

# ECOLOGICAL ASSESSMENT

for a  
proposed subdivision

at

Lot 101 DP 1233753 (No. 65)

and

Part Lot 102 DP 1233753 (No. 99)

**Owlpen Lane**

**FARLEY, NSW**

**Prepared by:**

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**For:**

**ACM Landmark Pty Ltd**



**Job No: 12591**

**October 2021**

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Project Name	Ecological Assessment for a proposed subdivision at Lot 101 DP 1233753 (No. 65) and Part Lot 102 DP 1233753 (No. 99) Owlpen Lane. Farley NSW.	
Project Number	12591	
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## Disclaimer

This report has been prepared in accordance with the proposal provided by the Client and outlined within this report. All findings, conclusions or recommendations contained within this report are based upon the data and results collected under the times and conditions specified in the report and are only applicable for the proposal considered within this report. This report has been prepared for use exclusively by the Client. No responsibility for its use by any other party is accepted by WILDTHING Environmental Consultants.

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**CONTENTS**

<b><u>1.0</u></b>	<b><u>INTRODUCTION</u></b>	<b><u>1</u></b>
1.1	DESCRIPTION OF SITE	1
1.2	THE DEVELOPMENT	1
<b><u>2.0</u></b>	<b><u>SITE CONTEXT</u></b>	<b><u>5</u></b>
2.1	HYDROGEOGRAPHY	5
2.2	TOPOGRAPHY, GEOLOGY AND SOILS	5
2.3	VEGETATION	5
<b><u>3.0</u></b>	<b><u>LEGISLATIVE CONTEXT</u></b>	<b><u>6</u></b>
3.1	NSW ENVIRONMENTAL PLANNING AND ASSESSMENT AMENDMENT ACT 2017	6
3.2	NSW BIODIVERSITY CONSERVATION ACT 2016	6
3.3	STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2021	9
3.4	STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2020	9
3.5	BIOSECURITY ACT 2015	10
3.6	COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999	10
3.7	LICENSING	11
<b><u>4.0</u></b>	<b><u>METHODOLOGY</u></b>	<b><u>12</u></b>
4.1	DESKTOP ASSESSMENT	12
4.2	FIELD ASSESSMENT	13
4.2.1	VEGETATION ASSESSMENT	13
4.2.2	DIURNAL FAUNA SURVEY	13
4.2.3	GENERAL HABITAT FOR NATIVE SPECIES	15
4.2.4	HABITAT FOR SIGNIFICANT SPECIES	15
4.2.5	TREE SURVEY	15
4.2.6	DIURNAL AVIFAUNA SURVEY	15
4.2.7	NOCTURNAL SURVEY	15
4.3	SIGNIFICANT SPECIES	16
<b><u>5.0</u></b>	<b><u>RESULTS</u></b>	<b><u>21</u></b>

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5.1	FLORA ASSEMBLAGES	21
5.1.1	THREATENED ECOLOGICAL COMMUNITIES	27
5.1.2	ENDANGERED POPULATIONS	27
5.1.3	THREATENED AND RARE FLORA SPECIES	27
5.1.4	PRIORITY WEEDS AND WEEDS OF STATE AND NATIONAL SIGNIFICANCE	29
5.2	HABITAT APPRASIAL	30
5.2.1	HABITAT DESCRIPTION AND DISTRIBUTION IN THE VICINITY	30
5.2.2	TREE SURVEY	30
5.3	HABITAT FOR SIGNIFICANT SPECIES	30
5.4	FAUNA APPRASIAL RESULTS	44
5.4.1	DIURNAL SURVEYS	44
5.4.2	NOCTURNAL SURVEYS	44
5.5	SURVEY LIMITATIONS	45
<b>6.0</b>	<b><u>IMPACT ASSESSMENT</u></b>	<b>46</b>
6.1	AVOIDANCE AND MINIMISATION OF IMPACTS	46
6.2	DIRECT IMPACT	46
6.3	INDIRECT IMPACTS	46
6.4	MITIGATION MEASURES	46
<b>7.0</b>	<b><u>CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016</u></b>	<b>48</b>
<b>8.0</b>	<b><u>CONSIDERATIONS UNDER STATE ENVIRONMENTAL PLANNING POLICIES (KOALA HABITAT PROTECTION)</u></b>	<b>53</b>
8.1	STATE ENVIRONMENTAL PLANNING POLICIES (KOALA HABITAT PROTECTION) 2021	53
8.2	CONSIDERATIONS UNDER STATE ENVIRONMENT PLANNING POLICY (KOALA HABITAT PROTECTION) 2020	56
8.2.1	FIRST CONSIDERATION - IS THE LAND 'POTENTIAL KOALA HABITAT'?	56
<b>9.0</b>	<b><u>ASSESSMENT OF SERIOUS AND IRREVERSIBLE IMPACTS</u></b>	<b>57</b>
<b>10.0</b>	<b><u>CONSIDERATIONS UNDER THE COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999</u></b>	<b>59</b>
<b>12.0</b>	<b><u>BIBLIOGRAPHY</u></b>	<b>64</b>

**APPENDIX A – FLORA LIST**

**Acronyms and Abbreviations used in this report**

AOBV	Area of outstanding Biodiversity Value
BAR	Biodiversity Assessment Report
BC Act	Biodiversity Conservation Act 2016
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BOSET	Biodiversity Offsets Scheme Entry Tool
BSA	Biodiversity Stewardship Site Agreement
BSSAR	Biodiversity Stewardship Site Assessment Report
DAWE	Department of Agriculture, Water and the Environment
EEC	Endangered Ecological Community
EPBC Act	Environmental Protection & Biodiversity Conservation Act 1999
EP&A Act	Environmental Planning & Assessment Act 1979
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LLS Act	Local Land Services Act 2013
MCC	Maitland City Council
NES	Matters of National Significance under the EPBC Act
NPW Act	National Parks & Wildlife Act 1974
OEH	Office of Environment & Heritage (now DPIE)
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SAII	Serious and Irreversible Impacts
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community
TSC Act	Threatened Species Conservation Act 1995

## **1.0 INTRODUCTION**

Flora, fauna and habitat studies have been undertaken for a proposed subdivision at 65 and 99 Owlpen Lane, Farley NSW. The investigations were in accordance with the requirements of the *Environmental Planning and Assessment Amendment Act 2017* (EP&A Act 2017), the *Biodiversity Conservation Act 2016* (BC Act 2016) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The results are presented here in the form of an Ecological Assessment.

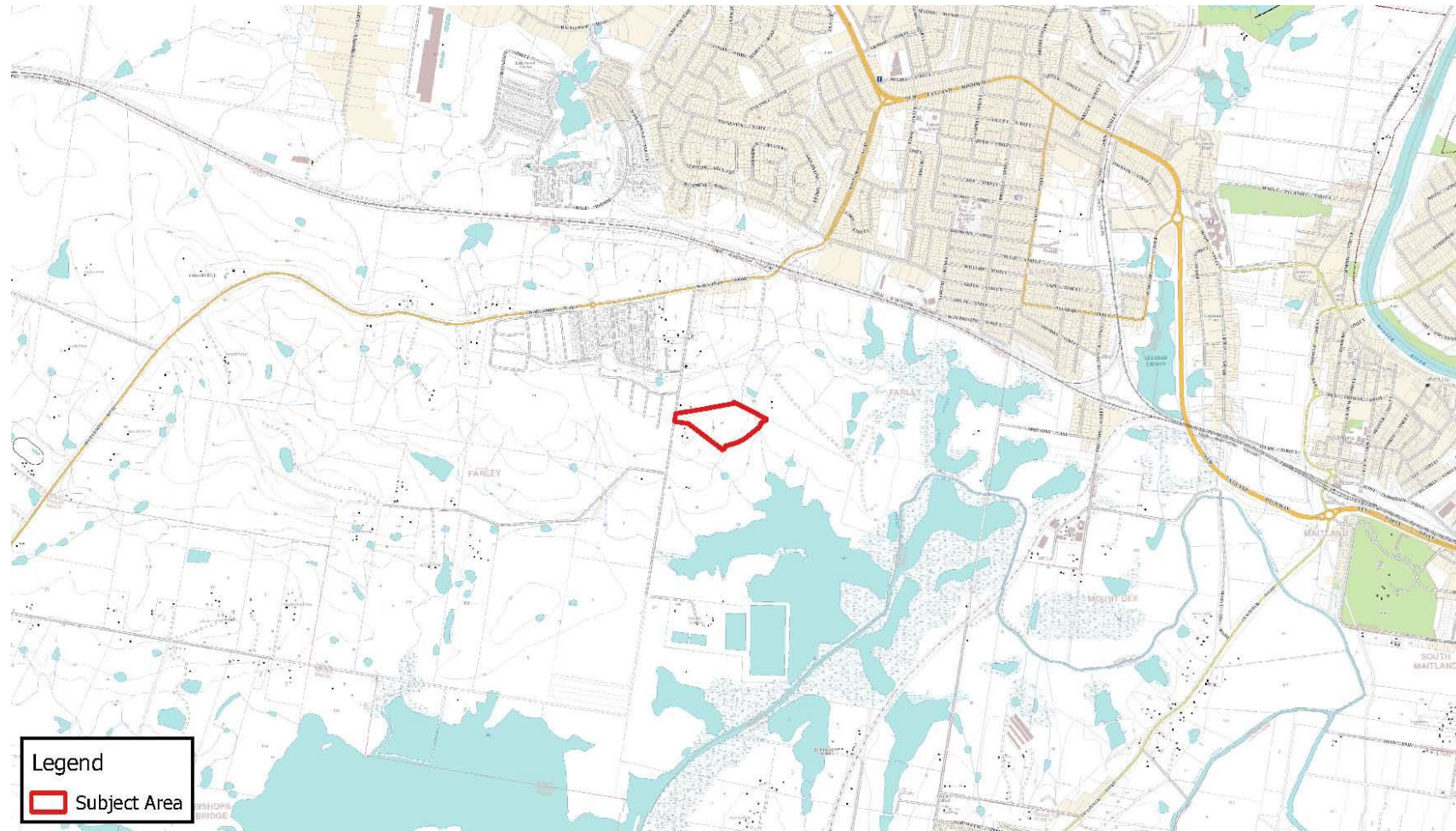
### **1.1 DESCRIPTION OF SITE**

The 6.04ha site was located on the east side of Owlpen Lane and included all of Lot 101 DP 1233753 (No. 65) and Part Lot 102 DP 1233753 (No. 99) Owlpen Lane, Farley NSW. The site had an undulating topography which sloped away to the east. The site had been largely cleared of native vegetation and has had a long history of grazing with more recent cultivation. At the time of the survey the entire site was under cultivation and planted with oats. A number of cattle were also grazing on the crop. A small patch of remnant trees was present within the vicinity of a small constructed dam within the central northern area of the site. Two additional isolated trees were also present in the east. An old brick/concrete dome water tank was also present along the south-west boundary of the site.

A location map and aerial photo of the site are shown in Figures 1.1 and 1.2.

### **1.2 THE DEVELOPMENT**

The proposal involves the subdivision of the site (Lot 101 and part of Lot 102 DP 1233753) into 70 lots plus road infrastructure. Lots 1-69 are planned to be residential lots and Lot 70 is planned to be a reserve for stormwater detention. The majority of Lot 101 is zoned as R1 General Residential with a thin portion along the eastern boundary zoned as RU2 Rural Landscape. The north-western portion of Lot 102 that falls within the subject site is zoned as RU2 Rural Landscaping. The proposal will likely result in the removal of all of the remnant trees within the site.



**Legend**  
 Subject Area

Job Ref	12591
A4 Scale	1:25,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

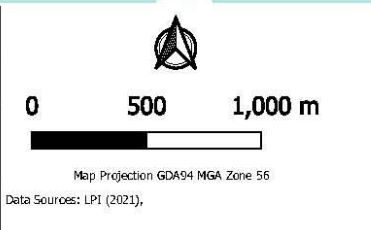
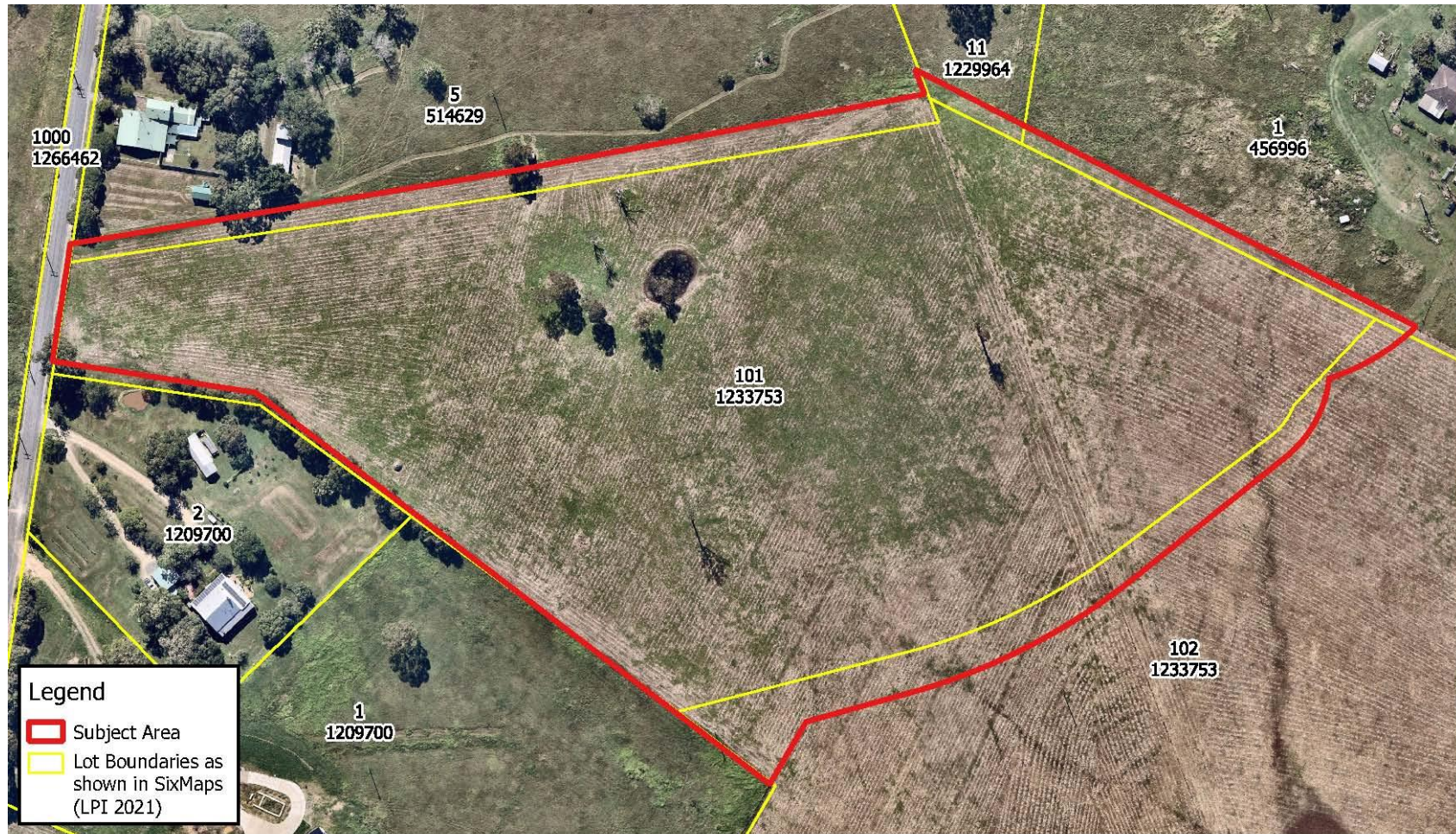


Figure 1.1  
**Location Map**  
 65 & 95 Owlpen Lane  
 FARLEY, NSW  
 8 July 2021

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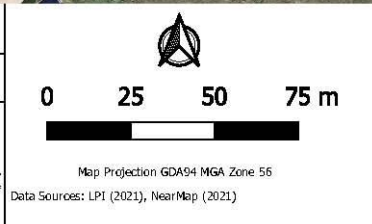


**Legend**

- Subject Area
- Lot Boundaries as shown in SixMaps (LPI 2021)

Job Ref	12591
A4 Scale	1:1,700

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**Aerial Image Map**

65 & 95 Owlpen Lane  
 FARLEY, NSW  
 8 July 2021

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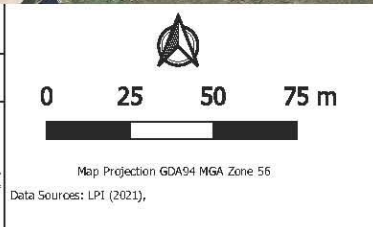




Legend	
Hydro	
	First Order Waterway
Development Plan	
	BDY
	BLDG
	EASE
	K&G
	TOPO-BANK(T)
	Subject Area

Job Ref	12591
A4 Scale	1:1,700

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## **2.0 SITE CONTEXT**

The site is located within the Sydney Basin Bioregion and Hunter Sub-bioregion (regions gazetted by the Minister, or an Interim Biogeographical Regionalisation of Australia (IBRA Bioregion)). The subject site is located within the Maitland City Council Local Government Area (LGA) and within the Newcastle Coastal Ramp Mitchell Landscape.

## **2.1 HYDROGEOGRAPHY**

One prescribed ephemeral first order stream begins the east corner of the site and runs south where it and five other ephemeral first order streams feed into each other and eventually feed into Swamp Creek as a third order stream. A small constructed dam was also present within the middle of the site. Figure 1.3 shows the prescribed stream within the site.

## **2.2 TOPOGRAPHY, GEOLOGY AND SOILS**

The site was located on Bolwarra Heights (bh) Soil Landscapes consisting of rolling low hills on Permian sediments with moderately deep soils (<150cm) consisting of Yellow, Red and Brown Podzolic Soils (Matthei 1995).

## **2.3 VEGETATION**

The site has historically been subjected to grazing and recently been subject to cropping of oats. Native vegetation was only present in the form of a small number of remnant trees consisting of two species; *Corymbia maculata* (Spotted Gum) and four specimens consistent with the threatened species *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum). Virtually no native understorey was present with the ground layer almost entirely composed of introduced species.

### **3.0 LEGISLATIVE CONTEXT**

The following sections detail the legislative frameworks relevant to this report.

#### **3.1 NSW ENVIRONMENTAL PLANNING AND ASSESSMENT AMENDMENT ACT 2017**

The assessment of development applications in NSW are regulated under Part 4 or Part 5 of the EP&A Act. Under Section 110B(1)(a) of the EP&A Act, Singleton Council is both the proponent and determining authority and, as such, acts under Part 5 of the EP&A Act. Section 5AA of the EP&A Act links proponents to Part 7 of the BC Act for the operation of the EP&A Act in connection with the terrestrial environment. The EP&A Act is also supported by other statutory environmental planning instruments, including State Environmental Planning Policies (SEPPs). The following SEPPs and acts are relevant to this report:

- State Environment Planning Policy (Koala Habitat Protection) 2020 (SEPP Koala Habitat Protection);
- State Environment Planning Policy (Koala Habitat Protection) 2021 (SEPP Koala Habitat Protection).

#### **3.2 NSW BIODIVERSITY CONSERVATION ACT 2016**

The purpose of the BC Act is “to establish a pathway to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity and to establish a scientific method for assessing the likely impacts on biodiversity values of proposed development and land use change, for calculating measures to offset those impacts and for assessing improvements in biodiversity values”.

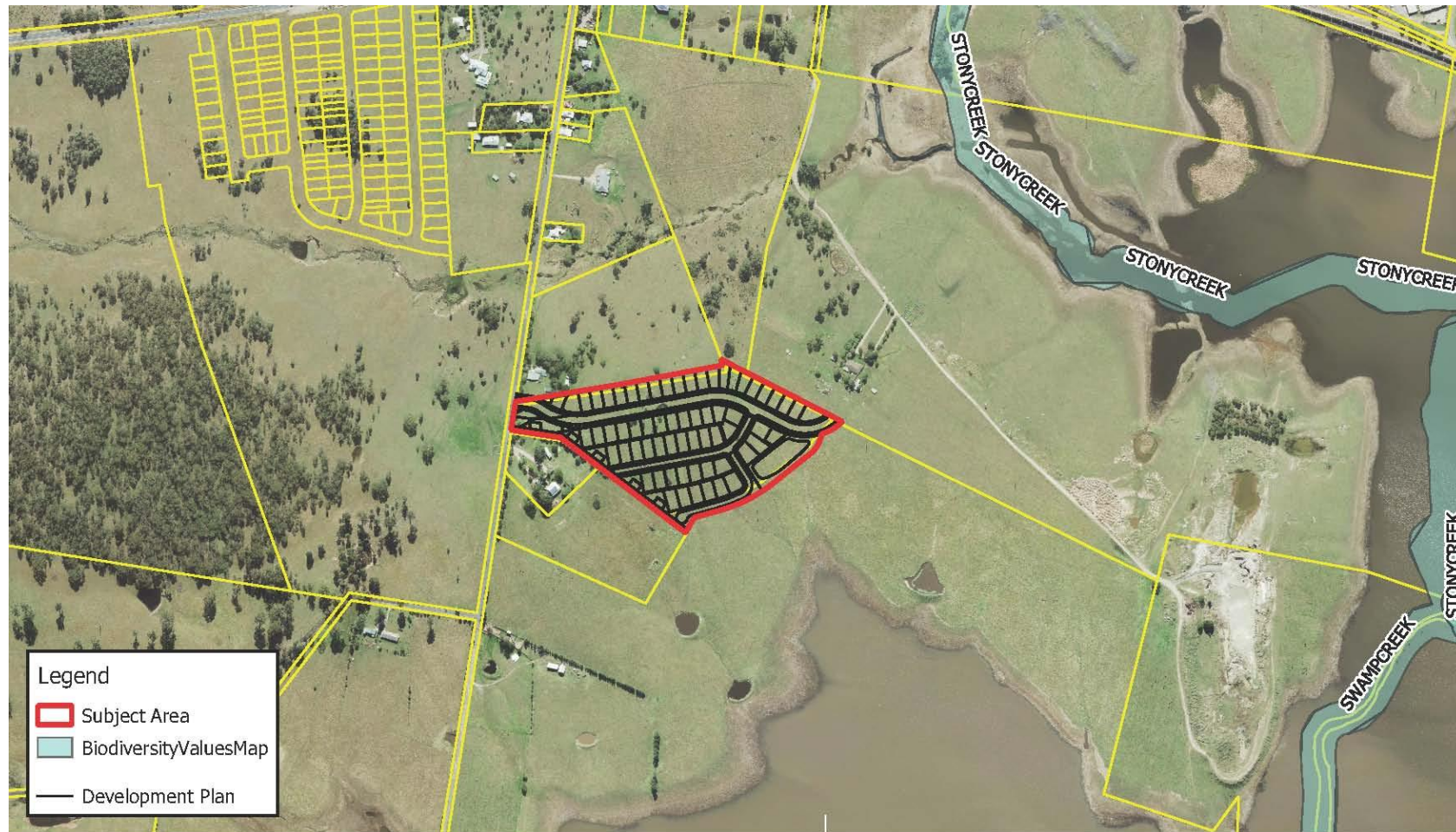
In accordance with the BC Act, the Biodiversity Assessment Method (BAM) and entry into the Biodiversity Offsets Scheme (BOS) is applicable to certain development activities based on specific Preparation of a Biodiversity Development Assessment Report (BDAR) is required for a development application that meets any of the following criteria detailed in Table 3.1.

As the proposed development was not found to comply within any of the criteria it was determined that a BDAR and entry into the BOS threshold would not be applicable for this development. Thus, the survey methodology detailed in the following sections have been undertaken in accordance with the requirements for a standard Assessment of Significance.

The BC Act also imposes various obligations on determining authorities in relation to impacts on biodiversity values that are serious and irreversible. For applications for development consent under Part 4 of the EP&A Act these obligations generally require a decision-maker to refuse to grant development consent. In order to provide clarity regarding what could be considered a serious and irreversible impact a guidance document has been released (NSW Gov 2017) which identifies the species and ecological communities (SAIL entities) that are likely to be the subject of serious and irreversible impacts. No candidate SAIL entities were found to be present within the study area thus no obligation for development refusal would be applicable to this proposed development from relevant regulatory bodies.

**Table 3.1: Criteria for entry into the Biodiversity Offsets Scheme in relation to the proposed development.**

<b>CRITERIA FOR ENTRY INTO THE BIODIVERSITY OFFSETS SCHEME (BOS)</b>	<b>SECTION CRITERIA ADDRESSED</b>	<b>ASSESSMENT OF CRITERIA</b>
Part 4 development activities deemed to be 'State Significant' under the NSW Environmental Planning and Assessment Act 1979 (NSW EP&A Act)		The proposal is not recognised as State Significant
Development activities that have the potential to impact Areas of Outstanding Biodiversity Value (AOBV) as listed under Part 3 of the BC Act.	Section 7.0	No declared areas of outstanding biodiversity value were located within or in proximity to the site.
Development activities that have the potential to cause a significant impact on a threatened species, population or ecological community, listed under Schedules 1 and 2 of the BC Act, as determined by application of a five-part-test of significance in accordance with Section 7.3 of the BC Act;	Section 7.0	The five-part test found no significant impact on threatened species, populations or ecological communities listed under Schedules 1 and 2 of the BC Act.
Development activities that have the potential to impact areas mapped as having 'high biodiversity value' as indicated by the NSW Biodiversity Values Map (BV Map);	Section 3.0 Figure 3.1.	The NSW Biodiversity Values Map was consulted on the 28 June 2021. As of this date it was determined that there were no mapped 'Biodiversity Values' within the subject site. Consequently, the proposed development would not exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act.
Development activities that involve clearing of native vegetation that exceeds the Biodiversity Offset Scheme thresholds (BOS thresholds) as determined by the NSW BC regulation.	Section 6.0	Most of the land within the site contained introduced species. Native species were only present in 0.05ha of land. The clearing of this native vegetation falls below the 0.25ha clearing threshold for this land and therefore does not trigger entry into the BOS.



Job Ref	12591
A4 Scale	1:7,000

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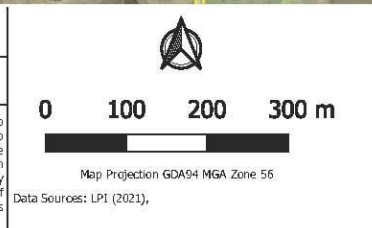


Figure 3.1  
**Biodiversity Values Map**  
65 & 95 Owlpen Lane  
FARLEY, NSW  
8 July 2021

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### 3.3 STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2021

This Policy aims 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.

Land to which Policy applies

- (1) This Policy applies to each local government areas (LGAs) listed in Schedule 1.
- (2) The whole of each local government area is—
  - in the koala management area specified in Schedule 1 opposite the local government area, or
  - (b) if more than 1 koala management area is specified, in each of those koala management areas.
- (3) Despite subclause (1), this Policy does not apply to—
  - land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act, or
  - (b) land dedicated under the Forestry Act 2012 as a State Forest or a flora reserve, or
  - (c) land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016, or
  - (d) land in the following land use zones, or an equivalent land use zone, unless the zone is in a local government area marked with an \* in Schedule 1—
    - Zone RU1 Primary Production,
    - (ii) Zone RU2 Rural Landscape,
    - (iii) Zone RU3 Forestry.

Within the City of Maitland SEPP 2021 applies to land that is not zoned RU1, RU2 or RU3. Land zoned as R1 within Lot 101 therefore falls under SEPP 2021 has been addressed in Section 8.1 of this report. The remaining land within the site has been addressed in Section 3.4.

### 3.4 STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2020

The Koala SEPP 2020 replaces the Koala SEPP 2019 by reverting to operations under the former SEPP 44. SEPP 44 aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas (*Phascolarctos cinereus*). SEPP 44 also aims to ensure a permanent free-living population of Koalas over their present range, and reverse the current trend of Koala population decline by:

- Requiring the preparation of plans of management before development consent can be granted in relation to areas of core Koala habitat
- Encouraging the identification of areas of core Koala habitat
- Encouraging the inclusion of areas of core Koala habitat in environment protection zones.

The Koala SEPP 2020 applies to land that the SEPP 2021 does not apply to as defined in Schedule 1 of SEPP 2021. This includes land zoned as RU2 in the City of Maitland LGA. Land zoned as RU2 in the two lots (101 and 102) therefore falls under the Koala SEPP 2020 has been addressed in Section 8.2 of this report.

### **3.5 BIOSECURITY ACT 2015**

The NSW Biosecurity Act 2015 provides regulatory controls and powers to manage priority weeds in NSW. For weed management this Act divides NSW into regions based on combined LGAs and priority weeds for a region are listed. Some weeds are managed at a state level as they form part of a broader containment strategy. The legislation compliments listed Weeds of National Significance (WoNS).

### **3.6 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999**

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo a process of assessment. Under the EPBC Act, an action includes a project, undertaking, development or activity that may impact MNES. An action that 'has, will have or is likely to have a significant impact on a MNES' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Commonwealth Minister for the Department of Agriculture, Water and the Environment (DAWE).

MNES categories listed under the EPBC Act are:

- World heritage properties;
- National heritage places;
- Wetlands of international importance (Ramsar wetlands);
- Threatened species and ecological communities (Section 18 and 18A);
- Migratory species;
- Commonwealth marine areas;
- Nuclear actions (including uranium mining); and
- A water resource, in relation to coal seam gas development and large coal mining development.

Initially MNES protected under the EPBC Act are assessed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (DoE 2013). This is performed to determine if there is likelihood for an action to have a significant impact on MNES. An action will require referral to, and may require the approval of, the commonwealth minister for the Environment (in addition to any local or state government consent or approval) if that action will have, or is likely to have, a significant impact on the environment or on a MNES.

### **3.7 LICENSING**

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under NPWS Scientific Investigation Licence SL100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Department of Primary Industries (Trim File No. 13/251) for Fauna Survey for Biodiversity and Impact Assessment.



## **4.0 METHODOLOGY**

### **4.1 DESKTOP ASSESSMENT**

A site-specific literature and database review was undertaken prior to conducting the field survey and the preparation of this report. A list of the resources reviewed, the date they were accessed and the spatial extent of the search conducted, where relevant, is provided in Table 4.1.

**Table 4.1: Desktop Resources**

<b>RESOURCE</b>	<b>LAST ACCESS DATE</b>	<b>SPATIAL EXTENT</b>
<b>Biodiversity Values and Landscape Maps</b>		
BioNet Atlas of NSW Wildlife (BioNet) (DPIE 2021a)	28 June 2021	10x10km radius of subject site
Commonwealth Protected Matters Search Tool (PMST) (DAWE 2021a)	28 June 2021	10x10km radius of subject site
NSW Biodiversity Values Map (DPIE 2021b)	28 June 2021	Entire Subject Site
SIX Maps (LPI 2021)	28 June 2021	Entire Subject Site
NSW Government SEED Mapping (NSW Government 2021)	28 June 2021	Entire Subject Site
Mitchell Landscape Maps, Version 3.1 (DPIE 2017a).	02 July 2021	Entire Subject Site
Lower Hunter Vegetation Mapping, 2013. VIS_ID 4513 (DPIE 2017b)	6 July 2021	Entire Subject Site
Soil Landscapes of the Newcastle 1:100,000 Sheet (Matthei 1995)	6 July 2021	
Australia's IBRA Bioregions and sub-bioregions (DAWE 2017)	02 July 2021	Entire Subject Site
<b>Threatened Species and Vegetation Databases</b>		
Commonwealth species profiles and threats database (SPRAT) (DAWE 2021b)	8 July 2021	-
OEH BioNet vegetation classification database (DPIE 2021c)	8 July 2021	-
OEH Profiles of threatened species, population, and ecological communities (DPIE 2021d)	8 July 2021	

## 4.2 FIELD ASSESSMENT

Fieldwork was undertaken on the within July 2021. A summary of the time spent on site during fieldwork and the prevailing weather conditions at the time is contained in Table 4.2.

**Table 4.2: Survey Dates, Times and Weather Conditions**

DATE	TIME	SURVEY EFFORT (PERSON HOURS)	ACTIVITY	WEATHER
07/07/2021	0830 - 1100	5.0	General site inspection Vegetation Survey Diurnal fauna survey Significant Tree Survey Incidental observations	1/8 Cloud, 5.8°C, 88% Relative humidity, Wind WNW 11km/h
13/07/2021			Avifauna Survey Stag watching Nocturnal Survey	7/8 Cloud, 14°C, 88% Relative humidity, Wind W 11km/h

A detailed methodology for the surveys listed within Table 4.2 above have been described in the following Sections 4.2.1 – 4.2.7: Survey tracks and locations have been presented in Figures 4.1 and 4.2.

### 4.2.1 VEGETATION ASSESSMENT

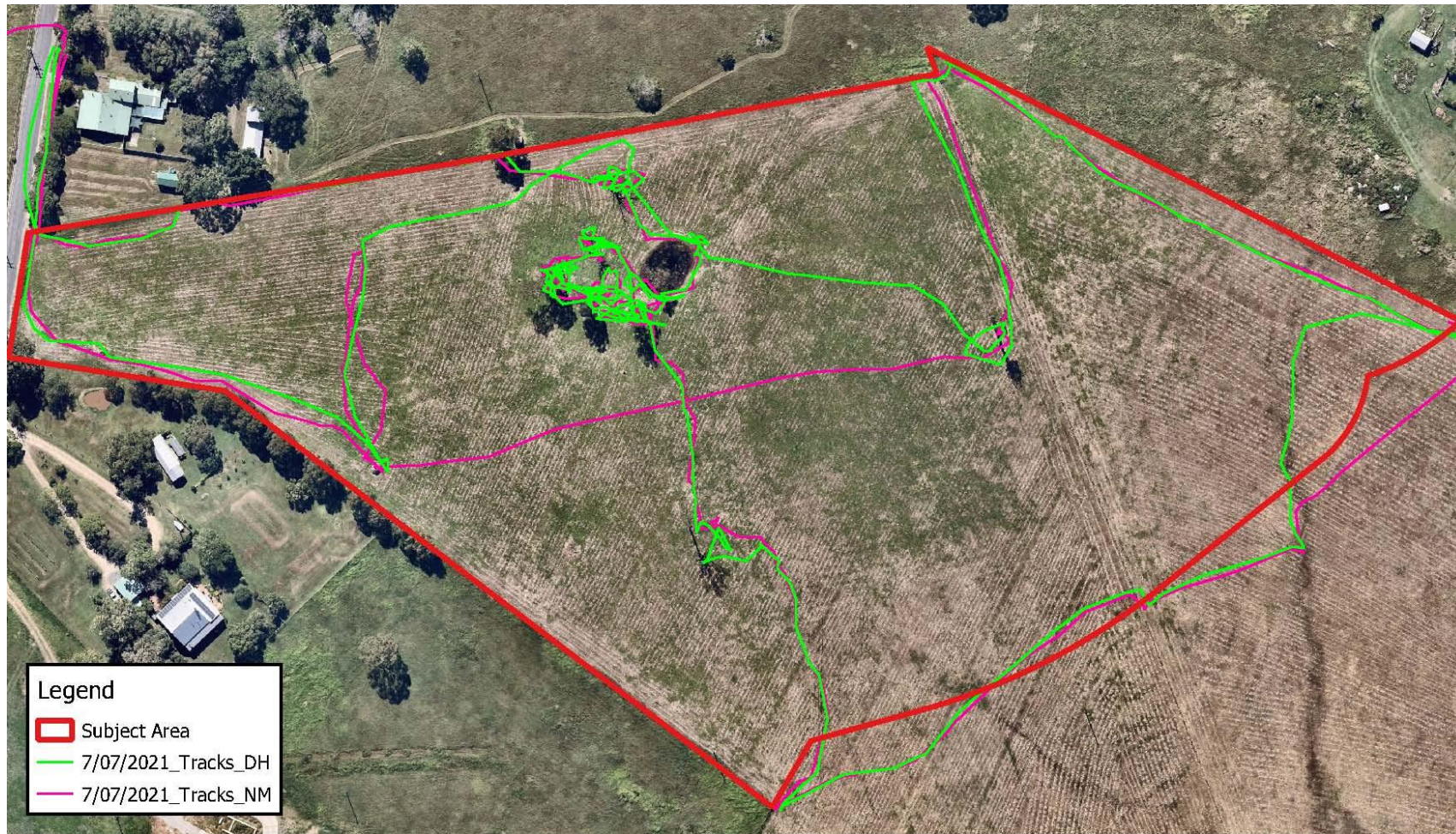
The initial determination of the basic vegetation community boundaries was undertaken through the review of an orthophoto covering the site. Following this, a detailed ground survey was conducted in accordance with the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (Department of Environment and Conservation, 2004). Due to the high disturbance no vegetation plots or quadrats were undertaken. Flora searches were undertaken within the site in the manner described by Cropper (1993) as the 'Random Meander Technique'. This involved walking in a random manner throughout the entire site. A list of all flora species identified on site has been provided in Appendix A.

### 4.2.2 DIURNAL FAUNA SURVEY

Opportunistic sightings of species and secondary indications (scats, scratches, diggings, tracks etc.) of resident fauna were noted and included:

- dedicated searches for avifauna;
- dedicated searches for herpetofauna;
- Checks for obvious nests of raptors;
- checking trees (particularly smooth-barked species) for scratches consistent with arboreal mammals.

Diurnal survey tracks are shown within Figure 4.1.



**Legend**

- Subject Area
- 7/07/2021\_Tracks\_DH
- 7/07/2021\_Tracks\_NM

Job Ref	12591
A4 Scale	1:1,600

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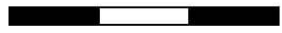
  
 0    25    50    75 m  
  
 Map Projection: GDA94 MGA Zone 56  
 Data Sources: NearMap (2021)

Figure 4.1

**Diurnal Survey Tracks**

65 & 95 Owlpen Lane  
 FARLEY, NSW

14 July 2021

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#### **4.2.3 GENERAL HABITAT FOR NATIVE SPECIES**

From the vegetation appraisal, diurnal fauna survey and a general inspection of the site and surrounding areas, a subjective assessment of the general habitat value of this site was made. Considered in this assessment were:

- occurrence of that habitat type in the general vicinity;
- degree of disturbance and degradation;
- area occupied by that habitat on site;
- continuity with similar habitat adjacent to the site, or connection with similar habitat off site by way of corridors; and
- structural and floral diversity.

#### **4.2.4 HABITAT FOR SIGNIFICANT SPECIES**

The subject site was evaluated as potential habitat for each of the threatened species reported on the BioNet (DIPE, 2021a) and PMST (DAWE, 2021a) databases from within 10km of the site. This evaluation was based on home range, feeding, roosting, breeding, movement patterns and corridor requirements for fauna and hydrology, soil types, aspect and structural formation for flora species. The list of threatened species recorded within these databases is provided within Table 4.3 and an assessment of the likelihood of occurrence of these threatened species within the subject site is provided in Table 5.3.

#### **4.2.5 TREE SURVEY**

During the fieldwork, a survey was undertaken to identify trees within the site. The survey also involved identifying the number of hollow-bearing trees present. Hollow-bearing trees are a habitat resource utilised by a variety of native avifaunal and mammalian species. This resource is usually a limiting factor in the occurrence of hollow-dependent species on a site, due to the time taken for hollows to form in trees.

It must be noted that observations made from ground level may fail to record a small number of hollows that are obscured. Some entrances may also not lead to a cavity. The internal dimensions of the hollows are also impossible in many cases to determine from the ground.

#### **4.2.6 DIURNAL AVIFAUNA SURVEY**

The diurnal avifauna survey involved point assessments for 30 minutes. Surveys were conducted at peak activity periods (i.e. dawn and dusk). A number of incidental observations of avifauna were also made during other surveys. Observations were also made of secondary indications (i.e., distinctive feathers and nests) of avifauna were also recorded.

#### **4.2.7 NOCTURNAL SURVEY**

The nocturnal surveys undertaken included:

- spotlighting/stag watching
- recording of microchiropteran bat calls;

- searches for frog species within suitable habitats.

The Stag watching involved watching the hollow-bearing trees proposed to be removed; 20 minutes prior to sunset and continuing until 20 minutes after sunset.

Spotlighting was undertaken on foot using 100watt hand-held spotlights and covered all trees within the site. The spotlighting involved walking at a slow pace around the entire site area and stopping every 2 minutes, allowing the observer to hear movements of animals.

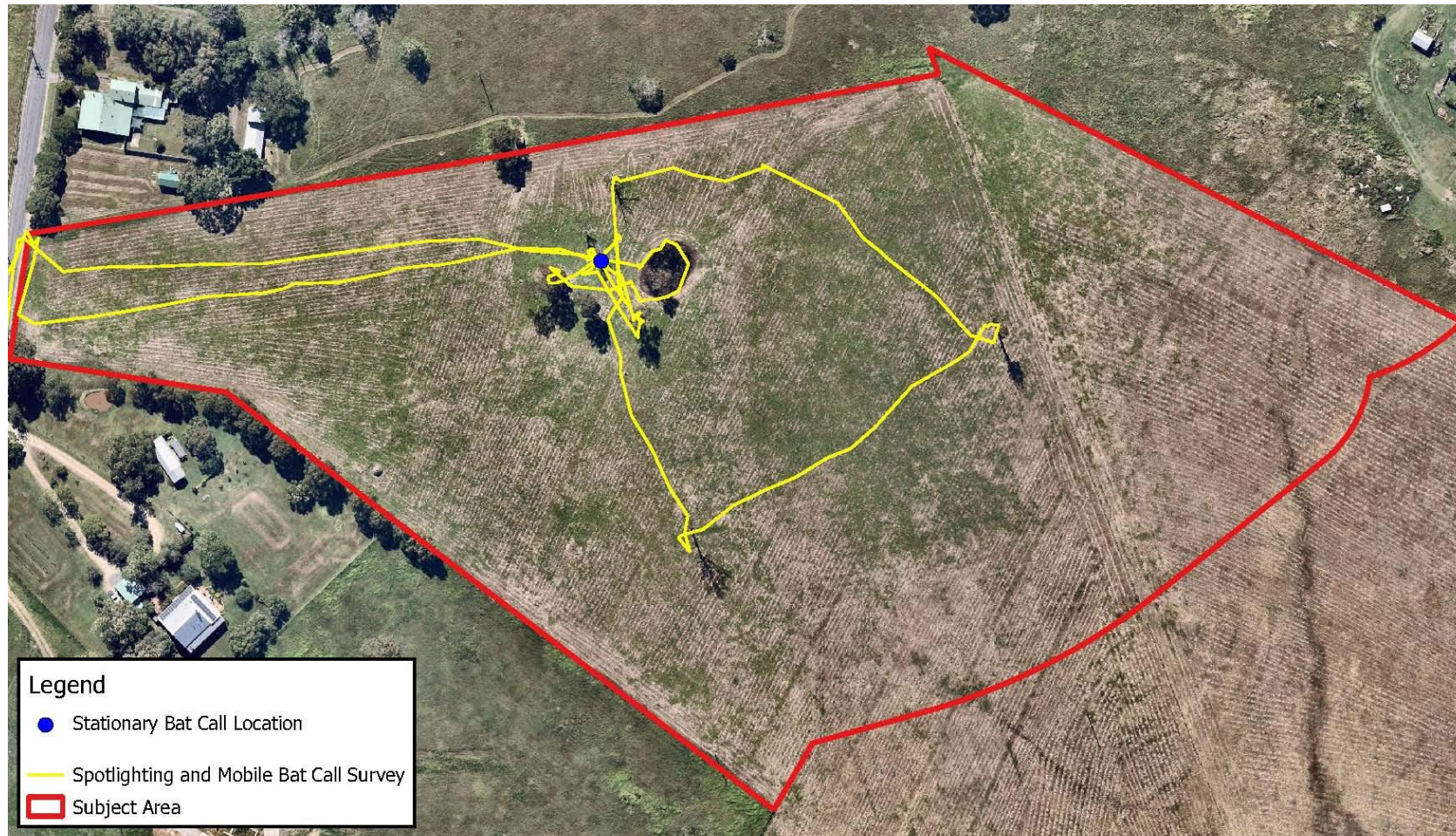
Stationary microchiropteran bat detection was undertaken from dusk to dawn. The transformed calls were analysed using an Anabat V Zero Crossing Analysis Interface feeding into a computer and were identified by comparison with sample bat calls. The recorded bat calls were analysed in-house.

Searches for frogs in likely habitats were undertaken during the evening survey. The survey was undertaken in suitable habitat and involved listening for the characteristic call of male frogs.

The location of the nocturnal surveys is shown in Figure 5.2.

#### **4.3 SIGNIFICANT SPECIES**

The following threatened species listed in Table 4.3 have been recorded on the BioNet and PMST Databases as occurring within 10km of the subject site. Species marked with an asterisk (\*) are listed on the DoE Database as having habitat likely to occur within 10km of the subject site.



**Legend**

- Stationary Bat Call Location
- Spotlighting and Mobile Bat Call Survey
- Subject Area

Job Ref	12591
A4 Scale	1:1,600

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

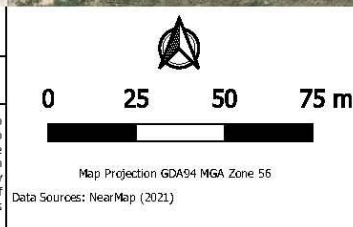


Figure 4.2  
**Nocturnal Survey Locations**

65 & 95 Owlpen Lane  
FARLEY, NSW  
14 July 2021

**WILDTHING**  
Environmental Consultants  
(a Division of Tattersall Lander Pty Ltd)  
ABN 41 003 509 215

Table 4.3: Threatened species, endangered populations and ecological communities considered.

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
<b>Flora Species</b>			
* <i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	V	V
<i>Diuris pedunculata</i>	Small Snake Orchid	E1	
* <i>Prasophyllum</i> sp. Wybong	A Leek Orchid		CE
* <i>Pterostylis gibbosa</i>	Illawarra Greenhood	E1	E
* <i>Rhizanthella slateri</i>	Eastern Underground Orchid	V	E1
* <i>Dichanthium setosum</i>	Bluegrass	V	V
* <i>Cynanchum elegans</i>	White-flowered Wax Plant	E1	E
* <i>Rutidosis heterogama</i>	Heath Wrinklewort	V	V
* <i>Tetradthea juncea</i>	Black-eyed Susan	V	V
* <i>Acacia bynoeana</i>	Bynoe's Wattle	E1	V
* <i>Prostanthera cineolifera</i>	Singleton Mint Bush	V	V
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V	
* <i>Eucalyptus glaucina</i>	Slaty Red Gum	V	V
* <i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Drooping Red Gum	V	V
* <i>Rhodamnia rubescens</i>	Scrub Turpentine	E4A	
* <i>Rhodomyrtus psidioides</i>	Native Guava	E4A	
* <i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E1	V
* <i>Euphrasia arguta</i>		E4A	CE
* <i>Persicaria elatior</i>	Tall Knotweed	V	V
* <i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flowered Grevillea	V	V
* <i>Persoonia hirsuta</i>	Hairy Geebung	E1	E
<i>Persoonia pauciflora</i>	North Rothbury Persoonia	E4A	CE
* <i>Pomaderris brunnea</i>	Brown Pomaderris	E1	V
* <i>Thesium australe</i>	Austral Toadflax	V	V
<b>Amphibians</b>			
* <i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V
* <i>Litoria aurea</i>	Green and Golden Bell Frog	E1	V
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	V	V
* <i>Mixophyes balbus</i>	Stuttering Frog	E1	V
<b>Reptiles</b>			
* <i>Delma impar</i>	Striped Legless Lizard	V	V
<b>Birds</b>			
* <i>Limosa lapponica baueri</i>	Bar-tailed Godwit		V & M
* <i>Calidris ferruginea</i>	Curlew Sandpiper	E1	CE & M
* <i>Numenius madagascariensis</i>	Eastern Curlew		CE & M
* <i>Rostratula australis</i>	Australian Painted Snipe	E1	V & M
* <i>Botaurus poiciloptilus</i>	Australian Bittern	E1	E
<i>Ixobrychus flavicollis</i>	Black Bittern	V	
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1	
<i>Anseranas semipalmata</i>	Maggie Goose	V	
<i>Oxyura australis</i>	Blue-billed Duck	V	
<i>Stictonetta naevosa</i>	Freckled Duck	V	
<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V	
<i>Callocephalon fimbriatum</i>	Gang Gang Cockatoo	V	
* <i>Lathamus discolor</i>	Swift Parrot	E1	E
<i>Neophema pulchella</i>	Turquoise Parrot	V	
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	
* <i>Hirundapus caudacutus</i>	White-throated Needle-tail		V & M
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	
<i>Epthianura albifrons</i>	White-fronted Chat	V	
<i>Melanodryas cucullata cucullata</i>	Hooded Robin	V	
<i>Petroica boodang</i>	Scarlet Robin	V	
<i>Petroica phoenicea</i>	Flame Robin	V	
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper	V	
<i>Pomatostomus temporalis</i> subsp. <i>temporalis</i>	Grey-crowned Babbler	V	

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
<i>Chthonicola sagittata</i>	Speckled Warbler	V	
* <i>Anthochaera phrygia</i>	Regent Honeyeater	E4A	CE & M
* <i>Grantiella picta</i>	Painted Honeyeater	V	V
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	V	
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	
<i>Circus assimilis</i>	Spotted Harrier	V	
<i>Lophoictinia isura</i>	Square-tailed Kite	V	
* <i>Erythrotriorchis radiatus</i>	Red Goshawk	E4A	V
<i>Hieraaetus morphnoides</i>	Little Eagle	V	
<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	V	
* <i>Falco hypoleucos</i>	Grey Falcon	E1	
<i>Ninox connivens</i>	Barking Owl	V	
<i>Ninox strenua</i>	Powerful Owl	V	
<i>Tyto novaehollandiae</i>	Masked Owl	V	
<i>Tyto tenebricosa</i>	Sooty Owl	V	
<b>Mammals</b>			
* <i>Dasyurus maculatus maculatus</i>	Tiger Quoll	V	V
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	
* <i>Phascolarctos cinereus</i>	Koala	V	
* <i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V
* <i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo	V	V
<i>Petaurus australis</i>	Yellow-bellied Glider	V	
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	
* <i>Petauroides volans</i>	Greater Glider		V
* <i>Pseudomys novaehollandiae</i>	New Holland Mouse		V
* <i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V	
<i>Micronomus norfolkensis</i>	Eastern Freetail-bat	V	
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	
<i>Miniopterus australis</i>	Little Bentwing-bat	V	
<i>Miniopterus orianae oceanensis</i>	Large Bentwing-bat	V	
<i>Myotis macropus</i>	Southern Myotis	V	
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	
* <i>Chalinolobus dwyeri</i>	Large Pied Bat	V	V
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V	
<b>Endangered Populations</b>			
<i>Cymbidium canaliculatum</i> population in the Hunter Catchment		E2	
<i>Eucalyptus camaldulensis</i> (River Red Gum) – population in the Hunter Catchment		E2	
<b>Endangered Ecological Communities</b>			
Central Hunter Grey Box - Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions		E3	CE
Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions		E3	CE
*Central Hunter Valley eucalypt forest and woodland			E3
*Coastal Swamp Oak ( <i>Casuarina glauca</i> ) Forest of New South Wales and South East Queensland ecological community			E3
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	E
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions		E3	
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions		E3	
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Hunter Valley Foothills Slaty Gum Woodland in the Sydney Basin Bioregion		V2	CE
Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions		E3	
*Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion		E4B	CE
Kurri Sand Swamp Woodland in the Sydney Basin Bioregion		E3	



Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	CE
Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions		E3	
Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions		V2	
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
*River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria			CE
Sydney Freshwater Wetlands in the Sydney Basin Bioregion		E3	
Warkworth Sands Woodland in the Sydney Basin Bioregion		E3	CE
*White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland			CE
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and		E4B	CE
*Lowland Rainforest of Subtropical Australia		E3	CE

**E1/E=Endangered Species E2=Endangered Population E3=Endangered Ecological Community  
V=Vulnerable Species V2= Vulnerable Ecological Community E4A/E4B/CE=Critically Endangered  
M=Migratory Species**

## 5.0 RESULTS

### 5.1 FLORA ASSEMBLAGES

The 6.04ha site has long history of past vegetation clearance, grazing and more recently cropping. The site was found to be almost entirely composed of cultivated oats with a small number of scattered and clumped remnant trees. The native understorey was absent. The Pre 1750 vegetation map produced for the Lower Hunter Central Coast Regional Environment Management Strategy (2003) shows the site was previously dominated by Lower Hunter Spotted Gum – Ironbark Forest. A very small number of isolated remnant canopy trees likely representing the past coverage of Lower Hunter Spotted Gum – Ironbark Forest were present in the form of *Corymbia maculata* (Spotted Gum). Four likely specimens of *Eucalyptus parramattensis subsp. decadens* (Drooping Red Gum) a listed threatened species was also present scattered within the vicinity of the dam.

Considering the historical mapping and presence of *C. maculata*, the site was once likely composed of Plant Community Type (PCT) 1600 - Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter, however due to the likely presence of *E. parramattensis subsp. decadens* it also has similarities to PCT 1633 Parramatta Red Gum - Narrow-leaved Apple - Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area.

Aquatic habitat in the form of a small dam was also located within the site. It contained a few native aquatic species such as *Juncus usitatus* (Common Rush), *Cycnogeton procerum* (Water Ribbons) and *Azolla pinnata* (Ferny Azolla).

The condition of the native vegetation is highly degraded and reduced to the form of only remnant trees. The area of these native trees was mapped for a total of 0.05ha and is displayed in Figure 5.1. Pictures of vegetation within the site are shown in Plates 1-8.



**Legend**

- Tree Locations
- Subject Area
- Native Vegetation
- Dam
- Development Plans

Job Ref	12591
A4 Scale	1:1,600

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

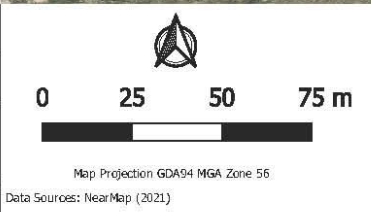


Figure 5.1  
**Vegetation Mapping & Tree Locations**

65 & 95 Owlpen Lane  
FARLEY, NSW  
8 July 2021

**WILDTHING**  
Environmental Consultants  
(a Division of Tattersall Lander Pty Ltd)  
ABN 41 003 509 215



Plate 1: Oat crops within site. (Facing east from north-west corner).



Plate 2: Remnant trees around dam in middle of site (facing west).



Plate 3: *Eucalyptus parramattensis* subsp. *decadens* on side of dam and oat crops on site (facing east).



Plate 4: Remnant trees in disturbed grassland and oat crops.



Plate 5: Remnant *Corymbia maculata* (Spotted Gum) in oat crops on south side of site (facing west).



Plate 6: Oat crop within site (facing east).



Plate 7: Oat crops within ephemeral prescribed first order stream on site (facing north-west).



Plate 8: Oat crops in north-east corner of site (facing west)

### 5.1.1 THREATENED ECOLOGICAL COMMUNITIES

Twenty-three threatened ecological communities (TECs) have been recorded within 10km of the subject site according to both the BioNet and PMST databases, results of the database search conducted for TECs are shown within Table 4.3. Pre 1750 vegetation map produced for the for the Lower Hunter Central Coast Regional Environment Management Strategy (2003) shows the site was previously dominated by Lower Hunter Spotted Gum – Ironbark Forest (LHSIF). Scattered *Corymbia maculata* (Spotted Gum) occurring within the site was a representative remnant of this ecological community. Taken this into account, the site likely historically contained vegetation representative of the BC Act listed TEC – Lower Hunter Spotted Gum – Ironbark Forest of Sydney Basin Bioregion (LHSIF).

The likely occurrence of *E. parramattensis* subsp. *decadens* and its association with PCT 1633 Parramatta Red Gum - Narrow-leaved Apple - Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area could be representative of BC Act listed TEC - Kurri sand swamp woodland in the Sydney Basin Bioregion that historically occurred on site. However due to the occurrence of LHSIF within some surrounding lots, the remnant trees were consisted to form part of this TEC.

The proposal will result in the likely removal of all remnant trees within the site. Due to the very high disturbance and the occurrence of only a small number of isolated remnant trees no significant area of any TEC would likely be removed. The impact of the proposal on LHSIF within the site has been addressed in Section 7.0 of this report.

### 5.1.2 ENDANGERED POPULATIONS

Two Endangered Populations are listed in the local area:

- *Eucalyptus camaldulensis* (River Red Gum) – population in the Hunter Catchment;
- *Cymbidium canaliculatum* population in the Hunter Catchment.

No endangered populations or suitable habitat were present within the site.

### 5.1.3 THREATENED AND RARE FLORA SPECIES

Four remnant trees within the site were found to have bark, buds and fruit consistent with that of the state and nationally threatened *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum). Samples of these subject trees have also been sent to the Herbarium in Sydney for validation however due to COVID 19 there is little chance of getting any positive identification before the end of the year. Photos of the subject trees including buds, fruit etc were shown to botanist Stephen Bell a local expert on *E. parramattensis* subsp. *decadens*, he indicated that the trees also appeared to be consistent with this threatened species.

Very few records of *E. parramattensis* subsp. *decadens* are known to occur within the Maitland City LGA. This species is usually associated with two metapopulations within the Kurri-Cessnock Area and the Tomago Sandbeds (Bell, 2006). The trees are mature and appear to have been present within the site for some period of time. The occurrence of these remnant trees would be significant as they would represent an outlying population, possibly a remnant of a larger population that once



occurred in the area. There could possibly be further specimens of *E. parramattensis* subsp. *decadens* within the local area.

Photos of the subject trees and buds are shown in Plates 9 & 10.

No other threatened flora species were recorded within the site. Only marginal habitat was considered to be present for the addressed species *Rutidosis heterogama* (Heath Wrinklewort) around the immediate base of a few remnant trees. Due to the highly degraded and cultivated state of the environment, no suitable habitat was considered to be present for any of the remaining addressed threatened flora species listed in Table 4.3. The impact of the proposal on threatened flora species has been addressed in Section 7.0 of this report.



Plate 9: Specimen potential *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) within the site.

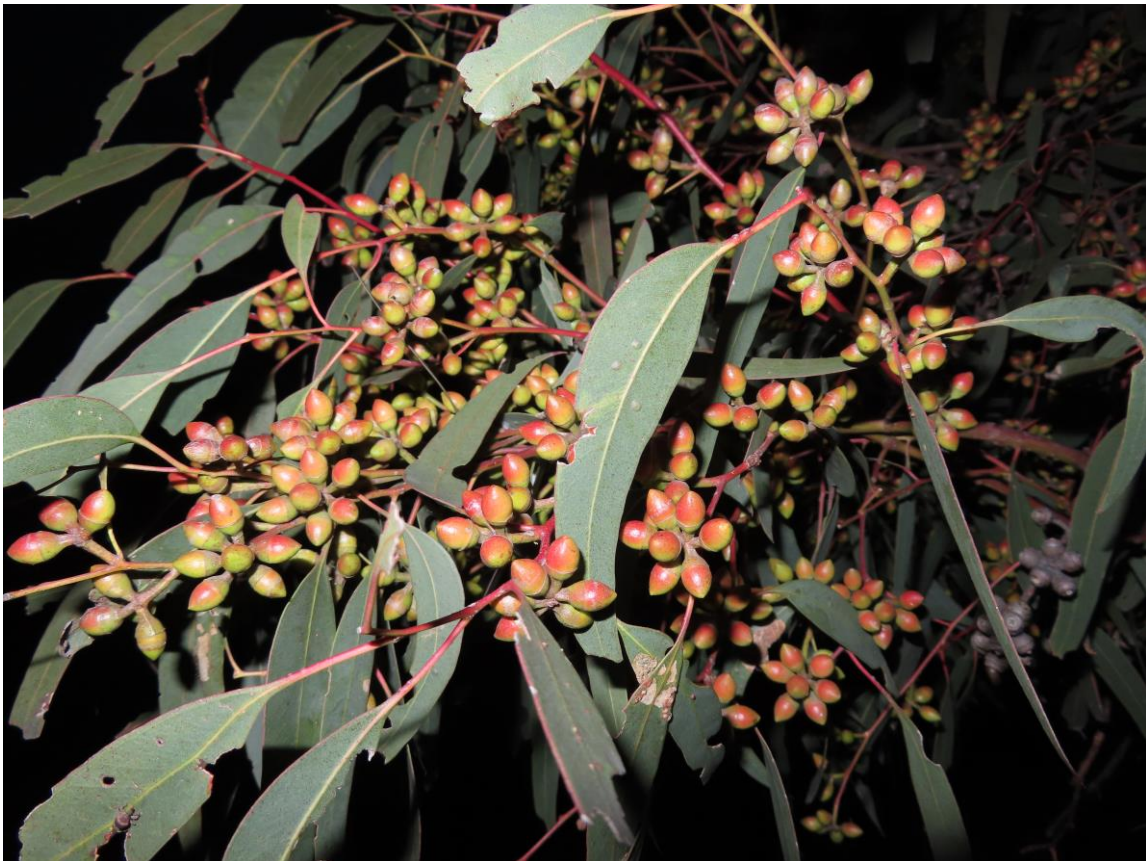


Plate 10: Buds of potential *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) within the site.

#### 5.1.4 PRIORITY WEEDS AND WEEDS OF STATE AND NATIONAL SIGNIFICANCE

Two priority weed species listed under the Biosecurity Act 2015 were identified on site and are listed below in Table 5.1. The site lies within the Hunter Regional Weed Committee (HRWC).

**Table 5.1: Priority Weed species found within the study area.**

WEED SPECIES	LEGAL REQUIREMENTS	ADDITIONAL SIGNIFICANCE
<i>Senecio madagascariensis</i> Fireweed	General Biosecurity Duty Prohibition on dealings	N
<i>Olea europaea</i> subsp. <i>cuspidate</i> African Olive	General Biosecurity Duty Regional Recommended Measure	T, N

T – Listed as a Threatening Process under the NSW BC Act 2016.

N – Weed of National Significance.

**\*Priorities under the Biosecurity Act 2015**

General Biosecurity Duty - any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).

Prohibition on dealings - Must not be imported into the State or sold.

Regional Recommended Measure - Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment.

It is recommended that these weeds be controlled as part of weed control as part of any future development.

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## 5.2 HABITAT APPRASIAL

### 5.2.1 HABITAT DESCRIPTION AND DISTRIBUTION IN THE VICINITY

The vegetation and landforms present within the site offer potential habitat for a limited number of native species. The broad habitat type within the site consisted of disturbed grassland and aquatic habitat, a detailed description of the habitat value of each broad habitat type has been provided below.

#### Cropping Land

The grassland/pasture habitat was composed primarily of oat crops and introduces species. Such habitat provides opportunity for a limited number of avifauna species, including predominantly terrestrial species preferring open highly modified spaces including seed eating birds and several birds of prey, which may hunt over this area in search of potential prey species. Macropods may also frequent such areas whilst grazing. Some species of bats may also forage over this cleared area for insects.

#### Area of remnant trees

Mature scattered trees would provide foraging and refuge for a number of avifauna and mammal species. Frugivorous, nectivorous, granivorous and insectivorous birds and microchiropteran bat species would find potential foraging resources as part of a larger home range. Up to thirty-seven hollows within nine of the trees would provide potential nesting and roosting sites for a small variety of avifauna and other hollow-dependent species such as arboreal marsupials and tree-roosting bats.

#### Aquatic Habitat

Aquatic habitat was represented in the form of a very small constructed dam within the site. This area of habitat would provide foraging and refuge for a number of amphibian, reptile and waterbird species. Some species of 'fishing' Microchiropteran Bats may also hunt over this area for insects. The water present would also provide a drinking resource for a number of native species such as macropods and birds.

### 5.2.2 TREE SURVEY

A total of 10 trees were recorded within the proposed subdivision. Details of each tree including height, diameter at breast height (DBH), coordinates and fauna habitat attributes such as hollows and are contained in Table 5.2. The location of the 10 trees is shown in Figure 5.1.

## 5.3 HABITAT FOR SIGNIFICANT SPECIES

An assessment of habitat attributes on site has been undertaken for the significant species listed in Table 4.3. The results of the assessment using definitions shown in Table 5.3 are displayed in Table 5.4. Threatened species identified in this assessment as having potential habitat available on site have been considered further in Section 7.0 of this report.

Table 5.2: Tree survey results.

Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Hollow Class				Comments	Removal Required?
						1	2	3	4		
1	Dead Tree	361163	6377230	0.81	10		1	5	5	Fallen timber underneath tree	Yes
2	<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i> Drooping Red Gum	361179	6377196	0.58	9						Yes
3	<i>E. parramattensis</i> subsp. <i>decadens</i>	361172	6377186	0.53	12			1	1	Scratch marks on trunk	Yes
4	<i>Corymbia maculata</i> Spotted Gum	361156	6377191	0.65	10	1	2	1	2	Lots of scratch marks on trunk. Galahs observed within higher class 2 hollow.	Yes
5	<i>E. parramattensis</i> subsp. <i>decadens</i>	361142	6377199	0.66	13				1?	Lots of scratch marks on trunk. Galahs observed within higher class 2 hollow.	Yes
6	<i>E. parramattensis</i> subsp. <i>decadens</i>	361146	6377200	0.43	7		1?		1	Scratch marks on trunk	Yes
7	Dead Tree	361159	6377206	0.49	6		1	1		Cracks in bark	Yes
8	Dead Tree	361154	6377214	0.44	5		1	1		Cracks in bark	Yes
9	<i>C. maculata</i>	361188	6377118	0.58	18	1			3	Observed wood duck exiting from hollow in tree. Trunk is covered in sap from distressed tree	Yes
10	<i>C. maculata</i>	361287	6377184	0.71	20	3	4	2	5	Scars on trunk and dead tissue.	Yes

Table 5.3: Definitions of likelihood of occurrence criteria.

Likelihood of Occurrence	Threatened Fauna	Threatened Flora
Unlikely	Suitable habitat is absent from the study area and/or the study area is outside of the species known distribution	
Low	<ul style="list-style-type: none"> <li>The species has not been recorded in the locality (10km) within the last five years; and/or</li> <li>Although suitable habitat is present in the study area the suitable habitat is in a highly modified, limited or degraded state; and/or</li> <li>This species may be an occasional visitor, but habitat similar or of higher quality is widely distributed in the local area.</li> </ul>	<ul style="list-style-type: none"> <li>The species has not been recorded in the locality (10km) within the last five years, and/or</li> <li>Although suitable habitat is present in the study area the suitable habitat is in a highly modified or degraded state</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>The species has been recorded in the locality (10km) within the last five years; and/or</li> <li>It is unlikely to be dependent on habitat within the study area (i.e., for breeding or important life cycle periods) or to maintain a permanent resident population. However, the species may seasonally, opportunistically or occasionally use resources within the study area; and/or</li> <li>Although suitable habitat is present in the study area the suitable habitat is in a moderately modified, limited or degraded state</li> </ul> <p>This category includes fauna species that were targeted by seasonal surveys and were not recorded, wide ranging species which may fly-over' the site, regardless of the habitat types present and generalist species with non-specific habitat requirements</p>	<ul style="list-style-type: none"> <li>The species has been recorded in the locality (10km) within the last five years; and/or</li> <li>Although potential habitat is present in the study area the suitable habitat is in a moderately modified or degraded state.</li> </ul> <p>This category includes flora species that were targeted by seasonal surveys and were not recorded.</p>
High	<ul style="list-style-type: none"> <li>The species has been recorded in the locality (10km) within the last five years; and/or</li> <li>It is highly likely that the species inhabits the study area and is dependent on identified suitable habitat (i.e., for breeding or important life cycle periods) and is likely to maintain a resident population. This includes species that are known to visit the study area during regular seasonal movements or migration.</li> </ul>	<ul style="list-style-type: none"> <li>The species has been recorded in the locality (10km) within the last five years; and/or</li> <li>It is highly likely to inhabit the study area and is dependent on identified suitable habitat.</li> </ul>
Known	The species was observed in the study area during the current survey and/or was recorded during a survey conducted on the site during the last 5 years.	

Table 5.4: Habitat Assessment for Significant Species

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
<b>FLORA</b>					
<i>Cryptostylis hunteriana</i> Leafless Tongue Orchid	V	V	No	Grows in swamp-heath on sandy soils, chiefly in coastal districts, south from the Gibraltar Range. It is known historically from several localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). Also recorded at Munmorah State Conservation Area, Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park.	<b>Unlikely</b> No suitable habitat was present.
<i>Diuris pedunculata</i> Small Snake Orchid	E1	E	No	Confined to north east NSW. It was originally found scattered from Tenterfield south to the Hawkesbury River. Mainly found on the New England Tablelands, around Armidale, Uralla, Guyra and Ebor. Grows on grassy slopes or flats, often on peaty soils in moist areas. Also occurs on shale and trap soils, on fine granite, and among boulders. It flowers during August-October.	<b>Unlikely</b> No suitable habitat was present primarily due to the high disturbance.
<i>Prasophyllum</i> sp. Wybong A Leek Orchid		CE	Yes	Leek orchids are generally found in shrubby and grassy habitats in dry to wet soil (Jones 2006). Known to occur in open eucalypt woodland and grassland.	<b>Unlikely</b> No suitable habitat was present
<i>Pterostylis gibbosa</i> Illawarra Greenhood	E1	E	No	All known sub-populations occur in open forest and woodland on flat or gently sloping land with poorly drained soils. Within the Hunter Valley this orchid species is confined to the Milbrodale area.	<b>Unlikely</b> No suitable habitat was present
<i>Rhizanthella slateri</i> Eastern Underground Orchid	V	E1	Yes	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Grows in sclerophyll forest in shallow to deep loams.	<b>Unlikely</b> No suitable habitat was present
<i>Dichanthium setosum</i> Blue Grass	V	V	No	Occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. Associated with heavy basaltic black soils and red-brown loams with clay subsoil.	<b>Unlikely</b> No suitable habitat was present.
<i>Cynanchum elegans</i> White-flowered Wax Plant	E1	E	No	This species occurs in scattered coastal localities from the QLD-NSW border south to Wollongong. Found in dry, littoral or subtropical rainforest, and occasionally in scrub and woodland from sea level to about 600m ASL.	<b>Unlikely</b> No suitable habitat was present.
<i>Rutidosis heterogama</i> Heath Wrinklewort	V	V	No	Grows in heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides. Recorded from near Cessnock to Kurri Kurri with an outlying occurrence at Howes Valley. On the Central Coast it is located north from Wyong to Newcastle.	<b>Low</b> Only marginal habitat may be present around the bases of remnant trees.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
<i>Tetradlea juncea</i> Black-eyed Susan	V	V	No	Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. Found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest.	<b>Unlikely</b> No suitable habitat was present.
<i>Acacia bynoeana</i> Bynoe's Wattle	E1	V	No	Found in heath, woodland and dry sclerophyll forests on sandy soils derived from Hawkesbury Sandstone. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple but has also been recorded within Spotted Gum – Ironbark Forest at its most northerly extent in North Rothbury in the Hunter Valley. Found in central eastern NSW, from the Hunter District (Morisset, Kurri Kurri & North Rothbury) south to the Southern Highlands and west to the Blue Mountains.	<b>Unlikely</b> No suitable habitat was present.
<i>Prostanthera cineolifera</i> Singleton Mint Bush			No	Grows in open woodlands on exposed sandstone ridges. Usually found in association with shallow or skeletal soils. Localities include Apesey Falls, east of Walcha; St Albans and the western side of Mangrove Creek Dam, near Bucketty; a site west of North Rothbury; Pokolbin State Forest (NSW Government, 2005) and Bellbird in the Hunter Valley (DECC NSW, 2008).	<b>Unlikely</b> No suitable habitat was present.
<i>Callistemon linearifolius</i> Netted Bottle Brush	V		No	Grows in dry sclerophyll forest on the coast and adjacent ranges. From the Georges River to the Hawkesbury River in the Sydney area, and north to Nelson Bay. Known to occur within Stony Ridge Reserve on Soldiers Point.	<b>Unlikely</b> No suitable habitat was present.
<i>Eucalyptus glaucina</i> Slaty Red Gum	V	V	No	Grows in grassy woodland and dry eucalypt forest, usually on deep, moderately fertile and well-watered soils. This species has only been recorded on the north coast of NSW and in small populations from Taree to Broke and west of Maitland.	<b>Unlikely</b> No suitable habitat was present.
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i> Drooping Red Gum	V	V	No	Generally, occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant. In the Kurri Kurri area, <i>E. parramattensis</i> subsp. <i>decadens</i> is a characteristic species of 'Kurri Sand Swamp Woodland and in the Tomago Sandbeds area, the species is usually associated with the 'Tomago Swamp Woodland'.	<b>Recorded within the site</b> Only limited habitat was currently present. Trees were present as older remnants.
<i>Rhodamnia rubescens</i> Scrub Turpentine	E4A		Yes	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic	<b>Unlikely</b> No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
				and sedimentary soils.	
<i>Rhodomlyrtus psidioides</i> Native Guava	E4A		Yes	Occurs from Broken Bay New South Wales to Maryborough in Queensland. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	<b>Unlikely</b> No suitable habitat was present
<i>Syzygium paniculatum</i> Magenta Lilly Pilly	E1	V	No	Occurs in a narrow coastal distribution in rainforests on sandy soils or stabilised coastal dunes from Jervis Bay to Bulahdelah in NSW.	<b>Unlikely</b> No suitable habitat was present
* <i>Euphrasia arguta</i> Eyebright	E4A	CE	Yes	Found within the Nundle area reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	<b>Unlikely</b> No suitable habitat was present.
<i>Persicaria elatior</i> Tall Knotweed	V	V	No	Recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertsocaleyin, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	<b>Unlikely</b> No suitable habitat was present
<i>Grevillea parviflora</i> subsp. <i>parviflora</i> Small-flower Grevillea	V	V	No	Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest and is found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests. Common canopy species vary greatly with community type but generally are species that favour soils with a strong lateritic influence including <i>Eucalyptus fibrosa</i> , <i>E. parramattensis</i> , <i>Angophora bakeri</i> and <i>Eucalyptus sclerophylla</i> .	<b>Unlikely</b> No suitable habitat was present
<i>Persoonia hirsuta</i> Hairy Geebung	E1		Yes	Has a scattered distribution around Sydney. The species is distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	<b>Unlikely</b> No suitable habitat was present.
<i>Persoonia pauciflora</i> North Rothbury Persoonia	E4A	CE	Yes	Found only in small area near North Rothbury in the Hunter Valley. Occurs in open forests and woodlands with a shrubby understorey on clay soils derived from silty sandstones.	<b>Unlikely</b> No suitable habitat was present
<i>Pomaderris brunnea</i> Brown Pomaderris	E1	V	No	Found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands and in far eastern Gippsland in Victoria. Grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	<b>Unlikely</b> No suitable habitat was present
<i>Thesium australe</i> Austral Toadflax	V	V	No	Grows in grassland or woodland, often in damp sites.	<b>Unlikely</b> No suitable habitat was



SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
					present.
<b>FAUNA - AMPHIBIANS</b>					
<i>Heleioporus australiacus</i> Giant Burrowing Frog	V	V	No	Banks of semi-permanent to ephemeral sand or rock-based streams and has also been identified in dams, drainage ditches and roadside culverts.	<b>Unlikely</b> No suitable habitat was present.
<i>Litoria aurea</i> Green and Golden Bell Frog	E1	V	No	Inhabits swamps, lagoons, streams and ponds as well as dams, drains and storm water basins.	<b>Low</b> Marginal habitat was present. No nearby records
<i>Litoria littlejohni</i> Littlejohn's Tree Frog	V	V	No	Habitats include wet and dry sclerophyll forest, coastal woodland and heath. Associated characteristics include rocky streams and sandstone outcrops, semi-permanent dams and slow flowing streams. The water quality required for breeding is usually tannic (pH 6.2) and contains detritus which is used as anchors for egg clusters.	<b>Unlikely</b> No suitable habitat was present.
<i>Mixophyes balbus</i> Stuttering Frog	E1	V	Yes	Occurs in wet forest regions of south-eastern Queensland, Eastern NSW and Victoria. In late spring, eggs are deposited among leaf litter on the banks of streams and subsequently are washed into the water during heavy rain.	<b>Unlikely</b> No suitable habitat was present.
<b>FAUNA - REPTILES</b>					
<i>Delma impar</i> Striped Legless Lizard	E	E	No	Occurs in the Southern Tablelands, the South West Slopes, the Upper Hunter and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook and Tumut areas. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland.	<b>Unlikely</b> No suitable habitat was present.
<b>FAUNA - BIRDS</b>					
<i>Limosa lapponica baueri</i> Bar-tailed Godwit		V & M	No	Most frequently recorded along major coastal river estuaries and sheltered embayments, particularly the Tweed, Richmond, Clarence, Macleay, Hastings, Hunter and Shoalhaven River estuaries, Port Stephens and Botany Bay. Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. Less frequently it occurs in salt lakes and brackish wetlands, sandy ocean beaches and rock platforms.	<b>Unlikely</b> No suitable habitat was present.
<i>Calidris ferruginea</i> Curlew Sandpiper		CE & M	Yes	Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	<b>Unlikely</b> No suitable habitat was present.

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	BC Act 2016	EPB C Act 1999	SAII		
<i>Numenius madagascariensis</i> Eastern Curlew		CE & M	Yes	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes.	<b>Unlikely</b> No suitable habitat was present.
<i>Rostratula australis</i> Australian Painted-snipe	E1	E	No	Margins of swamps and streams, chiefly those covered with low and stunted vegetation.	<b>Low</b> Marginal habitat was present around the dam.
<i>Botaurus poiciloptilus</i> Australasian Bittern	E1	E	No	The Australasian Bittern lives alone or in loose groups and favours permanent fresh-waters dominated by sedges, rushes, reeds or cutting grasses (e.g., Phragmites, Scirpus, Eleocharis, Juncus, Typha, Baumea and Gahnia) and feeds on insects, small fish, eels, frogs and other aquatic life, sometimes in rice fields.	<b>Low</b> Marginal habitat was present around the dam.
<i>Ixobrychus flavicollis</i> Black Bittern	V		No	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	<b>Unlikely</b> No suitable habitat was present.
<i>Ephippiorhynchus asiaticus</i> Black-necked Stork	E1		No	Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW. Breeding has been recorded as far south as Tomago NSW.	<b>Unlikely</b> No suitable habitat was present.
<i>Anseranas semipalmata</i> Magpie Goose	V		No	Relatively common in the Australian northern tropics. Records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	<b>Unlikely</b> No suitable habitat was present.
<i>Oxyura australis</i> Blue-billed Duck	V		No	Endemic to south-eastern and south-western Australia. It is widespread in NSW. Most common in the southern Murray-Darling Basin area. Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation.	<b>Unlikely</b> No suitable habitat was present.
<i>Stictonetta naevosa</i> Freckled Duck	V		No	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Is found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. The species may also occur as far as coastal NSW and Victoria during extensive droughts.	<b>Unlikely</b> No suitable habitat was present.
<i>Irediparra gallinacea</i> Comb-crested Jacana	V		No	Occurs in northern and eastern Australia, mainly in coastal and subcoastal regions, from the north-eastern Kimberley Division of Western Australia to Cape York Peninsula then south along the east coast to the Hunter region of NSW. Inhabits permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation.	<b>Unlikely</b> No suitable habitat was present.
<i>Calyptorhynchus lathamii</i> Glossy Black-Cockatoo	V		No	Lowland coastal forests, dense mountain forests, semi-arid woodland and trees bordering watercourses, with (Allo)Casuarina trees for foraging.	<b>Unlikely</b> No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
<i>Callocephalon fimbriatum</i> Gang Gang Cockatoo	V		No	Tall montane forests and woodlands in mature wet sclerophyll forests. Requires hollows in which to breed between October and January.	<b>Low</b> Marginal transitory habitat was present.
<i>Lathamus discolor</i> Swift Parrot	E1	CE & M	Yes	Open Forest to Woodland, also street trees and in parks and gardens, winter flowering eucalypts for feeding. This species nests in Tasmania during the summer months.	<b>Low</b> Limited seasonal foraging habitat was present.
<i>Neophema pulchella</i> Turquoise Parrot	V		No	Lives on the edges of Eucalypt woodland adjoining clearings and on timbered ridges and creeks in farmland. It has also been recorded utilising roadside verges and orchards. Nests in small hollow branches of Eucalypts.	<b>Low</b> Seasonal foraging habitat was present.
<i>Glossopsitta pusilla</i> Little Lorikeet	V		No	Tall Open Forests, woodlands, orchards, parks and street trees.	<b>Low-Moderate</b> Foraging and nesting habitat was present.
<i>Hirundapus caudacutus</i> White-throated Needletail		V & M	No	Inhabits the airspace above forests, woodlands, farmlands, plains, lakes, coasts and towns.	<b>Moderate</b> Due to the non-specific habitat requirements of this species habitat was considered to be present.
<i>Artamus cyanopterus</i> Dusky Woodswallow	V		No	The Dusky Woodswallow is found in open forests and woodlands, and may be seen along roadsides and on golf courses.	<b>Low-Moderate</b> Foraging and roosting habitat was present.
<i>Epthianura albifrons</i> White-fronted Chat	V		No	In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.	<b>Unlikely</b> No suitable habitat was present.
<i>Melanodryas cucullata</i> Hooded Robin (south-eastern form)	V		No	Eucalypt woodlands, Acacia scrublands, Banksia dominated coastal scrubs and open forests.	<b>Unlikely</b> No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
<i>Petroica boodang</i> Scarlet Robin	V		No	Primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. This species lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. Habitat usually contains abundant logs and fallen timber and these are important components of its habitat.	<b>Low</b> Marginal transitory habitat was present.
<i>Petroica phoenicea</i> Flame Robin	V		No	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Endemic to south eastern Australia, and ranges from near the Queensland border to south east South Australia and also in Tasmania.	<b>Low</b> Marginal transitory habitat was present.
<i>Climacteris picumnus victoriae</i> Brown Treecreeper	V		No	This species is a medium sized insectivorous bird that occupies Eucalypt woodlands, particularly open woodlands lacking a dense understorey, River Red Gums on watercourses and around lakeshores. It is sedentary and nests in tree hollows within permanent territories.	<b>Low</b> Marginal habitat was present.
<i>Pomastostomus temporalis</i> subsp. <i>temporalis</i> Grey-crowned Babbler	V		No	Open forest, woodland, scrubland, farmland and outer suburbs. Prefers woodlands with regenerating trees, tall shrubs, and an intact ground cover of grass and forbs.	<b>Low-Moderate</b> Marginal habitat was present. Recorded in neighbouring lot (Firebird 2019). Site lacks suitable native understorey.
<i>Chthonicola sagittata</i> Speckled Warbler	V		No	Speckled Warblers live in a wide range of eucalypt-dominated vegetation that has a grassy understorey, often on rocky ridges or in gullies. It builds a domed nest of grass, bark shreds and moss, lined with fur on the ground.	<b>Low</b> Marginal habitat was present.
<i>Anthochaera phrygia</i> Regent Honeyeater	E4A	CE & M	Yes	Temperate woodlands and open forest, including forest edges, preferring to forage on large-flowered Eucalypts.	<b>Low</b> Limited seasonal foraging habitat was present.
<i>Grantiella picta</i> Painted Honeyeater	V		No	Nomadic, within a range of generally drier forested areas with mistletoes.	<b>Unlikely</b> No suitable habitat was present.
<i>Meliphreptus gularis gularis</i> Black-chinned Honeyeater (eastern subspecies)	V		No	Usually found on the western side of the Great Dividing Range in dry sclerophyll forests and woodlands containing box-ironbark associations and River Red Gum. In the Hunter Valley this species is known to utilise drier coastal woodlands. Usually found in open woodlands.	<b>Low</b> Marginal habitat was present.
<i>Daphoenositta chrysoptera</i> Varied Sittella	V		No	Open eucalypt woodland/forest, mallee, inland acacia, coastal tea-tree scrubs, golf courses, orchards and parks.	<b>Low</b> Marginal habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
<i>Circus assimilis</i> Spotted Harrier	V		No	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Found in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land.	<b>Low</b> Marginal habitat was present.
<i>Pandion cristatus</i> Eastern Osprey	V		No	Found right around the Australian coast line. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feeds on fish over open waters.	<b>Unlikely</b> No suitable habitat was present.
<i>Lophoictinia isura</i> Square-tailed Kite	V		No	Inhabits open forests and woodlands, particularly those on fertile soils with abundant passerines.	<b>Low</b> Hunting habitat is available.
<i>Erythrotriorchis radiatus</i> Red Goshawk	E4A	E	Yes	The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus Forest of coastal rivers.	<b>Unlikely</b> This species is unlikely to utilise the site.
<i>Hieraetus morphnoides</i> Little Eagle	V		No	Is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used.	<b>Low</b> Marginal habitat was present.
<i>Hamirostra melanosternon</i> Black-breasted Buzzard	V		No	Found sparsely in areas of less than 500mm rainfall, from north-western NSW and north-eastern South Australia to the east coast at about Rockhampton. Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Hunts over grasslands and sparsely timbered woodlands.	<b>Low</b> Hunting habitat is available for this species.
<i>Falco hypoleucos</i> Grey Falcon	E1		No	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Generally restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	<b>Unlikely</b> This species is unlikely to utilise the site.
<i>Ninox connivens</i> Barking Owl	V		No	Is found in forest and woodland, encountered most commonly in savanna and paperbark woodlands. It sometimes roosts in rainforests, but it requires the more open country for hunting and hollow Eucalypts for breeding.	<b>Low</b> Hunting habitat was present.
<i>Ninox strenua</i> Powerful Owl	V		No	Inhabits a wide range of vegetation types from wet Eucalypt forests with a Rainforest understorey to Dry Open Forests and Woodlands. The species has been recorded utilising disturbed habitats such as exotic pine plantations and large trees in parks and gardens. Powerful Owls nest in a slight depression in the wood-mould on the base of a cavity in a	<b>Low</b> Hunting habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
				large old tree, sometimes in excess of 25 metres above the ground.	
<i>Tyto novaehollandiae</i> Masked Owl	V		No	A range of wooded habitats that contain mature trees with large hollows for roosting and nesting, and more open areas for hunting.	<b>Low</b> Hunting habitat was present.
<i>Tyto tenebricosa</i> Sooty Owl	V		Yes	Prefers dense dimly-lit forests, inhabiting pockets of rainforest and wet sclerophyll forest mainly in mountainous areas, often in south-east facing gullies.	<b>Unlikely</b> No suitable habitat was present.
<b>FAUNA – MAMMALS</b>					
<i>Dasyurus maculatus</i> ssp. <i>maculatus</i> Spotted-tailed Quoll	V	V	No	Inhabits sclerophyll forests, rainforests and coastal woodlands. Nests are made in rock caves and hollow logs or trees, and basking sites are usually found nearby.	<b>Low</b> Marginal hunting habitat was present.
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	V		No	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter.	<b>Low</b> Marginal habitat was present. Limited by the isolated nature of the remnant trees.
<i>Phascolarctos cinereus</i> Koala	V	V	No	Coastal woodland and open forest containing suitable food trees.	<b>Low</b> Few koala feed trees present under SEPP 2021. Trees are isolated and fenced into a paddock.
<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby	E1	V	Yes	Found in steep rocky sites in sclerophyll forests with a grassy understorey.	<b>Unlikely</b> No suitable habitat was present.
<i>Petaurus australis</i> Yellow-bellied Glider	V		No	Occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	<b>Unlikely</b> No suitable habitat was present.
<i>Petaurus norfolcensis</i> Squirrel Glider	V		No	Dry sclerophyll forests and woodlands with exudates for foraging and hollows for nesting.	<b>Unlikely</b> Remnant trees are too isolated from other areas of suitable habitat.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
<i>Petauroides volans</i> Greater Glider		V	No	Eucalypt-dominated low open forests on the coast to tall forests in the ranges and low woodland west of Great Dividing Range. Not found within rainforests.	<b>Unlikely</b> No suitable habitat was present.
<i>Pseudomys novaehollandiae</i> New Holland Mouse		V	No	Known to inhabit open heathlands, open woodlands with a heathland understorey and vegetated sand dunes.	<b>Unlikely</b> No suitable habitat was present.
<i>Pteropus poliocephalus</i> Grey-headed Flying-Fox	V	V	No	Wet and Dry Sclerophyll Forests, Rainforest, Mangroves and Paperbark swamps and Banksia Woodlands.	<b>Moderate</b> Seasonal foraging habitat was available in the form of flowering myrtaceous canopy species.
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail-bat	V		No	Has been reported from a wide variety of habitats. Roosts in tree hollows, animal burrows, dry clay cracks, under rock slabs and in abandoned Sugar Glider nests.	<b>Low-Moderate</b> Suitable hunting and roosting habitat were present.
<i>Micronomus norfolkensis</i> Eastern Freetail-bat	V		No	Appears to live in sclerophyll forests and woodland. Roosts in tree hollows or under loose bark.	<b>Moderate</b> Suitable hunting and roosting habitat were available.
<i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle	V		No	Inhabits sclerophyll forests and has been observed roosting in holes and hollow trunks of Eucalypts.	<b>Moderate</b> Suitable hunting and roosting habitat were available.
<i>Miniopterus australis</i> Little Bentwing-bat	V		Yes	Tropical rainforest to warm-temperate wet and dry sclerophyll forest; caves or similar structures for roosting.	<b>Low-Moderate</b> Suitable hunting habitat was present. Preferred roosting habitat in the form of caves was absent.
<i>Miniopterus orianae oceanensis</i> Large Bentwing-bat	V		No	Wet and dry tall open forest, rainforest, monsoon forest, open woodland, paperbark forests and open grasslands, caves or similar structures for roosting. It occasionally uses tree hollows.	<b>Low-Moderate</b> Suitable foraging habitat was present. Preferred roosting habitat in the form of caves was

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPB C Act 1999	SAII		
					absent.
<i>Myotis macropus</i> Southern Myotis	V		No	Various habitats of the coast and adjacent ranges with suitable waterbodies for hunting; caves or similar structures for roosting. It occasionally uses tree hollows.	<b>Low-Moderate</b> Waterbodies were present for hunting. Preferred roosting habitat in the form of caves was absent.
<i>Scoteanax rueppellii</i> Greater Broad-nosed Bat	V		No	Tree-lined creeks, woodland/clearing ecotones and rainforest creeks, roosting mainly in tree hollows.	<b>Low-Moderate</b> Suitable foraging and roosting habitat were present.
<i>Chalinolobus dwyeri</i> Large Pied Bat	V	V	Yes	Occupies dry sclerophyll forest and woodland. Roosts in caves, abandoned mud-nests of Fairy Martins and mine tunnels.	<b>Low</b> Suitable foraging habitat was present. Preferred roosting habitat was absent.
<i>Vespadelus troughtoni</i> Eastern Cave Bat	V		Yes	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals.	<b>Low</b> Suitable foraging habitat was present. No preferred roosting habitat was available within the site.



## 5.4 FAUNA APPRASIAL RESULTS

### 5.4.1 DIURNAL SURVEYS

A number of fauna species were observed during the field survey, the following list is inclusive of all species recorded within the site during field:

#### Avifauna

- *Manorina melanocephala* (Noisy Miner);
- *Ocyphaps lophotes* (Crested Pigeon);
- *Cracticus tibicen* (Australian Magpie);
- *Corvus coronoides* (Australian Raven);
- *Platycercus eximius* (Eastern Rosella);
- *Chenonetta jubata* (Australian Wood Duck);
- *Cacatua sanguinea* (Little Corella);
- *Petrochelidon nigricans* (Tree Martin);
- *Psephotus haematonotus* (Red-rumped Parrot);
- *Eolophus roseicapillus* (Galah);
- *Trichoglossus haematodus* (Rainbow Lorikeet);
- *Acridotheres tristis* (Indian Myna);
- *Falco cenchroides* (Australian Kestrel);
- *Dacelo novaeguineae* (Laughing Kookaburra);
- *Hirundo neoxena* (Welcome Swallow).

#### Mammals

Scats attributed to *Macropus giganteus* (Grey Kangaroo) were recorded within the site as well as pats attributed to *Bos taurus* (Cattle) were observed throughout the site. Cattle were also present within the site during the nocturnal survey. Scats and diggings attributed to *Oryctolagus cuniculus* (European Rabbit) were observed on the western side and far east corner of the site. Two European rabbits were also observed within the neighbouring lot in the far east corner.

No threatened species were observed in the survey area during diurnal fieldwork.

### 5.4.2 NOCTURNAL SURVEYS

A small number of fauna species were observed during the field surveys, the following list is inclusive of all species recorded within the site during nocturnal surveys:

#### Spotlighting/stag watching

Young birds were heard calling from a hollow in Tree No. 3 (Figure 5.1). Due to the timing of the survey in the middle of winter, these young were likely *Trichoglossus moluccanus* (Rainbow Lorikeet) as it is rare for other bird species to breed around this time of year. A pair of Rainbow Lorikeets were also seen within the vicinity of the hollow.

Microchiropteran bat call survey

During the microchiropteran bat call survey one species of microchiropteran bat; *Chalinolobus gouldii* (Gould's Wattled Bat) was positively identified as occurring on site.

No threatened species were observed or identified in the survey area during microchiropteran bat call surveys.

Amphibian Survey

During amphibian surveys no animals were heard calling around the dam within the site however *Crinia signifera* (Common Eastern Froglet) was heard calling to the north of the site within a dam or drainage line. *Crinia signifera* is not listed as a threatened species under state or national legislation.

**5.5 SURVEY LIMITATIONS**

As with all reports of this type the main survey limitation is considered to be the very short period of time in which the fieldwork was carried out. Limitations to the likelihood of detecting certain subject species were also encountered during this survey. Such limitations were generally related to the seasonal occurrence of species, be it as a result of known flowering periods for flora or migratory movements by fauna.

These limitations have been overcome by applying the precautionary principle in all cases where the survey methodology may have given a false negative result. This precautionary principle was achieved by recognising that most threatened species are rare and therefore unlikely to be encountered during a survey even if they may utilise the site at other times. These species have been assessed on the basis of the presence of their habitat and the likely significance of that habitat to a viable local population.

## **6.0 IMPACT ASSESSMENT**

The following sections provide an analysis of the potential impact the proposal may have on the biodiversity values within the site and provide recommendations of compensatory and ameliorative measures that should be undertaken.

### **6.1 AVOIDANCE AND MINIMISATION OF IMPACTS**

The subject site currently contains very little native vegetation and is dominated by oat crops. The subdivision will have less impact on native vegetation because of the highly degraded state of the land and vegetation.

### **6.2 DIRECT IMPACT**

The proposal will result in the following direct and potential impacts/losses:

- Removal of 10 remnant native trees within an area of 0.05ha;
- Removal of 9 habitat (hollow-bearing) trees (suitable nesting & roosting habitat for some bird and microchiropteran bat species);
- Removal of 4 trees consistent with the threatened species: *Eucalyptus parramattensis subsp. decadens* (Drooping Red Gum);
- Removal of approximately 6ha of highly modified grazing/cropping land which would provide some limited habitat for native species adapted to highly altered habitats;
- Draining and filling of a small constructed dam;
- The removal of an old brick/concrete dome water tank may also remove suitable roosting habitat for some microchiropteran bat species;
- Construction through/over prescribed first order stream (no defined watercourse was present on the ground, are was under cultivation at the time of the survey).

### **6.3 INDIRECT IMPACTS**

The proposal may result in the following indirect and potential impacts:

- Erosion and sedimentation;
- Increased spread of priority and other weed species;
- Increase in lighting
- Edge effects.

### **6.4 MITIGATION MEASURES**

A number of mitigation measures have been specified to minimise the impact of the loss of habitat. The measures will include:

- The hollow-bearing trees to be removed within the development footprint should be inspected by an ecologist prior to removal to ascertain if the trees are being used for nesting birds. An ecologist should be present during removal of the habitat trees to reduce the impact on any native fauna which may be present;

- 
- If possible hollow bearing trees should be removed outside of peak bird breeding season (Spring and early Summer);
  - When draining of the dam occurs, an ecologist should be present (if water level is relatively high) when the dam is drained to relocate any vertebrate species to nearby larger bodies of water such as Swamp Creek;
  - Specimens of *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) are likely to require removal. As a result of the likely isolated nature and distance of the specimens of *E. parramattensis* subsp. *decadens* within the site from other known populations, these trees would likely have some local; genetic variation. To help retain this genetic diversity is recommended that seed be collected from the subject trees by a suitably qualified plant propagator/native nursery to be used in plantings within the site. Tubestock of *E. parramattensis* subsp. *decadens* could be planted within the landscape buffer in the west and/or around the edge of the wetland landscaping.

## 7.0 CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016

Considerations of the effects of the vegetation removal undertaken for the proposed development under Section 7.3 of the BC Act (2016) for the concerned threatened species is given below. The species dealt with are those identified during the fieldwork and those identified as having potential habitat available on site in Table 4.3.

*For the purposes of the Section 7.3 of the BC Act (2016), the following factors have been taken into account in deciding whether there is likely to be a significant effect on this threatened species, populations or ecological communities, or their habitats:*

- a) *in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.*

### Threatened Flora

Four remnant trees within the site were found to have bark, buds and fruit consistent with that of the state and nationally threatened *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum). Samples of these subject trees have also been sent to the Herbarium in Sydney for validation however due to COVID 19 there is little chance of getting any positive identification before the end of the year. Photos of the subject trees including buds, fruit etc were shown to botanist Stephen Bell a local expert on *E. parramattensis* subsp. *decadens*, he indicated that the trees also appeared to be consistent with this threatened species.

Very few if any records of *E. parramattensis* subsp. *decadens* are known to occur within the Maitland City LGA. This species is usually associated with two metapopulations within the Kurri-Cessnock Area and the Tomago Sandbeds (Bell, 2006). The trees are mature remnants and appear to have been present within the site for some period of time. The occurrence of these remnant trees would be significant as they would represent an outlying population, possibly a remnant of a larger population that once occurred in the area. There could possibly be further specimens of *E. parramattensis* subsp. *decadens* within the local area. Due to the high disturbance within the site (under cultivation) the long-term occurrence of these trees would be questionable. The high disturbance and land use (weeds, changed soil chemistry, cropping and cattle grazing) would inhibit seed from these trees from germinating and growing into a tree. Additionally, previously occurring ecologically associated native flora and fauna species and other processes would also be lacking from the site. It least two of the dead trees within the site were likely specimens of *E. parramattensis* subsp. *decadens*.

All four specimens of *E. parramattensis* subsp. *decadens* may likely require removal as a result of the subdivision and subsequent development. As a result of the likely isolated nature and distance of the specimens of *E. parramattensis* subsp. *decadens* within the site from other known populations, these trees would likely have some local; genetic variation to other known populations. To help retain this genetic diversity is recommended that seed be collected from the subject trees by a suitably qualified

plant propagator/native nursery to be used in future plantings (tubestock) within the site, such as the landscape buffer in the west and/or around the edge of the wetland landscaping.

Taking into consideration the disturbance of the site, current agricultural activities, lack of natural recruitment and given recommendations the proposal is unlikely to have a significant impact on *Eucalyptus parramattensis subsp. decadens* such that a local population would be placed at risk of extinction.

No other addressed threatened flora species were recorded within the survey area during fieldwork. Due to the highly degraded and cultivated state of the environment only marginal habitat was considered to be present for one species; *Rutidosia heterogama* (Heath Wrinklewort). This marginal habitat would only be confined to around the bases of remnant trees. The proposal will result in a very small incremental reduction of marginal habitat for this species however is not likely to significantly impact this species such that a local extinction would occur.

#### Threatened Fauna

No threatened fauna species were recorded during fieldwork. Of the 49 addressed threatened fauna species the subject site was considered to contain suitable habitat for 27 species:

- *Litoria aurea* Green and Golden Bell Frog
- *Lathamus discolor* Swift Parrot
- *Neophema pulchella* Turquoise Parrot
- *Glossopsitta pusilla* Little Lorikeet
- *Artamus cyanopterus cyanopterus* Dusky Woodswallow
- *Petroica boodang* Scarlet Robin
- *Pomatostomus temporalis subsp. temporalis* Grey-crowned Babbler
- *Chthonicola sagittata* Speckled Warbler
- *Anthochaera phrygia* Regent Honeyeater
- *Daphoenositta chrysoptera* Varied Sittella
- *Lophoictinia isura* Square-tailed Kite
- *Hieraaetus morphnoides* Little Eagle
- *Hamirostra melanosternon* Black-breasted Buzzard
- *Ninox connivens* Barking Owl
- *Ninox strenua* Powerful Owl
- *Tyto novaehollandiae* Masked Owl
- *Phascolarctos cinereus* Koala
- *Pteropus poliocephalus* Grey-headed Flying-Fox
- *Micronomus norfolkensis* Eastern Freetail-bat
- *Falsistrellus tasmaniensis* Eastern False Pipistrelle
- *Miniopterus australis* Little Bentwing-bat
- *Miniopterus schreibersii oceanensis* Large Bentwing-bat
- *Myotis macropus* Southern Myotis
- *Saccolaimus flaviventris* Yellow-bellied Sheathtail-bat
- *Scoteanax rueppellii* Greater Broad-nosed Bat
- *Vespadelus troughtoni* Eastern Cave Bat

- *Chalinolobus dwyeri* Large Pied Bat

Of these remaining threatened fauna species those most likely to utilise the site would include a number of the woodland birds, Grey-headed Flying Fox and microchiropteran bats. The proposal will result in a very small incremental reduction habitat for the above species. Given the small impact it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

b) *In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*

- (i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- (ii) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

Remnant native vegetation in for form of remnant trees occurring around the dam within the site was found to be representative of a small, highly modified example (0.05ha) of the Endangered Ecological Community (EEC) – Lower Hunter Spotted Gum – Ironbark Forest of Sydney Basin Bioregion. This EEC was highly isolated and degraded through past and current land practices. The removal of these remnant trees will result in a very small incremental loss of this community in the local area; however, it is unlikely to substantially impact or adversely modify the composition or extent of this TEC such that its local occurrence will be placed at risk of extinction.

c) *In relation to the habitat of a threatened species or ecological community:*

- (i) *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*

The vegetation removal activities as defined in Section 6.0 have resulted in the following:

- Removal of 10 trees including 9 habitat trees and 4 likely threatened species *Eucalyptus parramattensis subsp. decadens* (Drooping Red Gum) (Area 0.05ha);
- Draining and filling of a small dam;

- (ii) *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*

Native vegetation is only present in a small patch (0.05ha) of scattered trees. They are located in the middle of the site, surrounded by oat crops. They are highly isolated from other areas with the nearest trees located 100m away. They are not likely used as a part of movement corridor and the removal of the 10 trees is unlikely to create a movement barrier for any threatened species.

- (iii) *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.*

The proposed development will result in the removal of ten mature trees which will result in the loss of a small amount of habitat for those threatened species with potential habitat on site. No important areas of habitat are likely to be removed fragmented or isolated as a result of the proposal.

- d) *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).*

No areas of outstanding biodiversity value are within the site.

- e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the site have been listed in Table 7.1.

**Table 7.1: Key Threatening Processes.**

Key Threatening Process	Applicability in regards to the subject site
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees	Nine hollow-bearing trees will require removal.
Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands.	A first order prescribed stream runs through the east corner of the proposed subdivision.
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as <i>Cenchrus clandestinus</i> (Kikuyu) were recorded within the subject site.
Predation by the <i>Felis catus</i> (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the <i>Vulpes vulpes</i> (Red Fox)	The Red Fox was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Aggressive exclusion of birds by noisy miners ( <i>Manorina melanocephala</i> )	Noisy miners were recorded within the site. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the site.



Key Threatening Process	Applicability in regards to the subject site
Competition and grazing by the feral European rabbit, <i>Oryctolagus cuniculus</i>	The European rabbit and evidence of them was observed within the subject area.
Invasion of native plant communities by African Olive <i>Olea europaea</i> subsp. <i>cuspidata</i>	African Olive was observed within the subject area.
Removal of dead wood and dead trees	Dead trees and fallen dead wood under them will require removal.

## 8.0 CONSIDERATIONS UNDER STATE ENVIRONMENTAL PLANNING POLICIES (KOALA HABITAT PROTECTION)

### 8.1 STATE ENVIRONMENTAL PLANNING POLICIES (KOALA HABITAT PROTECTION) 2021

This Policy aims 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.

Within the City of Maitland SEPP 2021 applies to land that is not zoned RU1, RU2 or RU3 and has an area of more than one hectare or an area which has together with any adjoining land in the same ownership an area of more than one hectare, whether or not the development application applies to the whole, or only part of the land. Land that is zoned R1 within Lot 101 DP 1233753 is therefore considered under this SEPP. The area of land zoned R1 is over 1.00ha therefore SEPP 2021 is addressed further below.

With no approved Koala Plan of Management for this LGA, SEPP 2021 is addressed by considering Clause 11 *Development assessment process — no approved koala plan of management for land*.

*For the purposes of Clause 11 of the SEPP 2021, the following factors have been taken into account in deciding whether there is likely to be a significant impact on koalas or koala habitat:*

- 11.5 ... the council may grant development consent if the applicant provides to the council—
- (a) information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application-
    - (i) does not include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area, or

Within this area of the site there were seven trees present (3 *Corymbia maculata* and 4 *Eucalyptus parramattensis* subsp. *decadens*). All trees are considered koala use trees species in the Central Coast Koala Management Area under Schedule 2 of SEPP 2021.

- (ii) is not core koala habitat, or

Core Koala Habitat is defined in 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.”

No koalas were identified during site surveys. According to the BioNet Atlas database search (DPIE, 2021a), there was a total of 7 koala sightings recorded with a 10km radius of the site. The closest koala recorded was approximately 2.7km to the east of the site in Maitland from 2017. Additionally, all records are physically isolated from the site due to residential developments, property fence lines,

large waterways (Swamp Creek) or the New England Highway (Figure 8.1). It is therefore unlikely that any koalas associated with these records are able to travel to the site as part of foraging or movements within their home range.

Habitat on site was not considered highly suitable koala habitat due to the isolation of trees, roads and boundary fence lines, the lack of any other native vegetation. Given that there is no suitable koala habitat, no koalas recorded during site visits and no koala records on site within the past 18 years, the site is not considered to constitute Core Koala Habitat. Based on this information, development consent may be given by council.

*(b) information the council is satisfied demonstrates that the land subject of the development application-*

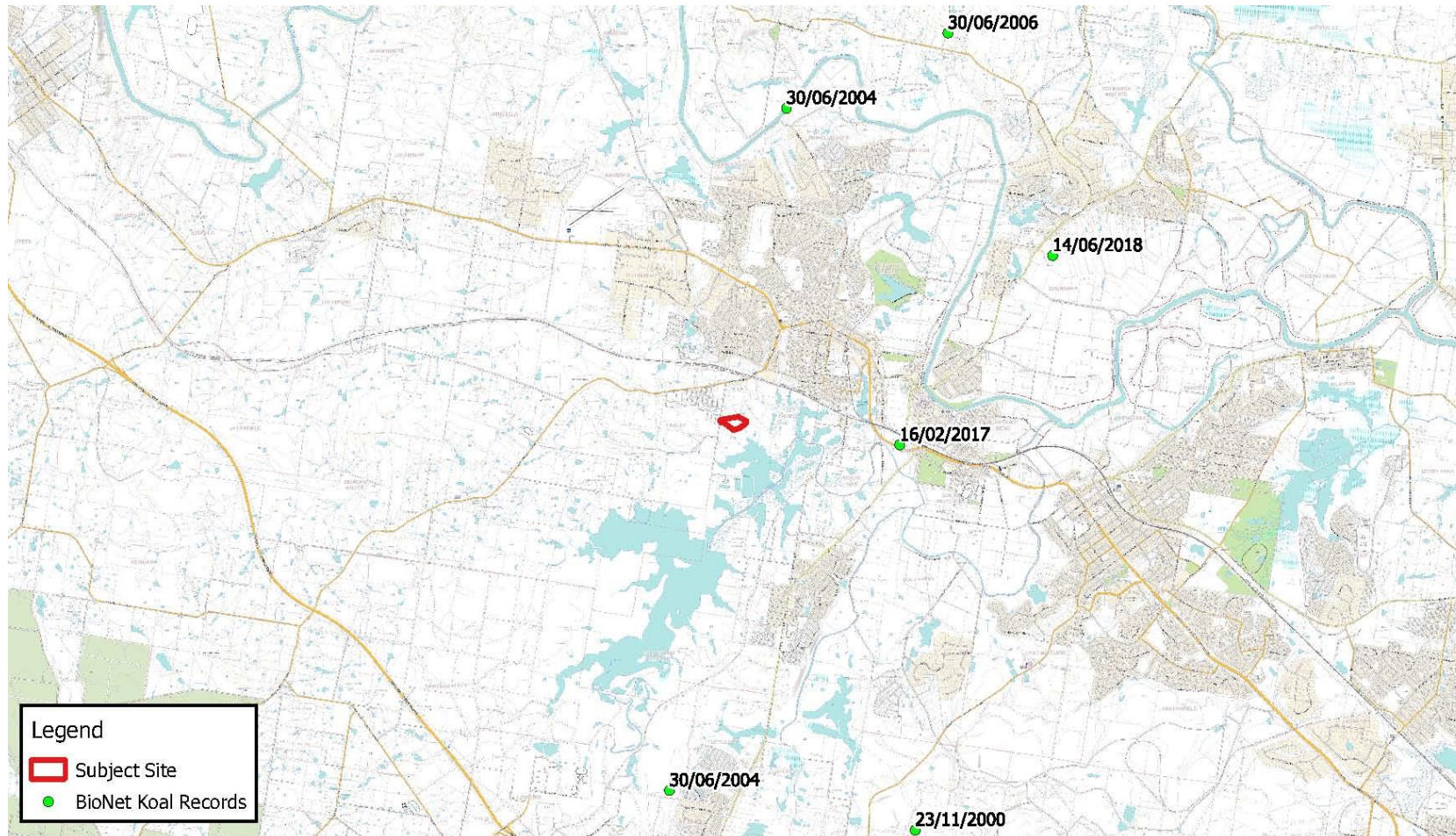
*(i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or*

All trees surveyed within the site had a BDH above 10cm (see Table 5.2).

*(ii) includes only horticultural or agricultural plantations.*

While the entire subject site contains agricultural plantation of oats, there are remnant trees present in the middle of the site.

Taking all elements into consideration including the isolated nature of the site and the lack of koala records within the locality the development is likely to have low or no impact on koalas or koala habitat.



Job Ref	12591
A4 Scale	1:85,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

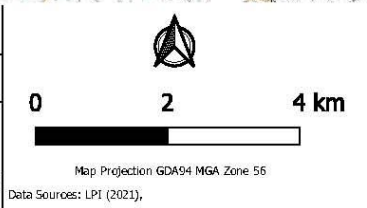


Figure 8.1  
**BioNet Koala Records**

65 & 95 Owlpen Lane  
 FARLEY, NSW  
 21 July 2021

**WILDTHING**  
 Environmental Consultants  
 (a Division of Tattersall Lander Pty Ltd)  
 ABN 41 003 509 215

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## **8.2 CONSIDERATIONS UNDER STATE ENVIRONMENT PLANNING POLICY (KOALA HABITAT PROTECTION) 2020**

The principal aim of State Environment Planning Policy 44 - Koala Habitat Protection, is to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and to reverse the current trend of Koala population decline.

The Koala SEPP 2020 applies to land that the SEPP 2021 does not apply to as defined in Schedule 1 of SEPP 2021. This includes land zoned as RU2 in the City of Maitland LGA. This policy applies to areas of more than one hectare or an area, which has together with any adjoining land in the same ownership an area of more than 1 hectare, whether or not the development application applies to the whole, or only part of the land. Land zoned as RU2 in the two lots (101 and 102) constitutes an area over 1ha therefore SEPP 2020 applies. In addressing SEPP44 there are two questions to be considered.

### **8.2.1 FIRST CONSIDERATION - IS THE LAND 'POTENTIAL KOALA HABITAT'?**

'Potential Koala Habitat' is defined in SEPP 44 as, "...an area of native vegetation where trees of the type listed in Schedule 2 (Koala feed tree species) constitute at least 15% of the total number of trees in the upper or lower strata of the tree component".

No species of 'Koala Feed Tree' were recorded within the land zoned RU2 in the site. There is no "Potential Koala Habitat" present in this area therefore no further consideration is required.

## 9.0 ASSESSMENT OF SERIOUS AND IRREVERSIBLE IMPACTS

Under the BC Act 2016, a determination of whether an impact is serious and irreversible (SAII) must be made in accordance with the principles prescribed in section 6.7 of the BC Regulation.

The “*Guidance to assist a decision maker to determine a serious and irreversible impact, 2017*”, sets out those potential SAII species and ecological communities (known as “potential SAII entities”).

The principles for determining serious and irreversible impacts in the Biodiversity Conservation Regulation, 2017 are:

- *will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or*
- *will further reduce the population of a species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very small population size, or*
- *are impacts on the habitat of a species or area of ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or*
- *are impacts on a species or ecological community is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.*

## 9.1 POTENTIAL SAII ENTITIES

In this case all potential SAII entities are derived from Appendix 2 of the Guide, and are within the Bionet search area. The approval authority must take those impacts into consideration and determine whether there are any additional and appropriate measures that will minimise those impacts if approval is to be granted. An Impact evaluation is shown in Table 9.1. Entities include:

- *Anthochaera phrygia* (Regent Honeyeater)
- *Lathamus discolor* (Swift Parrot)
- *Miniopterus australis* (Little Bentwing-bat)
- *Chalinolobus dwyeri* (Large Pied Bat)
- *Vespadelus troughtoni* (Eastern Cave Bat)

**Table 9.1: SAII impact evaluation**

Potential SAII Entities	Impact Evaluation	Impact Thresholds	Serious and Irreversible Impact?
<i>Anthochaera phrygia</i> Regent Honeyeater	Seasonal foraging habitat was present.	Not within a mapped BAM Important Area (DPIE, 2020)	No
<i>Lathamus discolor</i> Swift Parrot	Suitable foraging and nesting habitat were present.	Not within a mapped BAM Important Area (DPIE, 2020)	No
<i>Miniopterus australis</i> Little Bentwing-bat	Suitable foraging habitat was present. Roosting habitat was absent.		No
<i>Chalinolobus dwyeri</i> Large Pied Bat	Suitable foraging habitat was present. Preferred roosting habitat was absent		No

Potential SAI Entities	Impact Evaluation	Impact Thresholds	Serious and Irreversible Impact?
<i>Vespadelus troughtoni</i> Eastern Cave Bat	No preferred roosting habitat was available within the site		No

Whilst the subject site contains suitable habitat for a number of the listed SAI species none of these species were recorded within the subject site or within close proximity.

## 10.0 CONSIDERATIONS UNDER THE COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999. Assessments have been made to determine whether or not the proposal or activity has, will have, or is likely to have a significant impact on a matter of National Environmental Significance. The matters of National Environmental Significance and the appropriate responses are listed below:

- *World Heritage properties;*

The site is not likely to have a significant impact to any World Heritage Properties.

- *wetlands recognised under the Ramsar convention as having international significance;*

Hunter Estuary Ramsar Wetlands are 10-20km upstream. The site is not likely to have a significant impact on this or any other Ramsar wetland.

- *listed threatened species and communities;*

The vegetation communities present on site were not consistent with any nationally listed TECs and/or populations.

A total of 44 nationally threatened species were recorded on the DoEE database as occurring or having potential habitat available within 10km of the site, these being:

<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid
<i>Prasophyllum sp. Wybong</i>	A Leek Orchid
<i>Pterostylis gibbosa</i>	Illawarra Greenhood
<i>Rhizanthella slateri</i>	Eastern Underground Orchid
<i>Dichanthium setosum</i>	Bluegrass
<i>Cynanchum elegans</i>	White-flowered Wax Plant
<i>Rutidosis heterogama</i>	Heath Wrinklewort
<i>Tetralthea juncea</i>	Black-eyed Susan
<i>Acacia bynoeana</i>	Bynoe's Wattle
<i>Prostanthera cineolifera</i>	Singleton Mint Bush
<i>Eucalyptus glaucina</i>	Slaty Red Gum
<i>Eucalyptus parramattensis subsp. decadens</i>	Drooping Red Gum
<i>Rhodamnia rubescens</i>	Scrub Turpentine
<i>Rhodomyrtus psidioides</i>	Native Guava
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly
<i>Euphrasia arguta</i>	
<i>Persicaria elatior</i>	Tall Knotweed
<i>Grevillea parviflora subsp. parviflora</i>	Small-flowered Grevillea
<i>Persoonia hirsuta</i>	Hairy Geebung
<i>Pomaderris brunnea</i>	Brown Pomaderris
<i>Thesium australe</i>	Austral Toadflax
<i>Heleioporus australiacus</i>	Giant Burrowing Frog
<i>Litoria aurea</i>	Green and Golden Bell Frog
<i>Mixophyes balbus</i>	Stuttering Frog
<i>Delma impar</i>	Striped Legless Lizard
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit
<i>Calidris ferruginea</i>	Curlew Sandpiper
<i>Numenius madagascariensis</i>	Eastern Curlew
<i>Rostratula australis</i>	Australian Painted Snipe



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<i>Botaurus poiciloptilus</i>	Australian Bittern
<i>Lathamus discolor</i>	Swift Parrot
<i>Hirundapus caudacutus</i>	White-throated Needletail
<i>Anthochaera phrygia</i>	Regent Honeyeater
<i>Grantiella picta</i>	Painted Honeyeater
<i>Erythroriorchis radiatus</i>	Red Goshawk
<i>Falco hypoleucos</i>	Grey Falcon
<i>Dasyurus maculatus maculatus</i>	Tiger Quoll
<i>Phascolarctos cinereus</i>	Koala
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo
<i>Petauroides volans</i>	Greater Glider
<i>Pseudomys novaehollandiae</i>	New Holland Mouse
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox
<i>Chalinolobus dwyeri</i>	Large Pied Bat

One nationally threatened flora species *Eucalyptus parramattensis subsp. decadens* was observed within the site. Taking into consideration the disturbance of the site, current agricultural activities, lack of natural recruitment and given recommendations (Sections 6.0 & 7.0) the proposal is unlikely to have a significant impact on *Eucalyptus parramattensis subsp. decadens* such that it would be considered to be a controlled activity.

No other nationally threatened species were recorded on site during the survey. Habitat of varying quality was considered to be available for those highly mobile threatened species such as woodland birds and particularly microchiropteran bats. The action will result in an incremental loss/modification of habitat within the locality for these species. The removal of trees as a result of the proposal will also result in an incremental reduction of seasonal foraging habitat for the majority of birds listed above, as well as the Grey-headed Flying Fox. The proposal will result in an incremental loss of foraging and roosting/nesting habitat for these species in the local area, however it is not likely to have a significant impact on any of these species.

- *migratory species protected under international agreements;*

Seventeen nationally listed migratory species were recorded on the DAWE on-line database as occurring or having potential habitat available within 10km of the subject site, these being:

Migratory Terrestrial Species:

- *Cuculus optatus* (Oriental Cuckoo)
- *Hirundapus caudacutus* (White-throated Needletail)
- *Monarcha melanopsis* (Black-faced Monarch)
- *Monarcha trivirgatus* (Spectacled Monarch)
- *Motacilla flava* (Yellow Wagtail)
- *Myiagra cyanoleuca* (Satin Flycatcher)
- *Rhipidura rufifrons* (Rufous Fantail)

Migratory Wetland Species:

- *Actitis hypoleucos* (Common Sandpiper)
- *Calidris acuminata* (Sharp-tailed Sandpiper)
- *Calidris ferruginea* (Curlew Sandpiper)

- *Calidris melanotos* (Pectoral Sandpiper)
- *Gallinago hardwickii* (Latham's Snipe)
- *Limosa lapponica* (Bar-tailed Godwit)
- *Numenius madagascariensis* (Eastern Curlew)
- *Pandion cristatus* (Osprey)
- *Tringa nebularia* (Common Greenshank)

Migratory Marine Birds

- *Apus pacificus* (Fork-tailed Swift)

Considering the relatively small impact on habitat in the locality it is unlikely that these species or any of the listed migratory species would be significantly affected by the proposal.

- *nuclear activities;*

The proposal does not involve any type of nuclear activity.

- *the Commonwealth marine environment;*

The proposal does not involve the modification of the Commonwealth marine environment.

## **11.0 CONCLUSION**

Flora, fauna and habitat studies have been undertaken for a proposed subdivision at Lot 101 DP 1233753 (No. 65) Owlpen Lane and part of Lot 102 DP 1233753 (No. 99) Owlpen Lane.

The site was found to be highly disturbed as a result of past native vegetation clearance, ongoing cattle grazing and cropping. Native vegetation was only present in the form of a small number of remnant trees namely; *Corymbia maculata* (Spotted Gum) and *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum). Ground covers within the site were almost entirely introduced species with a couple native aquatic species present in a small shallow dam. Considering the historical mapping and presence of *C. maculata*, the site was once likely composed of Plant Community Type (PCT) 1600 - Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub-grass open forest of the lower Hunter.

The area of remnant trees was found to be most consistent with a very highly degraded example of the BC Act listed TEC – Lower Hunter Spotted Gum – Ironbark Forest of Sydney Basin Bioregion. The vegetation was very degraded and reduced to only a small clump of remnant trees. Due to the condition of what remains, the proposal is unlikely to substantially impact or adversely modify the composition or extent of these TECs such that their local occurrence will be placed at risk of extinction.

Four remnant trees within the site were found to be consistent with that of the state and nationally threatened species *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum). Very few records of *E. parramattensis* subsp. *decadens* are known to occur within the Maitland City LGA. This species is usually associated with two metapopulations within the Kurri-Cessnock Area and the Tomago Sandbeds (Bell, 2006). The occurrence of these remnant trees would be significant as they would represent an outlying population. Due to the high disturbance within the site (under cultivation) the long-term occurrence of these trees would be questionable. The high disturbance and land use (weed incursion, changed soil chemistry, cropping and cattle grazing) would inhibit seed from these trees from germinating and maturing into a tree. All four specimens of *E. parramattensis* subsp. *decadens* may likely require removal as a result of the subdivision and subsequent development. Taking into consideration the disturbance of the site, current agricultural activities, lack of natural recruitment and given mitigation measures for *Eucalyptus parramattensis* subsp. *decadens* the proposal is unlikely to have a significant impact on this threatened tree species such that a local population would be placed at risk of extinction.

No other threatened flora species were recorded within the survey area during fieldwork. Due to the highly degraded and cultivated state of the environment, only marginal habitat was considered to be present for only one additional threatened flora species; *Rutidosia heterogama* (Heath Wrinklewort).

No threatened fauna species were recorded during fieldwork. Of the 62 addressed threatened fauna species the subject site was considered to contain suitable habitat for 27 species. Of these remaining

threatened fauna species those most likely to utilise the site would include a number of the woodland birds, Grey-headed Flying Fox and microchiropteran bats. The proposal will result in a very small incremental reduction of marginal habitat for the above species. Given the small impact it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

Consideration of the State Environment Planning Policy 2021 - Koala Habitat Protection for areas of Lot 101 zoned as R1 identified that the study area would low or no impact on koalas or koala habitat.

Consideration of the State Environment Planning Policy 2020 - Koala Habitat Protection for areas of Lot 101 and 102 zoned as RU2 identified that the study area would not constitute 'Potential Koala Habitat.

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act (1999). One nationally threatened flora species *Eucalyptus parramattensis* subsp. *decadens* was observed within the site. Considering the disturbance to the site and given mitigation measures the proposal is unlikely to be significant and therefore not require controlled activity approval.

Mitigation measures have been specified to ameliorate the impact on native flora and fauna, particularly the presence of *E. parramattensis* subsp. *decadens* as a result of the subdivision and subsequent development.

In conclusion, the proposal will result in a small incremental reduction of habitat for a number of species, however is unlikely to disrupt the life cycle of any addressed threatened species, endangered populations or endangered ecological community such that local extinction would occur.

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## **APPENDIX A**

### **TOTAL FLORA LIST**

Introduced species are indicated by an asterisk (“\*”).

The following standard abbreviations are used to indicate subspecific taxa:

- subsp.** subspecies
- var.-** variety
- x -** hybrid between the two indicated species

**Threatened Species - NSW Biodiversity Conservation Act 2016 (BC Act)**

- V** Vulnerable
- E1** Endangered
- E2** Endangered Population
- E4A** Critically Endangered Population

**Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)**

- V** Vulnerable
- E** Endangered
- CE** Critically Endangered

**Serious and Irreversible Impact SAI**

**Regional Significance (Hunter Rare Plants Database – Version 1 2003)**

- L** endemic to Hunter Region
- DA** disjunct in the Hunter Region, rare or localized (aggregated)
- DB** disjunct in the Hunter Region, widespread and uncommon (broad)
- R** rare but extends beyond the Hunter Region
- U** everywhere uncommon
- N** at northern distributional limit in the Hunter
- E** at eastern distributional limit in the Hunter
- S** at southern distributional limited in the Hunter
- W** at western distributional limited in the Hunter
- T** may be threatened in the Hunter Region
- S** Probably secure in the Hunter Region



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<b>CLASS FILICOPSIDA (Ferns)</b>						
<b>Azollaceae</b>						
<i>Azolla pinnata</i>	Ferny Azolla					
<b>MAGNOLIOPSIDA: Magnoliidae</b>						
<b>LILOPSIDA: (Monocotyledons)</b>						
<b>Juncaceae</b>						
<i>Juncus usitatus</i>	Common Rush					
<b>Juncaginaceae</b>						
<i>Cyanogeton procerum syn. Triglochin procerum</i>	Water Ribbons					
<b>Poaceae</b>						
* <i>Avena sativa</i>	Oats					
* <i>Bromus catharticus</i>	Prairie Grass					
* <i>Cenchrus clandestinus syn Pennisetum clandestinum</i>	Kikuyu					
<i>Cynodon dactylon</i>	Common Couch					
* <i>Poa annua</i>	Winter Grass					Aug, Sept
<b>MAGNOLIIDAE (Dicotyledons)</b>						
<b>Asteraceae</b>						
* <i>Bidens pilosa</i>	Cobblers Pegs					
* <i>Cirsium vulgare</i>	Spear Thistle					Sept
* <i>Conyza bonariensis</i>	Flax-leaved Fleabane					
* <i>Senecio madagascariensis</i>	Fireweed					Sept, Oct
* <i>Sonchus asper</i>	Prickly Sowthistle					
* <i>Sonchus oleraceus</i>	Common Sow Thistle					
<b>Brassicaceae</b>						
* <i>Cardamine hirsuta</i>	Common Bittercress					
* <i>Lepidium africanum</i>	Peppergrass					
<b>Caryophyllaceae</b>						
* <i>Stellaria media</i>	Common Chickweed					Aug, Sept

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<b>Fabaceae Subfamily (Faboideae)</b>						
* <i>Trifolium repens</i>	White Clover					Sept, Oct
* <i>Vicia sativa</i>	Common Vetch					
<b>Malvaceae</b>						
* <i>Malva parviflora</i>	Small-flowered Mallow					
* <i>Sida rhombifolia</i>	Paddys Lucerne					
<b>Myrtaceae</b>						
<i>Corymbia maculata</i>	Spotted Gum					
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Drooping Red Gum	V	V			
<b>Oleaceae</b>						
* <i>Olea europaea</i> subsp. <i>cuspidata</i>	African Olive					
<b>Phytolaccaceae</b>						
* <i>Phytolacca octandra</i>	Inkweed					
<b>Plantaginaceae</b>						
* <i>Plantago lanceolata</i>	Plantain					
<b>Polygonaceae</b>						
<i>Persicaria decipens</i>	Slender Knotweed					
<b>Primulaceae</b>						
* <i>Lysimachia arvensis</i> syn. <i>Anagallis arvensis</i>	Scarlet Pimpernel					
<b>Solanaceae</b>						
* <i>Solanum nigrum</i>	Blackberry Nightshade					
<b>Verbenaceae</b>						
* <i>Verbena bonariensis</i>	Purple Top					