Level 3
101 Sussex Street
Sydney NSW 2000
t: (02) 9259 3800

27 October 2021

Our ref: 21SYD-20068

Landcom
Level 14, 60 Station Street
Parramatta NSW 2150

Attention: Steven Boukatos

Dear Steven,

Gurner Avenue, Austral DA02 – Biodiversity and Riparian Land Assessment

Eco Logical Australia (ELA) has prepared the following Biodiversity and Riparian Land Assessment to accompany a proposed Development Application (DA) for the Gurner Avenue, Austral Precinct (referred to as DA02 and shown in Figure 1).

BIODIVERSITY CERTIFICATION

ELA has undertaken a review of the proposed DA within the site and can confirm that the site is partially mapped as 'subject land' according to the *Threatened Species Conservation Act 1995* (TSC Act) (Figure 1). This is also known as biodiversity certified land.

In August 2017 the *Biodiversity Conservation Act 2016* (BC Act) was gazetted and repealed the TSC Act. Under section 43 of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, the repeal of the TSC Act does not affect the operation of part 7 or 8 of Schedule 7 to that Act which relate to biodiversity certification of the Sydney Region Growth Centres.

Section 8.4(2) of the BC Act describes the effect of biodiversity certification in relation to development under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This section states '*an assessment of the likely impact on biodiversity of development on biodiversity certified land is not required for the purposes of Part 4 of the EP&A Act 1979*'.

Biodiversity assessment is therefore only required for impacts on land that is not biodiversity certified (non-certified land).

STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

Appendix 8 (Liverpool Growth Centres Precinct Plan) of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* contains controls for the clearing of both Existing Native Vegetation (ENV) and Native Vegetation Retention (NVR) as shown on the Native Vegetation Protection Map. The subject site contains vegetation mapped as both ENV and NVR (Figure 2).

The Sydney region Growth Centres SEPP Appendix 8 Liverpool Growth Centres Precinct Plan, Clause 6.2(6) contains the following controls for the clearing of NVR:

> *Development consent under this clause is not to be granted unless the consent authority is satisfied of the following in relation to the disturbance of native vegetation:*
>
> - *that there is no reasonable alternative available to the disturbance of the native vegetation,*
> - *that as little native vegetation as possible will be disturbed,*
> - *that the disturbance of the native vegetation will not increase salinity,*
> - *that native vegetation disturbed for the purposes of construction will be reinstated where possible on completion of construction,*
> - *that the loss of remnant native vegetation caused by the disturbance will be compensated by revegetation on or near the land to avoid any net loss of remnant native vegetation,*
> - *that no more than 0.5 hectare of native vegetation will be cleared unless the clearing is essential for a previously permitted use of the land.*

The development has purposely been designed to avoid impacts to the biodiversity values present, in particularly within the riparian corridors and E2 (Environmental Conservation) zoned land. However, minor impacts to NVR (0.03 ha) will be required for essential infrastructure such as perimeter roads around the riparian corridors to adhere to bushfire risk management requirements. These impacts will be mitigated through the retention, revegetation, and management of native vegetation within the riparian corridors and through implementation of a Vegetation Management Plan (VMP).

The Sydney Region Growth Centres SEPP Appendix 8 Liverpool Growth Centres Precinct Plan, Clause 6.3(4) also states that:

> *The consent authority must not grant development consent for development on land to which this clause applies unless it is satisfied that the proposed development will not result in the clearing of any existing native vegetation (within the meaning of the relevant biodiversity measures under Part 7 of Schedule 7 to the Threatened Species Conservation Act 1995).*

No impacts to ENV are proposed.

EXISTING BIODIVERSITY VALUES ON NON-BIODIVERSITY CERTIFIED LAND AND POTENTIAL IMPACTS

Vegetation Communities

Field survey was conducted by ELA ecologists Stacey Wilson and Carolina Mora on the 24th of September 2019 to verify the presence of native vegetation, threatened ecological communities, and threatened species and / or their habitat within non-biodiversity certified land.

Field survey confirmed the presence of two Plant Community Types (PCTs) (Figure 3), which have been assigned to appropriate vegetation communities. Both of these vegetation communities are listed Threatened Ecological Communities (TECs) under both the BC Act and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Table 1 below provides a description of the vegetation communities.

Table 1: Plant Community Types recorded within non-biodiversity certified land

Vegetation Community	PCT ID and Name	Condition	Area within Non-Certified Areas (ha)	Description
River-flat Eucalypt-forest (RFEF)	**PCT 835:** Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Low – Moderate	11.79	The remnant vegetation on site is consistent with the native vegetation community RFEF which is listed as an endangered under the BC Act and critically endangered under the EPBC Act. The RFEF in this area was in low to moderate condition. The canopy was dominated by *Allocasuarina littoralis* (Black Sheoak) with *Eucalyptus tereticornis* (Forest Red Gum) trees concurringly sporadic throughout the community. A native midstorey was mostly lacking in this community, however some scattered *Melaleuca decora* was present in the south-east of the site. Weeds present in the midstorey included Privet spp., *Solanum pseudocapsicum* (Madeira winter cherry), *Olea europaea* subsp. *cuspidata* (African Olive) and *Lycium ferocissimum* (African Box Thorn). The groundcover was highly exotic across the majority of the community and species included *Tradescantia fluminensis, Sida rhombifolia* (Paddy's Lucerne), *Ligustrum* spp., *Ehrharta erecta* (Vasey Grass), *Bidens pilosa* (Cobblers Pegs) *Bryophyllum daigremontianum* (Mother-of-millions) and *Araujia sericifera* (Moth Vine). Native species in the groundcover included *Cheilanthes sieberi*, *Themeda triandra* (Kangaroo Grass)*, Microlaena stipoides* (Weeping Grass), *Glycine tabacina*, *Einadia spp., Desmodium varians* (Slender Tick-trefoil), and *Dichondra repens* (Kidney Weed). The outer edges of the RFEF are subject to invasion from exotic grasses including *Eragrostis curvula* (African Love Grass), *Setaria parviflora* (Slender Pigeon Grass), *Chloris gayana* (Rhodes Grass, *Paspalum dilatatum* and *Cenchrus clandestinus* (Kikuyu). In and along the creek line of RFEF *Juncus acutus* (Spiny Rush) and *Prunus serrulate* (Japanese Cherry). In wetter areas and where water pooled in the RFEF contained *Typha orientalis* (Broadleaf Cumbungi) *Juncus* sp., and *Rubus fruticosus* (Blackberry). A few stags were noted around the edges of the soak which could provide habitat for threatened microbat species.
Cumberland Plain Woodland	**PCT 849:** Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Varying Condition	1.84	The north-west portion of the RE1 area contained a patch of Cumberland Plain Woodland (CPW), which is listed as critically endangered under both the BC Act and EPBC Act. The canopy contained *Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box), with a smaller canopy of *Allocasuarina*

Vegetation Community	PCT ID and Name	Condition	Area within Non-Certified Areas (ha)	Description
				littoralis (Black Sheoak). *Bursaria spinosa* (Native Blackthorn) was dominant in the midstorey. Other scattered native midstorey species included *Dillwynia sieberi*, *Acacia decurrens* (Black Wattle) and *Leucopogon juniperinus* (Prickly Beard-heath). The groundcover directly below the canopy contained a high cover of native herbs and grasses including *Microlaena stipoides* (Weeping Grass), *Aristida ramosa (Purple Wiregrass), Brunoniella australis* (Blue Trumpet), *Einadia* spp., *Desmodium varians* (Slender Tick-trefoil), *Lomandra filiformis* and *Dichondra repens* (Kidney Weed). On the outer edges of CPW invasive grasses such as *Eragrostis curvula* (African Love Grass) and *Paspalum dilatatum* (Dallisgrass) were dominant. Regeneration of Eucalypts species and *Allocasuarina littoralis* was noted in this area suggesting that a native seed bank is present in the soil.
Exotic Grasses / Weeds	-	-	0.91	Areas of previously cleared land around the site are dominated by exotic grasses and weeds. Exotic grasses include *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whiskey Grass), *Chloris gayana* (Rhodes Grass), *Cenchrus clandestinus* (Kikuyu), *Bromus catharticus* (Prairie Grass), *Paspalum dilatatum* (Dallisgrass). Other weeds include *Vicia sativa* (Vetch), *Plantago lanceolata* (Plantain), *Lonicera japonica* (Japanese Honeysuckle), *Cestrum parqui (Green Cestrum), Conyza bonariensis* (Flax-leaf Fleabane), *Hypericum perforatum* (St. John's Wort), *Trifolium repens* (White Clover) and *Rumex crispus* (Curled Dock), *Lycium ferocissimum* (African Boxthorn), *Rubus fruticosus* (Blackberry), *Opuntia stricta* (Prickly Pear) and *Senecio madagascariensis* (Fireweed), *Anagallis arvensis* (Scarlet Pimpernel), *Cyperus Eragrostis* (Umbrella Sedge), *Opuntia stricta* (Common Prickly Pear). These areas are highly disturbed and unlikely to provide habitat for threatened flora species.

Threatened Flora and Fauna

A search for threatened species using the Protected Matters Search Tool and Atlas of NSW Wildlife (within a 5 km buffer around the study area) and the review of literature identified a number of threatened flora species, threatened fauna and migratory species. The literature review identified 24 threatened flora species and 50 threatened fauna species listed under the BC Act or EPBC Act, which may have the potential to occur within a 5 km radius of the study area (Appendix C).

An assessment of the likelihood of occurrence of threatened species within the study area (i.e. the non-certified lands) is in Appendix C and was used to guide the site inspection methodology. Note, the likelihood of occurrence provided in Appendix C represents the assessment following the site inspection results. The Atlas of NSW Wildlife database records of flora and fauna site are shown in Figure 4. It should be noted that some sensitive species cannot be displayed at this resolution.

No threatened flora species were identified during the site inspection.

No threatened fauna species were identified during the site inspection. However, the study area provides potential habitat for several threatened species. The habitat on site for threatened fauna guilds is described in the sections below.

Table 2: Potential threatened fauna habitat

Fauna	Threatened Fauna species
Forest Birds	Potential foraging habitat for threatened forest birds was identified within the study area for the following threatened birds, in the form of flowering Eucalypt species: • *Daphoenositta chrysoptera* (Varied Sittella) • *Glossopsitta pusilla* (Little Lorikeet) • *Lathamus discolor* (Swift Parrot)
Mammals (Bats)	Numerous stags were identified during the field survey. Several threatened microbat species that are known to roost in stags, and occur within a 5 km radius of the study area include: • *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) • *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat) • *Miniopterus australis* (Little Bent-winged bat) • *Myotis Macropus* (Southern Myotis) • *Scoteanax rueppellii* (Greater Broad-nosed Bat) • *Saccolaimus flaviventris* (Yellow-bellied Sheath-tailed Bat) Flowering Eucalypts also provide foraging habitat for megabat, *Pteropus poliocephalus* (Grey-headed flying fox).
Gastropods	The bases of larger remnant trees contained some leaf litter which may provide suitable habitat for threatened gastropod species *Meridolum corneovirens* (Cumberland Plain Land Snail). Cumberland Plain Land Snails are known to utilise rubbish as habitat which also exists on site. Some loose rocks may also provide habitat for this species.

Potential Impacts to Vegetation Communities

Table 3 outlines the amount of native vegetation that may be impacted by the proposed development.

Table 3: Potential impacts to native vegetation

PCT	Within Biodiversity Certified Land (ha)	Within Non-Biodiversity Certified Land (ha)	Total (ha)
849: Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	0.00	0.00	0.00
835: Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	0.61	0.04	0.65

Other potential indirect impacts this community may include:

- Introduction of exotic species
- Trampling of native vegetation for machinery and vehicle access
- Soil compaction
- Increase in surface water runoff, sedimentation, and nutrients during and following construction

An Assessment of Significance in accordance with Section 7.3 of the BC Act was undertaken (Appendix D) and Significant Impact Criteria in accordance with the EPBC Act was applied (Appendix E) to River-flat Eucalypt Forest, which both concluded that a significant impact to this vegetation community was unlikely.

Potential Impacts to Threatened Species

The proposed works have the potential to impact on potential threatened fauna. Potential impacts may include:

- Marginal loss of foraging habitat
- Increase in noise and disturbance to fauna inhabitants in adjacent vegetation

Assessments of Significance in accordance with Section 7.3 of the BC Act were undertaken for the following threatened fauna species (Appendix D):

- *Daphoenositta chrysoptera* (Varied Sittella)
- *Glossopsitta pusilla* (Little Lorikeet)
- Lathamus discolor (Swift Parrot)
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle)
- *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat)
- *Miniopterus australis* (Little Bent-winged bat)
- *Myotis Macropus* (Southern Myotis)
- *Pteropus poliocephaulus (Grey-headed Flying-fox)*

- *Scoteanax rueppellii* (Greater Broad-nosed Bat)
- *Saccolaimus flaviventris* (Yellow-bellied Sheath-tailed Bat)
- *Meridolum corneovirens* (Cumberland Plain Land Snail).

The assessments concluded that the proposed development is unlikely to result in a significant impact to any of these species, and therefore the preparation of a Biodiversity Development Assessment Report is not recommended.

The Significant Impact Criteria in accordance with the EPBC Act was applied to:

- *Daphoenositta chrysoptera* (Varied Sittella)
- Lathamus discolor (Swift Parrot)
- *Pteropus poliocephaulus (Grey-headed Flying-fox)*

The assessments concluded that the proposed works are unlikely to significantly impact these species.

No threatened flora species were found within the study area and none were considered likely to occur within the impacted native vegetation, as such no assessments of significance were undertaken for any threatened flora species.

BIODIVERSITY CONSERVATION ACT 2016

The BC Act requires development applications to be accompanied by a Biodiversity Development Assessment Report (BDAR) if the Biodiversity Offset Scheme is triggered.

For a local development under Part 4 of the EP&A Act, the BOS may be triggered by the following means:

- Have a significant impact on biodiversity values in accordance with Section 7.3 of the Act (i.e. 5-part test).
- Area clearing threshold – exceeding the area clearing threshold associated with the minimum lot size for the property will trigger entry into the BOS (Table 4).
- Whether the impacts occur on an area mapped on the Biodiversity Value Map (Figure 6).
- Impacting on an area of Outstanding Biodiversity Value.

Biodiversity Offsets Scheme – Area Clearing Threshold

The area clearing threshold is triggered when an area of native vegetation* to be cleared reaches the thresholds for the relevant lot size (Table 4). In accordance with the State Significant Precincts SEPP, the lot in which the subject site is located (Lot 184 DP 1237400) is partially covered with two specified minimum lot sizes, being 1,000 m^2 and 20,000 m^2 (Figure 5). Thus, as a precautionary approach, it was assumed that if the development proposed to clear more than 0.25 ha of native vegetation in areas that are not biodiversity certified, a BDAR would be required. As only 0.04 ha of native vegetation within non-biodiversity certified lands will be impacted by the development, this threshold is not triggered.

Table 4: Area clearing threshold

Minimum lot size associated with the property	Threshold for clearing native vegetation, 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

* Note: native vegetation is defined in Section 1.6 of the BC Act (and has the same meaning as in Part 5A of the *Local Land Services Act 2013*); essentially encompasses any species native to NSW and does not necessarily conform to a Plant Community Type.

Offset Scheme Thresholds – Biodiversity Values Land Map

The Biodiversity Value Map (Figure 6) identifies land considered to have high biodiversity value as defined by the *Biodiversity Conservation Regulation 2017.* Whilst the non-certified lands contain vegetation shown on the Biodiversity Values Map (accessed 13/10/2021), none of these areas would be impacted by the development.

Further, the site does not contain any Areas of Outstanding Biodiversity Value.

The development therefore does not trigger the Biodiversity Offset Scheme

LIVERPOOL GROWTH CENTRE PRECINCTS DEVELOPMENT CONTROL PLAN 2016

Section 2.3.5 of the 'Liverpool Growth Centre Precincts= Development Control Plan 2016' contains provisions relating to native vegetation and ecology (Table 5). Controls 2, 4, 5, 6, 7, 13, 14 and 15 to the management of street trees and landscape design and have therefore not been addressed within this letter.

Table 5: Liverpool Growth Centre Precincts DCP native vegetation and ecology controls

DCP Control	Relevance to Development Application
Native trees and other vegetation are to be retained where possible by careful planning of development (particularly at the subdivision stage) to incorporate trees into areas such as road reserves and private or communal open space	The design of the proposed development has aimed to retain areas with biodiversity value through retaining non-biodiversity certified areas, which will become conservational open space areas in the future.
All existing indigenous trees shall be retained or replaced where removal is unavoidable. Where approval is given to remove trees, appropriate replacement planting using similar species will be required.	As far as practical, all non-biodiversity certified native vegetation has been retained within the subject site. Minor impacts will be required for the construction of perimeter roads around the riparian corridor to manage bushfire risk. The riparian corridor will be subject to a VMP, which will include measures for revegetation.
Where practical, prior to development commencing, applicants are to: • provide for the appropriate re-use of native plants and topsoil that contains known or potential native seed bank; and	The VMP will stipulate measures for re-use of native plants such as collecting seeds from native vegetation proposed for removal for utilisation within the VMP area. A pre-clearance and clearance survey will be undertaken within native vegetation proposed for removal prior to the felling of trees. Any identified native fauna will be relocated

DCP Control	Relevance to Development Application
• relocate native animals from development sites. Applicants must refer to OEH's Policy on the Translocation of Threatened Fauna in NSW	to the VMP area or, if injured, taken to the nearest vet or rescue facility.
Within land that is in the Environmental Protection Overlay, as shown on the Indicative Layout Plan in the relevant Precinct Schedule, all native vegetation is to be retained and rehabilitated, except where clearing is required for essential infrastructure such as roads and drainage and where that clearing is consistent with the Growth Centres Biodiversity Certification and the Growth Centres Strategic Assessment Program.	No impacts to mapped ENV are proposed. Minor impacts to mapped NVR will occur (0.03 ha) for perimeter roads adjacent to the riparian corridor, which are proposed to mitigate risk to the public in the event of a bushfire. This is consistent with the Sydney region Growth Centres SEPP Appendix 8 Liverpool Growth Centres Precinct Plan, Clause 6.2(6).
Within land that is in a Riparian Protection Area (refer to the Riparian Protection Areas Figure in the relevant Precinct Schedule) native vegetation is to be conserved and managed in accordance with the Guidelines for riparian corridors on waterfront land prepared by the NSW Office of Water (available at www.water.nsw.gov.au).	The mapped Riparian Protection Area (RPA) within the subject site matched the NVR boundaries. Minor impacts to mapped RPA will occur (0.03 ha) for perimeter roads adjacent to the riparian corridor, which are proposed to mitigate risk to the public in the event of a bushfire. However, the remaining RPA will be subject to a VMP to ensure long-term management and conservation of the riparian corridor.
Development on land that adjoins land zoned E2 Environmental Conservation is to ensure that there are no significant detrimental impacts to the native vegetation and ecological values of the E2 zone.	Areas zoned E2 (Environmental Conservation) will not be impacted by the proposed development and will be subject to a VMP to ensure long-term management and conservation.
All subdivision design and bulk earthworks are to consider the need to minimise weed dispersion and to eradicate weeds on site. If Council believes that a significant weed risk exists, a Weed Eradication and Management Plan outlining weed control measures during and after construction is to be submitted with the subdivision DA.	If required, a Weed Eradication and Management Plan will be prepared and implemented.

WATER MANAGEMENT ACT 2000

There are several mapped watercourses that run through the subject site (Figure 8). Development on Waterfront Land (i.e., land within 40 m of the highest bank of a watercourse or waterbody) requires a Controlled Activity Approval (CAA) under the *Water Management Act 2000* (WM Act). To guide land use planning and decisions on watercourses and their riparian zones, the Natural Resources Access Regulator (NRAR) published *Guidelines for Controlled Activities on Waterfront Land* (2018). The guidelines state that watercourses should have riparian zones that are measured from the highest bank on each side of the watercourse (Table 6). The required Vegetated Riparian Zone (VRZ) is shown in Figure 7

Table 6: Riparian Corridor Matrix

Stream Order	Vegetated Riparian Zone (VRZ)
1st	10 m
2nd	20 m
3rd	30 m
4th +	40 m

As the proposed development is within Waterfront land (40 m of mapped watercourses), the DA will likely require a CAA. However, it is noted that the Austral growth centres precinct has undergone the precinct planning process, which among other things, has defined which areas of riparian land are to be protected. Figure 7 outlines the areas mapped as RPA, which will be required to both be retained and rehabilitated. The majority of these areas are proposed to be retained and conserved, which is consistent with the Indicative Layout Plan. The areas zoned as E2 (Environmental Conservation) and SP2 (Infrastructure) will also be protected or utilised for stormwater infrastructure, respectively. As shown in Figure 8, the first order watercourse to the east of the study area has been zoned R2 (Low Density Residential) and a drainage line south of this watercourse has been zoned SP2 (Infrastructure). It could therefore be assumed that this watercourse will not be required to be retained. However, consultation with NRAR will confirm this.

FISHERIES MANAGEMENT ACT 1994

The FM Act contains several provisions for the protection of fish habitat and threatened species. The proposed works:

- Will not impact on a waterway mapped as 'Key Fish Habitat' or a waterway that contains a threatened species record.
- Will not harm marine vegetation.
- Will not require, dredging of the bed and land reclamation of a Key Fish Habitat Creek.

Therefore, a Part 7 Permit under the FM Act is not required.

COMMONWEALTH STRATEGIC ASSESSMENT (ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (EPBC ACT))

On 28th February 2012, the Commonwealth Minister for the Environment announced that the program of development activities within the Growth Centres was approved under the EPBC Act Strategic Assessment process. Specifically, all actions associated with the development of the Western Sydney Growth Centres as described in the Sydney Growth Centres Strategic Assessment Program Report (Nov 2010) have been assessed at the strategic level and approved in regard to their impact on the following Matters of National Environmental Significance:

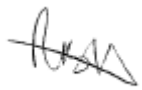
- World Heritage Properties
- National Heritage Places
- Wetlands of International Importance
- Listed threatened species and communities
- Listed migratory species

These decisions indicate that the Commonwealth is satisfied that the conservation and development outcomes that will be achieved through the Western Sydney Growth Centres Program will satisfy their requirements for environmental protection under the EPBC Act. Provided that development activity proceeds in accordance with the Growth Centres requirements (such as the Biodiversity Certification Order, the Growth Centres SEPP and DCPs, Growth Centres Development Code etc.) there is no requirement to assess the impact of development activities on Matters of National Environmental Significance within the Growth Centres and no requirement for referral of activities to the Commonwealth Department of Environment.

The site is therefore exempt from further assessment of threatened species and endangered ecological communities listed under the Commonwealth EPBC Act.

Should you have any questions on this matter, please contact me on (02) 9259 3745.

Regards,



Rebecca Ben-Haim
Senior Environmental Consultant

Appendix A Figures

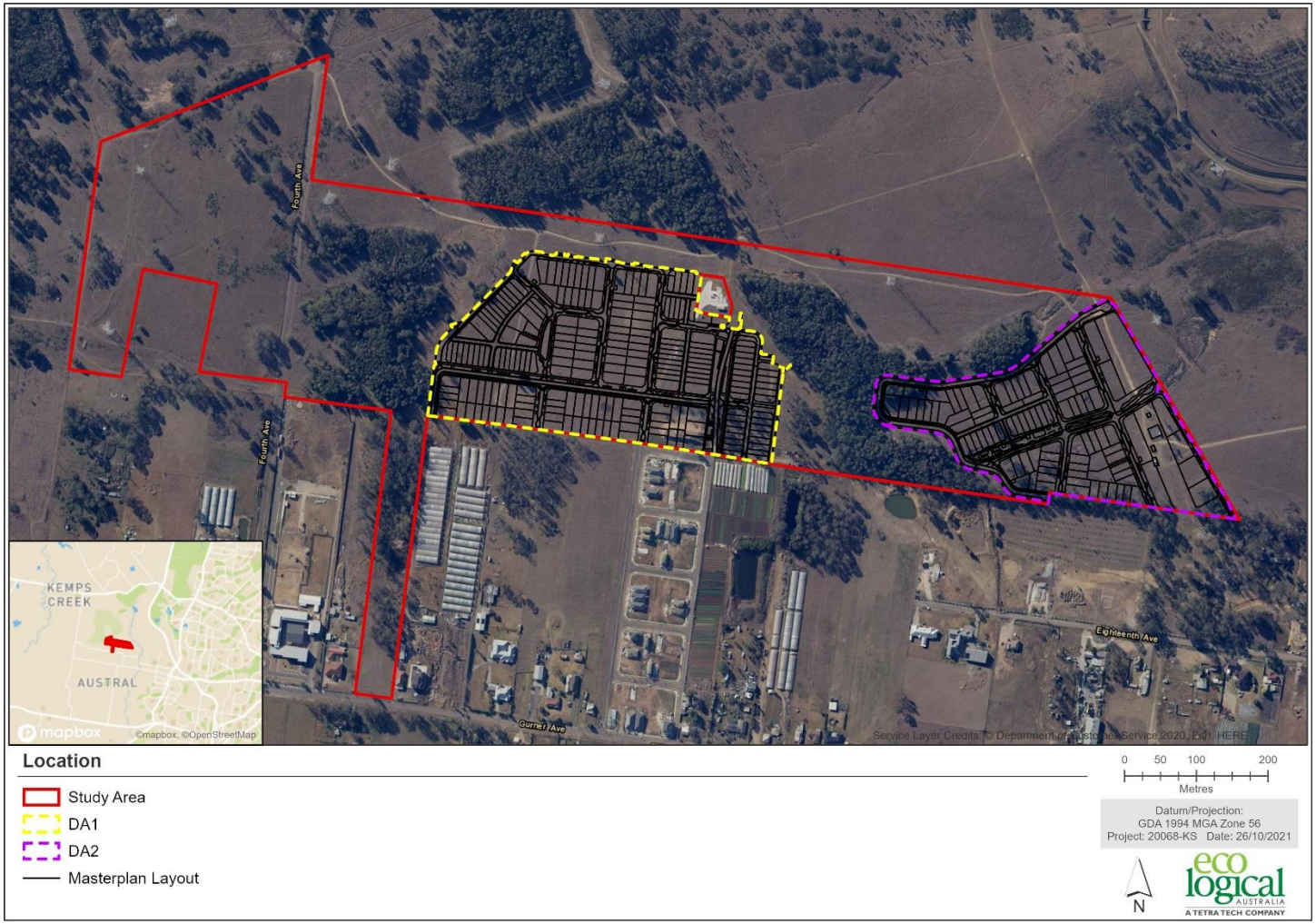


Figure 1: Location of subject site

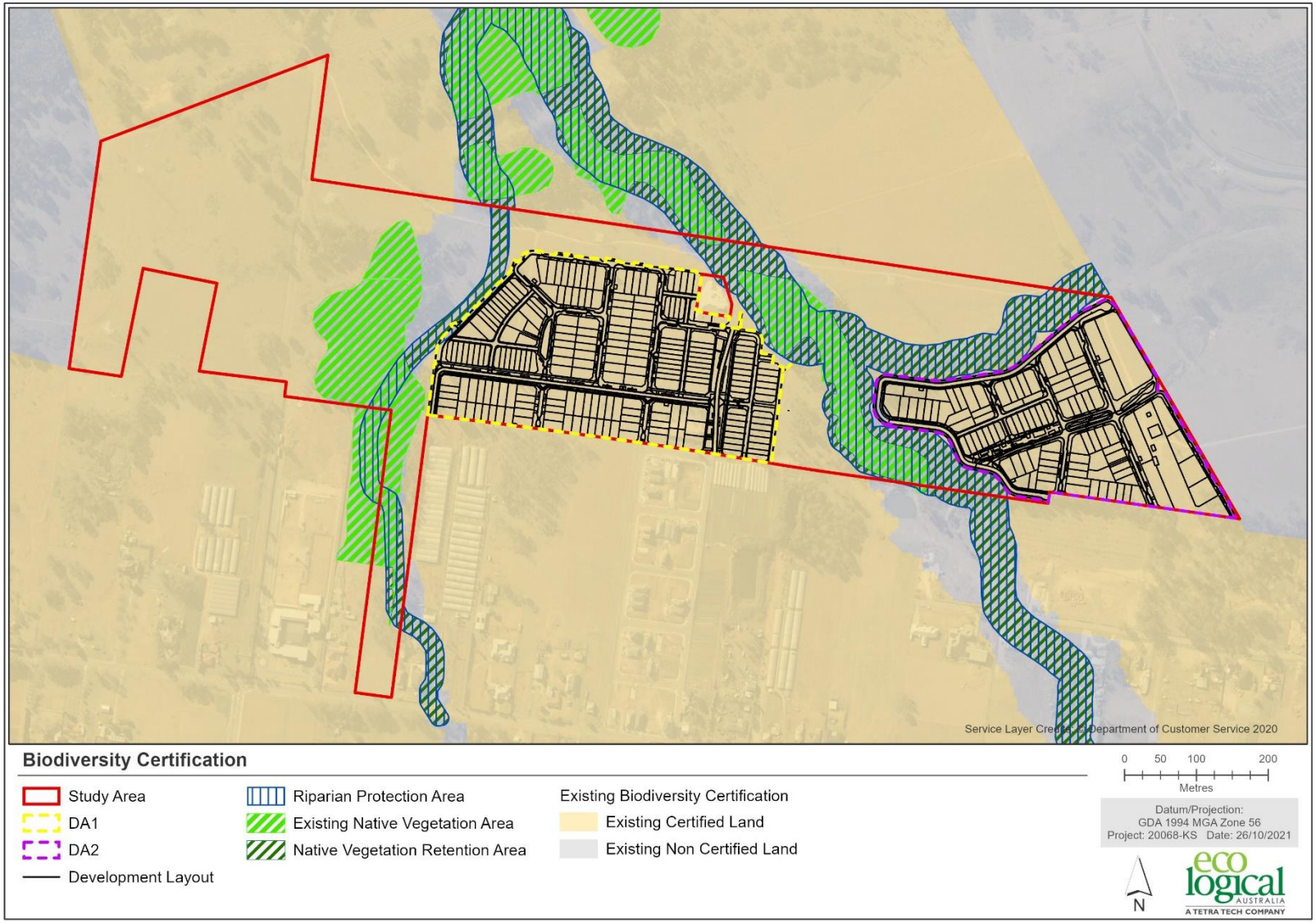


Figure 2: Biodiversity certified lands within the subject site, including non-certified lands, ENV, NVR and RPA)

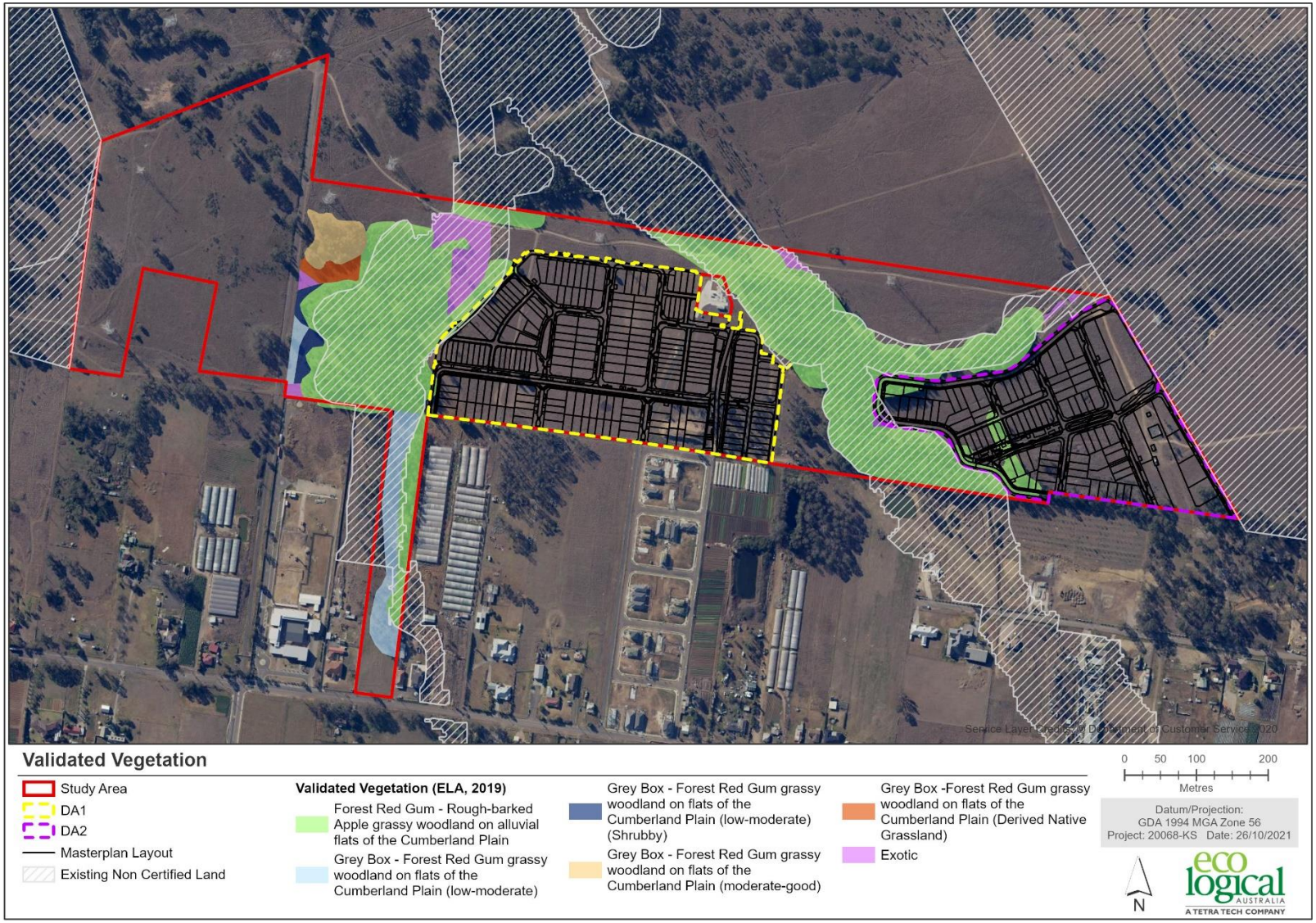


Figure 3: Vegetation communities within the subject site (ELA, 2019)

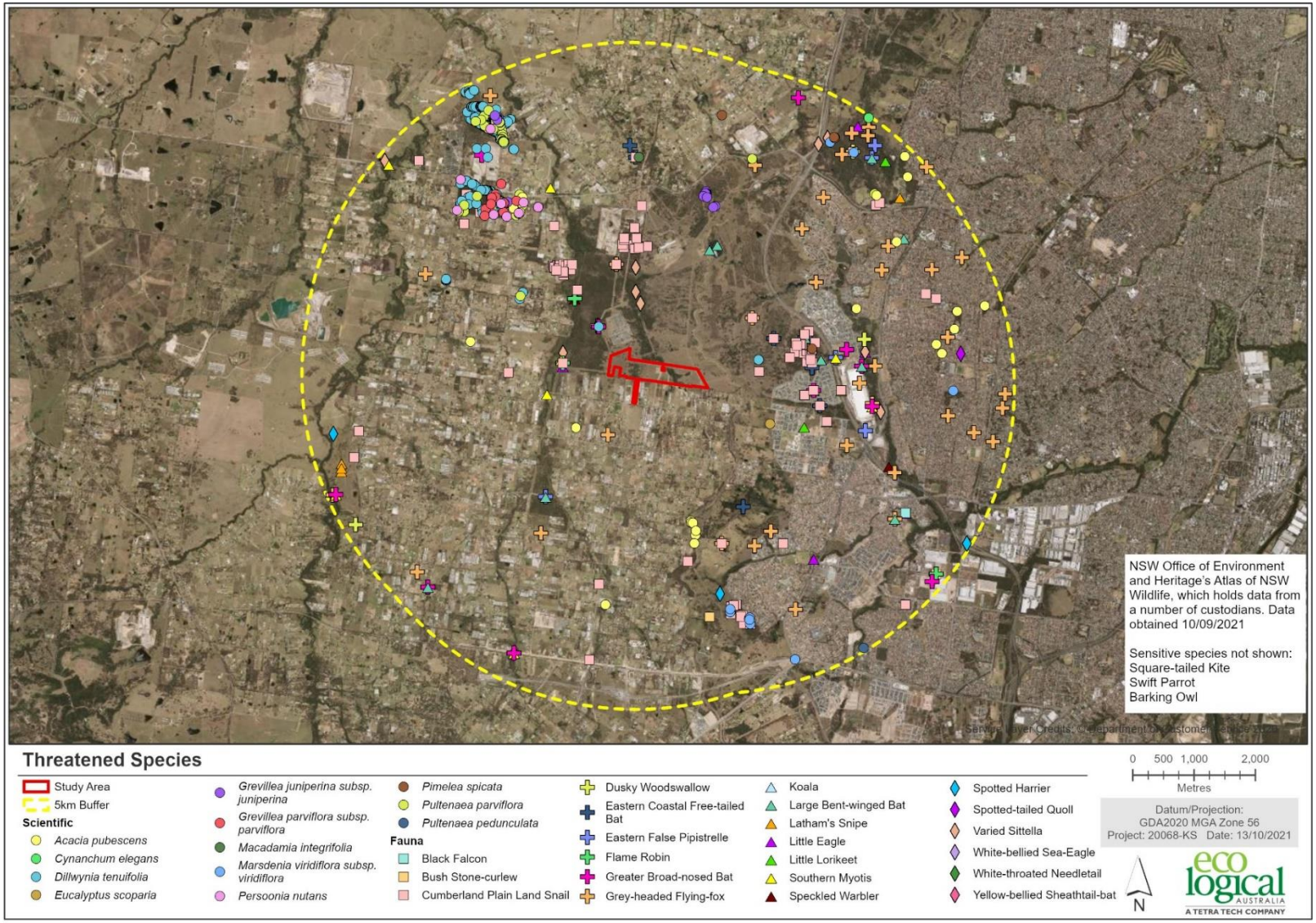


Figure 4: Previous threatened species records within a 5 km buffer from the subject site

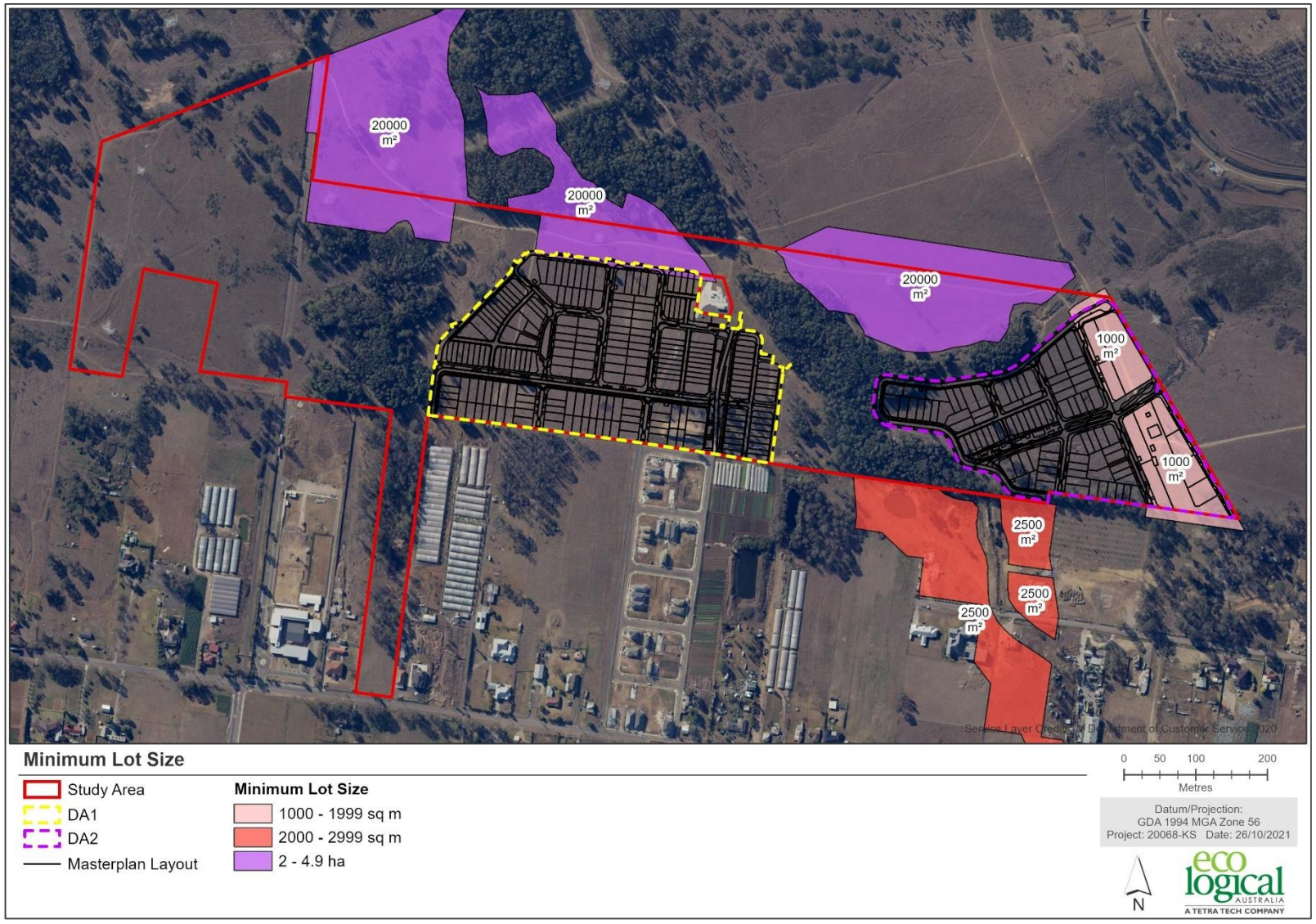


Figure 5: Minimum lot sized within the subject site

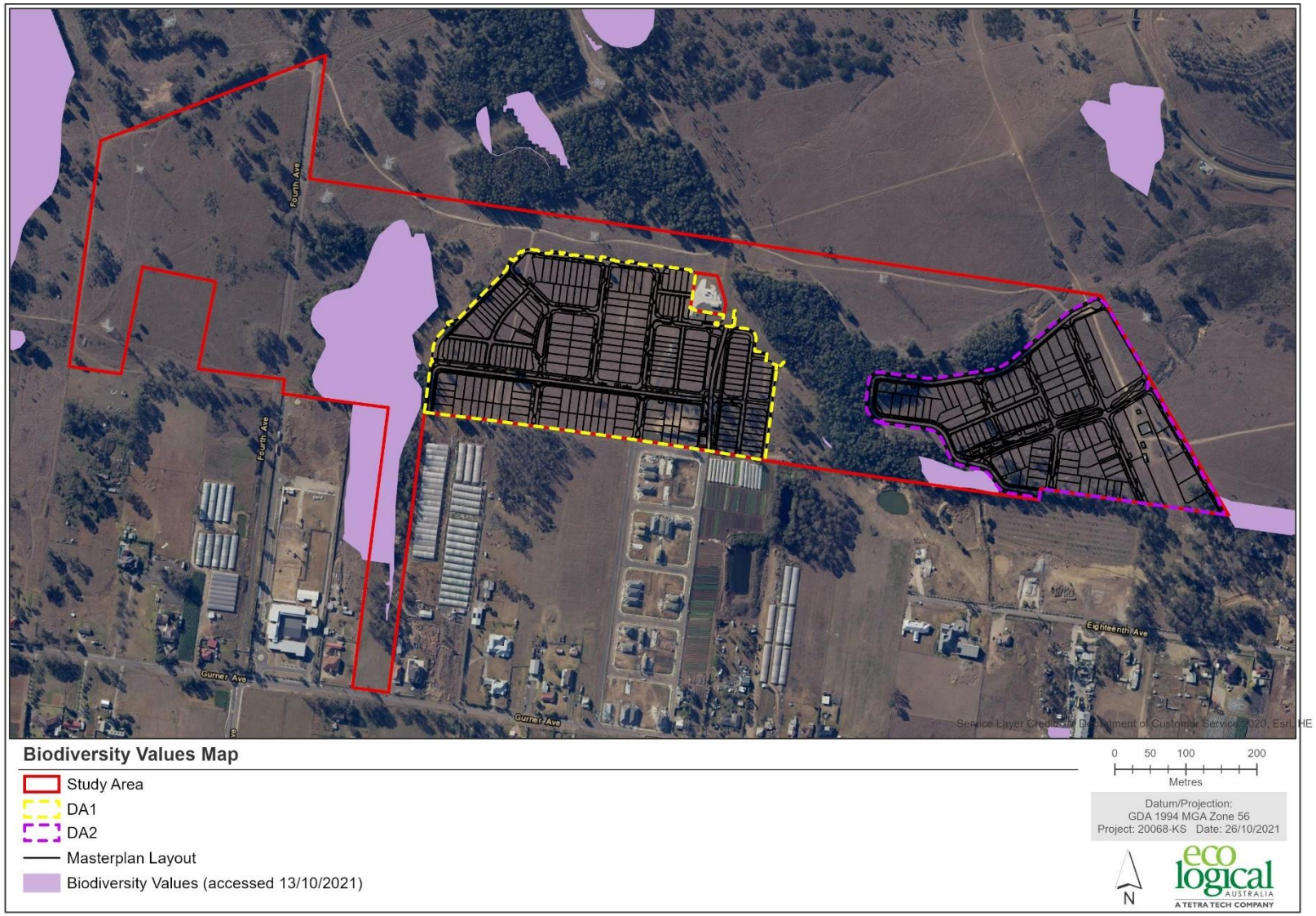


Figure 6: Biodiversity Values map of Maxwell's Creek (accessed 13 October 2021)

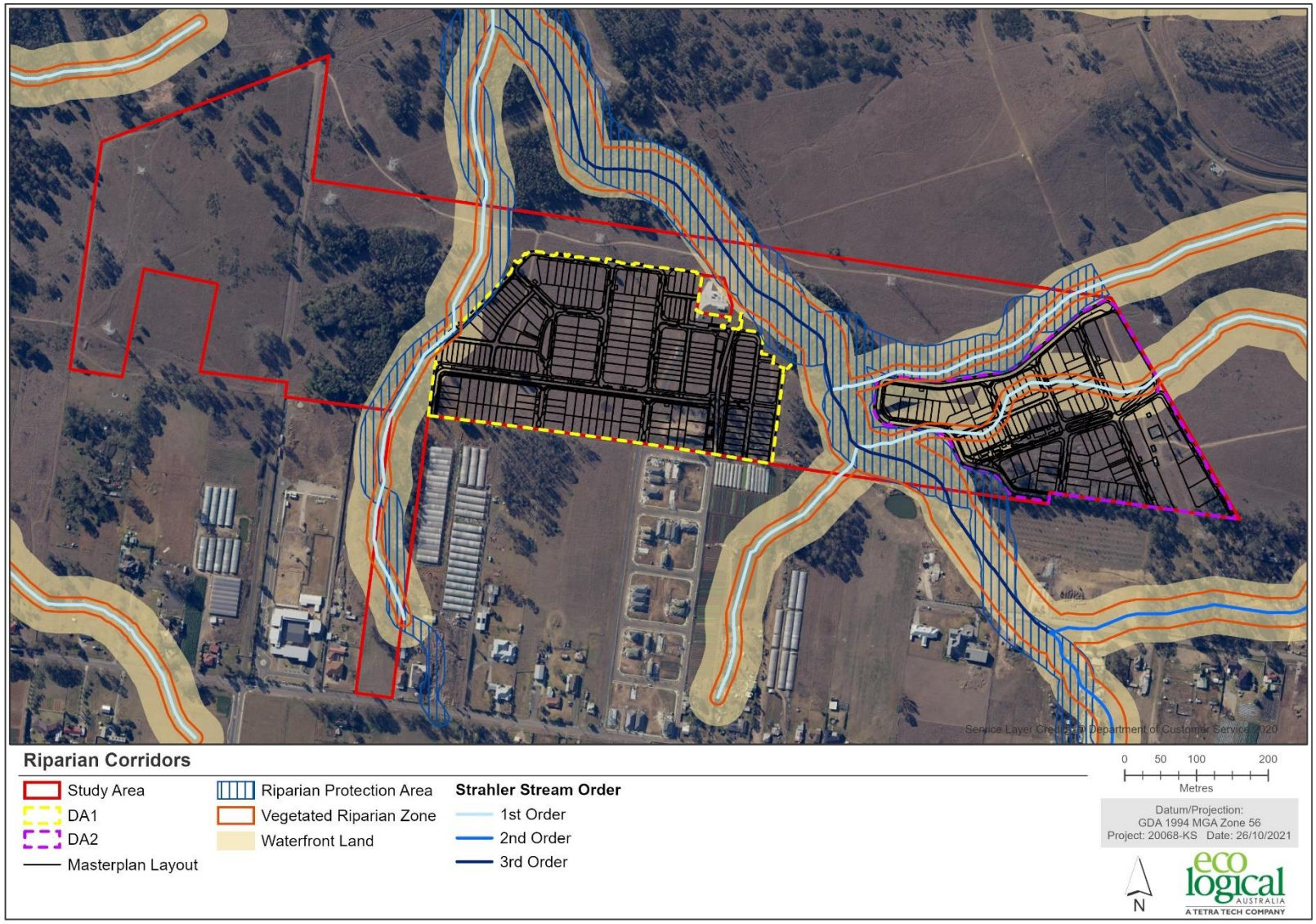


Figure 7: Mapped watercourses and waterfront land within the subject site

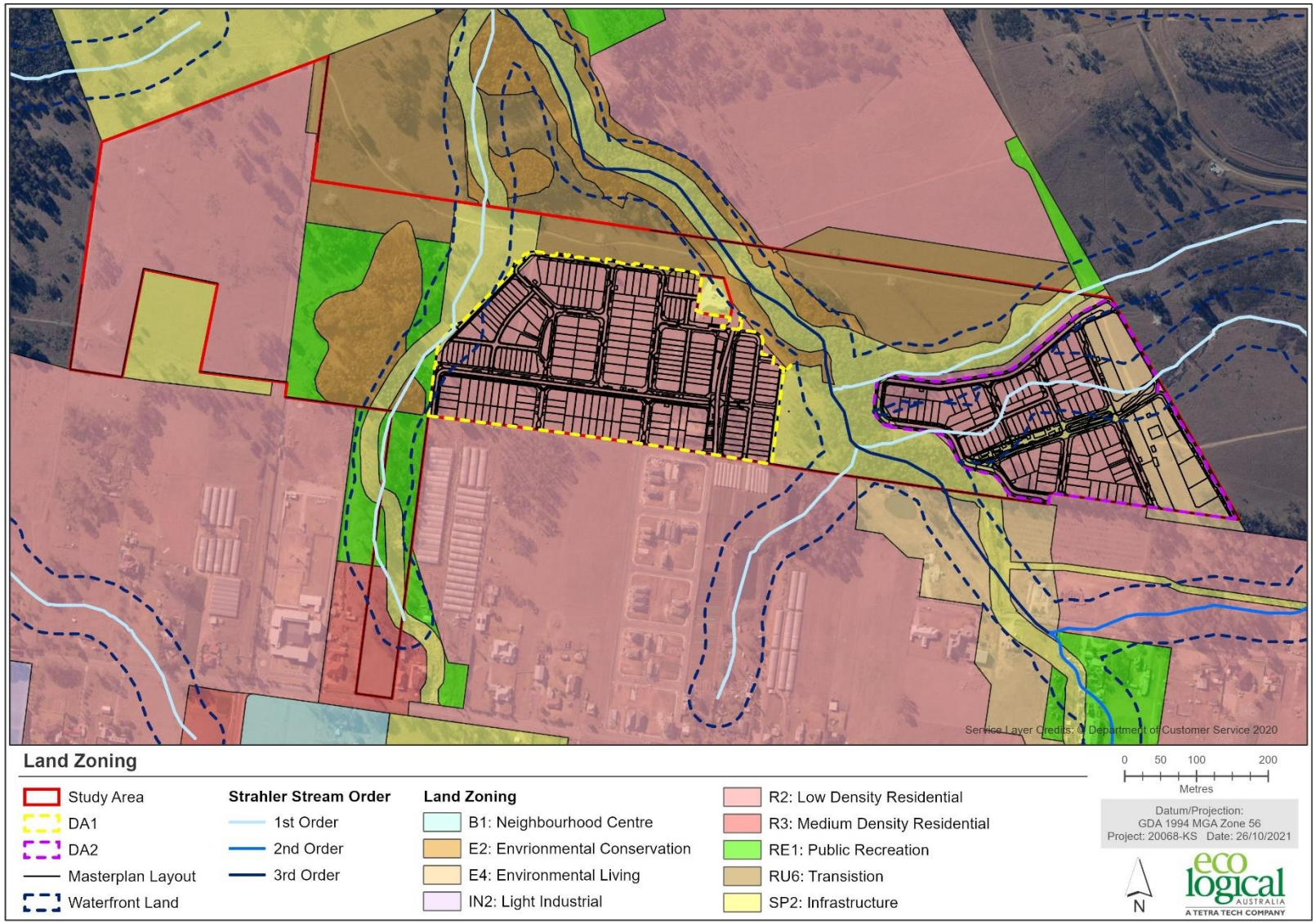


Figure 8: Land zoning within the subject site

Appendix B Species Recorded on Site

Table 7: Native, exotic and Weeds of National Significance (WoNS) recorded within the subject site

Family	Species Name	Common Name	Exotic (*)	Priority Weed (PW) and / or Weed of National Significance (WoNS)
Acanthaceae	*Brunoniella australis*	Blue Trumpet		
Apocynaceae	*Araujia sericifera*	Moth Vine	*	
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	*	PW, WONS
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	*	
Asteraceae	*Conyza bonariensis*	Flax-leaf Fleabane	*	
Asteraceae	*Senecio madagascariensis*	Fireweed	*	PW, WONS
Casuarinaceae	*Allocasuarina littoralis*	Black Sheoak		
Chenopodiaceae	*Einadia trigonos*	Fishweed		
Commelinaceae	*Tradescantia fluminensis*	Trad	*	
Convolvulaceae	*Dichondra repens*	Kidney Weed		
Cyperaceae	*Cyperus eragrostis*	Umbrella Sedge	*	
Ericaceae (Epacridaceae)	*Leucopogon juniperinus*	Prickly Beard-heath		
Fabaceae (Faboideae)	Dillwynia sieberi			
Fabaceae (Faboideae)	*Glycine tabacina*			
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	*	
Fabaceae (Faboideae)	*Vicia sativa*	Vetch	*	
Fabaceae (Mimosoideae)	*Acacia decurrens*	Black Wattle		
Geraniaceae	*Erodium cicutarium*	Common Storksbill	*	
Juncaceae	*Juncus acutus*	Spiny Rush	*	
Juncaceae	*Juncus* sp.			
Lomandraceae	*Lomandra filiformis*			
Malvaceae	*Sida rhombifolia*	Paddy's Lucerne	*	
Myrtaceae	*Corymbia maculata*	Spotted Gum		
Myrtaceae	*Eucalyptus fibrosa*	Broad-leaved Ironbark		
Myrtaceae	*Eucalyptus moluccana*	Grey Box		
Myrtaceae	*Eucalyptus punctata*	Grey Gum		

Family	Species Name	Common Name	Exotic (*)	Priority Weed (PW) and / or Weed of National Significance (WoNS)
Myrtaceae	*Melaleuca decora*	White-feathered Honey Myrtle		
Oleaceae	*Olea europaea subsp. cuspidata*	African Olive	*	PW
Phormiaceae	*Dianella* sp.			
Pittosporaceae	*Bursaria spinosa* subsp. *spinosa*	Blackthorn		
Plantaginaceae	*Plantago lanceolata*	Plantain	*	
Poaceae	*Andropogon virginicus*	Whisky Grass	*	
Poaceae	*Aristida ramosa*	Purple Wiregrass		
Poaceae	*Avena fatua*	Wild Oats	*	
Poaceae	*Briza subaristata*		*	
Poaceae	*Bromus catharticus*	Prairie Grass	*	
Poaceae	*Chloris gayana*	Rhodes Grass	*	
Poaceae	*Cynodon dactylon*	Common Couch		
Poaceae	*Digitaria* sp.			
Poaceae	*Ehrharta erecta*	Vasey Grass	*	
Poaceae	*Eragrostis curvula*	African Lovegrass	*	
Poaceae	*Microlaena stipoides*	Weeping Meadow Grass		
Poaceae	*Paspalum dilatatum*		*	
Poaceae	*Cenchrus clandestinus*	Kikuyu	*	
Poaceae	*Setaria parviflora*	Slender Pigeon Grass	*	
Poaceae	*Themeda triandra*	Kangaroo Grass		
Polygonaceae	*Persicaria* sp.			
Primulaceae	Anagallis arvensis	Scarlet Pimpernel	*	
Rosaceae	*Rubus fruticosus*	Blackberry	*	PW, WONS
Solanaceae	*Lycium ferocissimum*	African Boxthorn	*	PW, WONS
Solanaceae	*Solanum mauritianum*	Wild Tobacco	*	
Typhaceae	*Typha orientalis*	Broadleaf Cumbungi		
Verbenaceae	*Verbena bonariensis*	Purple Tops	*	
Apocynaceae	*Araujia sericifera*	Moth Vine	*	PW
Asteraceae	*Bidens pilosa*	Cobblers Pegs	*	
Convolvulaceae	*Dichondra repens*	Kidney Weed		

Family	Species Name	Common Name	Exotic (*)	Priority Weed (PW) and / or Weed of National Significance (WoNS)
Fabaceae (Faboideae)	*Desmodium varians*	Slender Tick-trefoil		
Hypericaceae	*Hypericum perforatum*	St. Johns Wort	*	
Asteraceae	*Onopordum acanthium*	Scotch Thistle	*	PW
Solanaceae	*Solanum pseudocapsicum*	Madeira Winte	*	
Cactaceae	*Opuntia stricta*	Common Prickly Pear	*	PW; WONS
Crassulaceae	*Bryophyllum daigremontianum*	Mother-of-millions	*	PW
Campanulaceae	*Wahlenbergia gracilis*	Sprawling Bluebell		
Rosaceae	*Prunus serrulata*	Japanese Cherry	*	

Appendix C Likelihood of Occurrence

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the site inspection and professional judgement. Some Migratory or Marine species identified from the Commonwealth database search have been excluded from the assessment, due to lack of habitat. The terms for likelihood of occurrence are defined below:

- "known" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the site
- "no" = habitat on site and in the vicinity is unsuitable for the species.

A test of significance was conducted for threatened species or ecological communities that were recorded within the study area or had a higher likelihood of occurring and were not recorded during the site visit. It is noted that some threatened fauna species that are highly mobile, wide ranging and vagrant may use portions of the study area intermittently for foraging. For these fauna species, the habitat present and likely to be impacted is not considered to be important to the threatened species, particularly in relation to the amount of similar habitat remaining in the surrounding landscape. As such, a test of significance in reference to State or Commonwealth legislation was not considered necessary.

The records column refers to the number of records occurring within 5 km of the study area, as provided by the Atlas of NSW Wildlife (BioNet) and Protected Matters Search Tool database search.

Information provided in the habitat associations' column has primarily been extracted (and modified) from the Commonwealth Species Profile and Threats Database and the NSW Threatened Species Profiles

Table 8: Likelihood of occurrence of threatened ecological communities

Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of occurrence within the study area	Test of Significance Required (Y/N)
Castlereagh Scribbly Gum and Agnes Banks Woodland	V	E	Occurs almost exclusively on soils derived from Tertiary alluvium, or on sites located on adjoining shale or Holocene alluvium. Often adjacent to and on slightly higher ground than Castlereagh Ironbark Forest or Shale Gravel Transition Forest in the Sydney Basin Bioregion. Dominated by *Eucalyptus parramattensis* subsp. *parramattensis*, *Angophora bakeri* and *Eucalyptus sclerophylla.* A small tree stratum of *Melaleuca decora* is sometimes present, generally in areas with poorer drainage. It has a well-developed shrub stratum consisting of sclerophyllous species such as *Banksia spinulosa* var. *spinulosa, Melaleuca nodosa, Hakea sericea* and *Hakea dactyloides* (multi-stemmed form). The ground stratum consists of a diverse range of forbs including *Themeda australis, Entolasia stricta*, *Cyathochaeta diandra, Dianella revoluta* subsp. *revoluta, Stylidium graminifolium*, *Platysace ericoides*, *Laxmannia gracilis* and *Aristida warburgii.*	No – this ecological community was not identified within the study area.	No
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland	E	E	The structure of the community may vary from open forests to low woodlands, scrubs or reedlands with scattered trees. It has a dense to sparse tree layer in which *Casuarina glauca* (swamp oak) is the dominant species northwards from Bermagui. Other trees including *Acmena smithii* (Lilly Pilly), *Glochidion spp.* (Cheese Trees) and *Melaleuca spp.* (Paperbarks) may be present as subordinate species and are found most frequently in stands of the community northwards from Gosford. *Melaleuca ericifolia* is the only abundant tree in this community south of Bermagui. The understorey is characterised by frequent occurrences of vines, *Parsonsia straminea, Geitonoplesium cymosum* and *Stephania japonica* var. *discolor,* a sparse cover of shrubs, and a continuous groundcover of forbs, sedges, grasses and leaf litter. The composition of the ground stratum varies depending on levels of salinity in the groundwater.	No – this ecological community was not identified within the study area.	No

Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of occurrence within the study area	Test of Significance Required (Y/N)
Cooks River / Castlereagh Ironbark Forest	E	CE	Associated with silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains. The structure of the community may vary from tall open forests (>40m) to woodlands. The most widespread and abundant dominant trees include *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus amplifolia* (Cabbage Gum), *Angophora floribunda* (Rough-barked Apple) and *Angophora subvelutina* (Broad-leaved Apple). *Eucalyptus baueriana* (Blue box), *Eucalyptus botryoides* (Bangalay) and *Eucalyptus elata* (River Peppermint) may be common south from Sydney. *Eucalyptus ovata* (Swamp Gum) occurs on the far south coast, *Eucalyptus. saligna* (Sydney Blue Gum) and *Eucalyptus grandis* (Flooded Gum) may occur north of Sydney, while *Eucalyptus benthamii* is restricted to the Hawkesbury floodplain. A layer of small trees may be present, including *Melaleuca decora, M. styphelioides* (prickly-leaved teatree), *Backhousia myrtifolia* (grey myrtle), *Melia azadarach* (white cedar), *Casuarina cunninghamiana* (river oak) and *Casuarina glauca* (swamp oak). Scattered shrubs include *Bursaria spinosa, Solanum prinophyllum, Rubus parvifolius, Breynia oblongifolia, Ozothamnus diosmifolius, Hymenanthera dentata, Acacia floribunda* and *Phyllanthus gunnii.* The groundcover is composed of abundant forbs, scramblers and grasses.	No – this ecological community was not identified within the study area.	No
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	CE	CE	Endemic to the shale hills and plains of the Sydney Basin Bioregion in NSW, occurring primarily in, but not limited to, the Cumberland Sub-region. Flat to undulating or hilly terrain, at elevations up to approximately 350 metres above sea level. Predominantly associated with clay soils, that are derived from Wianamatta Shale geology. Minor occurrences may be present on other soil groups, notably Holocene Alluvium and soils derived from the Mittagong Formation.	Yes – this ecological community was identified within the study area.	No. No impacts to this community are proposed.
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	**E**	**-**	**This ecological community is found on the river flats of the coastal floodplains. It has a tall open tree layer of eucalypts, which may exceed 40 m in height, but can be considerably shorter in regrowth stands or under conditions of lower site quality. While the composition of the tree stratum varies considerably, the most widespread and abundant dominant trees include *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus amplifolia* (Cabbage Gum), *Angophora floribunda* (Rough-barked Apple) and *Angophora subvelutina* (Broad-leaved Apple). Scattered shrubs include *Bursaria spinosa*, *Solanum prinophyllum*, *Rubus parvifolius*, *Breynia oblongifolia*, *Ozothamnus diosmifolius*,**	**Yes – this ecological community was identified within the study area.**	**Yes**

Name	BC Act Status	EPBC Act Status	Habitat Associations	Likelihood of occurrence within the study area	Test of Significance Required (Y/N)
			***Hymenanthera dentata*, *Acacia floribunda* and *Phyllanthus gunnii*. The composition and structure of the understorey is influenced by grazing, fire history and other disturbance, and may have a substantial component of exotic shrubs, grasses, vines and forbs.**		
Western Sydney Dry Rainforest and Moist Woodland on Shale	E	CE	Occurs almost exclusively on soils derived from Tertiary alluvium, or on sites located on adjoining shale or Holocene alluvium. Often adjacent to and on slightly higher ground than Castlereagh Ironbark Forest or Shale Gravel Transition Forest in the Sydney Basin Bioregion. Dominated by *Eucalyptus parramattensis* subsp. *parramattensis*, *Angophora bakeri* and *Eucalyptus sclerophylla.* A small tree stratum of *Melaleuca decora* is sometimes present, generally in areas with poorer drainage. It has a well-developed shrub stratum consisting of sclerophyllous species such as *Banksia spinulosa* var. *spinulosa, Melaleuca nodosa, Hakea sericea* and *Hakea dactyloides* (multi-stemmed form). The ground stratum consists of a diverse range of forbs including *Themeda australis, Entolasia stricta*, *Cyathochaeta diandra, Dianella revoluta* subsp. *revoluta, Stylidium graminifolium*, *Platysace ericoides*, *Laxmannia gracilis* and *Aristida warburgii.*	No – this ecological community was not identified within the study area.	No

V = vulnerable; EEC= endangered ecological community; CEEC = critically endangered ecological community

Table 9: Likelihood of occurrence of flora species recorded within a 5 km radius of the study area

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required (Y/N)
Acacia bynoeana	Bynoe's Wattle	E	V	*Acacia bynoeana* is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains and has recently been found in the Colymea and Parma Creek areas west of Nowra. It is found in heath and dry sclerophyll forest, typically on a sand or sandy clay substrate, often with ironstone gravels.	0	No - suitable habitat for this species was not identified in the study area.	No
Acacia pubescens	Downy Wattle	V	V	*Acacia pubescens* occurs on the NSW Central Coast in Western Sydney, mainly in the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. It is associated with Cumberland Plains Woodlands, Shale / Gravel Forest and Shale / Sandstone Transition Forest growing on clay soils, often with ironstone gravel.	402	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No
Allocasuarina glareicola	-	-	E	*Allocasuarina glareicola* is primarily restricted to the Richmond district on the north-west Cumberland Plain, with an outlier population found at Voyager Point. It grows in Castlereagh woodland on lateritic soil.	0	No - suitable habitat for this species was not identified in the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required (Y/N)
Cynanchum elegans	White-flowered Wax Plant	E	E	Dry rainforest; littoral rainforest; *Leptospermum laevigatum-Banksia integrifolia* subsp. *integrifolia* (Coastal Tea-tree– Coastal Banksia) coastal scrub; *Eucalyptus tereticornis* (Forest Red Gum) or *Corymbia maculata* (Spotted Gum) open forest and woodland; and *Melaleuca armillaris* (Bracelet Honeymyrtle) scrub.	1	No - suitable habitat for this species was not identified in the study area.	No
Dillwynia tenuifolia	-	V	-	Scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest, transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland, and disturbed escarpment woodland on Narrabeen sandstone.	16950	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No
Eucalyptus scoparia	Wallangarra White Gum	E1	V	In NSW it is known from only three locations near Tenterfield. Open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes.	1	No - suitable habitat for this species was not identified in the study area.	No
Genoplesium baueri	Yellow Gnat-orchid	V	E	Known from coastal areas from northern Sydney south to the Nowra district. Previous records from the Hunter Valley and Nelson Bay are now thought to be erroneous. Grows in shrubby woodland in open forest on shallow sandy soils and flowers from December to March.	0	No - suitable habitat for this species was not identified in the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required (Y/N)
Grevillea juniperina subsp. *juniperina*	Juniper-leaved Grevillea	V	-	Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest, on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium.	15	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No
Grevillea parviflora subsp. *parviflora*	Small-flower Grevillea	V	V	Sporadically distributed throughout the Sydney Basin and in the Hunter in the Cessnock - Kurri Kurri area. Also known from Putty to Wyong and Lake Macquarie on the Central Coast. Heath and shrubby woodland to open forest on sandy or light clay soils usually over thin shales.	275	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No
Haloragis exalata subsp. *exalata*	Wingless Raspwort	V	V	Disjunct distribution in the Central Coast, South Coast and North Western Slopes botanical subdivisions of NSW. Protected and shaded damp situations in riparian habitats.	0	No - suitable habitat not recorded within the study area.	No
Marsdenia viridiflora subsp. *viridiflora*	-	E2		Razorback Range, also recorded at Prospect, Bankstown, Smithfield, Cabramatta Creek and St Marys. Vine thickets and open shale woodland.	47	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No
Persicaria elatior	Tall Knotweed	V	V	Beside streams and lakes, swamp forest or disturbed areas.	0	No - suitable habitat not recorded within the study area.	No
Persoonia hirsuta	Hairy Geebung	E1	E	Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	0	No - suitable habitat not recorded within the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required (Y/N)
Persoonia nutans	Nodding Geebung	E	E	Northern populations: sclerophyll forest and woodland (Agnes Banks Woodland, Castlereagh Scribbly Gum Woodland and Cooks River / Castlereagh Ironbark Forest) on aeolian and alluvial sediments. Southern populations: tertiary alluvium, shale sandstone transition communities and Cooks River / Castlereagh Ironbark Forest.	42	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No
Pimelea curviflora var. *curviflora*	-	V	V	Woodland, mostly on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes.	0	No - suitable habitat not recorded within the study area.	No
Pimelea spicata	Spiked Rice-flower	E1	E	In western Sydney, *Pimelea spicata* occurs on an undulating topography of well-structured clay soils, derived from Wianamatta shale. It is associated with Cumberland Plains Woodland, in open woodland and grassland often in moist depressions or near creek lines. Has been located in disturbed areas that would have previously supported.	871	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No
Pomaderris brunnea	Brown Pomaderris	E1	V	Moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	0	No - suitable habitat not recorded within the study area.	No
Pterostylis gibbosa	Illawarra Greenhood	-	E	Known from a small number of populations in the upper Hunter Valley (Milbrodale), the Illawarra region (Albion Park and Yallah) and near Nowra (DECC 2007). Plants grow in a	0	No - suitable habitat not recorded within the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required (Y/N)
				variety of woodland and open forest communities with shallow rocky soils.			
Pterostylis nigricans	Dark Greenhood	V		North-east NSW north from Evans Head, and in Qld. Coastal heathland with Banksia ericifolia (Heath Banksia), and lower-growing heath with lichen-encrusted soil surfaces, on sandy soils.	1	Unlikely, suitable habitat for this species not present within the study area	No
Pterostylis saxicola	Sydney Plains Greenhood	E	E	Terrestrial orchid predominantly found in Hawkesbury Sandstone Gully Forest growing in small pockets of soil that have formed in depressions in sandstone rock shelves. Known from Georges River National Park, Ingleburn, Holsworthy, Peter Meadows Creek, St Marys Tower.	0	No - suitable habitat not recorded within the study area.	No
Pultenaea parviflora	-	E	V	Dry sclerophyll forest, especially Castlereagh Ironbark Forest, Shale Gravel Transition Forest and transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.	1561	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No
Pultenaea pedunculata	Matted Bush-pea	E1		In NSW it is represented by just three disjunct populations, in the Cumberland Plains in Sydney, the coast between Tathra and Bermagui and the Windellama area south of Goulburn. Woodland, sclerophyll forest, road batters and coastal cliffs.	15	Unlikely – lack of suitable habitat recorded within the study area. Not identified in the study area during survey.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required (Y/N)
Syzygium paniculatum	Magenta Lillypilly	V	V	This species occupies a narrow coastal area between Bulahdelah and Conjola State Forests in NSW. On the Central Coast, it occurs on Quaternary gravels, sands, silts and clays, in riparian gallery rainforests and remnant littoral rainforest communities. In the Ourimbah Creek valley, *S. paniculatum* occurs within gallery rainforest with *Alphitonia excelsa*, *Acmena smithii*, *Cryptocarya glaucescens*, *Toona 32ustral*, *Syzygium oleosum* with emergent *Eucalyptus saligna*. At Wyrrabalong NP, *S. paniculatum* occurs in littoral rainforest as a co-dominant with *Ficus fraseri*, *Syzygium oleosum*, *Acmena smithii*, *Cassine 32ustral*, and *Endiandra sieberi*.	0	No - suitable habitat not recorded within the study area.	No
Thesium australe	Austral Toadflax	V	V	Widespread throughout the eastern third of NSW but most common on the North Western Slopes, Northern Tablelands and North Coast. Occurs in grassland or grassy woodland. Often found in damp sites in association with Kangaroo Grass (*Themeda australis*) (DECC 2007). The preferred soil type is a fertile loam derived from basalt although it occasionally occurs on metasediments and granite.	0	No - suitable habitat not recorded within the study area.	No

V= Vulnerable; E= Endangered; E2= Endangered population; E= Endangered, CE= Critically Endangered.

Table 10: Likelihood of occurrence of fauna species recorded within a 5 km radius of the study area

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
				Amphibians			
Heleioporus australiacus	Giant Burrowing Frog	V	V	Forages in woodlands, wet heath, dry and wet sclerophyll forest (Ehmann 1997). Associated with semi-permanent to ephemeral sand or rock-based streams, where the soil is soft and sandy so that burrows can be constructed.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Litoria aurea	Green and Golden Bell Frog	E1	V	It can utilise a variety of natural and man-made waterbodies such as coastal swamps, marshes, lakes, other estuary wetlands, riverine floodplain wetlands, stormwater detention basins, farm dams, bunded areas, drains, ditches and other structures capable of storing water. Permanent swamps and ponds with established fringing vegetation (e.g. *Typha* sp. and spikerushes–*Eleocharis* sp.) adjacent to open grassland areas for foraging and free from predatory fish such as Mosquito Fish (*Gambusia holbrooki*) are also.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Litoria raniformis	Southern Bell Frog	E1	V	In NSW, only known to exist in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. A few recent unconfirmed records have also been made in the Murray Irrigation Area. Permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. Also found in irrigated rice crops.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
				Aves			

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
Anthochaera phrygia	Regent Honeyeater	E4A	CE	Associated with temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts, and riparian forests of River Oak (*C. cunninghamiana*). It primarily feeds on nectar from box and ironbark eucalypts and occasionally from Banksia's and mistletoes. It is reliant on locally abundant nectar sources with different flowering times to provide reliable supply of nectar. Suitable habitat likely to be present within the Precinct.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Apus pacificus	Fork-tailed Swift		M	Sometimes travels with Needletails. Varied habitat with a possible tendency to more arid areas but also over coasts and urban areas.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V		The Dusky Woodswallow is found in open forests and woodlands and may be seen along roadsides and on golf courses. The Dusky Woodswallow nests colonially in 'neighbourhoods'. The nest is a loose bowl of twigs, grass and roots, lined with fine grass, and is placed in a tree fork, behind bark, in a stump hollow or in a fence post, about 1 m – 10 m above the ground.	24	Unlikely - lack of suitable habitat for this species in the study area.	No
Botaurus poiciloptilus	Australasian Bittern	E1	E	Occurs in terrestrial wetlands with tall dense vegetation, occasionally estuarine habitats, reedbeds, swamps, streams, and estuaries.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Burhinus grallarius	Bush Stone-curlew	E1		In NSW, it occurs in lowland grassy woodland and open forest.	2	Unlikely - lack of suitable habitat for this	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
						species in the study area.	
Callocephalon fimbriatum	Gang-gang Cockatoo	V		Tall mountain forests and woodlands in summer; in winter, may occur at lower altitudes in open eucalypt forests and woodlands, and urban areas.	2	Unlikely - lack of suitable habitat for this species in the study area.	No
Chthonicola sagittata	Speckled Warbler	V		*Eucalyptus*-dominated communities with a grassy understorey and sparse shrub layer, often on rocky ridges or in gullies.	2	Unlikely - lack of suitable habitat for this species in the study area.	No
Circus assimilis	Spotted Harrier	V		Grassy open woodland, inland riparian woodland, grassland, shrub steppe, agricultural land and edges of inland wetlands.	6	Unlikely - lack of suitable habitat for this species in the study area.	No
Cuculus optatus	Oriental Cuckoo	V		Nonbreeding habitat: monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodland.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Daphoenositta chrysoptera	**Varied Sittella**	**E1**	**E**	**Distribution includes most of mainland Australia except deserts and open grasslands. Prefers eucalypt forests and woodlands with rough-barked species, or mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods from bark, dead branches, or small branches and twigs.**	**65**	**Likely – *Eucalyptus* sp., which represent foraging habitat for this species, were identified within the study area.**	**Yes**
Dasyornis brachypterus	Eastern Bristlebird	E1	E	There are three main populations: Northern - southern Qld/northern NSW, Central - Barren Ground NR, Budderoo NR, Woronora Plateau, Jervis Bay NP, Booderee NP and Beecroft Peninsula and Southern - Nadgee NR and	0	Unlikely - lack of suitable habitat for this species in the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
				Croajingalong NP in the vicinity of the NSW/Victorian border. Central and southern populations inhabit heath and open woodland with a heathy understorey. In northern NSW, habitat comprises open forest with dense tussocky grass understorey.			
Falco subniger	Black Falcon	V		Woodland, shrubland and grassland, especially riparian woodland and agricultural land. Often associated with streams or wetlands.	1	Unlikely - lack of suitable habitat for this species in the study area.	No
Gallinago hardwickii	Latham's Snipe		M	A variety of permanent and ephemeral wetlands, preferring open freshwater wetlands with nearby cover. Occupies a variety of vegetation around wetlands including wetland grasses and open wooded swamps. Can occur in habitats that have saline or brackish water, such as saltmarsh, mangrove creeks, around bays and beaches, and at tidal rivers. They are regularly recorded in or around modified or artificial habitats including pasture, ploughed paddocks, irrigation channels and drainage ditches and sewage and dairy farms. They can also occur in various sites close to humans or human activity (e.g. near roads, railways, airfields, commercial or industrial complexes).	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Glossopsitta pusilla	**Little Lorikeet**	**V**		**In NSW, found from the coast westward as far as Dubbo and Albury. Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.**	**12**	**Likely – *Eucalyptus* sp. and *Melaleuca* sp. which form foraging and roosting habitat for this species, were identified within the study area.**	**Yes**

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
Grantiella picta	Painted Honeyeater	V	V	A nomadic species that typically inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests with abundant mistletoe (DECC 2007). It is a specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias, preferring *Amyema* sp mistletoe (DECC 2007).	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V		Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	6	Unlikely – lack of large areas of open water which represent suitable habitat for this species in the study area.	No
Hieraaetus morphnoides	Little Eagle	V		Throughout the Australian mainland, with the exception of the most densely-forested parts of the Dividing Range escarpment. Open eucalypt forest, woodland or open woodland, including sheoak or Acacia woodlands and riparian woodlands of interior NSW.	14	Unlikely - lack of suitable habitat for this species in the study area.	No
Hirundapus caudacutus	White-throated Needletail	P	C, J, K	Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Lathamus discolor	**Swift Parrot**	**E**	**CE**	**Breeds in Tasmania between September and January. Migrates to mainland in autumn, where it forages on profuse flowering Eucalypts. Hence, in this region, autumn and winter flowering eucalypts are important for this species. Favoured feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum**	**20**	**Likely – *Eucalyptus* sp. which form foraging habitat for this species, were identified within the study area.**	**Yes**

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
				(*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*).			
Lophoictinia isura	Square-tailed Kite		M	Timbered habitats including dry woodlands and open forests, particularly timbered watercourses.	1	Unlikely - lack of suitable habitat for this species in the study area.	No
Monarcha melanopsis	Black-faced Monarch	E1	CE	Rainforest, open eucalypt forests, dry sclerophyll forests and woodlands, gullies in mountain areas or coastal foothills, Brigalow scrub, coastal scrub, mangroves, parks and gardens.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Motacilla flava	Yellow Wagtail	V		Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Myiagra cyanoleuca	Satin Flycatcher		M	Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily vegetated gullies.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Numenius madagascariensis	Eastern Curlew		CE, M	Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Petroica phoenicea	Flame Robin	V		In NSW, breeds in upland areas, and in winter many birds move to the inland slopes and plains, or occasionally to coastal areas. Likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in	3	Unlikely - lack of suitable habitat for this species in the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
				upland tall moist eucalypt forests and woodlands. In winter uses dry forests, open woodlands, heathlands, pastures and native grasslands. Occasionally occurs in temperate rainforest, herbfields, heathlands, shrublands and sedgelands at high altitudes.			
Rhipidura rufifrons	Rufous Fantail		M	Wet sclerophyll forests, subtropical and temperate rainforests. Sometimes drier sclerophyll forests and woodlands.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Rostratula australis	Australian Painted Snipe	E1	E	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds (ibid.). Breeding is often in response to local conditions; generally, occurs from September to December. Roosts during the day in dense vegetation. Forages nocturnally on mudflats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter (ibid.).	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Stagonopleura guttata	Diamond Firetail	V		Widely distributed in NSW, mainly recorded in the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina, and less commonly found in coastal areas and further inland. Grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland.	1	Unlikely - lack of suitable habitat for this species in the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
Stictonetta naevosa	Freckled Duck	V		Freshwater swamps and creeks, lakes, reservoirs, farm dams and sewage ponds.	1	Unlikely - lack of suitable habitat for this species in the study area.	No
Tringa nebularia	Common Greenshank		M	Terrestrial wetlands (swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans, saltflats, sewage farms and saltworks dams, inundated rice crops and bores) and sheltered coastal habitats (mudflats, saltmarsh, mangroves, embayments, harbours, river estuaries, deltas, lagoons, tidal pools, rock-flats and rock platforms).	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Tyto novaehollandiae	Masked Owl	V		Dry eucalypt forests and woodlands from sea level to 1100 m.	1	Unlikely - lack of suitable habitat for this species in the study area.	No
				Gastropods			
Meridolum corneovirens	**Cumberland Plain Land Snail**	**E1**		**Associated with open eucalypt forests, particularly Cumberland Plain Woodland described in Benson (1992). Found under fallen logs, debris and in bark and leaf litter around the trunk of gum trees or burrowing in loose soil around clumps of grass. Urban waste may also form suitable habitat.**	**215**	**Likely – suitable habitat for this species was identified within the study area in the form of leaf litter and logs.**	**Yes**
				Mammals (Excluding Bats)			
Dasyurus maculatus	Spotted-tailed Quoll	V	E	The Spotted-tailed Quoll inhabits a range of forest communities including wet and dry sclerophyll forests, coastal heathlands and rainforests (Mansergh 1984; DECC 2007j), more frequently recorded near the ecotones of closed	1	Unlikely - lack of suitable habitat for this species in the study area.	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
				and open forest and in NSW within 200km of the coast. Preferred habitat is mature wet forest (Belcher 2000b; Green & Scarborough 1990; Watt 1993), especially in areas with rainfall 600 mm/year (Edgar & Belcher 2008; Mansergh 1984). Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable (Catling et al. 1998, 2000). This species requires habitat features such as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage in (DECC 2007). Maternal den sites are logs with cryptic entrances; rock outcrops; windrows; burrows (Environment Australia 2000).			
Petauroides volans	Greater Glider	E2	V	The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species.	0	Unlikely, suitable habitat unlikely to be present within the study area and lack of records within the locality	No
Petrogale penicillata	Brush-tailed Rock-wallaby	E1	V	Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	0	Unlikely, suitable habitat unlikely to be present within the study area and lack of records within the locality	No
Phascolarctos cinereus	Koala	V	V	Associated with both wet and dry Eucalypt forest and woodland that contains a canopy cover of approximately 10 to 70%, with	4	Unlikely - lack of suitable habitat for this	No

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
				acceptable Eucalypt food trees. Some preferred Eucalyptus species are: *Eucalyptus tereticornis, E. punctata, E. cypellocarpa, E. viminalis.*		species in the study area.	
Pseudomys nobaehollandiae	New Holland Mouse		V	Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
				Mammals (Bats)			
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country. Roosts in caves, rock overhangs and disused mine shafts.	0	Unlikely - lack of suitable habitat for this species in the study area.	No
Falsistrellus tasmaniensis	**Eastern False Pipistrelle**	**V**		**Prefers moist habitats with trees taller than 20m. Roosts in tree hollows but has also been found roosting in buildings or under loose bark.**	**16**	**Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the study area.**	**Yes**
Micronomus norfolkensis	**Eastern Coastal Free-tailed Bat**	**V**		**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.**	**49**	**Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the study area.**	**Yes**
Miniopterus australis	**Little Bentwing-bat**	**V**		**Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub.**	**1**	**Likely – hollow bearing trees, which represent roosting habitat for this species, were**	**Yes**

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
						identified within the study area.	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V		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. Hunt in forested areas, catching moths and other flying insects above the treetops.	31	Unlikely – lack of caves or man-made structures that represent roosting habitat for this species within the study area.	No
Myotis macropus	**Southern Myotis**	**V**		**The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Will occupy most habitat types such as mangroves, paperbark swamps, riverine monsoon forest, rainforest, wet and dry sclerophyll forest, open woodland and River Red Gum woodland, as long as they are close to water. While roosting (in groups of 10-15) it is most commonly associated with caves, this species has been observed to roost in tree hollows, amongst vegetation, in clumps of Pandanus, under bridges, in mines, tunnels and stormwater drains. It forages over streams, dams and pools catching insects and small fish by raking their feet across the water surface.**	**16**	**Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the study area.**	**Yes**
Pteropus poliocephalus	**Grey-headed Flying-fox**	**V**	**V**	**Inhabits a wide range of habitats including rainforest, mangroves, paperbark forests, wet and dry sclerophyll forests and cultivated areas. Camps are often located in gullies,**	**102**	**Likely – suitable foraging habitat was identified in the study area.**	**Yes**

Scientific Name	Common Name	BC Status	EPBC Status	Habitat	Records within 5 km Radius	Likelihood of Occurrence	Test of Significance Required? (Y/N)
				typically close to water, in vegetation with a dense canopy.			
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V		Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	2	Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the subject site.	Yes
Scoteanax rueppellii	Greater Broad-nosed Bat	V		Associated with moist gullies in mature coastal forest, or rainforest, east of the Great Dividing Range, tending to be more frequently located in more productive forests. Within denser vegetation types, use is made of natural and man-made openings such as roads, creeks and small rivers, where it hawks backwards and forwards for prey.	15	Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the subject site.	Yes

BC Act: E1 = Endangered, E2 = Endangered Population, E4 = Extinct, E4A = Critically Endangered, V = Vulnerable.
EPBC Act: M = Migratory, CD = Conservation Dependent, CE = Critically Endangered, E = Endangered, V = Vulnerable, X = Extinct

Appendix D Test of Significance (BC Act)

The 'Assessment of significance' (5-part test) is applied to species, populations and ecological communities listed on Schedules 1 and 2 of the BC Act. The assessment sets out five factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether a significant impact is likely. All factors must be considered, and an overall conclusion made based on all factors in combination.

D1 River-flat Eucalypt Forest

The Test of Significance was undertaken for River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. The proposed development would remove 0.04 ha vegetation associated with River-Flat Eucalypt Forest for the construction of perimeter roads around the riparian corridor.

BC Act	Question	Response
7.3.1 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	Not applicable.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	The proposed development would remove 0.04 ha of vegetation associated with River-Flat Eucalypt Forest. This vegetation is located on the edge of the patch and is currently subject to edge effects from the cleared biodiversity certified area directly adjacent. It is considered unlikely that the removal of this vegetation, which is located on the edge of a larger patch and is currently subject to edge effects would adversely impact on this ecological community to an extent that its local occurrence will be placed at risk of becoming extinct.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	The proposed works would result in a direct impact to 0.04 ha of River-Flat Eucalypt Forest, which has undergone previous disturbance and is located on the edge of a disturbed portion of the study area, adjacent to the biodiversity certified area. The remainder of the non-biodiversity certified area within the riparian corridor was observed to contain a similar assemblage of flora species to those observed within the potential impact area. All flora species recorded during the surveys are common in the locality. Therefore, it is considered unlikely that the proposed impacts would not result in substantial and adverse modifications to such an extent to place this community at risk of extinction.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed works would directly impact 0.04 ha of River-Flat Eucalypt Forest. The vegetation to be removed is relatively small compared with the remaining extent of this community within the study area and surrounding landscape. Other patches of River-Flat Eucalypt Forest are present within the riparian corridor.

BC Act	Question	Response
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: 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	The vegetation to be removed is relatively small compared with the remaining extent of this community within the study area and surrounding landscape. Other patches of River-Flat Eucalypt Forest are present within the riparian corridor. Connectivity of the community will be marginally reduced. However, as the impacts are located on the edge of the patch is unlikely that they would fragment or isolate areas of this ecological community.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The proposed works would remove 0.04 ha of River-Flat Eucalypt Forest. As previously mentioned, the vegetation identified for removal is a small portion of one of multiple patches of the community within the riparian corridor and is currently subject to edge effects. Therefore, it is unlikely that this would impact upon the long-term survival of this ecological community in the locality as the potential indirect impact will not significantly affect the long-term viability, tenure, quality and integrity of the habitat within the remaining patch and within locality.
7.3.1 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).	The River-Flat Eucalypt Forest to be removed is not associated with any declared area of outstanding biodiversity value.
7.3.1 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.	A number of Key Threatening Processes (KTP) are relevant to this proposal with respect to River-Flat Eucalypt Forest. These include: • clearing of native vegetation • invasion of native plant communities by exotic perennial grasses The areas where impacts are proposed are located on the edge of a patch which has undergone previous disturbance and is currently subject to edge as they are directly adjacent to the cleared biodiversity certified area which currently contains exotic perennial grasses. Therefore, it is considered unlikely that the proposal would significantly exacerbate either KTP.
Conclusion	Is there likely to be a significant impact?	No. The proposed development is unlikely to significantly impact upon River-Flat Eucalypt Forest given that: • The 0.04 ha of vegetation proposed to be cleared is minimal compared to the remaining patch within the study area. • The vegetation to be impacted is located on the edge of a patch which is currently subject to edge effects and invasion of exotic perennial grasses. • Any impacts to abiotic factors (such as water and soil) to this ecological community will be mitigated through sediment and erosion control measures. • Any indirect impacts that may occur from weed invasion will be managed through the implementation of a VMP for the remaining vegetation within the riparian corridor.

D2 Forest Birds

The following species were not observed during field survey but have the potential to occur within the subject land:

- *Daphoenositta chrysoptera* (Varied Sittella)
- *Glossopsitta pusilla* (Little Lorikeet)
- *Lathamus discolor* (Swift Parrot)

These species have varying habitat associations (Appendix C). However, within the context of the proposed works, habitat within the study area was limited to *Eucalyptus* and *Melaleuca* species identified within PCT 835. This would provide foraging habitat for all three species and potential roosting habitat for the Varied Sittella and Little Lorikeet. The proposed works would remove 0.04 ha of this vegetation. Given the similarity between habitat within the subject land, a single Test of Significance was applied for the above species.

BC Act	Question	Response
7.3.1 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	The proposed development would remove 0.04 ha of vegetation, containing foraging and roosting habitat for the Varied Sittella and Little Lorikeet and foraging habitat for the Swift Parrot. The vegetation to be removed is on the edge of a much larger patch of the same vegetation type and is currently suffering the effects of edge effects. These highly mobile species would not rely on such a small portion of vegetation for survival and can easily access areas in better condition within the larger patch. Therefore, it is considered unlikely that the proposed works would place a viable population of any of these species at risk of extinction. Similar habitat would be retained within the study area.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	Not applicable
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not applicable
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed development would remove 0.04 ha of vegetation, containing foraging and roosting habitat for the threatened bird species as listed above. The extent of this removal is considered minimal given that a much larger area of similar habitat would be retained within the study area.

BC Act	Question	Response
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: 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	The proposed development would remove 0.04 ha of low-moderate condition vegetation suffering edge effects. The vegetation to be removed is on the edge of a much larger patch of similar vegetation. Removing it would reduce the size of the patch slightly, but not fragment it any further. Therefore, the proposed development would not contribute to further fragmenting or isolating of habitat for the threatened species. The species are highly mobile and will still be able to access foraging habitat within the study area.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The proposed development would remove 0.04 ha of foraging and roosting habitat for the Varied Sittella and Little Lorikeet and foraging habitat for the Swift Parrot. This habitat to be removed is not considered vital to the long-term survival of this species within the locality because the species is highly mobile and would be able to continue utilise habitat in similar vegetation within the study area. This habitat is on the edge of a much larger patch and is suffering edge effects. Preferable habitat would exist within the larger patch.
7.3.1 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).	The proposed development would not impact any declared area of outstanding biodiversity value.
7.3.1 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.	One key threatening process, clearing of native vegetation, is associated with the proposed works and is relevant to the threatened species. The impacts of this key threatening process resulting from the proposed works are considered to be minimal. The species are highly mobile and would be able to continue utilising habitat in similar vegetation retained within the study area.
Conclusion	**Is there likely to be a significant impact?**	No. The proposed development is unlikely to have a significant impact on the Varied Sittella, Little Lorikeet or Swift Parrot for the following reasons: • The 0.04 ha of habitat is a very small portion on the edge of a much larger patch and is currently suffering from edge effects. • Similar habitat for this species will be retained within the study area and more is available adjacent to the subject land.

D3 Mammals (Microbats)

The following species were not observed during field survey but have the potential to occur within the subject land:

- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle)
- *Micronomus norfolkensis* (Eastern Coastal Free-tailed Bat)
- *Miniopterus australis* (Little Bent-winged bat)
- *Myotis Macropus* (Southern Myotis)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)
- *Saccolaimus flaviventris* (Yellow-bellied Sheath-tailed Bat)

The description and habitat associations of these species are presented in Appendix C. The study area contains habitat for the above microbat species in the form of hollow-bearing trees, which represent potential roosting habitat, and native vegetation, which represents foraging habitat.

BC Act	Question	Response
7.3.1 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	The proposed development would remove 0.04 ha of vegetation which may provide roosting and foraging habitat. The vegetation to be removed is on the edge of a much larger patch of the same vegetation type and is currently suffering the effects of edge effects. These highly mobile species would not rely on such a small portion of vegetation for survival and can easily access areas in better condition within the larger patch. Therefore, it is considered unlikely that the proposed works would place a viable population of any of these species at risk of extinction. Similar habitat would be retained within the study area.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	Not applicable
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not applicable
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed development would remove a small amount of roosting and foraging habitat for the species. These impacts are considered negligible given that similar foraging habitat will be retained within the study area. These species are highly mobile and could continue to access additional habitat.

BC Act	Question	Response
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: 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	The proposed development would remove 0.04 ha of low-moderate condition vegetation suffering edge effects. The vegetation to be removed is on the edge of a much larger patch of similar vegetation. Removing it would reduce the size of the patch slightly, but not fragment it any further. Therefore, the proposed works would not contribute to further fragmenting or isolating of habitat for the threatened species. The species are highly mobile and will still be able to access foraging habitat within the study area.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The proposed development would remove 0.04 ha of foraging and roosting habitat for these species. This habitat to be removed is not considered vital to the long-term survival of this species within the locality because the species is highly mobile and would be able to continue foraging in similar vegetation within the study area and the vegetation to be removed is such a small part of the larger area.
7.3.1 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).	The proposed development would not impact any declared area of outstanding biodiversity value.
7.3.1 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.	One key threatening process, clearing of native vegetation, is associated with the proposed works and is relevant to the threatened species. The impacts of this key threatening process resulting from the proposed works are considered to minimal. The species is highly mobile and would be able to continue foraging in similar vegetation retained within study area.
Conclusion	**Is there likely to be a significant impact?**	No. The proposed development is unlikely to have a significant impact on the listed microbat species for the following reasons: • The extent of habitat to be removed is minimal (0.04 ha). • Similar habitat for this species will be retained within the study area.

D4 Mammals (Megabats)

The Grey-headed Flying-fox is listed as vulnerable under the BC Act and EPBC Act. The description and habitat associations of this species are presented in Appendix C. This species was not observed during field survey. The subject site contains habitat for the species in the form of *Eucalyptus* sp., which represents foraging habitat. GHFF roost in camps of up to 10,000s. No camps were identified within the study area.

BC Act	Question	Response
7.3.1 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	The proposed development would remove 0.04 ha of foraging habitat for the Grey-headed Flying-fox. No breeding habitat in the form of camps would be impacted as part of the proposed works. It is considered unlikely that the proposed development would place a viable population of the species at risk of extinction given that foraging habitat would be retained within the study area and surrounds which the highly mobile species could access.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	Not applicable
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not applicable
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed development would remove 0.04 ha of foraging habitat for this species. These impacts are considered minor given that foraging habitat would be retained within the study area, and the species is highly mobile. No breeding habitat (camps) would be impacted.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: 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	The proposed development would remove 0.04 ha of low-moderate condition vegetation suffering edge effects. The vegetation to be removed is on the edge of a much larger patch of similar vegetation. Removing it would reduce the size of the patch slightly, but not fragment it any further. Therefore, the proposed development would not contribute to further fragmenting or isolating of habitat for the threatened species. The species are highly mobile and will still be able to access foraging habitat within the study area.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community:	The proposed development would remove 0.04 ha of foraging habitat for the Grey-headed Flying-fox. This habitat to be removed is not considered vital to the

BC Act	Question	Response
	The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	long-term survival of this species within the locality because the species is highly mobile and would be able to continue foraging in similar vegetation within the study area and surrounds. Furthermore, the proposed works would not remove breeding habitat.
7.3.1 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).	The proposed development would not impact any declared area of outstanding biodiversity value.
7.3.1 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 process, clearing of native vegetation, is associated with the proposed works. However, impacts resulting from these processes are considered to be minimal. The species is highly mobile and would be able to continue foraging in similar vegetation within and adjacent to the study area.
Conclusion	**Is there likely to be a significant impact?**	No. The proposed development is unlikely to have a significant impact on the Grey-headed Flying-fox for the following reasons: • The extent of habitat to be removed is minimal (0.04 ha). • Similar habitat for this species will be retained within the study area and more is available adjacent to the study area. • No breeding habitat would be removed.

D5 Meridolum corneovirens (Cumberland Plain Land Snail)

Cumberland Plain Land Snail is listed as endangered under the BC Act. The Cumberland Plain Land Snail is a native snail species with a typical adult shell diameter ranging between 25-30 mm. Current knowledge suggests that Cumberland Plain Land Snail is restricted to the Cumberland Plain and Castlereagh Woodlands of Western Sydney and also along the fringes of River-flat Eucalypt Forest, especially where it meets Cumberland Plain Woodland. It is currently known from over 100 locations. However, most of these populations are scattered throughout the region and are often small and isolated (DEC 2007). Cumberland land snail typically occurs under logs and other debris, amongst leaf and bark accumulations and sometimes under grass clumps. Where possible it will burrow into loose soil (DEC 2007). No Cumberland Plain Land Snail individuals were recorded during field surveys.

BC Act	Question	Response
7.3.1 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	Factors likely to have an adverse effect on the life cycle of the Cumberland Plain Land Snail would include a substantial loss and / or fragmentation of habitat or alteration of fire regime. The proposed development will not result in any alteration to the fire regime. The proposal will result in the removal of 0.04 ha of potential habitat. The area to be impacted accounts for a very small proportion of potential habitat within the study area, which is not considered likely to have an adverse effect on the lifecycle of the species such that a local population would be placed at risk of extinction.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	Not applicable
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not applicable
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed development would result in the removal of approximately 0.04 ha of habitat for the Cumberland Plain Land Snail, which represents a very small proportion of potential habitat within the study area. More degraded areas are unlikely to be inhabited by this species, particularly in areas with significant weed infestation. The portion of vegetation to be removed is on the edge of a much larger patch and is suffering from edge effects.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community:	The Cumberland Plain Land Snail does not require large areas to maintain a viable population and have been demonstrated to be highly structured at very short

BC Act	Question	Response
	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	distances (2 m) and after about 350 m the populations are random. Therefore, individuals within a 350 m radius are more likely to be related than they would be if found more than this distance apart (Clark et al., 2004). Within the RFEF habitat, the proposed development will result in the removal of 0.04 ha of potential habitat. The vegetation to be removed is on the edge of a much larger patch of similar vegetation. Removing it would reduce the size of the patch slightly, but not fragment it any further. Therefore, the proposed works would not contribute to further fragmenting or isolating of habitat for the threatened species. As this species is known to have small home ranges the proposed development will not isolate or fragment an area of habitat from other areas of habitat.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The proposed development will result in the removal of 0.04 ha of potential habitat for the Cumberland Plain Land Snail, a small proportion of that which exists within the study area. As this species has a small range and does not require large areas to maintain a viable population the remaining potential habitat is expected to maintain the long-term survival of the species in the locality.
7.3.1 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 area of declared outstanding biodiversity is located within the vicinity of the proposed works area.
7.3.1 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.	One key threatening process is relevant to the proposed works, namely habitat loss from the clearing of native vegetation and associated weed invasion. The final determination the Cumberland Plain Land Snail identifies habitat loss as part of the decline of this species. Under the proposed works, a small amount of vegetation removal and trimming is unlikely to exacerbate this key threatening process.
Conclusion	Is there likely to be a significant impact?	No

Appendix E Significant Impact Criteria (EPBC Act)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where MNES may be affected. Under the Act, any action which "has, will have, or is likely to have a significant impact on MNES" is defined as a "controlled action", and requires approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE), which is responsible for administering the EPBC Act.

E1 River-flat Eucalypt Forest on coastal floodplains of southern New South Wales and eastern Victoria

The proposed development would remove 0.04 ha of vegetation associated with River-Flat Eucalypt Forest for the construction of perimeter roads around the riparian corridor.

Criterion	Question	Response
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:		
1)	reduce the extent of an ecological community	The proposed action would reduce the extent of River-flat Eucalypt Forest by 0.04 ha for the construction of perimeter roads around the riparian corridor.
2)	fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The vegetation which would be impacted represents a relatively small portion of one, out of multiple patches of similar vegetation within the riparian corridor and likely extends into the wider locality of Native Vegetation Protection area patch to the north of the development site. Fragmentation is unlikely to increase as a result of the proposed development.
3)	adversely affect habitat critical to the survival of an ecological community	The Approved Conservation Advice for River-flat Eucalypt Forest (DAWE 2020) states, "the habitat or areas most critical to the survival of the ecological community are those patches that are in the best condition (i.e., Classes A and B)." The occurrences of the ecological community within the study area were identified as being in condition C2. The development would remove 0.04 ha of the ecological community and retaining more within Maxwells Creek. The majority of the vegetation will be retained within the riparian corridor and will be subject to a VMP which will aim to protect and increase the condition on the vegetation of this ecological community and aid the recovery of this ecological community.
4)	modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	The proposed development has the potential to indirectly modify abiotic factors such as changed water runoff, increased sedimentation, and increased nutrients to 0.04 ha of this ecological community. However, during and following construction these impacts will be mitigated through preparation and implementation of an Erosion and Sediment Control Plan. Therefore, it is unlikely that the proposed works

Criterion	Question	Response
		would modify or destroy abiotic factors necessary for an ecological community's survival.
5)	cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The proposed action would directly impact 0.04 ha of River-flat Eucalypt Forest. The proposed action is unlikely to result in a decline or loss of functionally important species as the potential trees to be indirectly impacted are common in the locality. Further, the remaining vegetation will be actively managed for conservation through the implementation.
6) i)	cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: assisting invasive species, that are harmful to the listed ecological community, to become established, or	The proposed action would remove 0.04 ha of the ecological community. However, the proposed action is unlikely to result in reduction of quality or integrity of the vegetation as the area will be actively managed for conservation. This will include managing the retained vegetation against impacts from invasive species. The VMP in the long-term will improve the quality and integrity of the retained vegetation through the removal of weeds and implementation of pest management actions.
6) ii)	cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	As per above. The implementation of a VMP will provide guidance on how to actively manage the retained vegetation. This will include the correct use herbicides in the VMP area.
7)	causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	There is no Recovery Plan for this TEC listed under the EPBC Act. The Approved Conservation Plan outlines relevant Priority Actions.
Conclusion	Is there likely to be a significant impact?	No. In consideration of the above, the proposed action is unlikely to have a significant impact on the River-flat Eucalypt Forest.

E2 *Daphoenositta chrysoptera* (Varied Sitella)

The proposed development would remove 0.04 ha of potential foraging and roosting habitat for the construction of perimeter roads around the riparian corridor. This species feeds on insects inhabiting trees and roosts in the forks of branches high up in the canopy. This species was not identified during survey.

Criterion	Question	Response
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:		
1)	will the action lead to a long-term decrease in the size of a population	A 'population of a species' refers to a population, or collection of local populations, that occurs within a particular bioregion. The proposed development would remove 0.04 ha of native vegetation, containing habitat for Varied Sittella. Given that the species are highly mobile and can continue to access foraging habitat retained within the study area and greater locality, the proposed development would not lead to a long-term decrease in populations of either species.
2)	will the action reduce the area of occupancy of the species	The proposed action would reduce the area of occupancy for this species through the direct removal of 0.04 ha of foraging and roosting habitat. This amount of vegetation is considered minimal. More habitat would be retained within the study area and similar habitat is available in the greater locality.
3)	will the action fragment an existing population into two or more populations	The proposed action would remove 0.04 ha of habitat that the species may use on occasion. The vegetation to be removed is on the edge of a much larger patch of vegetation. This species is highly mobile and removing a small portion of vegetation would not prevent them from accessing adjacent vegetation. Subsequently, the proposed works would not fragment populations of either species.
4)	will the action adversely affect habitat critical to the survival of a species	The proposed development would not impact critical habitat for either species.
5)	will the action disrupt the breeding cycle of a population	Varied Sittella build nests in the canopy of trees. The vegetation to be removed may represent a small area of potential breeding habitat. However, these impacts are considered minimal given the availability of habitat within study area and surrounds.
6) i)	will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed development would remove 0.04 ha of habitat available for the species within the study area. The highly mobile species would still be able to access habitat retained within the study area and surrounds.
6) ii)	will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Varied Sittella.
7)	will the action introduce disease that may cause the species to decline	The proposed action is unlikely to introduce disease that may cause the Varied Sittella to decline.

Criterion	Question	Response
Conclusion	will the action interfere with the recovery of the species	One threat activity is relevant to the proposed development: Habitat degradation/ Habitat loss and alteration. The proposed action would remove 0.04 ha of habitat for this species. However, this threat is considered minimal given that similar habitat would still be available for the highly mobile species within and adjacent to the study area.

E3 *Lathamus discolor* (Swift Parrot)

The proposed development would remove 0.04 ha of potential foraging habitat in the form of *Eucalyptus* sp. for the construction of perimeter roads around the riparian corridor. This species was not identified during survey.

Criterion	Question	Response
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:		
1)	will the action lead to a long-term decrease in the size of a population	A 'population of a species' refers to a population, or collection of local populations, that occurs within a particular bioregion. The proposed works would remove 0.04 ha of native vegetation, containing foraging habitat for Swift Parrot. Given that the species are highly mobile and can continue to access habitat retained within the study area and greater locality, the proposed works would not lead to a long-term decrease in populations of either species.
2)	will the action reduce the area of occupancy of the species	The proposed action would reduce the area of occupancy for this species through the direct removal of 0.04 ha of foraging habitat. This area is considered minimal. More habitat would be retained within the study area and similar habitat is available in the greater locality.
3)	will the action fragment an existing population into two or more populations	The proposed action would remove 0.04 ha of habitat that the species may use on occasion. The vegetation to be removed is on the edge of a much larger patch of vegetation. This species is highly mobile and removing a small portion of vegetation would not prevent them from accessing adjacent vegetation. Subsequently, the proposed works would not fragment populations of either species.
4)	will the action adversely affect habitat critical to the survival of a species	The proposed development would not impact critical habitat for this species.
5)	will the action disrupt the breeding cycle of a population	The Swift Parrot breeds only in Tasmania. The breeding cycle of these species might be impacted by the loss of 0.04 ha of foraging habitat. However, these impacts are considered minimal given the availability of foraging habitat within the study area and surrounds.
6) i)	will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed development would remove 0.04 ha of habitat available for the species within the study area. The highly mobile species would still be able to access habitat retained within the study area and surrounds.
6) ii)	will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Varied Sittella.
7)	will the action introduce disease that may cause the species to decline	The proposed action is unlikely to introduce disease that may cause the Swift Parrot to decline.

Criterion	Question	Response
Conclusion	will the action interfere with the recovery of the species	One threat activity is relevant to the proposed development: Habitat degradation/ Habitat loss and alteration. The proposed action would remove 0.04 ha of habitat for this species. However, this threat is considered minimal given that similar habitat would still be available for the highly mobile species within and adjacent to the study area.

E4 *Pteropus poliocephalus* (Grey-headed Flying-fox)

The proposed development would remove 0.04 ha of potential foraging habitat in the form of Eucalyptus sp. for the construction of perimeter roads around the riparian corridor. This species was not identified during survey.

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an population of the species	No roosting habitat (camps) would be affected by the proposed action. The proposed action would remove 0.04 ha of foraging habitat for the Grey-headed Flying-fox. The Grey-headed Flying-fox is recorded as travelling long distances (up to 20 km) on feeding forays. Given that vegetation within the study area would be retained and similar foraging habitat is available adjacent to the study area, the removal of this potential foraging habitat would not lead to the long-term decrease in the size of an important population of Grey-headed Flying-fox.
2)	reduce the area of occupancy of an important population	The proposed action would remove 0.04 ha of foraging habitat for this species. The Grey-headed Flying-fox is not known to occupy the study area in the form of a camp but may occasionally forage within the study area. The Grey-headed Flying-fox is recorded as travelling long distances on feeding forays and would likely utilise the potential foraging habitat outside of the study area.
3)	fragment an existing important population into two or more populations	According to the National Recovery Plan for the Grey-headed Flying-fox 2021, "the Grey-headed Flying-fox is considered to be a single, mobile population with individuals distributed across Queensland, New South Wales, Victoria, South Australia, Tasmania and the ACT." The proposed action would remove 0.04 ha of foraging habitat. No camps would be affected by the proposed action and other areas of foraging habitat are available for this highly mobile species within the study area and surrounds. Therefore, it would not fragment an existing important population into two or more populations.
4)	adversely affect habitat critical to the survival of a species	The National Recovery Plan for the Grey-headed Flying-fox 2021 identifies 'a continuous temporal sequence of productive foraging habitats, linked by migration corridors or stopover habitats, and suitable roosting habitat within nightly commuting distance of foraging areas' as habitat critical to the survival of the species. The proposed action would remove 0.04 ha of vegetation. This small amount of vegetation is not considered habitat critical survival to this species because the species is recorded as travelling long distances (20 km) on feeding forays and similar habitat is available within the study area and surrounds. Therefore, this impact is considered unlikely to have an adverse effect.
5)	disrupt the breeding cycle of an important population	No camps would be affected by the proposed action. The proposed works would not fragment or isolate camps from foraging areas or reduce the extent of available foraging resources within their foraging range resulting in lack of

Criterion	Question	Response
		food. Therefore, proposed works would not disrupt the breeding cycle of the Grey-headed Flying-fox.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed development would remove 0.04 ha of native vegetation, which forms foraging habitat for the Grey-headed Flying-fox. It is unlikely that the extent of this vegetation removal would cause the species to decline because suitable habitat is available within their foraging range.
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed development is unlikely to result in the establishment of an invasive species that is harmful to the Grey-headed Flying-fox.
8)	introduce disease that may cause the species to decline, or	Grey-headed Flying-fox are reservoirs for the Australian bat lyssavirus, Hendra Virus and Menangle virus, and can cause clinical disease and mortality in Grey-headed Flying-fox. The proposed works would not increase the incidence of this disease.
9)	interfere substantially with the recovery of the species.	The proposed development would remove suitable foraging habitat for this species; however, this would not interfere substantially with recovery objectives listed in the National Recovery Plan for the Grey-headed Flying-fox 2021. The proposed action would not affect any camps and suitable foraging habitat is available within the study area and surrounds.
Conclusion	Is there likely to be a significant impact?	No. The proposed development is unlikely to have a significant impact on the Grey-headed Flying-fox for the following reasons: • The extent of habitat to be removed is minimal (0.04 ha). • Similar habitat for this species will be retained within the subject land and more is available adjacent to the subject land. • No breeding habitat would be removed.