APPENDIX E

ECOLOGICAL ASSESSMENT

BIODIVERSITY ASSESSMENT REPORT

-incld 5 Part Test Assessment of Significance-

-Mr & Mrs Deal-
11 Edwards Ave
Thornton

PREPARED BY:

PEAK LAND MANAGEMENT

JULY 2021

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Land management consulting services:

-Bush Fire- **-Ecological-** **-Environmental-**

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Cover Photo: View of subject site.

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Document Id.	Prep. Date	Version	Submitted to:
Biodiversity Assessment Report	12.7.21	1	HDB Planning

AUTHOR DETAILS

PEAK LAND MANAGEMENT is an independent company specialising in providing quality consulting services in natural resource/land management including bush fire assessment. The company is a consultant member of the NSW Ecological Association, and accredited BAM Assessor and abides by both the NSW Ecological Association & NSW DPIE professional code of conduct and ethics. PEAK LAND MANAGEMENT is licenced with DPIE for survey and collection of threatened flora (SL 100640).

Some examples of the type of work PEAK LAND MANAGEMENT PTY LTD undertakes includes Review of Environmental Factors, Flora & Fauna Surveys/ Ecological Assessments, Bushland/Vegetation Management Plans, and Bush Fire Assessment Reports.

Mr Ted Smith is the Director of PEAK LAND MANAGEMENT PTY LTD. Ted has a Bachelor of Science Degree with Honours majoring in Physical Geography from the University of New South Wales, and a Graduate Diploma in Design for Bushfire Prone Areas from the University of Western Sydney. He is a qualified & experienced Ecologist being a Certified Practicing Ecological Consultant Ecologist (under the NSW Ecological Association -006); Certified Bushfire Practitioner (FPA Aust-17671), and accredited Biodiversity Assessment Method (BAM) Assessor with DPIE (BAAS 17076).

Ted Smith was the author of this work, and conducted all fieldwork.

TERMS AND ABBREVIATIONS

Abbreviation	Meaning
APZ	Asset Protection Zone
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016*
BAR	Biodiversity Assessment Report incld 5 Part Test. Prepared when under the clearing threshold, not on BV Map (or incorrectly mapped), no significant impact on any threatened species or Endangered Ecological Community or over a declared Outstanding Biodiversity Area, or a Part 5 activity where authority chooses not to opt in to BOS scheme.
BCAR	Biodiversity Conservation Assessment Report
BDAR	Biodiversity Development Assessment Report
BSSAR	Biodiversity Stewardship Site Assessment Report
BTA	Bushfire Threat Assessment
CEEC	Critically Endangered Ecological Community
Defendable Space	An area within the asset protection zone that provides an environment in which a person can undertake property protection after the passage of a bush fire with some level of safety.
Development site	The area of native vegetation impact from the proposed development footprint.
DPIE	NSW Department of Planning, Industry and Environment
Ecological community	An assemblage of species occupying a particular area.
Ecosystem credit species	A measurement of the value of vegetation communities, EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development.
EEC	Endangered Ecological Community
EP&A Act	*NSW Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FDI	Fire Danger Index
Ha	Hectare
HBT	Hollow bearing habitat tree
Habitat	(a) an area periodically or occasionally occupied by a species or ecological community, and (b) the biotic and abiotic components of an area.
IPA	Inner Protection Area
Key threatening process	A threatening process listed in Schedule 4 of the *Biodiversity Conservation Act 2016*.
LEP	Local Environment Plan
LGA	Local Government Area
LLS Act	*Local Land Services Amendment Act 2016*
Native Vegetation	Native vegetation means any of the following types of plants native to New South Wales: (a) trees (including any sapling or shrub or any scrub), (b) understorey plants,

	c) groundcover (being any type of herbaceous vegetation), (d) plants occurring in a wetland.
Native Vegetation clearing	Clearing native vegetation means any one or more of the following: (a) cutting down, felling, uprooting, thinning or otherwise removing native vegetation, (b) killing, destroying, poisoning, ringbarking or burning native vegetation.
Native vegetation regulatory map	A native vegetation regulatory map prepared and published under Division 2 of the LLS Act 2016.
NRAR	Natural Resources Access Regulator (NSW Water)
OPA	Outer Protection Area
PBP 2006	Planning for Bushfire Protection 2006
PCT	Plant Community Type
Preferred Koala Feed Trees	Tree species used preferentially as forage for Koalas. In the context of SEPP (Koala Habitat Protection) around 65 tree species are listed regionally including Swamp Mahogany (*Eucalyptus robusta)*, *Eucalyptus punctata* (Grey Gum), Parramatta Red Gum (*Eucalyptus parramattensis),* Scribbly Gum *(E.haemastoma),* Tallowood *(E. microcorys),* Forest Red Gum (*Eucalyptus tereticornis),* Narrow leafed Ironbark (*Eucalyptus crebra)* and Spotted Gum *(Corymbia maculata).*
Protected Animal	Any of the following that are native to Australia or that periodically or occasionally migrate to Australia (including their eggs and young): amphibians—frogs or other members of the class amphibia. Birds—birds of any species. Mammals—mammals of any species (including aquatic or amphibious mammals but not including dingoes). Reptiles—snakes, lizards, crocodiles, tortoises, turtles or other members of the class reptilia.
Protected plant	(a) a plant that is of a threatened species, or (b) a plant that is part of a threatened ecological community, or (c) a protected plant (as listed in Schedule 6 of the BCA 2016).
RoTAP	Rare or Threatened Australian Plant
RF Act	*Rural Fires Act 1997*
RF Regulation	Rural Fires Regulation
Species/candidate credit species	Threatened species or components of species habitat that are identified in the Threatened Species Data Collection as requiring assessment for credit species. These species cannot be reliably predicted to use an area of land based on habitat surrogates.
Study area	The locality including the subject land/development site and surrounding areas.
Subject site/land	The entire extent of the land holdings associated with the development. Includes vegetation and land that is not being developed, but may have indirect impacts upon it.
Threatening process	A process that threatens, or that may threaten, the survival or evolutionary development of species or ecological communities
VIS	NSW Vegetation Information System
VMP	Vegetation Management Plan
WMS	Wildlife Management Strategy

1.0 INTRODUCTION AND BACKGROUND

PEAK LAND MANAGEMENT has been engaged by HDB Planning on behalf of Mr & Mrs Deal to prepare a Biodiversity Assessment Report (BAR) for a proposed subdivision located over Lot 1208 DP 808664/ 11 Edwards Ave Thornton (referred to hereafter as "subject site").

Figures 1-5 show the proposal including site plan, subject site aerial photo, and topographic map.

The report has been prepared in accordance with the *Biodiversity Conservation Act 2016* (BC Act), which is applicable for Maitland City LGA.

This report includes all ecological assessments required under the provisions of the *Environmental Planning and Assessment Act 1979, EP&BC Act 1999, BC Act 2016* and Maitland Council Flora & Fauna Survey Guidelines/DCP (STCA as variation proposed). Please note this BAR includes a 5 Part Test assessment of significance (where applicable), and meets all requirements under the BC Act, and can be assessed by Council. It is not a Biodiversity Development Assessment Report as it is not triggered in this instance (STCA) and not required under the *BC Act 2016*, nor is any referral with NSW DPIE required.

Note:- all areas of native vegetation impacted (incld LLS Act Category 1 mapped land areas) are assessed in this report for the purposes of Councils Flora & Fauna Survey Guidelines. As the land is zoned R1 the LLS Act is irrelevant in this case.

1.1 SCOPE OF WORKS

The proposal is for:

- One into three lot subdivision, which is termed "development site".
- The maximum area of clearing to provide for all these proposed activities is <1Ha.
- All area measurements have been made using a Geographic Information System (GIS), from georeferenced Nearmap images, and the site ground truthed, and reference made to the site location as identified on site by the proponents and site plan based upon that stated location.

In this case the area of impact proposed for native vegetation removal is 0.1Ha for BC Act area clearing determination. The total impact area is therefore under the 0.25Ha threshold (see Section 2.2 re: determination) for the minimum lot size, and is not located within an area mapped on the Biodiversity Values Map, and has no significant impact on threatened species or Endangered Ecological Communities. The development does not trigger the BOS, and does not require a BDAR.

The proposed development is sited within an urban area, with no connectivity present surrounded by dwellings and roads, reducing & avoiding impact where feasible in conformation with the BC Act.

2.0 PLANNING INSTRUMENTS

2.1 FEDERAL

Environment Protection and Biodiversity Conservation Act 1999

This Act is related to actions which may have a detrimental impact on matters of National Environmental Significance (NES). This includes:

- Nationally Threatened Species (including koala) and Ecological Communities,
- Listed Migratory Species which may be relevant to this site
- Declared world heritage sites
- Ramsar Wetlands
- Nuclear actions
- Actions in a Commonwealth marine area.

For the purposes of this Act this report should be used by Council to allow an Assessment of whether the site requires approval from Department of Environment. It is an offence to carry out an action that will or is likely to have a significant impact on one of the above NES matters without first obtaining an approval from the Commonwealth Environment Minister except where an exemption in the EPBC Act applies. A Bionet database search which includes listed locally recorded federal threatened species has been produced (Appendix 3).

The site is not a Declared World Heritage Site, Ramsar Wetland, has no Federal listed Critically Endangered Ecological Community present, and Nuclear Actions/Actions in a Commonwealth marine area are not relevant. There is habitat present for some listed EPBC threatened species, which are addressed within the 5 Part Test where applicable. The proposal in the consultant's opinion conforms to the *EP&BC Act 1999* and does not need referring to Federal Department of Environment.

2.2 STATE

Environmental Planning and Assessment Act 1979

Austlii state:- "*Under Section 55AA of the EP& A Act - Application of Part 7 of Biodiversity Conservation Act 2016 and Part 7A of Fisheries Management Act 1994. This Act has effect subject to the provisions of Part 7 of the Biodiversity Conservation Act 2016 and Part 7A of the Fisheries Management Act 1994 that relate to the operation of this Act in connection with the terrestrial and aquatic environment*". *Note: Those Acts contain additional requirements with respect to assessments, consents and approvals under this Act.*

The development application is assessed in accordance with standard procedures under section 4.15 (previously section 79C) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act requires consideration of the likely impacts of a development, including the environmental impacts on the natural environment when evaluating a development application.

If the biodiversity offset scheme is not triggered by the area threshold or the BV Map, a test of significance should be prepared in accordance with section 7.3 of the *Biodiversity Conservation*

Act 2016 and the *Threatened Species Test of Significance Guidelines*. This test will form part of the documentation that accompanies a development application.

The *BC Act 2016* has been addressed within this report, and therefore the relevant biodiversity sections of the *EP& A Act 1979* have been addressed also.

Figure 1: Aerial photo showing subject site (imagery from Lands Department). North to top of all images.

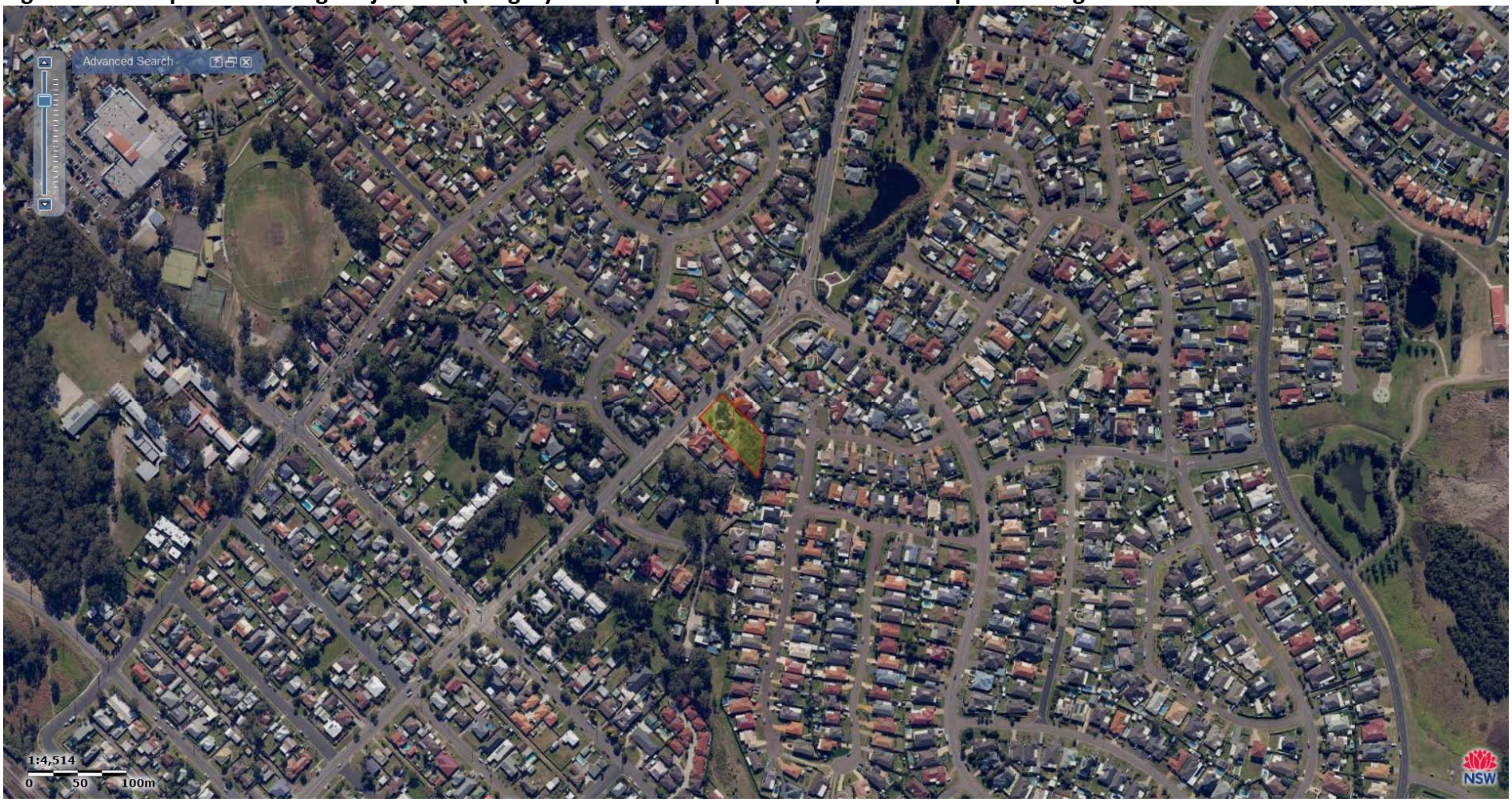


Figure 2: Aerial photo showing subject site in more detail (imagery from Lands Department).

Figure 3: Site plan showing proposed development in detail (from HDB Planning, dated 23.4.21)

Figure 4: Topographic map showing subject site (imagery from SIX maps, Lands Department)

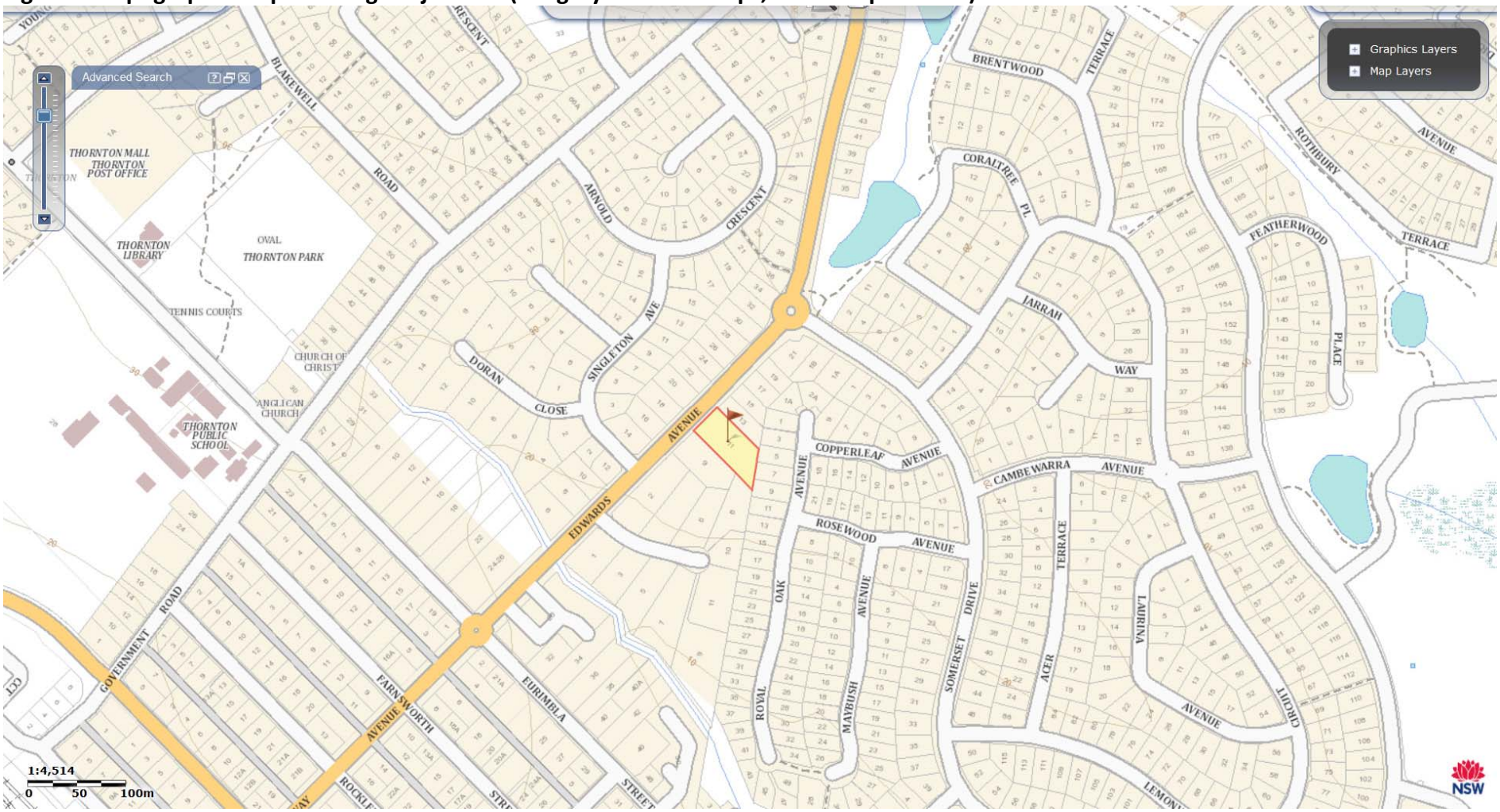


Figure 5: Vegetation Communities over the subject site (from LHCCREMS, 2003)

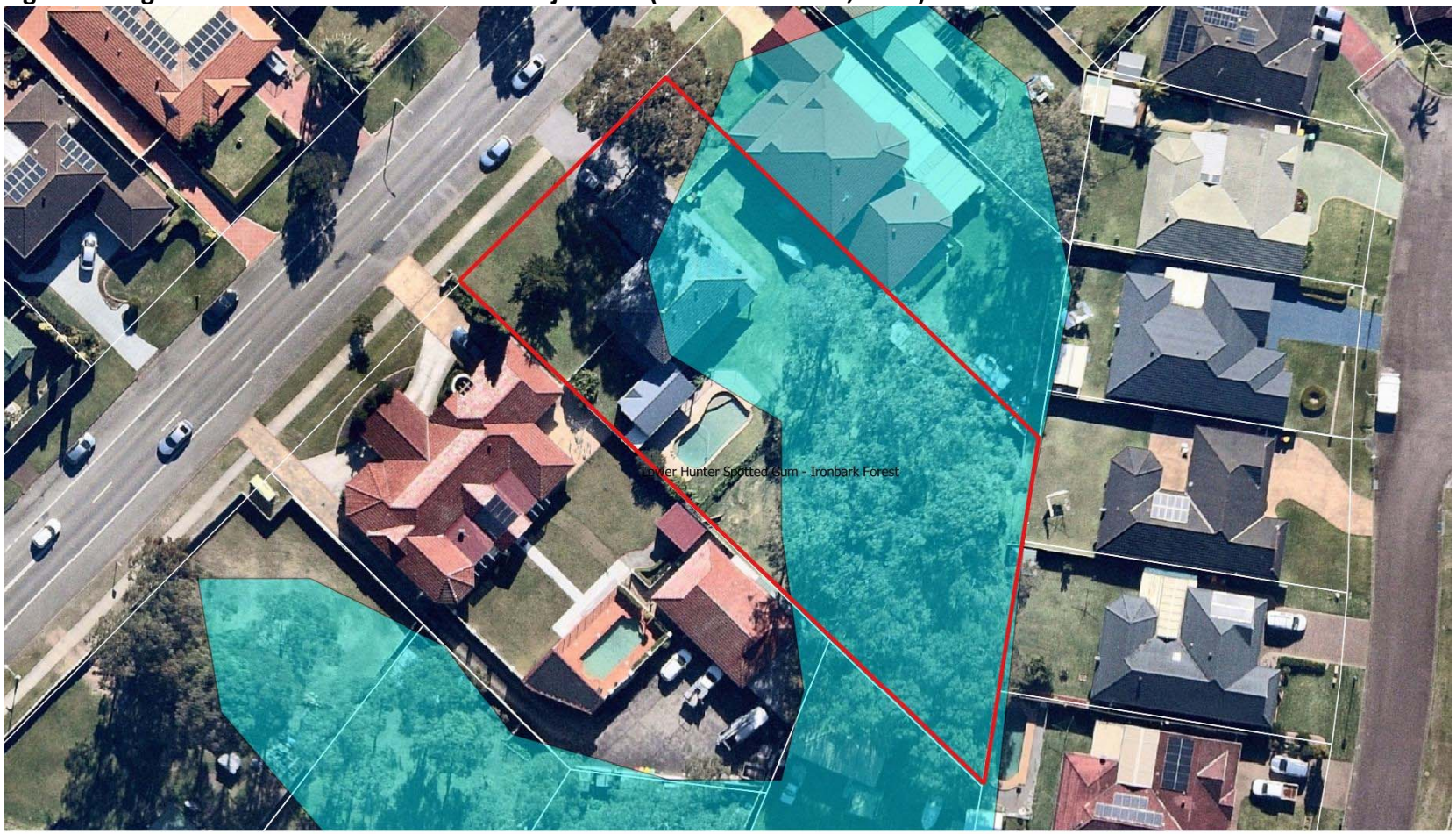
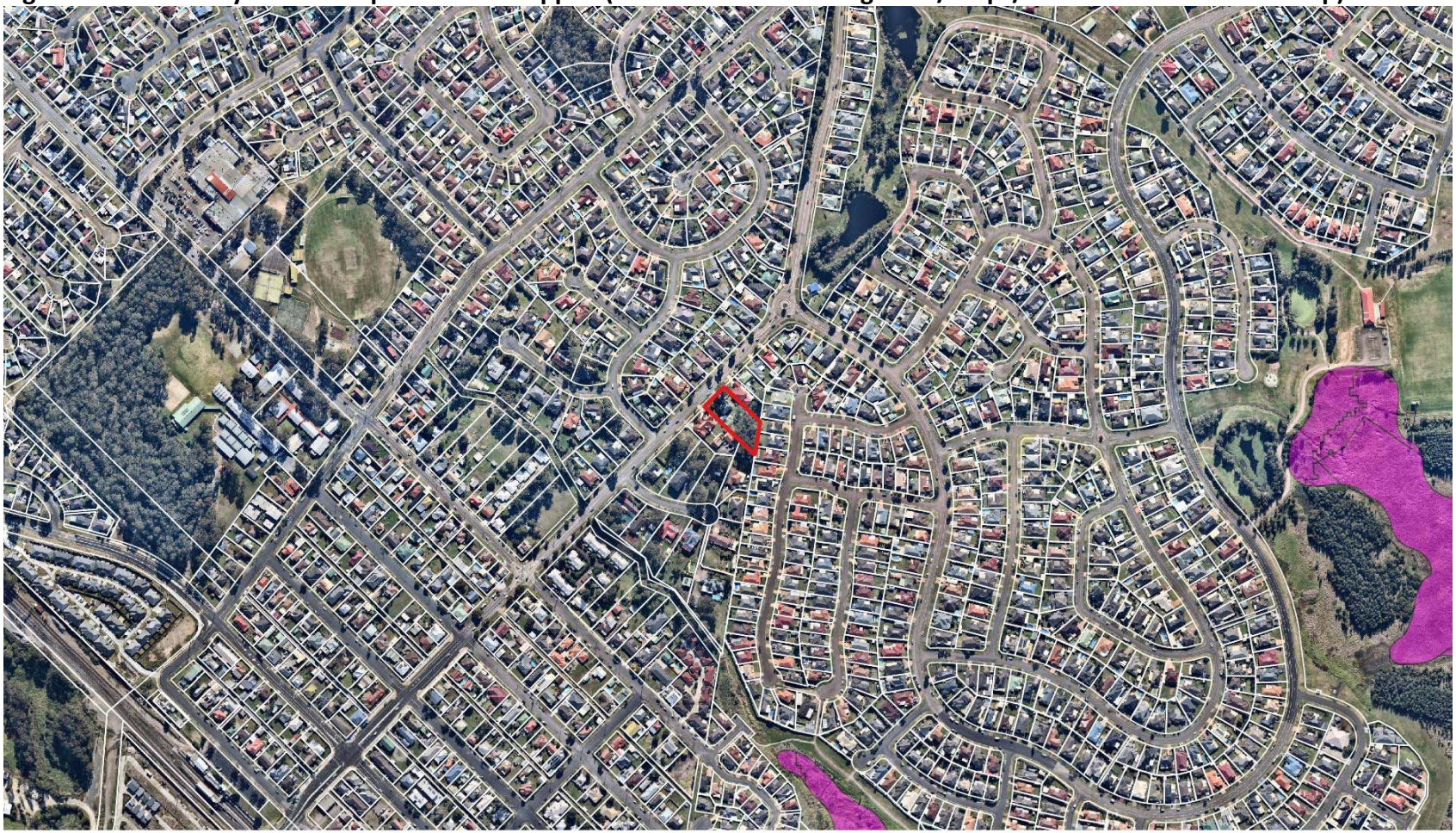


Figure 6: Vegetation Communities over the subject site (by PEAK LAND MANAGEMENT)

Figure 7: Hollow bearing habitat trees, transect, and threatened species recorded over site

Figure 8: Biodiversity Values Map – site not mapped (from www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap)



Note:Cadastre & GPS (+/-3m) may be subject to innaccuracy

Biodiversity Conservation Act 2016.

The *BC Act 2016* repeals the *Threatened Species Conservation Act 1995* (NSW), the *Native Vegetation Conservation Act, Nature Conservation Trust Act 2001* (NSW) and parts of the *National Parks and Wildlife Act 1974* (NSW).

The BC Act establishes a new regulatory framework for assessing and offsetting biodiversity impacts on proposed developments. Where development consent is granted, the authority may impose as a condition of consent an obligation to retire a number and type of biodiversity credits determined under the new Biodiversity Assessment Method (**BAM**).

The purpose of the Act (from Austlii, Aug,2017) relevant to this Biodiversity Assessment Report is:

The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development.

OEH state: - *"The test of significance detailed in section 7.3 of the Biodiversity Conservation Act 2016 must be used to determine whether a local development is likely to significantly affect threatened species.*

Proponents will need to supply evidence relating to the triggers for the Biodiversity Offsets Scheme (BOS) *Threshold and the test of significance when submitting their application to the consent authority.*

Area clearing threshold

The area threshold varies depending on the minimum lot size (shown in the Lot Size Maps made under the relevant Local Environmental Plan (LEP)), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP).

The area threshold applies to all proposed native vegetation clearing associated with a development proposal – for example in the case of a subdivision; all future clearing across the lots subject to the subdivision, must be considered". Table 2 shows the proposed clearing amount, and other details.

Table 1: Area clearing thresholds (from *Biodiversity Conservation Regulation 2017 cl. 7.2 (4)*)

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

Biodiversity Values Map (BV Map)

OEH 2018 (www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap) state: - "*The Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the Biodiversity Conservation Regulation 2017. The Biodiversity Offsets Scheme applies to all local developments, major projects or the clearing of native vegetation where the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 applies. Any of these will require entry into the Biodiversity Offsets Scheme if they occur on land mapped on the Biodiversity Values Map. Exempt and complying development or private native forestry are not subject to the Biodiversity Offsets Scheme".*

The subject site is not mapped on the Biodiversity Values Map (Fig. 8).

Therefore this proposal does not trigger the BC Act full BDAR assessment requirements (Table 2) under this criteria.

5 Part Test

Under the *Biodiversity Conservation Act 2016 (Sect 7.3)*, a 5 Part Test is undertaken to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

Under the *Biodiversity Conservation Act 2016* Part 4 development work will require a 5 Part Test for any clearing of native vegetation, impacts over threatened flora/fauna species and Endangered Ecological Communities.

The "Five Part Test of Significance" was required in this instance as this proposed development is Part 4 under the Act, and does propose vegetation clearing, which also provides habitat for some threatened species. It is not an Endangered Ecological Community.

It found there was no significant impact over any threatened species (subject to Council approval), Endangered Ecological Communities or Endangered Populations (see Section 6).

This report has also addressed other relevant ecological factors (over the site such as threatened species observations, Endangered Ecological Communities, hollow bearing habitat trees, other habitat features such as caves, hollow logs, connectivity, water bodies/creeks, and details amount of native vegetation clearing proposed for the development.

Table 2: Summary of BC Act triggers applicable to the subject site

Land zone & Development type (under EP& A Act) & land type under LLS Act	Minimum lot size associated with the property	Applicable threshold for clearing, above which the BAM and offsets scheme apply	Biodiversity Values mapped over site?	Proposed clearing (Ha)	5 Part Test Assessment of significance required?	Full BDAR required
R1, Part 4, Not under LLS Act	450m2	0.25ha or more	No	0.14Ha	Yes	No*

*See 5 Part Test results, no significant impact on any threatened species, Endangered Ecological Community or critical habitat was found.

Planning data obtained from www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/lot, and Native Vegetation Regulatory map, 21st Dec, 2020.

Local Land Services Act, 2013

Rural land is defined as land zoned as RU1, RU2, RU3, RU4, RU6 and deferred matters. RU5 is considered not to be rural land.

This land is zoned R1, not being rural land, and therefore the LLS Act is not relevant.

Water Management Act, 2000 – Riparian Management
Water Management (General) Regulation 2018

This Act is administered by the Natural Resources Regulator (NRAR) and controls works along rivers and foreshore areas of streams or drainage lines, termed waterfront land where within 40m of a mapped (as shown on a topographic map) lake or creek.

The development site is not located over any mapped creek lines. Referral to NRAR is therefore not considered required.

Appropriate erosion and sedimentation control principles, should be followed nevertheless for any works to prevent off site sedimentation/water quality runoff & indirect impacts on local creeks/dams/drainage lines.

State Environmental Planning Policy (Koala Habitat Protection) 2021.

The State Environmental Planning Policy (Koala Habitat Protection) 2021 was made and commenced on 17 March 2021.

The Koala SEPP 2021 reinstates the policy framework of SEPP Koala Habitat Protection 2019 to 83 Local Government Areas (LGA) in NSW. At this stage:

- *In nine of these LGAs – Metropolitan Sydney (Blue Mountains, Campbelltown, Hawkesbury, Ku-Ring-Gai, Liverpool, Northern Beaches, Hornsby, Wollondilly) and the Central Coast LGA – Koala SEPP 2021 applies to* ***all zones****.*
- *In all other identified LGAs, Koala SEPP 2021* ***does not apply*** *to land zoned RU1 Primary Production, RU2 Rural Landscape or RU3 Forestry.*

For all RU1, RU2 and RU3 zoned land outside of the Sydney Metropolitan Area and the Central Coast, Koala SEPP 2020 continues to apply. This is an interim measure while new land management and private native forestry codes are developed in line with the NSW Government's announcement on 8 March 2021.

The principles of the Koala SEPP 2021 are to:

- *Help reverse the decline of koala populations by ensuring koala habitat is properly considered during the development assessment process.*
- *Provide a process for councils to strategically manage koala habitat through the development of koala plans of management.*

This land is zoned R1, and outside of Sydney. It therefore needs to comply with the former SEPP 2019.

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

"guidelines" means the guidelines, as in force from time to time, made for the purposes of this Policy by the Director.

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

This SEPP applies across NSW to land which is greater than 1 hectare in extent, including adjoining land in the same ownership whether or not the proposal applies to the whole or only part of the land, and is not a National Park or Forestry Reserve. Therefore this SEPP does not apply, as land is <1Ha in extent.

It is considered that the proposed works conform to this SEPP, and that no further koala SEPP studies are considered warranted or required under this SEPP.

NSW Rural Fire Service 10/50 Vegetation Clearing Code of Practice for NSW.

NSW Rural Fire Service state:
"The 10/50 Vegetation Clearing Scheme was introduced following the devastating 2013 bush fires in which more than 200 properties were destroyed. If you live in an area close to the bush, you need to prepare your home. The 10/50 Vegetation Clearing Scheme gives people living near the bush an additional way of being better prepared for bush fires.

The scheme allows people in a designated area to:

- *Clear trees on their property within 10 metres of a home, without seeking approval; and*
- *Clear underlying vegetation such as shrubs (but not trees) on their property within 50 metres of a home, without seeking approval.*

This site is not within a designated 10/50 Vegetation Clearing Entitlement Area as it is not mapped as Bush Fire Prone Land. This Code of Practice is therefore not relevant.

2.3 LOCAL

The relevant local government is Maitland City Council. The land is zoned R1, minimum lot size 450m2. Environmental reporting (under Maitland City Council Flora & Fauna Survey Guidelines/DCP) is required on land where any development, and particularly any native vegetation removal, is proposed, which this report addresses.

2.3.1 DRAFT LOCAL ENVIRONMENTAL PLANNING INSTRUMENTS

No other draft planning instruments have been identified.

3.0 SITE ASSESSMENT

3.1 DISTURBANCE HISTORY

The development site has a variety of disturbance processes occurring including:

- Native trees being Spotted Gum present over part of the site,
- Past clearing of part of the site for a dwelling and surrounding garden;
- Native mid, and understorey almost completely removed over the treed area with exotic species present;
- Entire site regularly mown;
- Feral/domestic animals–almost certainly rats/mice, & cats present from time to time.
- Weeds present over subject site, mainly grasses and herbs within understorey;
- Proximity of surrounding house with light spill, noise and probable fertilizer use.

3.2 CONNECTIVITY

Native vegetation is present predominantly over the southern part of the property, but is confined predominantly to trees. There are suburban fences present, cleared surrounding lots, and connectivity is not present being a remnant within a residential area.

3.3 WATER COURSES

Mapped streams (see Fig 4) do not occur over the site, and no impact proposed over any creek line.

3.4 SOILS, GEOLOGY AND TOPOGRAPHY

Soils occur on the property as a result of parent material, geology, slope, landscape position, land use, aspect, time, and to a lesser degree vegetation and climate. The soil landscapes have been derived for this area by Kovac and Lawrie, 1985. Soil landscapes are mapped using a combination of slope, soil type, and terrain to give a broad picture of major soil groups occurring over the landscape.

The soil-landscape over the subject site is mapped by Matthei, 1995 as:

- Be (Beresfield). These soil landscapes are dominated by clay-based subsoils being Yellow, Brown and Red Podzolics over the crests and upper slopes, and Yellow Podzolics and Soloths over lower slopes. They are moderately deep. They are highly acid, with low fertility, with water erosion hazard. Topography is undulating low hills over Permian sediments.

4.0 FAUNA AND HABITAT SURVEY

4.1: METHODOLOGY LIMITATIONS

A fauna survey was conducted for birds (voice- recorded where necessary for identification, and visual by binoculars), amphibians (voice, recorded where necessary for identification), mammals (visual, scats, tree scratch marks, burrows, footprints), and reptiles (visual). This is shown in Table 3.

No trapping, hair sampling, pit fall traps, owl or anabat call detection, spotlighting, etc were used as limited impact proposed.

This reduced fauna survey effort was considered satisfactory given the relatively small area of clearing, retention of most trees over the property, and a full fauna survey is generally not required under the BC Act when under the clearing threshold, or by Council when impact minimised, and no hollow bearing habitat trees affected, subject to Council determination. In this case around 25 trees proposed for removal, including one with a small hollow.

In addition to on site fauna survey, habitat assessment, and research using Bionet records, and other records where available have been used to determine possible occurrence of threatened species. If suitable habitat is present, and Wildlife Atlas- Bionet records occur in the local area, an assumption has been made that potential threatened fauna species listed in Appendix 3 Bionet search may occur.

Several factors limit the ability of surveys such as this ecological investigation to fully determine the occurrence of all species of fauna which may utilise the subject site. Surveys undertaken over a short time period are unlikely to document the full inventory of fauna species which may occur in the study area.

In the case of highly mobile fauna such as birds and bats, many species may utilise the site only temporarily as a component of their larger foraging range, or may occur in the study area or locality during particular periods of the year, such as their seasonal migratory path.

Table 3: Flora & fauna survey effort

Type of survey	Survey dates	Weather conditions	Survey outline	Survey Effort
Flora transect	28th June, 2021. 11am-12pm	15^{0}C, overcast, low wind, cool, light drizzle, high humidity.	Systematic flora survey and targeted threatened species surveys over site and meander transect over surrounds.	1hr
Diurnal fauna, birds, searches	28th June, 2021. 11am-12pm	15^{0}C, overcast, low wind, cool, light drizzle, high humidity.	Opportunistic and targeted searches for fauna, including searches for scat, tracks, hollows and nests. Listening for any amphibian calling or observations of any tadpoles or fish within/ surrounding dams.	1hr

Type of survey	Survey dates	Weather conditions	Survey outline	Survey Effort
			Targeted surveys using binoculars, auditory surveys, scats/owl pellets, and searches for feathers and nests.	

4.2: SURVEY RESULTS

Survey was conducted as shown in Table 3, and transect locations are shown in Figure 7.

A limited number of birds and other fauna were recorded over or near the subject site. The survey covered land over the development site.

In summary:

- The proposed development site is part cleared, regularly mown, with remnant trees only present.
- The proposed development requires removal of around 25 trees, most being younger regrowth, however one larger tree near the road present with one hollow;
- Habitat is limited to common species, and mobile threatened fauna species, being predominately Flying Fox, microbats, and some birds. Habitat and connectivity very limited or not present for most threatened species in this area.
- The site does not have an impact on wildlife connectivity, with connectivity not present.
- Removal of 0.14Ha of native vegetation over the site.
- SEPP Koala listed feed trees are present, however Koala would not be present and locally extinct in this residential area due to lack of habitat.
- The development site has no hollow fallen logs, nests, rock outcrops, streams, dams or caves present.
- No other fauna ecological features were recorded.

From this site assessment and Wildlife Atlas records there is potential habitat over the subject site for:

- Bats:-Suitable foraging habitat is present. Bats can exist quite well in scattered paddock trees/remnant patches of bushland with flyways present through the forest, and microbats such as Eastern Bentwing Bat and Little Bent Wing Bat and Grey Head Flying Fox are likely to forage over the site from time to time where insects & blossom/nectar occur. Some limited hollows/fissures were recorded over the development site (one small hollow). The proposed development will have a low impact on bats due to foraging resource loss and indirect impacts such as noise & light spill. They are tested further within the 5 Part Test.

- Birds, including owls: - Suitable foraging habitat present over the site for some limited birds such as Little Lorikeet, but unlikely foraging habitat for owls due to limited prey present, no large hollows present for owl nesting. No impact on Casuarina - a feed tree for Glossy Black Cockatoo. Impact over winter flowering gums such as Spotted Gum. One hollow present for nesting/roosting for birds recorded, and affected by the proposal.

Due to bird's mobility and large home ranges, and surrounding large expanses of suitable habitat, impact is expected to be low with one hollow affected. They are therefore tested.

- Reptiles/amphibians:-

  There is unsuitable disturbed habitat present for threatened amphibians within the proposed development site, being slashed disturbed land, with no water & no natural riparian vegetation present on or within 100m of the site. No Bionet records present locally of any threatened amphibians, and they are not therefore tested.

  There is marginal/unsuitable habitat present for threatened reptiles within the proposed development site, and they are not tested. No Bionet records of any threatened reptiles.

- Mammals:-

  Habitat is not considered present for any mammal species over the development site such as Squirrel Glider or Koala due to lack of connectivity and /or limited foraging habitat presence. They are not tested within the 5 Part Test.

5.0 FLORA SURVEY RESULTS

5.1: METHODOLOGY AND LIMITATIONS

Vegetation was assessed on site by transect (after Cropper 1993) over the development site and surrounds according to Maitland City Council Flora & Fauna Survey Guidelines. All transects, and any hollow bearing trees or threatened species were recorded by a Garmin handheld GPS 60CSx unit, generally accurate to within 3m depending on canopy cover (reading +/- 3m accuracy at time of survey). A quadrat was not undertaken in this case as transects covered the site adequately, and site impact very small and related primarily to loss of trees only which were all inspected. Transects covered the entire development site and surrounds (Figure 7). Special attention was paid to any potential threatened species. This has enabled identification and assessment of most flora species on the development site & immediate surrounds. The survey is limited by:

- Non flowering of cryptic orchid/grass/other species at time of survey as described above making identification impossible/problematic.

To help overcome these limitations surveys are carried out where feasible during known flowering seasons, and if this cannot occur and habitat requirements are suitable for a species to be present then an additional targeted survey will be recommended if impact is expected. Any plants that were not readily identifiable in the field were sampled and analysed in the office. Potential threatened species are sent to NSW Herbarium for identification /ratification, and NSW DPIE informed of locations for recording on the NSW Bionet database as per NSW DPIE scientific licence requirements. This was not required in this instance.

5.2: RESULTS

In summary:-

- 33 flora species were recorded over and immediately around the development site (Appendix 1), comprising 8 native flora species, no threatened species, no ROTAP species, and 25 weed species including 1 declared priority weed.
- Site has low flora biodiversity, with one native vegetation community present (Fig 5-6), being *Lower Hunter Spotted Gum Ironbark Forest Endangered Ecological Community.*
- No federal Endangered Ecological Communities/ flora species present.

This community occurs only over vegetated remnants of the subject site where native tree cover present, and some areas of native understorey where >10% native cover present.

Trees are to 20m in height, being all *Corymbia maculata* (Spotted Gum).

Floristics are shown in Table 4. The LHCCREMS map (Fig 5) is considered a little inaccurate in this case, with more accurate mapping shown in Figure 6.

Table 4: Floristics for development site

Canopy cover	Tree species dominating & tree height	Mid storey	Shrub and ground storey	Hollows / Fallen logs	Other
Approx 70% over the development area.	*Corymbia maculata* (Spotted Gum) to around 20m in height	Nil	Shrubs cleared. Some native grasses and herbs, with around 0-10% groundcover, with the majority of the site being exotic lawn species/weeds.	No	Disturbed, mown, predominantly cleared except native trees.

Table 5: Hollow bearing habitat tree/other details over development site & surrounds

Tree Species	Common name	Number –see Figure 7	Hollow details
Corymbia maculata	Spotted Gum	1	1S
TOTAL		**1 HBT's proposed for removal**	

Hollow sizes:
Small (S) <15cm
Medium (M)- 15-30cm diameter
Large (L) - >30cm diameter

Fissure (F) -crack in trunk suitable for microbats
Spout (SP)

Plate 1: Hollow bearing habitat tree

Figure 9: Impact area over Endangered Ecological Community (by PEAK LAND MANAGEMENT)

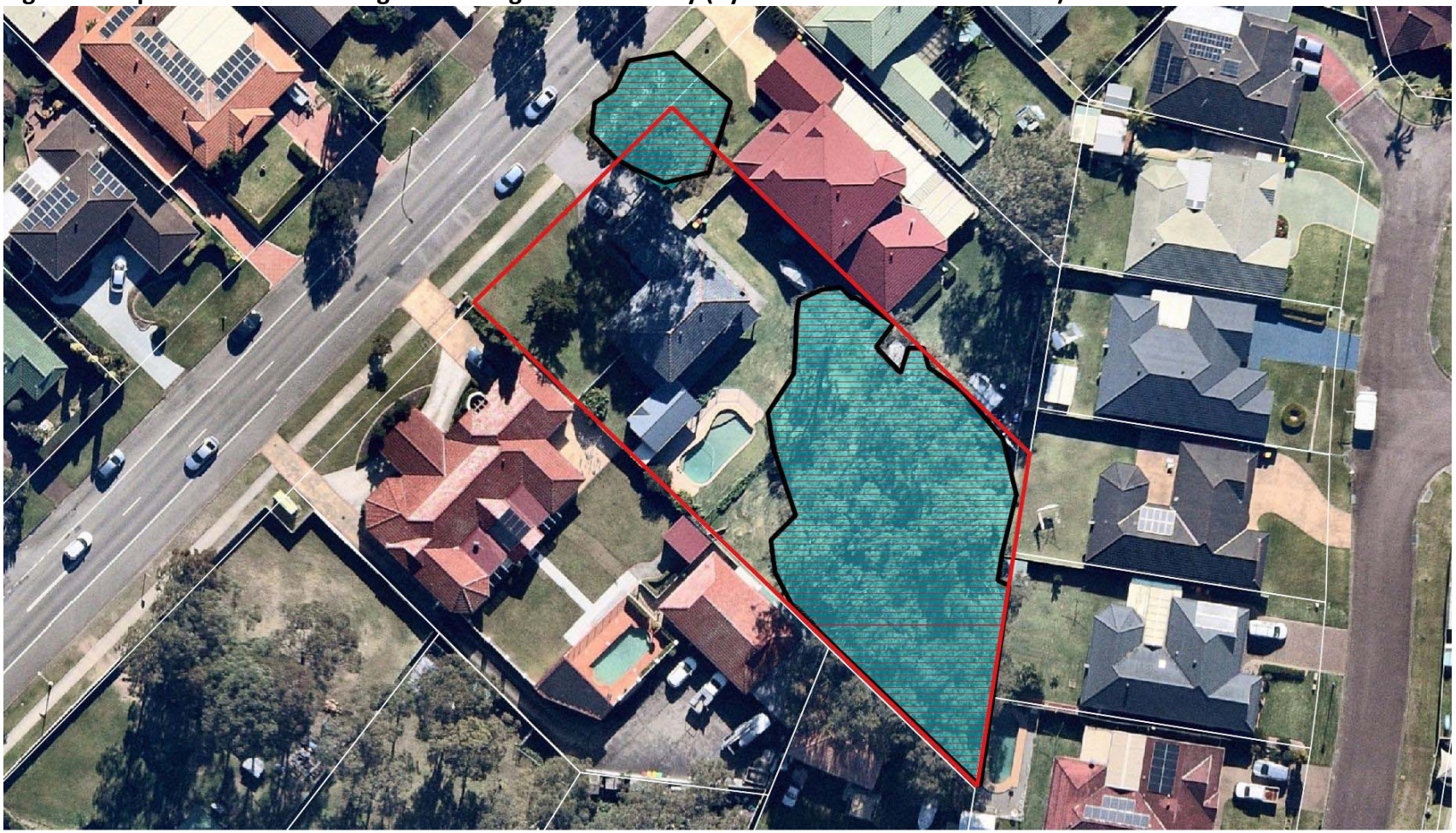
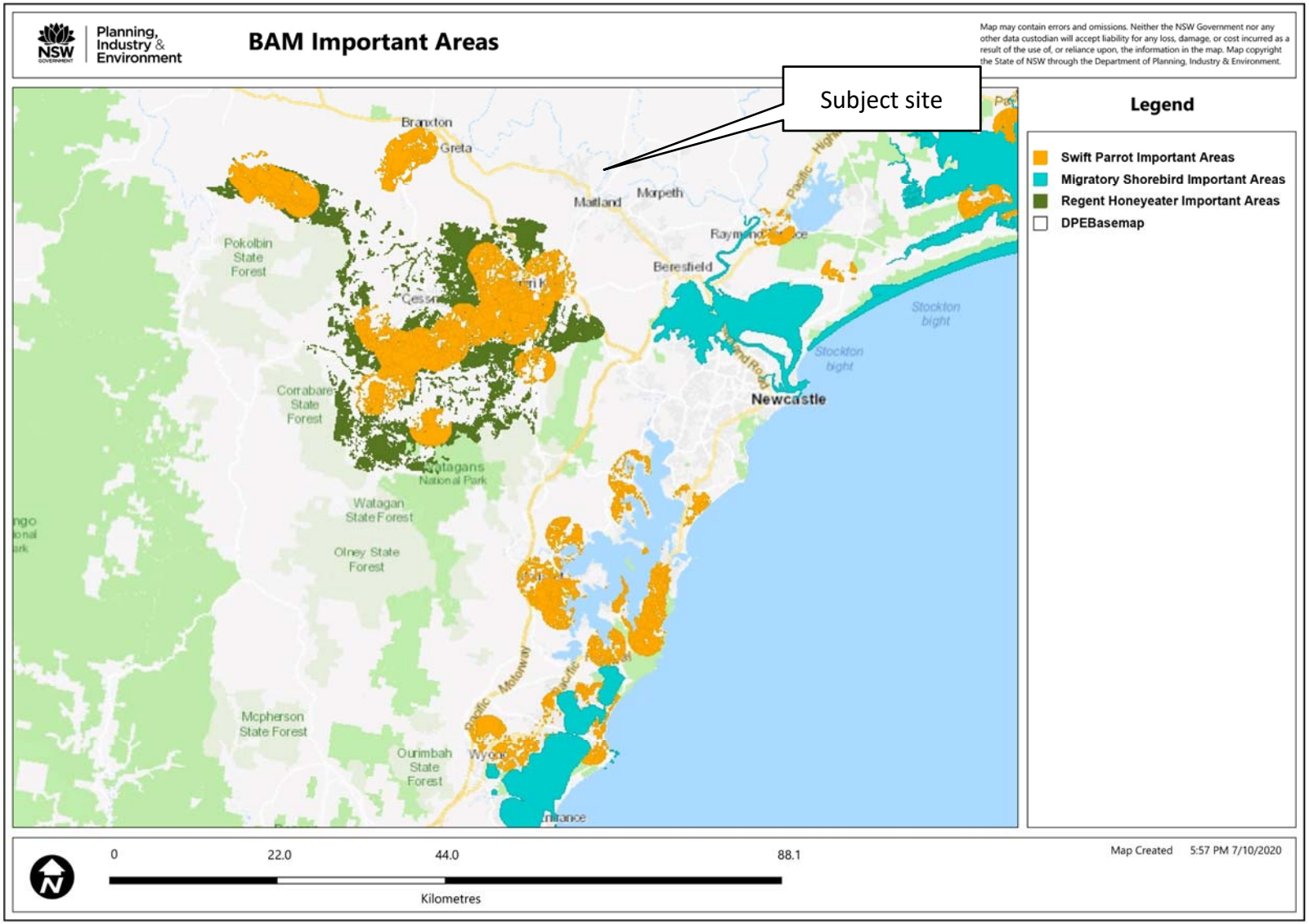


Figure 10: Mapped important areas for Regent Honeyeater & Swift Parrot (from OEH, 2021)



6.0 FIVE PART TEST UNDER BC Act 2016

Under the *Biodiversity Conservation Act 2016 (Sect 7.3)*, a 5 Part Test is undertaken to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

A consideration of threatened species potentially occurring on this site which have been gazetted within the *BC Act 2016* was conducted by a search of the NSW DPIE (100km^2 or greater area surrounding subject site) which is shown in Appendix 1. Each species/ population/ ecological community is considered for its potential to occur upon the site and the likely level of impact as a result of the proposal. All species regarded as having potential to be impacted upon in any more than a very low way have been subject to a 5 Part Test of Significance. Species which would obviously not occur on the site due to incorrect habitat requirements, or be impacted negligibly by any works, have not been listed below, or tested (as outlined in Section 4 & 5 of this report).

Additionally a literature review of potentially occurring threatened species was conducted. Once each species particular habitat requirements were identified a field inspection occurred of the site to verify the likely impact. This was done by direct species observation during traverses around the site, assessment of likely habitat, and the suitability of the site for threatened species identified. It should be noted however that no trapping, hair sampling, owl /bat call playback/recording, spotlighting/night surveys occurred and therefore if suitable habitat is present, and Wildlife Atlas- Bionet records occur in the local area, an assumption has been made that they may occur, and a 5 Part Test completed if relevant.

Note: all recorded locations of threatened species are sourced from NSW DPIE Bionet database. Please note that often flora & fauna records and research are not complete, and therefore these are subjective ratings only and may change over time. They are put here as guide only for regulatory authorities, and the proponent to consider.

In this case due to proposed vegetation removal those species as described in Section 4.2 with presence of suitable habitat are tested as described within Table 7 & the Five Part Test.

Indirect impacts such as increased human disturbance from noise, light spill, dogs, pollution, etc is possible and taken into account within the 5 Part Test.

In this case a 5 Part Test is considered to be required, due to impact upon vegetation which provides habitat for threatened species.

Table 6: Threatened flora/fauna and Endangered Ecological Community assessment of potential impact

As low impact from 0.14Ha of clearing, species have been grouped where relevant.

Species	Comments	Likely level of impact *	NSW status	Federal status
Raptors	Threatened birds of prey such as Little Eagle and White- bellied Sea Eagle have large foraging ranges (thousands of kilometres for some species) and can migrate in search of food resources, and would be affected in only a very minor way by this proposal due to no removal of foraging resources. No raptor nests were observed in any tree, however there are raptor records within the Bionet search area. A low impact from loss of 0.14Ha of foraging resources.	Very Low	V, P	
Birds (including owls)	Suitable foraging habitat is present for some bird species, such as Grey Crowned Babbler, Little Lorikeet, Swift Parrot and Regent Honeyeater (very unlikely however as a suburban area) due to winter flowering foraging trees, with limited hollows present over the development site. They would be affected in only a very minor way by this proposal due to removal of 0.14Ha foraging roosting resources, and one small hollow being removed. A low impact from loss of 0.14Ha of foraging resources.	Very Low	V, P	White-throated Needletail- V, C, J, K Swift Parrot- CE
Grey headed flying fox (*Pteropus poliocephalus*)	Forages over a large area for nectar/fruits etc. Roosts in communal base camps, which are typically found in gullies, close to water and in vegetation with a thick canopy. As there are flowering gums and other native flora they would occur from time to time. They are a reasonably common species, and impacts from this development would make a very Low impact on them from loss of 0.14Ha of foraging resources. No camp was observed over the site.	Very Low	V,V	
Yellow-bellied Sheathtail-bat *(Saccolaimus flaviventris)*	Australian Museum report "*Yellow-bellied sheath-tailed bats are a cavity-roosting species and are generally reliant on old growth tree hollows. However, they have been known to opportunistically utilise abandoned animal burrows, human structures, and under dry clay and rock, though generally only solitary bats have been observed to do this.*	Very Low	V	

	Yellow-bellied sheath-tailed bats are canopy feeders, meaning that they are capable of fast flight, but inefficient at rapid manoeuvring. They generally feed at heights of 20-25m, unless feeding in open spaces or at forest edges, where they forage lower. Studies of stomach contents have found grasshopper, beetle, and true bug species, with beetles making up the bulk of the diet. Therefore suitable foraging & roosting habitat is present. The loss of 0.14Ha of foraging habitat, and impact over one hollow bearing tree is anticipated to have a very low impact on this species.			
Eastern Freetail-bat *(Mormopterus norfolkensis)*	OEH state:- • *Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.* • *Roost mainly in tree hollows but will also roost under bark or in man-made structures.* • *Usually solitary but also recorded roosting communally, probably insectivorous.* Therefore suitable foraging & roosting habitat is present. The loss of 0.14Ha of foraging habitat, and impact over one hollow bearing tree is anticipated to have a very low impact on this species.	Very Low	V	
Little Bentwing Bat (*Miniopterus australis)*	OEH state:- • *Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas.* • *Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.* • *They often share roosting sites with the Common Bentwing-bat and, in winter, the two species may form mixed clusters.* • *In NSW the largest maternity colony is in close association with a large maternity colony of Eastern Bentwing-bats (Miniopterus schreibersii) and appears to depend on the large colony to provide the high temperatures needed to rear its young.*	Very Low	V	

	• *Maternity colonies form in spring and birthing occurs in early summer. Males and juveniles disperse in summer.* • *Only five nursery sites /maternity colonies are known in Australia.* Therefore suitable foraging & roosting habitat is present. The loss of 0.14Ha of foraging habitat, and impact over one hollow bearing tree is anticipated to have a very low impact on this species.			
Eastern Bent-wing Bat *(Miniopterus schreibersii)*	OEH state: • *Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.* • *Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young.* • *Maternity caves have very specific temperature and humidity regimes.* • *At other times of the year, populations disperse within about 300 km range of maternity caves.* • *Cold caves are used for hibernation in southern Australia.* • *Breeding or roosting colonies can number from 100 to 150,000 individuals.* • *Hunt in forested areas, catching moths and other flying insects above the tree tops.* A cave dependent species that while foraging through trees on the site will be roosting in a cave, mine or culvert elsewhere in the local region. Therefore suitable foraging habitat is present. The loss of 0.14Ha of foraging habitat, and impact over one hollow bearing tree is anticipated to have a very low impact on this species.	Very Low	V	
Large eared Pied Bat *(Chalinolobus dwyeri)*	OEH state:- *"Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years.* • *Found in well-timbered areas containing gullies.*	Very Low	V, EPBC-V	

	• *The relatively short, broad wing combined with the low weight per unit area of wing indicates manoeuvrable flight. This species probably forages for small, flying insects below the forest canopy.* • *Likely to hibernate through the coolest months.* • *It is uncertain whether mating occurs early in winter or in spring.* Large eared Pied Bat *(Chalinolobus dwyeri)* are cave dependent species that while foraging through trees on the site will be roosting in a cave, mine or culvert elsewhere in the local region. Therefore suitable foraging habitat is present. The loss of 0.14Ha of foraging habitat, and impact over one hollow bearing tree is anticipated to have a very low impact on this species.			
Eastern False Pippistrelle (*Falsistrellus tasmaniensis*)	OEH state:- • *Prefers moist habitats, with trees taller than 20 m.* • *Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.* • *Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.* • *Hibernates in winter.* • *Females are pregnant in late spring to early summer.* Therefore suitable foraging & roosting habitat is present. The loss of 0.14Ha of foraging habitat, and impact over one hollow bearing tree is anticipated to have a very low impact on this species.	Very low	V	
Greater broad nosed bat (*Scoteanax Rueppellii*)	OEH state:- *The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m.* • *Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.*	Very Low	V	

	• *Although this species usually roosts in tree hollows, it has also been found in buildings.* • *Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m.* • *Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.* Therefore suitable foraging & roosting habitat is present. The loss of 0.14Ha of foraging habitat, and impact over one hollow bearing tree is anticipated to have a very low impact on this species.			
Flora				
No threatened flora species were recorded	Despite an intensive search for threatened flora species no species were recorded. There are no BioNet records of any species, and a targeted search did not record any.	Nil	V	
Endangered ecological communities/populations	*Lower Hunter Spotted Gum Ironbark Forest* EEC 0.14Ha proposed for impact over development site, which is already slashed with most trees retained.	Very Low - 0.14Ha	Endangered	
Threatening Processes (under both EPBC Act and BC Act)	Yes - see Tables below and 5 Part Test			

Table 7: Listed relevant Key Threatening Processes (as listed under EPBC Act)

Listed Key Threatening Process	Effective
Aggressive exclusion of birds from potential woodland and forest habitat by over-abundant noisy miners (*Manorina melanocephala*)	09-May-2014
Competition and land degradation by rabbits	16-Jul-2000
Competition and land degradation by unmanaged goats	16-Jul-2000
Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)	16-Jul-2000
Incidental catch (bycatch) of Sea Turtle during coastal otter-trawling operations within Australian waters north of 28 degrees South	04-Apr-2001
Incidental catch (or bycatch) of seabirds during oceanic longline fishing operations	16-Jul-2000
Infection of amphibians with chytrid fungus resulting in chytridiomycosis	23-Jul-2002
Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris	13-Aug-2003
Invasion of northern Australia by Gamba Grass and other introduced grasses	16-Sep-2009
Land clearance	04-Apr-2001
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	08-Jan-2010
Loss of biodiversity and ecosystem integrity following invasion by the Yellow Crazy Ant (*Anoplolepis gracilipes*) on Christmas Island, Indian Ocean	12-Apr-2005
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	04-Apr-2001
Novel biota and their impact on biodiversity	26-Feb-2013
Predation by European red fox	16-Jul-2000
Predation by exotic rats on Australian offshore islands of less than 1000 km^2 (100,000 ha)	29-Mar-2006
Predation by feral cats	16-Jul-2000
Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs	06-Aug-2001
Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species	04-Apr-2001
The biological effects, including lethal toxic ingestion, caused by Cane Toads (*Bufo marinus*)	12-Apr-2005
The reduction in the biodiversity of Australian native fauna and flora due to the red imported fire ant, *Solenopsis invicta* (fire ant)	02-Apr-2003

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Table 8: Key relevant threatening processes in NSW under the *BC Act 2016.*

Key threatening process	Type of threat
Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands.	Habitat Loss/Change
Bushrock Removal	Habitat Loss/Change
Clearing of native vegetation	Habitat Loss/Change
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala*.	Pest Animal
Alteration of habitat following subsidence due to longwall mining	Habitat Loss/Change
Competition and grazing by the feral European rabbit	Pest Animal
Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758	Pest Animal
Competition from feral honeybees	Pest Animal
Death or injury to marine species following capture in shark control programs on ocean beaches	Other Threat
Ecological consequences of high frequency fires	Habitat Loss/Change
Entanglement in, or ingestion of anthropogenic debris in marine and estuarine environments	Other Threat
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Other Threat
Habitat degradation and loss by Feral Horses (brumbies, wild horses), *Equus caballus*	Pest Animal
Herbivory and environmental degradation caused by feral deer	Pest Animal
Human-caused Climate Change	Habitat Loss/Change
Importation of red imported fire ants into NSW	Pest Animal
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species	Disease
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Disease
Infection of native plants by *Phytophthora cinnamomi*	Disease
Introduction and establishment of Exotic Rust Fungi of the order *Pucciniales* pathogenic on plants of the family *Myrtaceae*	Disease
Introduction of the large earth bumblebee (*Bombus terrestris*)	Pest Animal
Invasion and establishment of exotic vines and scramblers	Weed
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	Weed
Invasion and establishment of the Cane Toad	Pest Animal
Invasion of native plant communities by exotic perennial grasses	Weed
Invasion of native plant communities by Bitou Bush & Boneseed	Weed
Invasion of native plant communities by African Olive Olea europaea subsp. cuspidata (Wall. ex G. Don) Cif.	Weed
Invasion of the Yellow Crazy Ant (*Anoplolepis gracilipes*) into NSW	Pest Animal

Invasion, establishment and spread of Lantana (*Lantana camara* L. *sens. lat*)	Weed
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Weed
Loss and/or degradation of sites used for hill-topping by butterflies	Habitat Loss/Change
Loss of Hollow-bearing Trees	Habitat Loss/Change
Predation and hybridisation by Feral Dogs, Canis lupus familiaris	Pest Animal
Predation by feral cats	Pest Animal
Predation by the European Red Fox	Pest Animal
Predation by the Plague Minnow (*Gambusia holbrooki*)	Pest Animal
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island	Pest Animal
Predation, habitat degradation, competition and disease transmission by Feral Pigs (*Sus scrofa*)	Pest Animal
Removal of dead wood and dead trees	Habitat Loss/Change

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Table 9: Legal status key

Key - ** Legal status (from NSW Department of Environment and Conservation, 2008):	
V	Vulnerable (Threatened Species Conservation Act, 1995)
E1	Endangered (Threatened Species Conservation Act, 1995)
E2	Endangered (Threatened Species Conservation Act, 1995)
E4	Presumed Extinct (Threatened Species Conservation Act, 1995)
P	Protected (National Parks and Wildlife Act, 1974)
P13	Protected Plants (National Parks and Wildlife Act, 1974)
U	Unprotected

Table 10: Likely level of impact key used by PEAK LAND MANAGEMENT

Key - Likely level of impact
This is a subjective qualitative measure used by the consultant. It is determined by the relative impact on a species (ie whether a species will be put in danger of extinction, numbers of individuals likely to be affected directly or indirectly, current status of species) and takes into account factors such as amount of clearing proposed, and surrounding amount of suitable habitat for that species.
Ratings:
Nil (plant only): Not present as site conditions (ie soil/geology, climate, elevation, etc) and on site survey verify it was not present, and could never be naturally present.
Negligible: No impact can be discerned, but is included as there is a minor chance of that species possibly using the site (using the precautionary principle). In some cases there may also be positive impacts such as more foraging feed available from clearing some understorey and promoting native grass growth, or establishment of more vegetation.
Very Low: Individuals unlikely to be affected directly, but could be affected indirectly, and if they are in a very minor way with no major effect likely on any individual.
Low: Recognises that individuals may be present on site (either permanently or infrequently) and affected in a small way such as loss of habitat, including foraging or nesting/denning resources. Suitable surrounding habitat is available to offset direct impact, but it is acknowledged that this may place an individual under more stress, and lead to possible death of individual(s).
Moderate: Individuals will be affected, with impact likely to cause stress and possible death to a local individual or group of individuals. Loss of habitat may lead to the significant impact on a small local population, with its possible demise. Possible significant impact.
High: Will cause the death directly of local individuals, and lead to the loss of habitat for that species to re-establish permanently. Will also lead to the death of a local population/family group, and increase the chance of extinction of the species. Significant impact.

6.1 FIVE PART TEST UNDER SECT 7.3 OF THE BC ACT 2016

Under the *Biodiversity Conservation Act 2016 (Sect 7.3)*, a 5 Part Test is undertaken to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

A five part test is presented below for all species possibly affected as listed in Table 6:

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.

As examined within Table 7 all species examined are anticipated to have a negligible to very low impact from the proposal, with no threatened species considered to be impacted such that a viable local population is affected.

The site proposed clearing / habitat loss is limited to around 0.14Ha comprising around 25 trees understorey already slashed/exotic and disturbed, and loss of one hollow bearing habitat tree with one small hollow only. No water or creeks impacted, no rock outcrops, caves or fallen hollow logs on the ground affected by the proposal. Wildlife corridor connectivity is not present in this residential area.

Most threatened fauna species in this area occur over larger home ranges (birds/bats/owls/mammals) and although they would forage from time to time over this site it represents a small percentage of their home range. Possible indirect effects such as human disturbance, waste water runoff, pets, light spill, human disturbance, noise, etc may occur.

To reduce these indirect impacts all native vegetation/trees should be retained outside of the nominated development footprint, understorey allowed to regenerate, and other recommendations followed which are made later.

(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

i) Approximately 0.14Ha of LHSGIF Endangered Ecological Community is expected to be removed being in order for proposed development.

This is considered minor when compared to total distribution across the region. Office of Environment and Heritage website (scientific committee determination) report *"Modelling included in NSW NPWS (2000) shows that much of the pre-1750 extent of the community has been cleared. Only about 27% (less than 5000 ha) of the original distribution survives and this is highly fragmented"*

The proposal is not expected to adversely affect either community's extent such that its local occurrence is at risk of local extinction.

(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,

(ii) The proposal is not expected to adversely affect either community's composition, or place either community at risk of extinction locally.

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

(i) The site proposed clearing / habitat loss is limited to around 0.14Ha of native vegetation.

(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

No fragmentation anticipated, with connectivity to be retained.

(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,

Whilst all habitat and ecological Communities are important, the loss of 0.14Ha of remnant native vegetation, retention of all other vegetation over the property, loss of one hollow bearing habitat tree, with no threatened flora recorded, and a very low impact upon any threatened fauna species is assessed as of a very low impact.

(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),
Not applicable.

(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.
Key threatening processes are listed on Schedule 3 of the TSC Act 1995 (and now under BC Act 2016), and the federal EPBC schedule shown in Tables 6 & 7. Of direct relevance to this proposal are:

- Clearing of native vegetation/ land clearance;
- Loss of hollow bearing trees.

The proposal is also likely to increase the impact of the following KTP's:-

- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants (including lantana), including aquatic plants;
- Invasion of native plant communities by exotic perennial grasses;
- Predation, habitat degradation and competition by fox, feral cats, honey bees, pigs, rabbits, plague minnow.

7.0 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.*

7.1: 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 as shown in Appendix 3 of this report. An Impact evaluation is shown in Table 11. Entities include:

- Regent Honeyeater
- Swift Parrot
- Little Bentwing Bat (breeding)
- Eastern Bentwing Bat (breeding).
- Large eared Pied Bat (breeding)
- Eastern Cave Bat (breeding)

Table 11: SAII impact evaluation

Potential SAII entities	Impact evaluation	Impact thresholds	Serious and irreversible impact?
Regent Honeyeater	Habitat present but marginal in this residential location, winter flowering feed trees present, is associated with this vegetation type (from NSW DPIE threatened species profile database).	Not within an OEH mapped threshold area (Fig 10).	No
Swift Parrot	Habitat present but marginal in this residential location, winter flowering feed trees present, is associated with this	Not within an OEH mapped	No

	vegetation type (from NSW DPIE threatened species profile database).	threshold area (Fig 10).	
Large eared Pied Bat (*Chalinolobus dwyeri*)	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin Petrochelidon ariel, frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies.	Species roosting or breeding habitat is not considered present within the development site.	No
Eastern Cave Bat (*Vespadelus troughtoni)*	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. Very little is known about the biology of this uncommon species. 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.	Species roosting or breeding habitat is not considered present within the development site.	No
Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*)	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia. Hunt in forested areas, catching moths and other flying insects above the tree tops.	Species roosting or breeding habitat is not considered present within the development site.	No
Miniopterus australis Little Bentwing-bat (Breeding)	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	Species roosting or breeding habitat is considered present within the development site. Minimal impact from one hollow bearing trees to be	No

		removed, not considered a SAII.	

8.0 CONCLUSION AND RECOMMENDATIONS

The ecological investigations and assessment of impact have found that there is no significant impact on any threatened species, Endangered Ecological Community, critical habitat, or endangered populations by the proposed works on any state or nationally listed species under the *EP&BC Act 1999,* or *BC Act 2016* if the proposal adopts the recommendations of this report.

The following recommendations (in no order of importance and not compulsory) if adopted will improve the biodiversity outcomes for this proposal:

- Where not affected by the proposal all native vegetation (particularly larger trees including hollow bearing tree) outside of the nominated development footprint/ /impact area be retained;
- All trees to be removed should be clearly marked out prior to clearing;
- Clearing of trees should be as per Lake Macquarie City Council Clearing Protocol Guidelines to include:
    - Felling techniques are to be sensitive to arboreal mammals and bird species identified on site.
    - Clearing should be not be undertaken in Spring when nesting birds and other species present, or if necessary trees checked beforehand (including the tree hollow) and any fauna nesting removed/relocated if present;
    - All millable timber retrieved. Recycling of waste vegetation as chip or grinding is mandatory. The use of woodchip, topsoil and tub grindings for on site mulching or seedbank regeneration is preferred & recommended in this case for the landscaping.

It is the consultant's opinion that this application does not need referring to the Federal Department of Environment and Energy or NSW DPIE.

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PEAK LAND MANAGEMENT

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APPENDIX 1: FLORA SURVEY RESULTS

These species found over the development site and immediate surrounds.

Scientific Name	Common Name	Transect
Trees:		
Corymbia maculata	Spotted Gum	x
Midstorey:		
Shrubs and understorey:		
Dichondra repens	Kidney weed	x
Lomandra filiformis subsp filiformis	A Mat Rush	x
Veronica plebeia	Trailing Speedwell, Creeping Speedwell	x
Grasses		
Cynodon dactyldon	Couch	x
Microlaena stipoides	Weeping grass	x
Ferns:		x
Sedges and water plants:		x
Fimbristylis dichotoma	Common Fringe Sedge	x
Vines and scramblers:		x
Orchids/epiphytes:		
Amyema spps	Mistletoe	
Weeds		
Anagallis arvensis	Scarlet pimpernel	x
Axonopus affinis	Narrow leaf carpet grass	x
Bromus catharticus	Prairie Grass	x
Cenchrus clandestinus	Kikuyu	x
Cerastium glomeratum	Chickweed	x
Conyza bonariensis	Flax leaved fleabane	x
Ehrharta erecta	Panic or African Veldt grass	x
Eragrostis tenuifolia	Elastic Grass	x
Facelis retusa	Annual Trampweed	x
Gamochaeta antillana	American Cudweed	x
Gnaphalium sphaericum	Common cudweed	x
Hypochoeris radicata	Flatweed	x
Lolium rigidum	Annual rye grass	x
Panicum maximum var. *maximum*	Guinea Grass	x
Paronychia brasiliana	Brazilian Whitlow	x
Plantago lanceolata	Lambs tongue	x

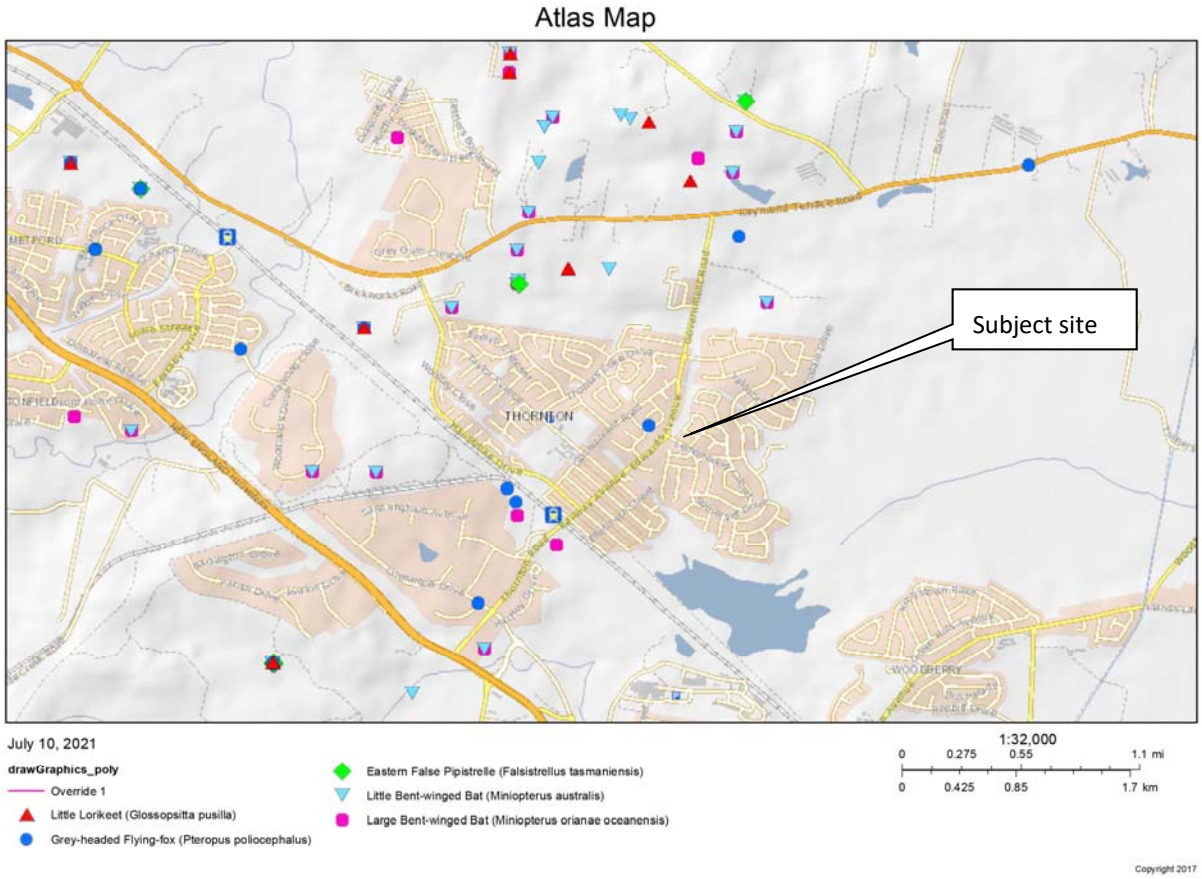
Poa annua	Winter Grass	x
Romulea rosea	Onion Grass	x
(P) Senecio madagascariensis	Fireweed	x
Sida rhombifolia	Paddy's lucerne	x
Sonchus oleraceus	Common sowthistle	x
Stenotaphrum secundatum	Buffalo Grass	x
Taraxacum officinale	Dandelion	x
Trifolium campestre	Hop Clover	x
Sporobolus africanus	Parramatta Grass	x
Native species total:	**8**	
Weed species total:	**25**	
TOTAL PLANTS:	**33**	
# Threatened species		
(R) ROTAP - Rare plant		
Priority weed (5) NSW DPI Class for Maitland LGA	**1**	

APPENDIX 2: FAUNA SURVEY RESULTS

COMMON NAME	
The following birds were observed, or heard either on or near the subject site, including flying overhead (common bird names from Pizzey & Knight, 1997):	
Pee Wee	Masked Lapwing/Plover
Rainbow Lorikeet	Australian Raven
Yellow tailed Black Cockatoo (nearby off site)	Magpie
Kookaburra	Noisy Miner
Butcherbird	Crested Pigeon
	Eastern Rosella
Other fauna observed, or heard from calls/scats/footprints/scratch marks were:	
-	
+ Threatened spps listed under EPBC Act	
# Threatened spps listed under BC Act	
* Exotic species	

APPENDIX 3: THREATENED FLORA & FAUNA SPECIES SEARCH RESULT (Over a 100 square kilometre area – NSW & National EPBC Species – from Bionet).

Note: this does not mean these species are found on the site.
Search area and some key local species records:



Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -32.73 West: 151.60 East: 151.70 South: -32.83] recorded since 10 Jul 1990 until 10 Jul 2021 returned a total of 750 records of 47 species.

Report generated on 10/07/2021 12:04 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Aves	Anseranatidae	0199	*Anseranas semipalmata*		Magpie Goose	V,P		2	
Animalia	Aves	Columbidae	0025	*Ptilinopus magnificus*		Wompoo Fruit-Dove	V,P		1	
Animalia	Aves	Columbidae	0021	*Ptilinopus regina*		Rose-crowned Fruit-Dove	V,P		1	
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*		White-throated Needletail	P	V,C,J,K	4	
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*		Black-necked Stork	E1,P		25	
Animalia	Aves	Accipitridae	0218	*Circus assimilis*		Spotted Harrier	V,P		3	
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*		White-bellied Sea-Eagle	V,P		11	

Animalia	Aves	Accipitridae	0231	*Hamirostra melanosternon*	Black-breasted Buzzard	V,P,3		1
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*	Little Eagle	V,P		2
Animalia	Aves	Accipitridae	0230	*Lophoictinia isura*	Square-tailed Kite	V,P,3		1
Animalia	Aves	Accipitridae	8739	*Pandion cristatus*	Eastern Osprey	V,P,3		3
Animalia	Aves	Cacatuidae	0268	*Callocephalon fimbriatum*	Gang-gang Cockatoo	V,P,3		2
Animalia	Aves	Cacatuidae	0265	*^^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2		3
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*	Little Lorikeet	V,P		22
Animalia	Aves	Psittacidae	0309	*Lathamus discolor*	Swift Parrot	E1,P,3	CE	2
Animalia	Aves	Psittacidae	0302	*Neophema pulchella*	Turquoise Parrot	V,P,3		2
Animalia	Aves	Strigidae	0246	*Ninox connivens*	Barking Owl	V,P,3		1
Animalia	Aves	Strigidae	0248	*Ninox strenua*	Powerful Owl	V,P,3		14
Animalia	Aves	Tytonidae	0252	*Tyto longimembris*	Eastern Grass Owl	V,P,3		2
Animalia	Aves	Tytonidae	0250	*Tyto novaehollandiae*	Masked Owl	V,P,3		14
Animalia	Aves	Tytonidae	9924	*Tyto tenebricosa*	Sooty Owl	V,P,3		1

Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*	White-fronted Chat	V,P		1
Animalia	Aves	Meliphagidae	8303	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		3
Animalia	Aves	Pomatostomidae	8388	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P		31
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*	Varied Sittella	V,P		8
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		3
Animalia	Aves	Petroicidae	0380	*Petroica boodang*	Scarlet Robin	V,P		1
Animalia	Mammalia	Dasyuridae	1017	*Phascogale tapoatafa*	Brush-tailed Phascogale	V,P		1
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	V,P	V	3
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P		23
Animalia	Mammalia	Pseudocheiridae	1133	*Petauroides volans*	Greater Glider	P	V	2
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	48

Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		6
Animalia	Mammalia	Molossidae	1329	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	V,P		45
Animalia	Mammalia	Vespertilionidae	1353	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	V	1
Animalia	Mammalia	Vespertilionidae	1372	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P		28
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P		22
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		25
Animalia	Mammalia	Vespertilionidae	1025	*Vespadelus troughtoni*	Eastern Cave Bat	V,P		7
Animalia	Mammalia	Miniopteridae	1346	*Miniopterus australis*	Little Bent-winged Bat	V,P		82
Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		29
Plantae	Flora	Elaeocarpaceae	6206	*Tetratheca juncea*	Black-eyed Susan	V	V	2

Plantae	Flora	Juncaginaceae	3363	*Maundia triglochinoides*		V	3	
Plantae	Flora	Myrtaceae	4007	*Callistemon linearifolius*	Netted Bottle Brush	V,3	254	
Plantae	Flora	Myrtaceae	6360	*Eucalyptus camaldulensis*	Eucalyptus camaldulensis population in the Hunter catchment	E2	1	
Plantae	Flora	Myrtaceae	4283	*Rhodamnia rubescens*	Scrub Turpentine	E4A	2	
Plantae	Flora	Myrtaceae	4284	*Rhodomyrtus psidioides*	Native Guava	E4A	2	

APPENDIX 4: SELECTED PHOTOS OF SITE

Subject site entrance–looking east

Subject site entrance–looking north-east

Subject site/development area. Most/all of these trees proposed to be removed

Subject site/development area. Most/all of these trees proposed to be removed

Subject site/development area. Most/all of these trees proposed to be removed