</i>	*	Blackberry complex								

				Vegetation Community	Acacia Regrowth		Shale Plains Woodland		River Flat Eucalypt Forest		Shale Plains Woodland	
				Plot Number	1		2		3		4	
BAM Growth Form Group	Family	Scientific Name	Exo tic	Common Name	C	A	C	A	C	A	C	A
Exotic	Solanaceae	<i>Cestrum parqui</i>	*	Green Cestrum								
Exotic	Solanaceae	<i>Lycium ferocissimum</i>	*	African Boxthorn			20.0	50	10.0	30	0.3	1
Exotic	Solanaceae	<i>Solanum mauritianum</i>	*	Wild Tobacco Bush	0.2	1						
Exotic	Solanaceae	<i>Solanum nigrum</i>	*	Black-berry Nightshade	0.2	10						
Exotic	Solanaceae	<i>Solanum nigrum</i>	*	Black-berry Nightshade	0.1	5	0.3	10				
Exotic	Solanaceae	<i>Solanum radicans</i>	*	Cusmayllo								
Exotic	Solanaceae	<i>Solanum sisymbriifolium</i>	*									
Exotic	Verbenaceae	<i>Verbena bonariensis</i>	*	Purpletop								
Exotic	Verbenaceae	<i>Verbena rigida</i>	*	Veined Verbena	0.1	3	0.1	5			0.2	20

FIGURES





Legend



Study Area

Vegetation Communities (CE)

- Shale Plains Woodland
- Shale Hills Woodland
- Elderslie Banksia Scrub Forest
- River Flat Eucalypt Forest
- Swamp Oak Floodplain Forest

- River Oak Riparian Woodland
- Freshwater Wetlands
- Acacia Regrowth
- Derived Native Grassland
- Exotic Vegetation
- Dam

Coordinate System: MGA Zone 56 (GDA 94)

Image Source:
Image © Nearmap (2021)
Dated: 06/07/2021

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Figure 1. Vegetation Mapping

0 150 300 450 600 m

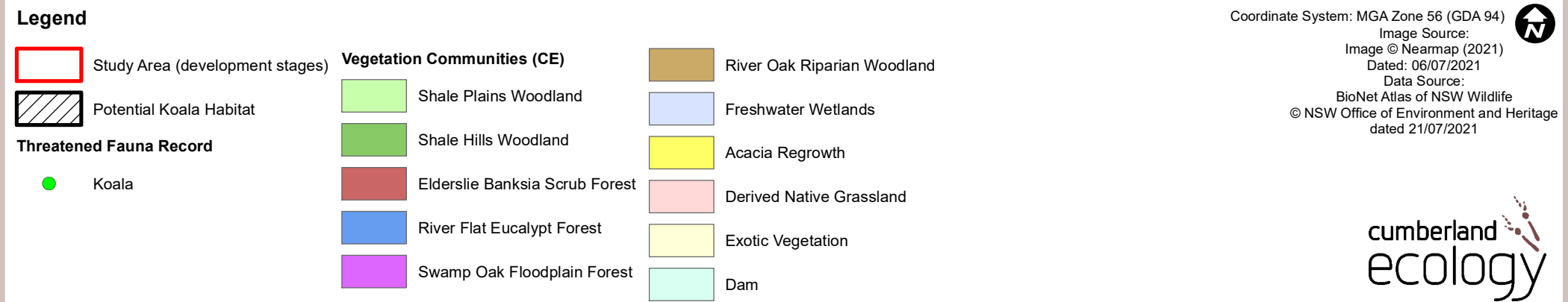
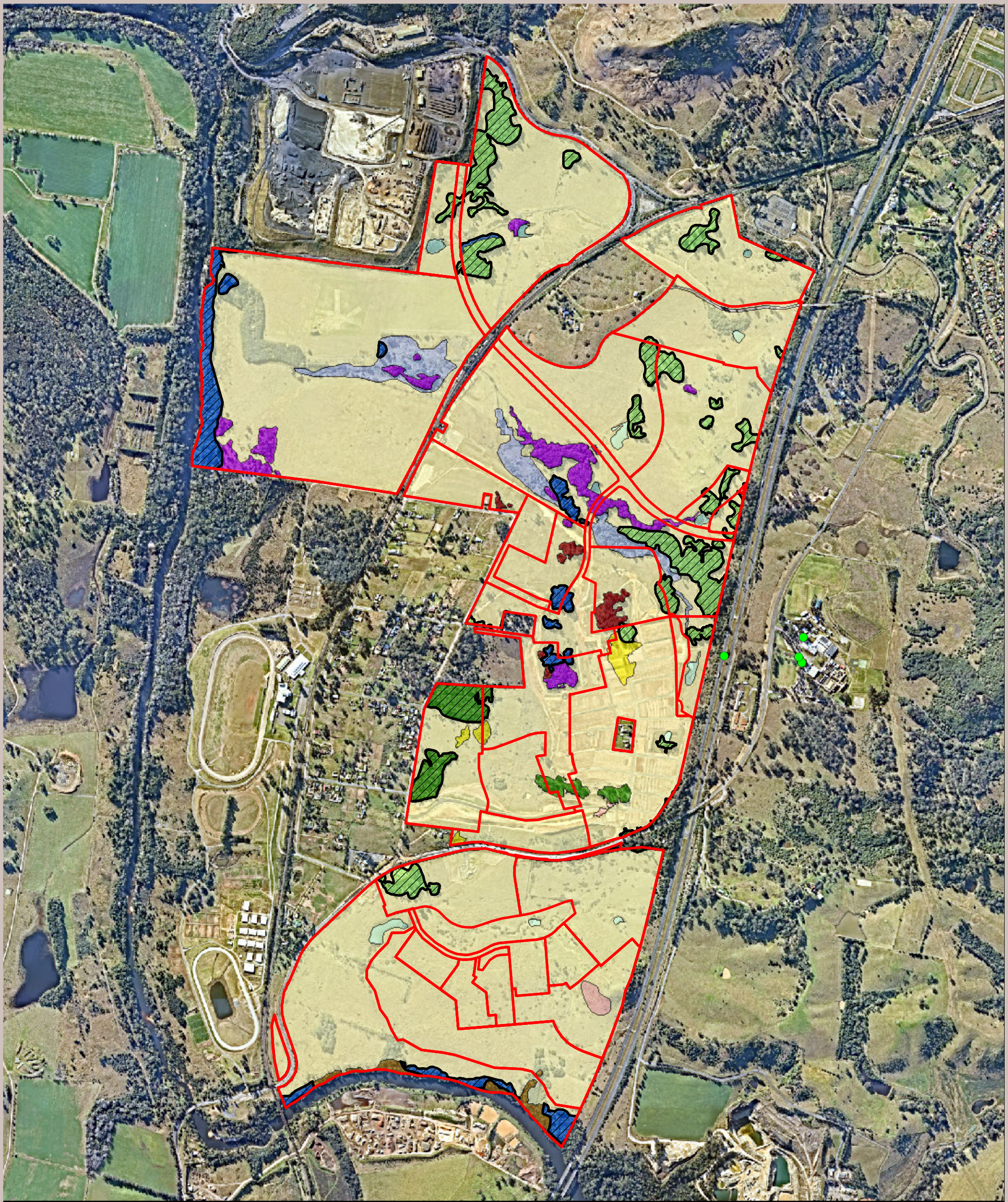


Figure 2. Koala Habitat under the Campbelltown Koala Plan of Management

0 150 300 450 600 m

 Core Koala Habitat
 Potential Koala Habitat

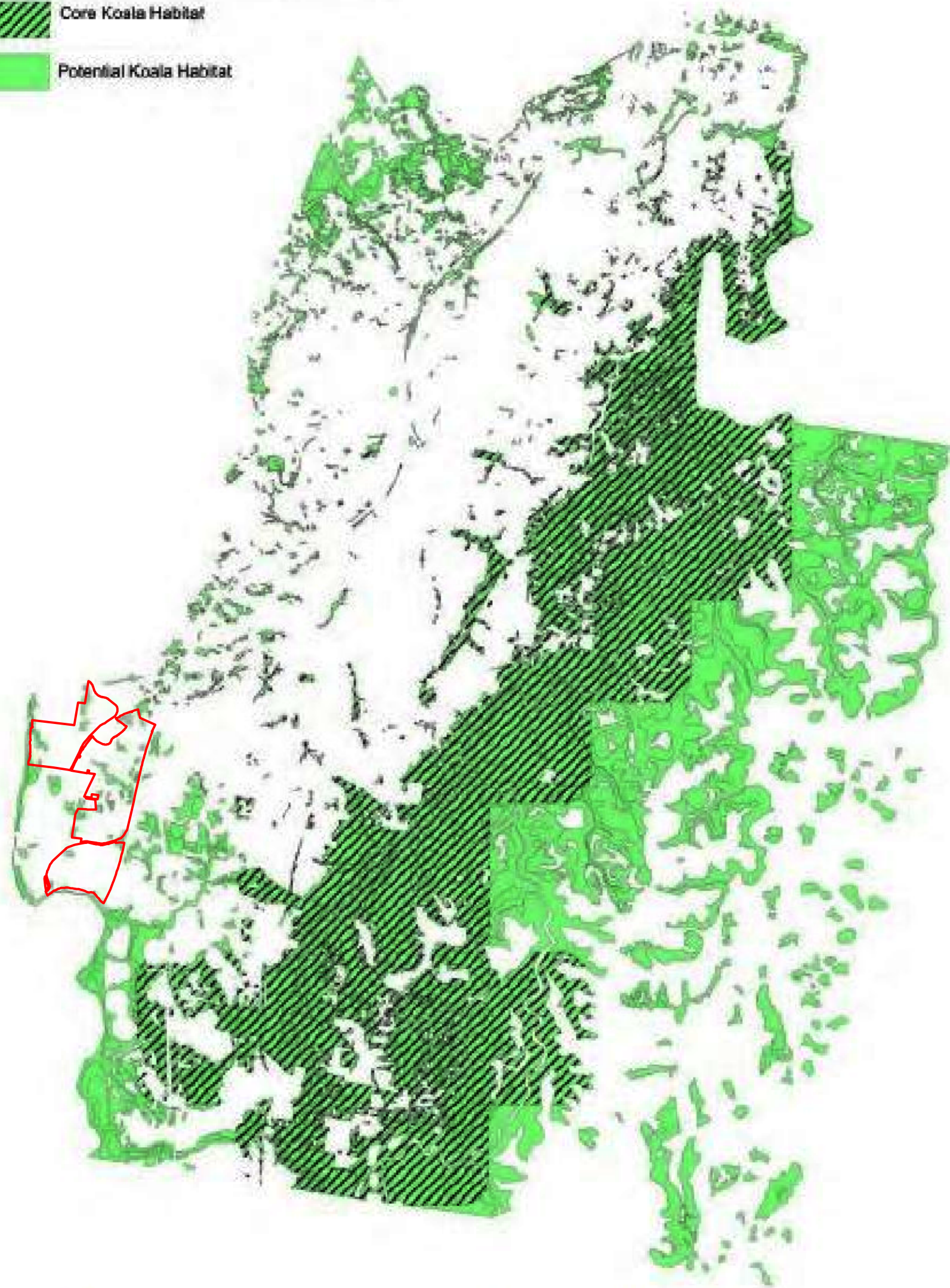


Figure 5.1: Extent of potential and core koala habitat across the Campbelltown LGA.

Note: The approximate extent of core koala habitat as evidenced by the presence of one or more koala records for each of the three most recent koala generations 1994 - 2017 (Appendix F)

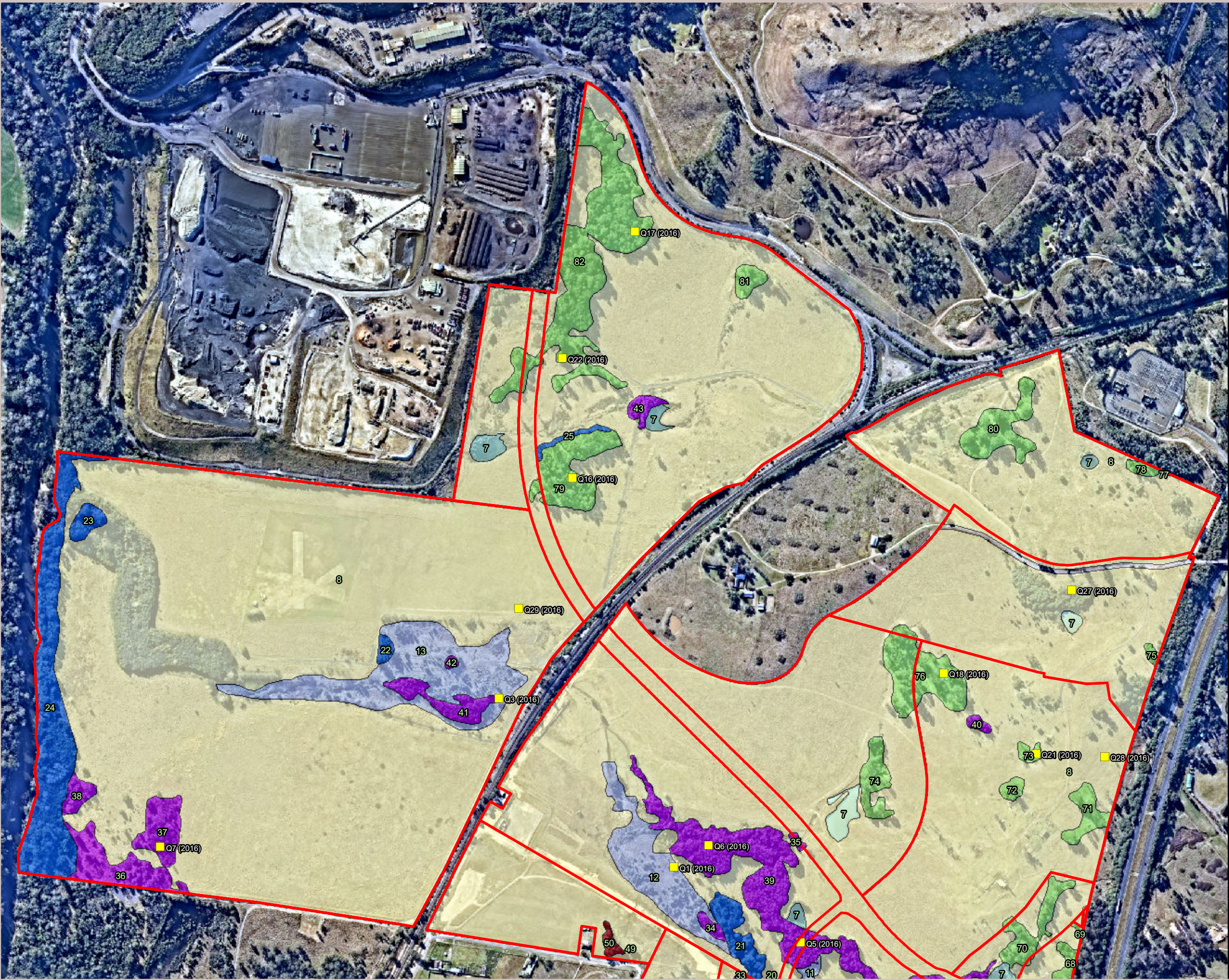
Legend

 Study Area

Coordinate System: MGA Zone 56 (GDA 94)
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 Comprehensive Koala Plan
 of Management (2018)
 Campbelltown City Council



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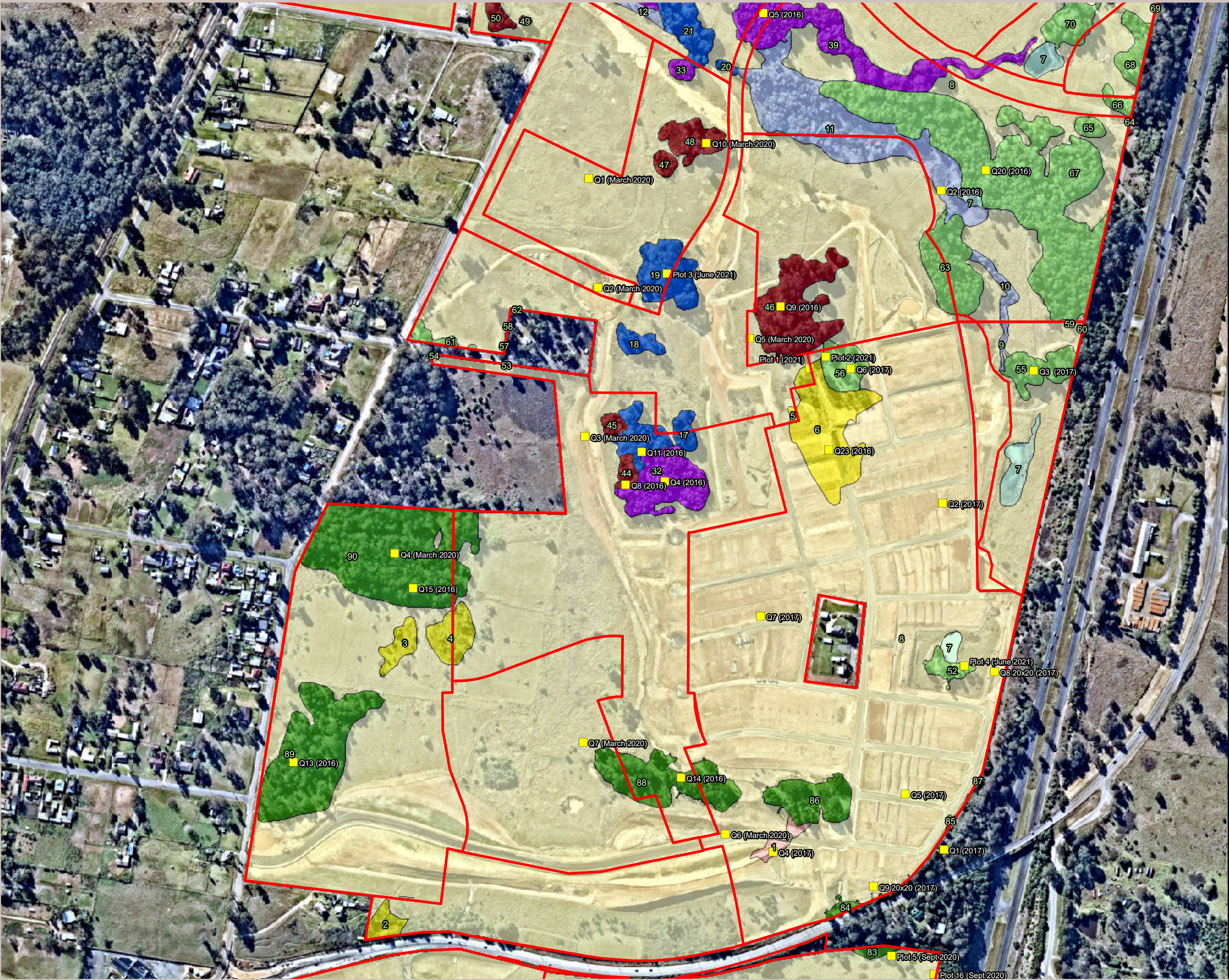
- Study Area
- Plot Locations
- Vegetation Communities (CE)**
 - Shale Plains Woodland
 - Elderslie Banksia Scrub Forest
 - River Flat Eucalypt Forest
 - Swamp Oak Floodplain Forest
 - Freshwater Wetlands
 - Exotic Vegetation
 - Dam

Image Source:
Image © Nearmap (2021)
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Coordinate System: MGA Zone 56 (GDA 94)



0 50 100 150 200 m

Figure 4. Vegetation Patches and Plots within the Site - North



Legend

Study Area

Plot Locations

Vegetation Communities (CE)

Shale Plains Woodland

Shale Hills Woodland

Elderslie Banksia Scrub Forest

River Flat Eucalypt Forest

Swamp Oak Floodplain Forest

Freshwater Wetlands

Acacia Regrowth

Derived Native Grassland

Exotic Vegetation

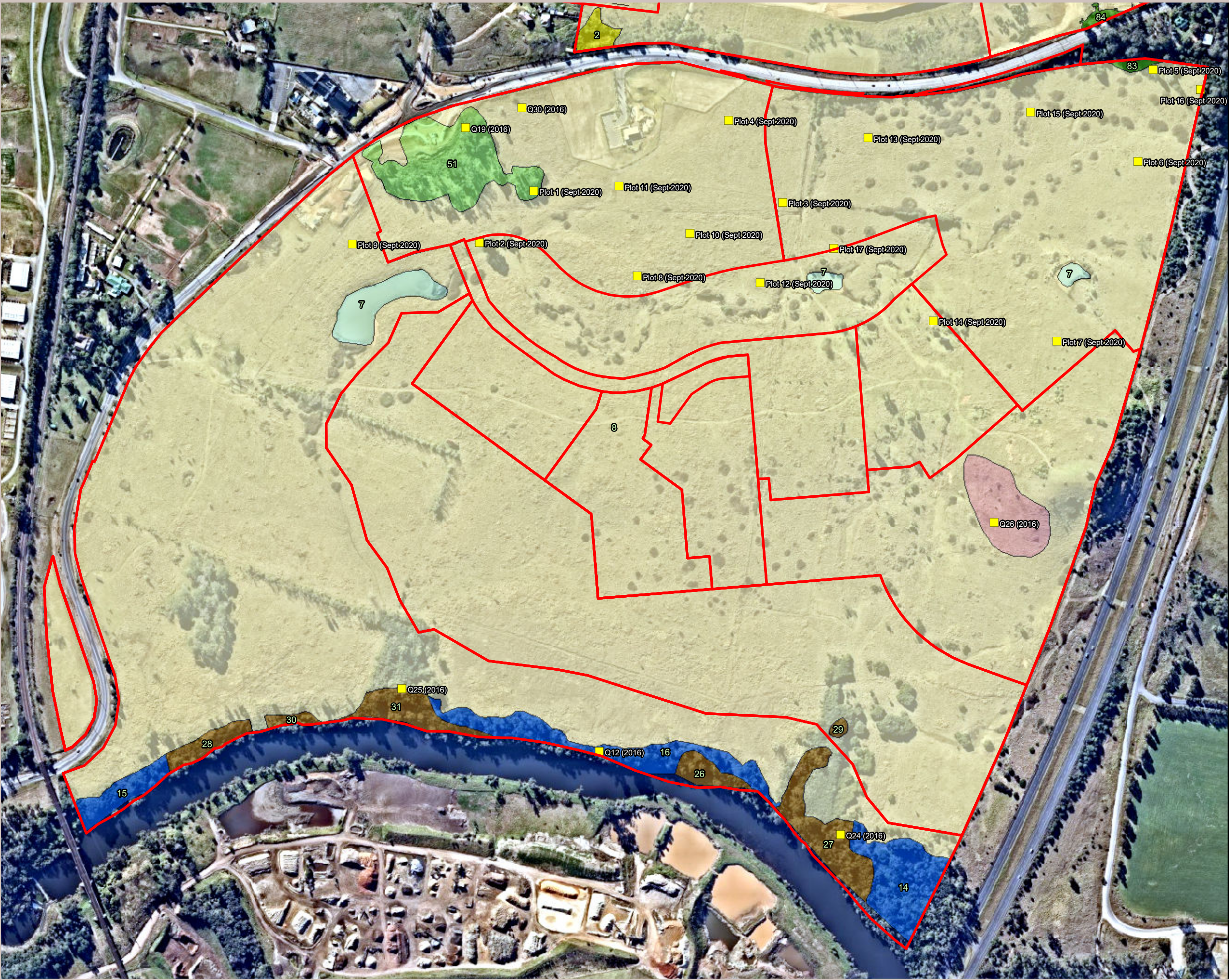
Dam

Image Source:
Image © Nearmap (2021)
Dated:

Coordinate System: MGA Zone 56 (GDA 94)

0 50 100 150 200 m

Figure 5. Vegetation Patches and Plots within the Site - Central



Legend

- Study Area
- Plot Locations
- Vegetation Communities (CE)**
 - Shale Plains Woodland
 - Shale Hills Woodland
 - River Flat Eucalypt Forest
 - River Oak Riparian Woodland
 - Acacia Regrowth
 - Derived Native Grassland
 - Exotic Vegetation
 - Dam

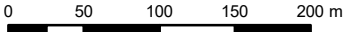
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Coordinate System: MGA Zone 56 (GDA 94)



Figure 6. Vegetation Patches and Plots within the Site - South



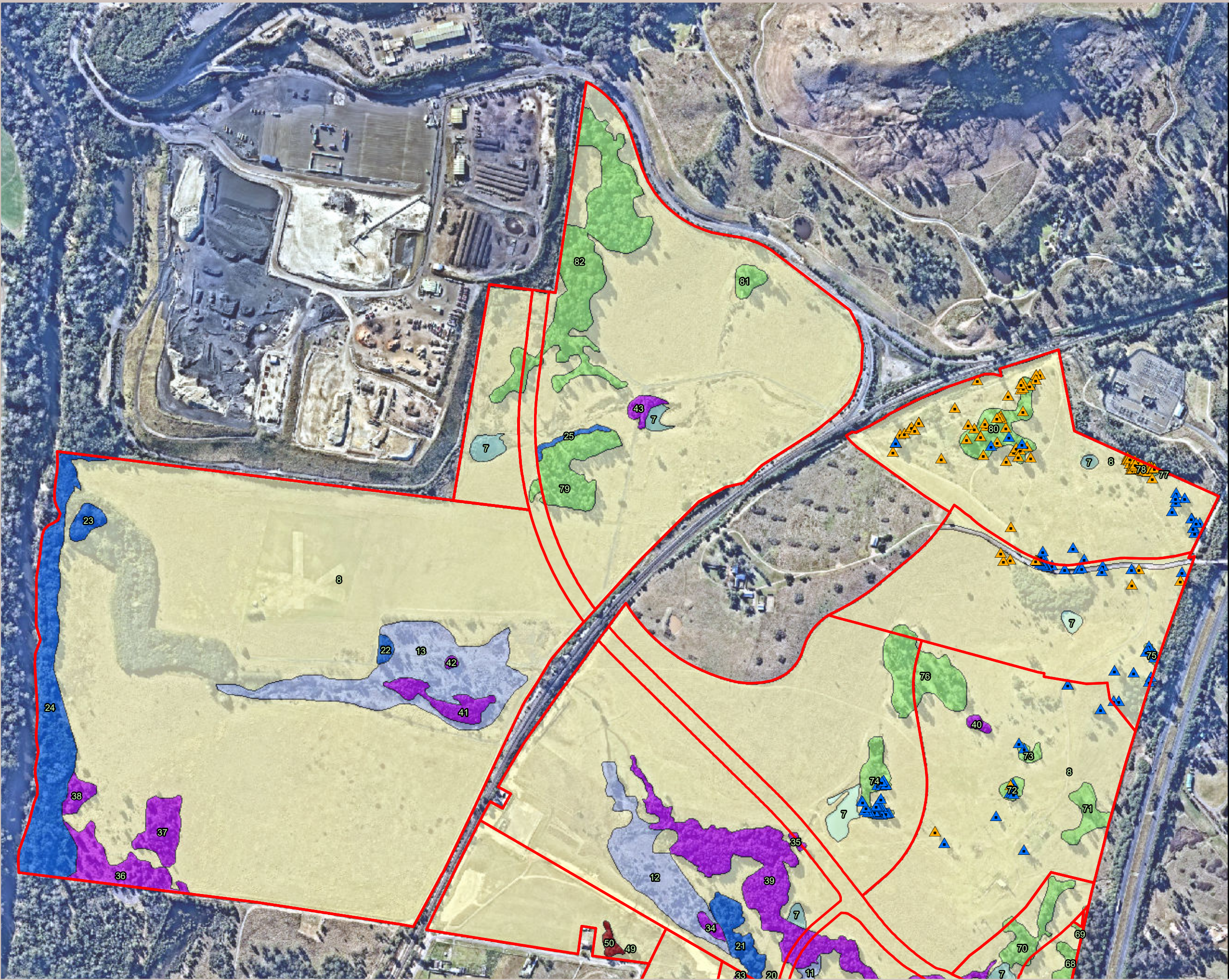
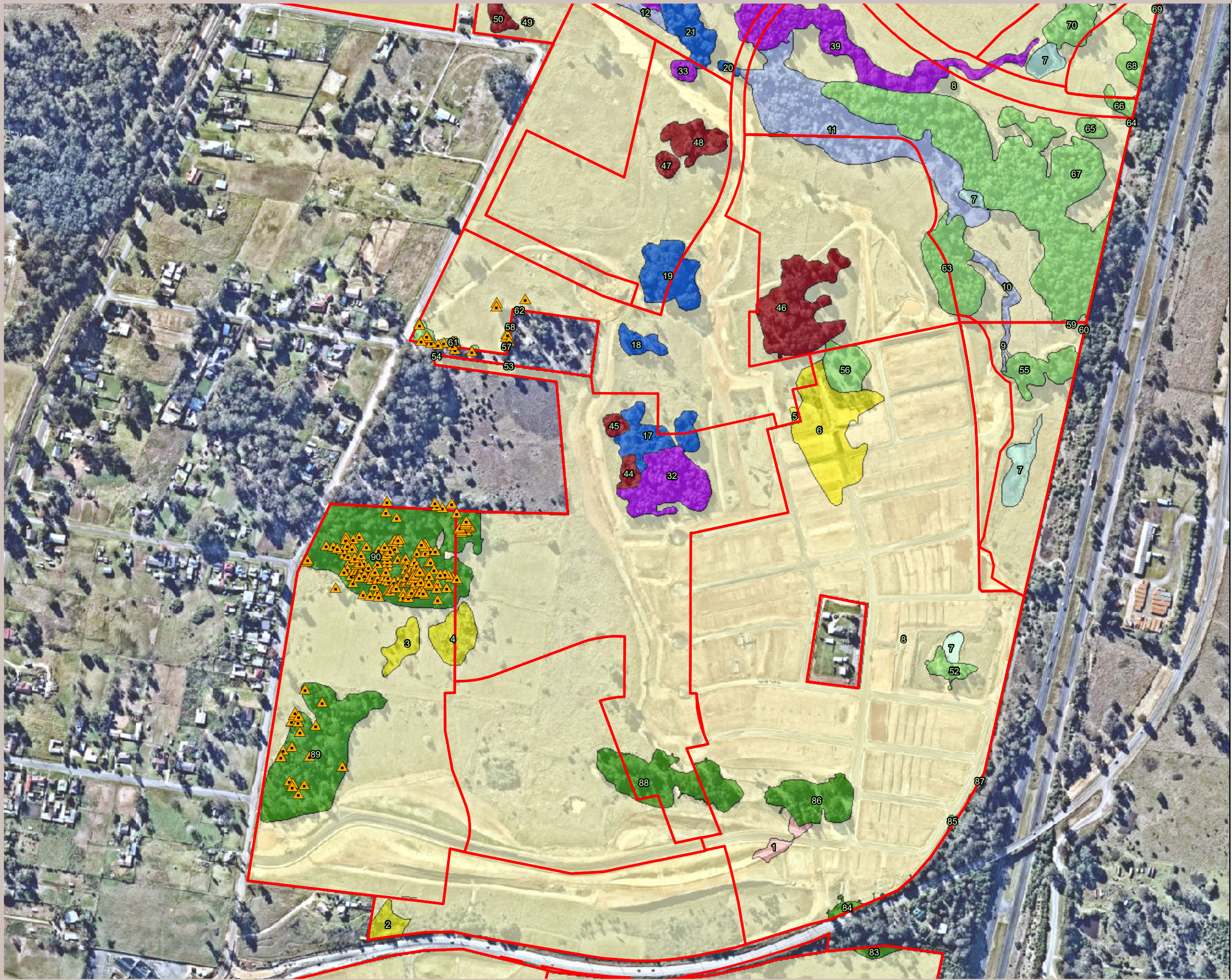


Figure 7. Stadia Metric Survey Results - North



Legend

Study Area

Vegetation Communities (CE)

- Shale Plains Woodland
- Shale Hills Woodland
- Elderslie Banksia Scrub Forest
- River Flat Eucalypt Forest
- Swamp Oak Floodplain Forest
- Freshwater Wetlands
- Acacia Regrowth
- Derived Native Grassland
- Exotic Vegetation
- Dam

Preferred Koala Feed Tree Species (CKPOM)

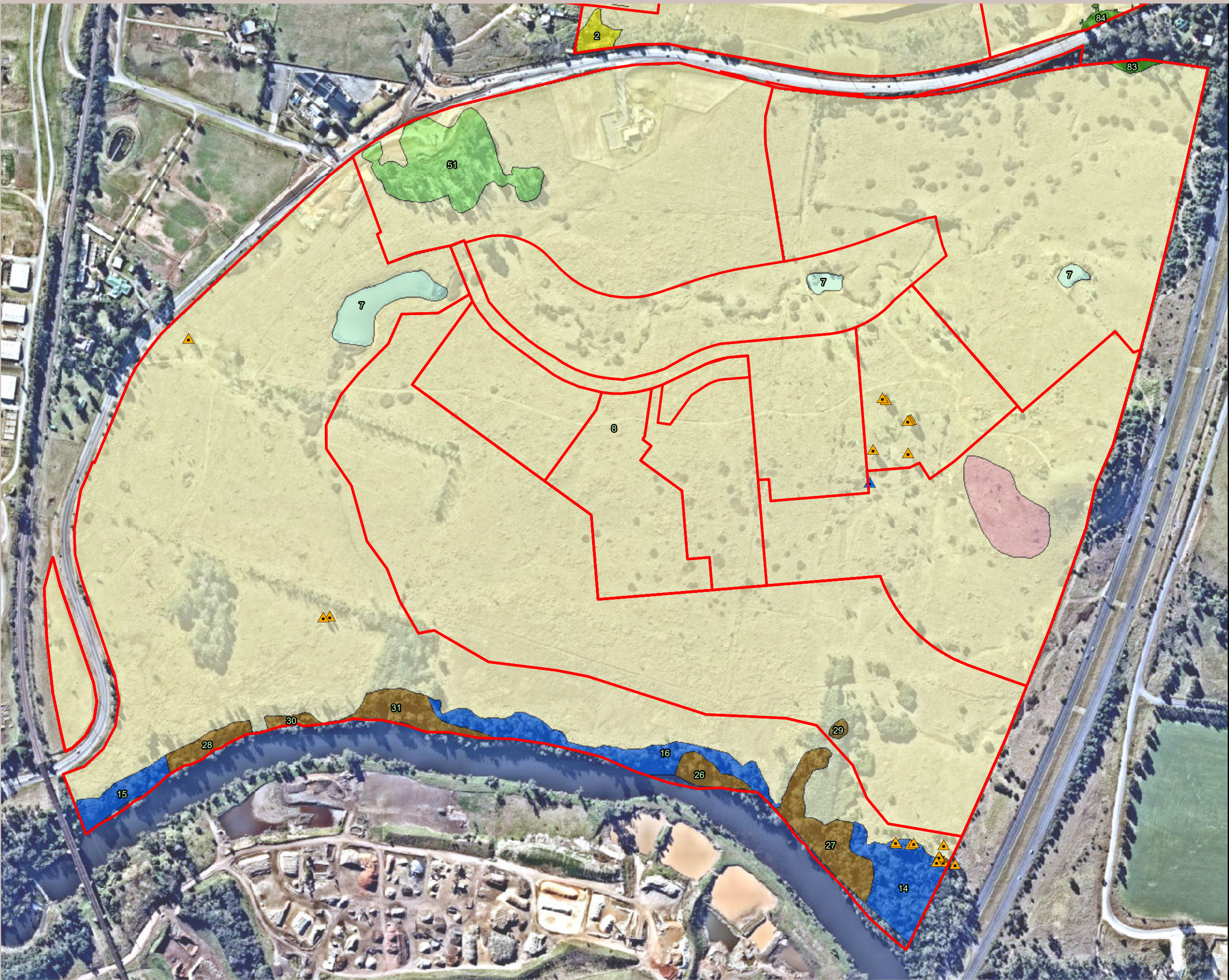
- Eucalyptus tereticornis

Image Source:
Image © Nearmap (2021)
Dated:

Coordinate System: MGA Zone 56 (GDA 94)

0 50 100 150 200 m

Figure 8. Stadia Metric Survey Results - Central



Legend



Study Area

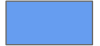
Vegetation Communities (CE)



Shale Plains Woodland



Shale Hills Woodland



River Flat Eucalypt Forest



River Oak Riparian Woodland



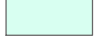
Acacia Regrowth



Derived Native Grassland



Exotic Vegetation



Dam

Preferred Koala Feed Tree Species (CKPOM)



Eucalyptus moluccana



Eucalyptus tereticornis

Image Source:
Image © Nearmap (2021)
Dated:



Coordinate System: MGA Zone 56 (GDA 94)

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0 50 100 150 200 m

Figure 9. Stadia Metric Survey Results - South