10) Appendix J

Flora and Fauna Assessment
Prepared by
EcoLogical Australia

679-685 Old Northern Road, Dural

Healing ONR Pty Ltd

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DOCUMENT TRACKING

Project Name	679-685 Old Northern Road, Dural – Flora and Fauna Assessment
Project Number	20SUT-17253
Project Manager	Kirsten McLaren
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Reviewed by	Karen Spicer / Deanne Hickey
Approved by	Deanne Hickey
Status	Draft
Version Number	v3
Last saved on	16 December 2021

This report should be cited as 'Eco Logical Australia 2021. *679-685 Old Northern Road Dural Flora and Fauna Assessment*. Prepared for Healing ONR Pty Ltd.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Healing ONR Pty Limited

Template 2.8.1

Contents

List of Figures

List of Tables

List of Photos

Abbreviations

Abbreviation	Description
BC Act	NSW *Biodiversity Conservation Act 2016*
BAM	Biodiversity Assessment Methodology
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
DA	Development Application
DAWE	Department of the Agriculture, Water and the Environment
DCP	Development Control Plan
DPIE	NSW Department of Planning, Industry and Environment (formally OEH)
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FFA	Flora and Fauna Assessment
FM Act	NSW *Fisheries Management Act 1994*
HBT	Hollow bearing tree
KTP	Key Threatening Process
LEP	Local Environment Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NSW	New South Wales
OEH	Office of Environment and Heritage now (DPIE)
PCT	Plant Type Community
SAII	Serious and Irreversible Impacts
SEPP	State Environmental Planning Policy
TEC	Threatened ecological community
WM Act	NSW *Water Management Act 2000*

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was commissioned by Healing ONR Pty Ltd to prepare a Flora and Fauna Assessment (FFA) report for the proposed Planning Proposal for 679-681 (Lot 3, DP 395437) and 683-685 (Lot 1, DP 120004) Old Northern Road, Dural (i.e. the 'study area'). Healing ONR Pty Ltd propose to submit a planning proposal to Hornsby Shire Council under Part 3 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The planning proposal is for an Additional Permitted Use (APU) and increase in height from 10.5 metres to 14 metres.

This Flora and Fauna Assessment describes impacts on native vegetation, threatened species, populations and communities listed under the NSW *Biodiversity Conservation Act* 2016 (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) based on the indicative concept plan for the health services facility. Impacts should be reassessed once the final design is available.

The study area contains two existing residential dwellings and planted native vegetation. No remnant vegetation was recorded within the study area. No threatened flora and fauna species were recorded within the study area. Limited habitat features suitable for threatened species were recorded within the study area. The study area contains native canopy species which may provide supplementary foraging habitat for urbanised threatened birds, microbat and flying-fox species. However, no tests of significance under Section 7.3 of the BC Act were undertaken for threatened species, given the impact of the proposed works are considered negligible on foraging habitat utilised by these species.

Approximately 0.08 ha of planted vegetation that is native to NSW will be removed under the proposed indicative concept plan. The amount of native vegetation clearing does not exceed the native vegetation clearing threshold (0.5 ha) under the Biodiversity Offsets Scheme (BOS) for the minimum lot size for the current zoning (RU2 Rural Landscape; 2 ha min. lot size). Additionally, the land in the study area is not mapped on the Biodiversity Values Map (DPIE, accessed 20 October 2021). Therefore, the BOS will not be triggered by future development of the study area and a BDAR will not be required.

Following consideration of the administrative guidelines for determining a significant impact under the EPBC Act, it is considered that the proposed future development of the study area is unlikely to have a significant impact on any threatened flora and fauna species and therefore, a referral to the Commonwealth will not be required.

Mitigation measures to reduce impacts to potential threatened species habitat have been provided in Section 6 of this report.

1. Introduction

1.1 Purpose of the report

Eco logical Australia Pty Ltd (ELA) was engaged to prepare a Flora and Fauna Assessment (FFA) for 679-681 (Lot 3, DP 395437) and 683-685 (Lot 1, DP 120004) Old Northern Road, Dural (i.e. the 'study area') for Healing ONR Pty Ltd. The subject lots, hereafter referred to as the 'study area', are mapped in Figure 1.

Healing ONR Pty Ltd propose to submit a planning proposal under Part 3 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) to Hornsby Shire Council, which seeks an Additional Permitted Use (APU) for the study area to enable provision for a health services facility and an increase in building height from 10.5 m to 14 m.

1.2 Study area

The study area comprises of two existing residential properties with built structures and planted native and exotic vegetation. The residential properties share a common boundary fence. Vehicle access to the study area is via Old Northern Road, which forms the western boundary of the study area.

The study area is currently zoned RU2 Rural Landscape and SP2 Infrastructure under the Hornsby Local Environmental Plan (LEP) 2013. The study area is located directly south-east of Round Corner Centre. The remaining land in the broader landscape is commercial uses and residential aged care facilities.

1.3 Key definitions

The following key terms and definitions are used in this FFA.

- Subject site – represents the area of land directly impacted by the Planning Proposal and indicative concept design. This is the area directly affected by the proposal as per the definitions in the Threatened Biodiversity Assessment Guidelines (DEC 2004).
- Study area – this includes the subject site and any additional areas which are likely to be affected by the Planning Proposal (directly or indirectly) (as per DEC 2004 definitions). This includes the entire 679-685 Old Northern Road, Dural lot boundary (Figure 1).

Figure 1: Study area location

2. Legislative context

Table 1: Legislative context

Name	Relevance to the project	Report Section
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act aims to protect Matters of National Environmental Significance (MNES) including wetlands of international importance, threatened species and communities and listed migratory species. An action that may or is likely to have a significant impact on MNES should be referred to the Commonwealth to determine whether it is a Controlled Action that requires approval from the Commonwealth. No MNES were identified within the study area.	5.5 and Appendix B
State		
Environmental Planning and Assessment Act 1979 (EP&A Act)	The planning proposal will be assessed under Part 3 of the EP&A Act, as an amendment to *Hornsby Shire Council Local Environmental Plan 2013* (LEP)	
Biodiversity Conservation Act 2016 (BC Act)	The BC Act outlines the assessment requirements to determine whether proposed development (Part 4 of the EP&A Act) is likely to significantly affect threatened species or ecological communities, or their habitats under section 7.3 and whether the Biodiversity Offsets Scheme (BOS) will be triggered. Works that exceed the BOS thresholds as set out in Part 7 of the Act and Part 7 of the *Biodiversity Conservation Regulation 2017* (BC Regulation), are required to undertake the ecological assessment in accordance with the Biodiversity Assessment Method (BAM), including the preparation of a Biodiversity Development Assessment Report (BDAR). However, the proposal does not trigger entry into the BOS for the following reasons: • The proposal will not impact upon land mapped under the Biodiversity Values Map (accessed 20 October 2021) • The proposal will remove 0.08 ha of native vegetation and will not exceed the clearing threshold for the minimum lot size (minimum lot size is 2 ha. Clearing of up to 0.5 ha can occur before triggering the BOS) • The proposal is not likely to have a significant impact to threatened ecological values*. * Tests of Significance for the impact to threatened species and endangered ecological communities in accordance with s7.3 of the Act were not required for the proposed works. A significant impact is not likely to result and an assessment under the BOS is not required. The proposed development does not trigger the BOS and therefore a Biodiversity Development Assessment Report is not required.	Section 5.3 and Appendix B
Biodiversity Conservation Regulation 2017	The Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the Biodiversity Conservation Regulation 2017. The study area does not contain land identified on the BV Map (accessed 20 October 2021) (Figure 1).	
Biosecurity Act 2015	Under the Biosecurity Act, priority weeds have been identified for local government areas and assigned strategies to contain, remove or manage. Occupiers of land (this includes owners of land) have responsibility for taking appropriate action for priority weeds on the land they occupy.	Section 4.2.4

Name	Relevance to the project	Report Section
Fisheries Management Act 1994 (FM Act)	The development does not involve impacts to mapped areas of 'Key Fish Habitat', does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.	N/A
Water Management Act 2000	The project is not located within waterfront land and therefore does not require a Controlled Activity Approval under s91 of the WM Act	N/A
Planning Instruments		
State Environmental Planning Policy (SEPP) (Vegetation in Non-Rural Areas) 2017 (Vegetation SEPP)	The Vegetation SEPP applies to development that does not require consent. As this project requires consent, the Vegetation SEPP is not relevant.	N/A
SEPP (Coastal Management) 2018	The proposed development is not located on land subject to the Coastal Management SEPP 2018.	N/A
State Environmental Planning Policy (SEPP Koala Habitat Protection 2021)	Koala SEPP 2021 commenced in March 2021 and applies to all land zones within Hornsby LGA. On land without no approved Koala Plan of Management, the Koala SEPP 2021 applies if land subject to the DA is greater than 1 ha. The study area is less than 1 ha in size. Therefore, Koala SEPP 2021 does not apply.	N/A
Hornsby Local Environmental Plan 2013 (LEP)	The study area is currently zoned RU2 Rural Landscape and SP2 Infrastructure under the Hornsby LEP. The Planning Proposal seeks Hornsby Shire Council approval for the consideration of a site-specific 'Additional Permitted Use' for the development of the health services facility and an increase in height from 10.5 metres to 14 metres. Clause 6.4 Terrestrial Biodiversity of the LEP does not apply to the study area. Hornsby Shire Council presently has a Planning Proposal submitted to DPIE to update the Terrestrial Biodiversity overlay. Within the locality, this will see an increase in the area of land to which this clause applies. However, the proposed extent of the Terrestrial Biodiversity overlay will not apply to the study area.	N/A

3. Methodology

3.1 Literature review and database search

A review of readily available databases pertaining to the ecology and environmental features of the entire extent of the study area and surrounding area, and existing vegetation mapping was conducted to identify records of threatened species, populations and communities and their potential habitat.

Databases and vegetation mapping that were reviewed included:

- BioNet (Atlas of NSW Wildlife) database search (5 km) for threatened species, populations and ecological communities listed under the BC Act (Department of Industry Planning and Environment, DPIE 2020) (Accessed 2 November 2021).
- EPBC Act Protected Matters Search Tool (5 km) for threatened and migratory species, populations and ecological communities listed under the Commonwealth EPBC Act (Department of Agriculture, Water and the Environment (DAWE), accessed 3 November 2021).
- Previous vegetation mapping:
    - The Native Vegetation of the Sydney Metropolitan Area (OEH, 2013), Version 2.0 - VIS_ID 3817 (Office of Environment and Heritage (OEH) 2013)
    - Hornsby Shire Council (HSC) 2017
- Review of relevant planning instruments, documentation, and information relating to biodiversity values and threatened habitat.
- Aerial photography (Six Maps) of the study area and surrounds were also used to investigate the extent of vegetation cover and landscape features. In addition, relevant Geographic Information System (GIS) datasets (soil, geology, drainage) were reviewed.

Species from both the BioNet Wildlife Atlas and DAWE online search were combined to produce a list of threatened species, populations and communities that may occur within the study area. The likelihood of occurrences for threatened species, populations and communities in the site were then determined based on location of database records, the likely presence or absence of suitable habitat in the study area, and knowledge of the species' ecology. This information informed the subsequent field assessments and targeted surveys.

After the field inspections had been completed the likelihood of occurrence of each species, population or communities was determined again. This was based on the increase in knowledge about the extent and type of habitats and which species were present on the site. The likelihood of occurrence of species, populations and communities following the field inspection is presented within the likelihood table in Appendix B.

3.2 Field inspection

3.2.1 Ecology survey

The site inspection was undertaken by field ecologist Belinda Failes on 3 November 2020 to identify the biodiversity values of the study area, including to validate the extent and condition of the native vegetation communities, identify threatened flora and fauna species, and habitat for threatened fauna species within the study area (Appendix A). The field surveys were also conducted to gather relevant

field information for the preparation of a Biodiversity Development Assessment Report (BDAR) if required at a later stage.

The field survey was undertaken in accordance with the BC Act and consisted of the following:

- Validation and mapping of the extent and quality of native vegetation to Plant Community Types (PCT), and validation and mapping of threatened ecological communities listed under the NSW BC Act and/or the Commonwealth EPBC Act if present.
- Collection of vegetation integrity plot data, within each identified vegetation zone in accordance with the BC Act Biodiversity Assessment Method (BAM).
- Identify the presence of threatened species or populations with potential habitat within the study area.
- Identify any other potential ecological constraints within the study area such as fauna habitat features (hollow-bearing trees - HBTs).

The random meander method (Cropper 1993) was used to confirm the boundaries of vegetation communities and species assemblages within the study area. Where the boundaries of vegetation communities differed from existing vegetation mapping, these were modified on hard copy maps and marked with a hand-held Global Positioning System (GPS).

The presence of threatened flora and fauna species identified as having the potential to occur in the study area was determined through a habitat assessment. Where threatened species or important habitat features were observed, such as hollow-bearing trees, their locations were marked using a hand-held GPS. Opportunistic sightings of all fauna present within the study area were also recorded.

3.3 Survey limitations

This assessment was not intended to provide an inventory of all species across the study area. Instead, it provides an overall assessment of the ecological values of the study area with particular emphasis on threatened species, endangered communities and key fauna habitat features.

4. Results

4.1 Data audit and literature review

4.1.1 Soils, topography and hydrology

The study area is located on Glenorie soil landscapes. Glenorie soil landscapes (erosional) are associated with Wianamatta Group shales. The vegetation associated with Glenorie soil landscapes have been extensively cleared; however, remnant vegetation typically contains *Syncarpia glomulifera* (Turpentine) *Eucalyptus saligna* (Sydney Blue Gum) and *Angophora floribunda* (Rough-barked Apple).

The study area does not contain any mapped watercourses. The nearest mapped watercourse is Georges Creek, approximately 170 m to the south-east (Figure 1).

4.1.2 Vegetation communities

Prior to field validation, previous vegetation mapping undertaken by OEH (2013) and Hornsby Shire Council (2017) were reviewed. The Hornsby mapping (2017) does not identify any native vegetation within the study area but notes that the vegetation may contain remnant vegetation which requires field validation. OEH (2013) vegetation mapping did not record any existing native vegetation within the study area but identified native vegetation to the south of the study area as shown in Figure 2.

4.1.3 Threatened species

The search for threatened species using the Protected Matters Search Tool and BioNet (Atlas of NSW Wildlife) (within a 5 km buffer around the study area) resulted in a list of 43 threatened flora species and 68 threatened or migratory fauna species and one endangered population, which are shown in Appendix B.

It should be noted that the result of the Protected Matters Search Tool, which has been included in Appendix B, is only a list of species based on habitat modelling. The Atlas of NSW Wildlife database records for the study area of threatened flora and fauna are shown in Figure 3 and Figure 4.

There are no threatened flora or fauna species BioNet records located within the study area.

4.1.4 Biodiversity Values Map

ELA confirmed on 20 October 2021 during desktop database search that the vegetation within the study area is not mapped as containing high biodiversity value on the Biodiversity Values Map defined in the *Biodiversity Conservation Regulation 2017* (BC Regulation) (Figure 1).

Figure 2: Previous vegetation mapping (OEH, 2013)

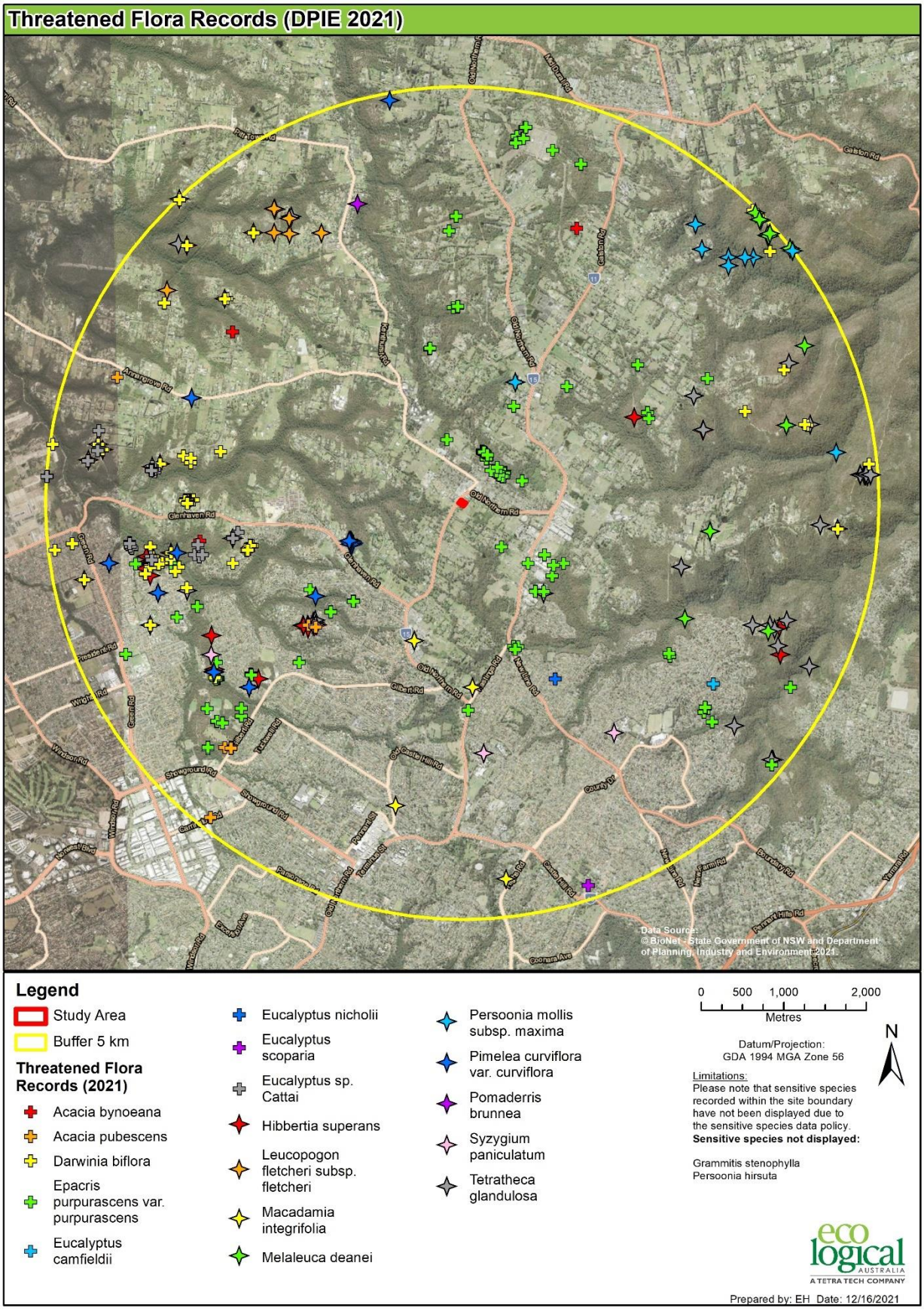

Figure 3: BioNet threatened flora species records

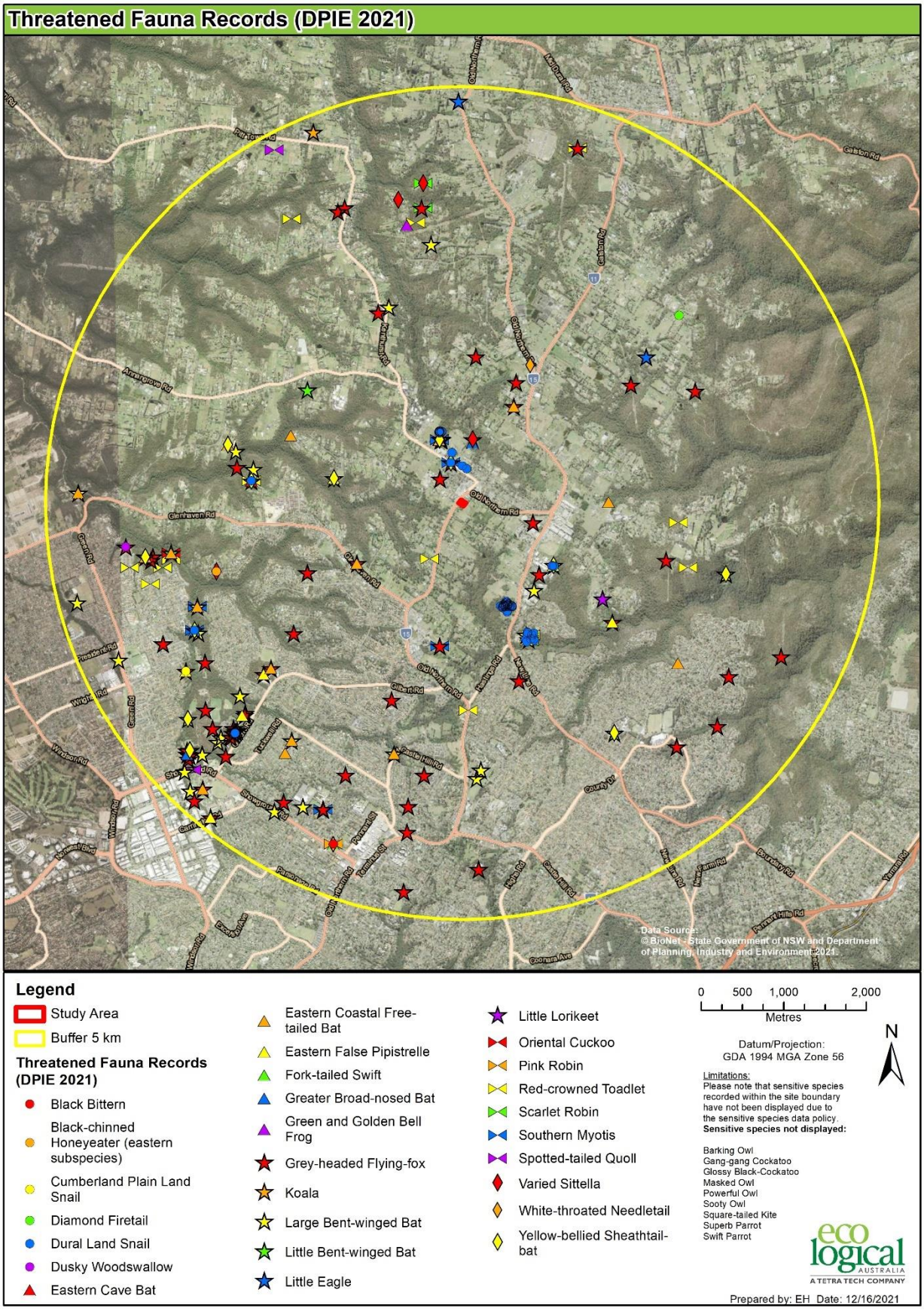

Figure 4: BioNet threatened fauna species records

4.2 Field survey results

4.2.1 Vegetation communities

4.2.1.1 Study area vegetation

The field survey identified that the vegetation within the study area contains planted native species and exotic species and weeds. No remnant vegetation was recorded within the study area (Figure 5).

Native Planted Vegetation

Several mature canopy species have been planted along the boundary between the two residential properties. These include *Corymbia maculata* (Spotted Gum) and *Eucalyptus bicostata* (Southern Blue Gum). *Eucalyptus bicostata* is not a locally indigenous or coastal species, occurring west of the Great Dividing Ranges. *Corymbia maculata* is also not considered a locally indigenous species to the area. Both species are commonly utilised in landscaping.

The rear of 683-685 Old Northern Road, Dural also contained additional mature native planted species including *Corymbia maculata* and *Angophora costata* (Sydney Red Gum). Opportunistic native species have established including two *Acacia parramattensis* (Parramatta Wattle) in the midstorey and occasional native ground cover species; *Dichondra repens* (Kidney Weed), *Oplismenus aemulus* (Australian Basket Grass) and *Microlaena stipoides* (Weeping Grass). The remaining vegetation contained exotic landscaping species and weeds.

Weeds and Exotics

Exotic species included landscaped varieties incorporated into garden beds, including *Jacaranda mimosifolia* (Jacaranda), *Cupressus* sp., *Lagerstroemia* sp. (Crepe Myrtle), *Liquidambar styraciflua* (American Sweetgum), *Syagrus romanzoffiana (*Queen Palm) and *Ulmus parvifolia (*Chinese Elm).

4.2.2 Flora species

A total of 72 flora species were identified within the study area (Appendix A). Exotic species represented the majority of the species recorded within the study area. A total of 61 exotic species and 11 native species were recorded opportunistically within the study area.

4.2.3 Threatened flora species

No threatened flora species were recorded within the study area during field surveys or from BioNet results.

The vegetation within the study area has been subject to recent and historical clearing and is fragmented from patches of remnant or intact native vegetation. The study area is unlikely to support habitat for threatened flora species.

4.2.4 Priority weeds

Of the weeds identified during field surveys, five species are listed as State priority weeds, and seven are listed as other weeds of regional concern. Weeds present within the study area, along with their priority listing under the *Biosecurity Act 2016*, their associated asset/value at risk and whether they are Weeds of National Significance (WoNS), are present in Table 2.

Species identified as state-level priority weeds or WONS should be removed from the site prior to works being undertaken and disposed of appropriately as green waste at landfill. This is to ensure that the weeds will not spread across the site or onto adjacent land during earthworks. As a precaution, "come-clean go-clean measures" should be implemented as part of the site Construction Environmental Management Plan, to ensure new weed species are not introduced to the site or dispersed from the site to other locations.

Table 2: State level determined priority weeds and other weeds of concern present

Scientific name	Common name	WONS	Priority weed obligations
State level priority weeds			
Asparagus aethiopicus	Ground Asparagus	Yes	Asset protection[1]
Asparagus asparagoides	Bridal Creeper	Yes	Asset protection[1]
Lantana camara	Lantana	Yes	Asset protection[1]
Rubus fruticosus agg.	Blackberry	Yes	Asset protection[1]
Senecio madagascariensis	Fireweed	Yes	Asset protection[1]
Weeds of Other Regional Concern			
Ageratina adenophora	Crofton Weed	No	Environment/ Agriculture[2]
Araujia sericifera	Moth Vine	No	Environment[2]
Cenchrus clandestinus	Kikuyu	No	Environment[2]
Ligustrum lucidum	Broad-leaf Privet	No	Environment, Human Health[2]
Lonicera japonica	Japanese Honeysuckle	No	Environment[2]
Solanum mauritianum	Wild Tobacco Bush	No	Environment/ Agriculture[2]

[1] Mandatory measure (Whole of NSW)

[2] Regional Strategic Response

4.2.5 Fauna species and their habitat

There were no threatened fauna species identified from BioNet records or recorded within the study area during field surveys. Additionally, the study area contains limited habitat features such as hollow-bearing trees (HBTs), logs or large patches of intact native vegetation. Despite the absence of most habitat features, the study area contains a number of nectar-producing species, primarily canopy Eucalyptus species. These may provide foraging resources to arboreal mammals and birds during flowering periods.

A list of habitat features recorded in the study area is available in Table 3 below.

Table 3: Habitat features recorded in the study area

Habitat feature	Associated species	Presence
Large expanse of native vegetation	Birds, microchiropteran bats (microbats), megachiropteran bats (fruit bats), arboreal mammals, reptiles	Absent in the study area.
Nectar producing species	Arboreal mammals/birds and fruit bats	Present in the study area as Myrtaceae canopy species

Habitat feature	Associated species	Presence
Hollow-bearing trees	Microbats, birds, mammals, amphibians, reptile	Possible HBT located along the boundary of the two properties.
Coarse woody debris (fallen logs)	Terrestrial mammals, reptiles, invertebrates	Present
Leaf litter	Reptiles, amphibians, invertebrates	Minor
Water body	Amphibians, reptiles, microbats	Absent within the study area.
Rocky outcrops	Microbats, reptiles	Absent
Mistletoe	Arboreal mammals/birds and fruit bats	Absent
Winter flowering species	Winter migratory birds, arboreal mammals and megachiropteran bats (fruit bats)	Absent

BATS

There are a number of threatened microbat species recorded within 5 km of the study area, which may occasionally forage within the study area. However, higher quality habitat for these species occurs outside of the study area in the wider locality, particularly along vegetated riparian areas and within large areas of intact vegetation.

One potential tree hollow was observed (5-10cm wide) within the study area but did not show signs of active use. Given the size of the hollow and location within a highly disturbed landscape, it is unlikely to be used as breeding habitat for threatened microbats. Confirmation of this tree hollow and existing fauna use can only be determined via tree climbing or an elevated work platform.

Additionally, the canopy species within the study area may attract megachiropteran (fruit bats) such as *Pteropus poliocephalus* (Grey-headed Flying-fox). The nearest Grey-headed Flying-fox camp to the study area is the nationally important camp at the Ku-ring-gai Flying-fox Reserve in Gordon, located 15 km south-east of the study area. The habitat within the study area is considered to be marginal for Grey-headed Flying-fox, with higher quality foraging habitat present throughout the locality along vegetated riparian corridors.

BIRDS

The vegetation within the study area provides marginal habitat for common peri-urban bird species. The presence of exotic fruit and tall canopy species may provide seasonal foraging for some urbanised species.

Habitat resources within the study area however, are considered marginal for threatened species. The vegetation lacks an intact canopy or other habitat features (such as HBTs) required for most threatened species. One possible HBT was recorded within the study area, this HBT had an entrance between 5-10 cm wide. Whilst no evidence of fauna use observed, it may provide suitable habitat for medium hollow-dependent bird species.

One threatened nocturnal species, *Ninox strenua* (Powerful Owl) was considered to have potential to utilise the vegetation within the study area on occasion. This species requires large tree-hollows and intact vegetation which contains suitable habitat for prey items (such as possums/ gliders). The field

survey did not record suitable habitat for possums within the study area. Therefore, the vegetation is considered very marginal seasonal foraging for Powerful Owl within the study area.

INVERTEBRATES

The vegetation in the study area does not support habitat for threatened invertebrate, *Pommerhelix duralensis* (Dural Land Snail). The study area lacks suitable habitat for this species in the form of leaf litter or rocks.

AMPHIBIANS

The study area lacks watercourses or standing waterbodies and therefore no suitable habitat for amphibians was recorded within the study area.

4.2.6 Connectivity

The vegetation within the study area contains limited connectivity between patches of intact native vegetation. Some connectivity is maintained along busy urban streets through street plantings and in private lands. This stepping stone corridor is likely to support limited movement and exchange of genetic material of native flora and fauna species.

4.2.7 Threatened fauna species

Based on the absence of BioNet records and poor-quality vegetation and fauna habitat recorded within the study area, no Tests of Significance under the BC Act or Assessment of Significance under the EPBC Act are required for threatened species.

Plate 1: Vegetation zone 1 planted native species

Plate 2: Planted native canopy and exotic species along the boundary between the two properties

Plate 3: Exotic species and weeds recorded in the study area

Plate 4: Possible hollow which may provide habitat for fauna species recorded within study area

Figure 5: Validated vegetation map and fauna habitat

5. Impact assessment

5.1 Direct impacts

5.1.1 Clearing of vegetation

The proposed works will result in the clearing of native planted species and exotic vegetation (Figure 6). Some of the vegetation within the study area has already been approved for removal by Hornsby Council under tree removal application TA/37/2021. A total of 0.08 ha of native vegetation will be impacted within the study area (Table 4).

Table 4: Assessment of vegetation impacted in the subject site

Vegetation community	Direct Impact (ha)
Planted native (to NSW)	0.08
Planted exotics	0.06
TOTAL	0.14

No remnant native vegetation communities will be directly impacted. Given the lack of connectivity with intact remnant vegetation, removal of vegetation within the study area will not result in the fragmentation or isolation of native vegetation.

5.1.2 Loss / modification of threatened species habitat

Habitat for threatened species within the study area is poor and limited to marginal foraging habitat for highly mobile threatened birds and bats. Given the small area of planted native vegetation impacted (0.08 ha) and the lack of connectivity to remnant native vegetation, the loss of this foraging habitat will have a negligible impact on threatened fauna. Threatened species occurring within the locality are likely to forage within vegetated riparian corridors with connectivity to large intact remnants.

One potential tree hollow was observed (5-10cm wide) within the study area but did not show signs of active use. Given the size of the hollow and location within a highly disturbed landscape, it is unlikely to be used as breeding habitat for threatened microbats or birds. No other important fauna habitat features occur within the study area.

No threatened flora species were observed, and none are considered likely to occur based on the highly disturbed condition of the vegetation.

Figure 6: Vegetation/habitat impact area

5.2 Other indirect impacts

Indirect impacts are those impacts that do not directly affect habitat and individuals but have the potential to interfere through indirect action. Indirect impacts considered for this assessment are site impacts (noise, light and weed invasion) and downwind impacts (sedimentation, dust, accidental spills and leaks).

During the construction, noise, dust and to a small degree vibration will be emitted which could have an indirect impact on local fauna. These impacts result from the operation of heavy machinery to clear vegetation and construct the buildings and infrastructure. These impacts are short term only and therefore are unlikely to significantly impact fauna. Also, during the construction period there is a risk that sediment runoff may impact adjacent native vegetation and nearby tributaries if appropriate sediment and erosion measures are not in place. These impacts will be managed via an appropriate sediment and erosion control plan. The overall impacts are likely to be minor.

Possible increase in weed infestation can result if weed propagules are introduced or moved around by machinery during construction. Weed control measures are recommended below to minimise this risk.

As such, indirect impacts to threatened species and native vegetation are unlikely to be significant and will be managed.

5.3 Biodiversity Conservation Act 2016

5.3.1 BC Act – Test of Significance

A 'test of significance' (also known as a 5-part test) is required for a Part 4 development to determine if the development is likely to have a significant impact on any threatened species, population or ecological community. If a significant impact is indicated by the 5-part test, then the proposal would trigger the BOS and a BDAR is required.

No threatened fauna species were recorded in the study area during the survey. Furthermore, suitable foraging habitat for threatened fauna species was limited within the study area due to the relatively small amount of planted native vegetation present and lack of habitat features. The removal of this habitat for the proposed development is considered negligible on a local scale and would not result in a long-term decline in the population of threatened fauna species.

Several species of microbats listed as threatened under the BC Act, may infrequently utilise foraging resources within the study area. One small potential tree hollow was recorded but did not show any signs of use (scratches and guano). Therefore, no test of significance for microbats or other threatened species were conducted under Section 7.3 of the BC Act.

5.3.2 Key threatening processes

The Key Threatening Processes (KTPs) listed under the BC Act and / or EPBC Act that are likely to be relevant to the proposed works include:

- Clearing of native vegetation (BC Act) / Land clearance (EPBC Act).

5.4 EPBC Act – Assessment of Significance

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

No Assessment of Significance were undertaken for EPBC Act listed species due to the lack of habitat identified within the study area.

6. Recommendations

The following measures are recommended to reduce the potential impacts of the proposed development, including habitat for threatened species and ecological processes. The ameliorative measures have been designed in consideration of relevant legislation and guidelines.

Table 5: Recommendations

Species / sensitive area	Potential impact	Appropriate mitigation measure
Planted native vegetation	Compaction of soil Accidental damage/clearing	Pre-construction: • Install temporary barrier fencing to prevent entry into adjacent vegetation and appropriate 'no-go zone' signage. • Installation of tree protection measures as per the Arboricultural Impact Assessment (ELA 2021). During construction: • Maintain temporary fencing to prevent access into retained vegetation. Post construction: • Stabilise all disturbed areas, implement vegetation protection measures as required. • Consider use of locally occurring native vegetation within the landscape plan.
Sediments and erosion control	Increase in sediment flow into stormwater	Pre-construction: • A Sediment and Erosion Control Plan is required prior to any on-ground works. • Soil and erosion control measures such as sediment fencing must be installed prior to on-ground works. These are to be inspected regularly and more frequently during rain periods to ensure structures are in proper working order. Post-construction: • Bare areas should be mulched, using on-site native vegetation if removed, following clearance works to prevent erosion or soil damage. Alternatively, erosion prone areas, when not in use, may be covered with biodegradable weed matting or similar product.
Spread of weeds and disease	Introduction of new weeds species	Pre-construction: • All state-priority weeds and WONS (see Section 4.2.4) are to be bagged, removed from site and disposed of as green waste

Species / sensitive area	Potential impact	Appropriate mitigation measure
		at landfill to reduce the spread of these species During construction: • All equipment must be thoroughly cleaned of soil and weed propagules prior to entry into the study area. • All equipment must be cleaned before exiting the study area.
Fauna habitat	Potential tree hollow identified within the study area contains native fauna	This tree should be removed under supervision by an ecologist to ensure animal welfare and capture / relocation if required.

7. Conclusion

Eco Logical Australia (ELA) was contracted by Healing ONR Pty Ltd to prepare a FFA to support a planning proposal for 679-681 (Lot 3, DP 395437) and 683-685 (Lot 1, DP 120004) Old Northern Road, Dural. The planning proposal seeks an Additional Permitted Use (APU) for a health services facility and an increase in height from 10.5 metres to 14 metres.

Approximately 0.08 ha of planted vegetation that is native to NSW will be removed under the indicative concept plan. The amount of native vegetation clearing does not exceed the native vegetation clearing threshold under the Biodiversity Offsets Scheme (BOS) and the land in the study area is not mapped on the Biodiversity Values Map. Therefore, the BOS will not be triggered by future development of the study area and a BDAR will not be required.

The study area contains two existing residential dwellings and planted native vegetation. No remnant vegetation was recorded within the study area. No threatened flora and fauna species were recorded within the study area. The study area contains native canopy species which may provide supplementary foraging habitat for urbanised threatened birds, microbat and flying-fox species. However, no tests of significance were undertaken for threatened species, given the impact of the proposed works are considered negligible on foraging habitat for these species.

Following consideration of the administrative guidelines for determining a significant impact under the EPBC Act, it is considered that the Planning Proposal and indicative concept plan for the study area is unlikely to have a significant impact on any threatened flora and fauna species and therefore, a referral to the Commonwealth will not be required.

Mitigation measures to manage potential impacts includes tree protection for retained trees, sediment and erosion control measures to prevent stormwater pollution, come clean / go clean measures to reduce introduction of new weed species and supervision by an ecologist for removal of the potential hollow-bearing tree to ensure animal welfare and capture / relocation if required.

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Appendix A Flora and fauna species list

Table 6: Flora species recorded within the study area

Scientific Name	Common name	Exotic*
Acacia parramattensis	Parramatta Wattle	
Ageratina adenophora	Crofton Weed	*
Alocasia brisbanensis	Cunjevoi	*
Angophora costata	Smooth-barked Apple	
Araujia sericifera	Moth Vine	*
Asparagus aethiopicus	Ground Asparagus	*
Asparagus asparagoides	Bridal Creeper	*
Bidens pilosa	Cobbler's Pegs	*
Bougainvillea sp.		*
Brachychiton acerifolius	Flame Bottletree	
Bromus catharticus	Prairie Grass	*
Callistemon citrinus	Crimson Bottlebrush	
Celtis sinensis	Chinese Celtis	*
Cenchrus clandestinus	Kikuyu	*
Chlorophytum comosum	Spider Plant	*
Cordyline sp.		*
Corymbia maculata	Spotted Gum	
Cupressus sp.		*
Dichondra repens	Kidney Weed	
Duranta erecta		*
Ehrharta erecta	Vasey Grass	*
Eucalyptus bicostata	Southern Blue Gum	
Ficus elastica	Rubber Tree	*
Fragaria sp.	Strawberries	*
Galium aparine	Cleavers	*
Gamochaeta calviceps	Cudweed	*
Gardenia sp.		*
Hibiscus sp.		*
Hypochaeris radicata	Flatweed	*
Jacaranda mimosifolia	Jacaranda	*
Lagerstroemia sp.	Crepe Myrtle	*
Lantana camara	Lantana	*
Lavandula sp.	Lavender	*
Leptospermum polygalifolium subsp. polygalifolium	Tantoon	
Ligustrum lucidum	Broad-leaf Privet	*
Liquidambar styraciflua	American Sweetgum	*
Lolium perenne	Perennial Ryegrass	*
Lonicera japonica	Japanese Honeysuckle	*
Lysimachia arvensis	Scarlet Pimpernel (Anagallis)	*
Malus domestica	Apple Tree	*

Scientific Name	Common name	Exotic*
Medicago spp.		*
Melaleuca quinquenervia	Prickly-leaved Paperbark	
Microlaena stipoides	Weeping Meadow Grass	
Modiola caroliniana	Red-flowered Mallow	*
Morus alba	White Mulberry	*
Murraya sp.		*
Nandina domestica	Japanese Sacred Bamboo	*
Nerium oleander	Oleander	*
Nothoscordum borbonicum	Onion Weed	*
Oplismenus aemulus	Australian Basket Grass	
Oxalis articulata		*
Pelargonium sp.		*
Photinia sp.		*
Phytolacca octandra	Inkweed	*
Plantago lanceolata	Plantain	*
Prunus persica	Peach Tree	*
Quercus robur	English Oak	*
Rhododendron sp.	Azalea	*
Rosa sp.		*
Salvia rosmarinus	Rosemary	*
Senecio madagascariensis	Fireweed	*
Sida rhombifolia	Paddy's Lucerne	*
Solanum mauritianum	Wild Tobacco	*
Solanum nigrum	Black-berry Nightshade	*
Soliva sessilis	Bindii	*
Stenotaphrum secundatum	Buffalo Grass	*
Strelitzia nicolai	Bird of Paradise	*
Syagrus romanzoffiana	Queen Palm	*
Taraxacum officinale	Dandelion	*
Ulmus parvifolia	Chinese Elm	*
Verbena bonariensis	Purple Tops	*
Viola odorata	Sweet Violet	*

* Denotes exotic species

Table 7: Fauna species recorded within the study area or adjacent lands

Class	Family	Scientific Name	Common Name
Aves	Artamidae	*Cracticus tibicen*	Australian Magpie
Aves	Artamidae	*Cracticus torquatus*	Grey Butcherbird
Aves	Cacatuidae	*Cacatua galerita*	Sulphur-crested Cockatoo
Aves	Cuculidae	*Eudynamys orientalis*	Eastern Koel
Aves	Cuculidae	*Scythrops novaehollandiae*	Channel-billed Cuckoo

Class	Family	Scientific Name	Common Name
Aves	Corvidae	*Corvus coronoides*	Australian Raven
Aves	Meliphagidae	*Anthochaera chrysoptera*	Little Wattlebird
Aves	Meliphagidae	*Manorina melanocephala*	Noisy Miner
Aves	Monarchidae	*Grallina cyanoleuca*	Magpie-lark
Aves	Psittaculidae	*Trichoglossus haematodus*	Rainbow Lorikeet
Reptilia	Scincidae	*Lampropholis delicata*	Delicate Skink

* Denotes exotic species

Appendix B : Likelihood of occurrence

The table below provides the collated results from the 5 km database searches (buffered around the study area) of the NSW Wildlife Atlas and the EPBC Protected Matters Search Tool. An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database searches. 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 field survey and professional judgement. The terms for likelihood of occurrence are defined below:

- "yes" 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.

The likelihood of occurrence was only one factor among other factors, which was used to determine whether to apply the Assessment of Significance' (5-part test) and/or EPBC Significant Impact Criteria assessments to threatened species, populations, communities or migratory species.

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
ECOLOGICAL COMMUNITIES				
Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion (BC Act) Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion (EPBC Act)	V	E	Occurs within the local government areas of Bankstown, Blacktown, Campbelltown, Hawkesbury, Liverpool and Penrith. Mainly found in the Castlereagh area of the Cumberland Plain, with small patches occurring at Kemps Creek and Longneck Lagoon; also present around Holsworthy. 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.	No - this community was not identified within the study area during field survey.
Coastal Upland Swamps in the Sydney Basin Bioregion	EEC	EEC	Occur primarily on impermeable sandstone plateaux with shallow groundwater aquifers in the headwaters and impeded drainage lines of streams, and on sandstone benches with abundant seepage moisture. Generally associated with acidic soils.	No – not identified within the study area
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion (BC Act, EPBC Act)	E	CE	Occurs in western Sydney, with the most extensive stands occurring in the Castlereagh and Holsworthy areas. Smaller remnants occur in the Kemps Creek area and in the eastern section of the Cumberland Plain. Mainly occurs on clay soils derived from the deposits of ancient river systems (alluvium), or on shale soils of the Wianamatta Shales.	No - this community was not identified within the study area during field survey.
Cumberland Plain Woodland in the Sydney Basin Bioregion (BC Act) Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest (EPBC Act)	CE	CE	Remnants scattered widely across the Cumberland Plain in western Sydney. Typically occurs on heavy clay soils derived from Wianamatta Shale. 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	No - this community was not identified within the study area during field survey.
Moist Shale Woodland in the Sydney Basin Bioregion (BC Act) Western Sydney Dry Rainforest and Moist	E	CE	Cumberland Plain Sub-region of the Sydney Basin Bioregion. It generally occurs in rugged terrain and other patches may occur on undulating terrain, with dry rainforest patches typically occupying steep lower slopes and gullies, and moist woodland patches typically occupying upper sections of the slope. Occurs almost exclusively on clay soils derived from Wiannamatta Group shales."	No - this community was not identified within the study area during field survey.

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
Woodland on Shale (EPBC Act)				
River-Flat Eucalypt Forest on Coastal Floodplains of the NSW north coast, Sydney Basin and SE corner Bioregions (BC Act)	E	-	This 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, E. amplifolia, Angophora floribunda and A. subvelutina.	No - this community was not identified within the study area during field survey.
Shale-Gravel Transition Forest in the Sydney Basin Bioregion (BC Act) Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest (EPBC Act)	E	CE	This vegetation community typically has an open forest structure with a canopy dominated by *Eucalyptus fibrosa* with *Eucalyptus moluccana* (Grey Box) and *Eucalyptus tereticornis* occurring less frequently. *Melaleuca decora* (Paperbark) is common in the small tree layer. A sparse shrub layer is usually present which includes *Bursaria spinosa* (Blackthorn), *Daviesia ulicifolia* (Gorse Bitter Pea) and *Lissanthe strigosa*.	No - this community was not identified within the study area during field survey.
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	CE	CE	Occurs at the edges of the Cumberland Plain, where clay soils from the shale rock intergrade with earthy and sandy soils from sandstone, or where shale caps overlay sandstone. The boundaries are indistinct, and the species composition varies depending on the soil influences. It typically occurs in moderately wet sites, with an annual rainfall of 800-1100mm per year, and on clay soils derived from Wianamatta shale. The tree canopy is dominated by Turpentine and a variety of eucalypt species. Its distribution is mainly on the Cumberland Plain of the Sydney region. Was not recorded during the site inspection.	No - this community was not identified within the study area during field survey.
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act) Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland (EPBC Act)	E	E	The ecological community occurs in coastal catchments, mostly at elevations of less than 20 m above sea-level (ASL) that are typically found within 30 km of the coast. However, this distance varies by catchment. This community typically occurs on unconsolidated sediments, including alluvium deposits, and where soils formed during the Quaternary period as a result of sea-level rise during the Holocene period (Sloss et al., 2007). The ecological community can also occur on peaty soils. Occurrences of swamp oak trees on rocky headlands or other consolidated substrates are not considered to be a part of the ecological community, but areas where soils transition into unconsolidated sediments may	No - this community was not identified within the study area during field survey.

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence
			contain the ecological community. The ecological community is typically found where groundwater is saline or brackish, but can occur in areas where groundwater is relatively fresh. It is typically found on coastal flats, floodplains, drainage lines, lake margins, wetlands and estuarine fringes where soils are at least occasionally saturated, water-logged or inundated	
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	CEEC	CEEC	Occurs close to the shale/sandstone boundary on the more fertile shale influenced soils, in higher rainfall areas on the higher altitude margins of the Cumberland Plain, and on the shale, ridge caps of sandstone plateaus. Open forest, with dominant canopy trees including *Syncarpia glomulifera* (Turpentine), *Eucalyptus punctata* (Grey Gum), *E. paniculata* (Grey Ironbark) and *E. eugenioides* (Thin-leaved Stringybark). In areas of high rainfall (over 1050 mm per annum) *E. saligna* (Sydney Blue Gum) is more dominant. The shrub stratum is usually sparse and may contain mesic species such as *Pittosporum undulatum* (Sweet Pittosporum) and *Polyscias sambucifolia* (Elderberry Panax).	No

Table 8: Likelihood of occurrence of threatened fauna species within 5 km of the study area

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Actitis hypoleucos	Common Sandpiper	-	M	Summer migrant. In NSW, widespread along coastline and also occurs in many areas inland. Coastal wetlands and some inland wetlands, especially muddy margins or rocky shores. Also, estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	0	No – no suitable habitat in the study area and lack of records in the locality	No.
Anthochaera phrygia	Regent Honeyeater	E4A	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions. Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of Casuarina cunninghamiana (River Oak).	0	No – no suitable habitat in the study area and lack of records in the locality	No.
Apus pacificus	Fork-tailed Swift	-	M	Recorded in all regions of NSW. Riparian woodland., swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	2	No – no suitable habitat in the study area and lack of records in the locality	No.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Widespread in NSW from coast to inland including the western slopes of the Great Dividing Range and farther west. Species have also been recorded in southern and southwestern Australia. Woodlands and dry open sclerophyll forest, usually eucalypts and mallee associations. Also have recordings in shrub and heathlands and various modified habitats, including regenerating forests. In western NSW, this species is primarily associated with River Red Gum/Black Box/Coolabah open forest/woodland and associated with larger river/creek systems.	2	No – no suitable habitat in the study area and lack of records in the locality	No.

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Botaurus poiciloptilus	Australasian Bittern	E1	E	Found over most of NSW except for the far north-west. Permanent freshwater wetlands with tall, dense vegetation, particularly Typha spp. (bullrushes) and Eleocharis spp. (spikerushes).	0	No – no suitable habitat in the study area and lack of records in the locality	No.
Calidris acuminata	Sharp-tailed Sandpiper	-	M	Summer migrant. Widespread in most regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions. Shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	0	No – no suitable habitat in the study area and lack of records in the locality	No.
Calidris ferruginea	Curlew Sandpiper	E1	CE, M	Occurs along the entire coast of NSW, and sometimes in freshwater wetlands in the Murray-Darling Basin. Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	0	No – no suitable habitat in the study area and lack of records in the locality	No.
Calidris melanotos	Pectoral Sandpiper	-	M	Shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	0	No – no suitable habitat in the study area and lack of records in the locality	No.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	Forest and woodland, urban fringes.	4	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Callocephalon fimbriatum	Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local	E2; V	-	The population is believed to be largely confined to an area bounded by Thornleigh and Wahroonga in the north, Epping and North Epping in the south, Beecroft and Cheltenham in the west and Turramurra/South Turramurra to the east. Found in forest and woodland, urban fringes.	2	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
	Government Areas						
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	Open forest and woodlands of the coast and the Great Dividing Range where stands of Sheoak occur.	5	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes. Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	0	No – no suitable foraging or roosting habitat in the study area and lack of records in the locality	No
Cuculus optatus	Oriental Cuckoo	-	M	Non-breeding habitat: monsoonal rainforest, vine thickets, wet sclerophyll forest or open casuarina, acacia or eucalyptus woodland.	2	No – no suitable habitat in the study area and lack of records in the locality	No
Daphoenositta chrysoptera	Varied Sittella	V	-	Inhabits eucalypt forests and woodlands, mallee and *Acacia* woodland.	4	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Dasyurus maculatus maculatus (SE mainland population)	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	2	No – no suitable habitat in the study area	No.
Falco hypoleucos	Grey Falcon	E	-	Restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions and occasionally in open woodlands near the coast.	0	No – no suitable habitat in the study area	No.

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	South-east coast and ranges of Australia, from southern Qld to Victoria and Tasmania. In NSW, records extend to the western slopes of the Great Dividing Range. Tall (greater than 20m) moist habitats.	11	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Gallinago hardwickii	Latham's Snipe	-	M	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW. Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands.	0	No – no suitable habitat in the study area	No. Impacts are negligible for this mobile species
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.	4	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Grantiella picta	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas. Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	Distributed along the coastline of mainland Australia and Tasmania, extending inland along some of the larger waterways, especially in eastern Australia. 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.	0	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Heleioporus australiacus	Giant Burrowing Frog	V	V	South eastern NSW and Victoria, in two distinct populations: a northern population in the sandstone geology of the Sydney Basin as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria. Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	0	No – no suitable habitat in the study area and lack of records in the locality	No

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
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.	2	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Hirundapus caudacutus	White-throated Needletail	-	M	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide. Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	8	No – no suitable habitat in the study area and lack of records in the locality	No
Hoplocephalus bungaroides	Broad-headed Snake	E1	V	Dry and wet sclerophyll forests, riverine forests, coastal heath swamps, rocky outcrops, heaths, grassy woodlands.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Ixobrychus flavicollis	Black Bittern	V	-	Found in terrestrial and estuarine wetlands in areas of permanent water and dense vegetation.	3	No – no suitable habitat in the study area and lack of records in the locality	No
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	E1	E	Heath or open forest with a heathy understorey on sandy or friable soils.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Lathamus discolor	Swift Parrot	E1	CE; M	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes. Box-ironbark forests and woodlands.	3	No – no suitable habitat in the study area	No. Impacts are negligible for this mobile species
Litoria aurea	Green and Golden Bell Frog	E1	V	Since 1990, recorded from ~50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region. Marshes, dams and	1	No – no suitable habitat in the study area and	No

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				stream-sides, particularly those containing Typha spp. (bullrushes) or Eleocharis spp. (spikerushes). Some populations occur in highly disturbed areas.		lack of records in the locality	
Litoria littlejohni	Littlejohn's Tree Frog	V	V	Breeding habitat is the upper reaches of permanent streams and perched swamps. Non-breeding habitat is heath-based forests and woodlands	0	No – no suitable habitat in the study area and lack of records in the locality	No
Lophoictinia isura	Square-tailed Kite	V	-	In NSW, it is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast. Timbered habitats including dry woodlands and open forests, particularly timbered watercourses.	3	No – no suitable habitat in the study area and lack of records in the locality	No
Macquaria australasica	Macquarie Perch	E1	E	River and lake habitats, especially the upper reaches of rivers and their tributaries.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	-	Open forests or woodlands dominated by box and ironbark eucalypts, or by smooth-barked gums, stringybarks, river she-oaks and tea-trees.	0	Unlikely – lack of suitable habitat in the study area	No
Meridolum corneovirens	Cumberland Plain Land Snail	E1	-	Primarily inhabits CPW. Also occurs in Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest.	0	Unlikely – lack of suitable habitat in the study area	No
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.	20	Potential, marginal foraging habitat available in the study area	No

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Miniopterus australis	Little Bent-winged Bat	V	-	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub.	17	Unlikely – lack of suitable foraging or roosting habitat in the study area	No. Impacts are negligible for this mobile species
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. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia. Breeding or roosting colonies can number from 100 to 150,000 individuals. Hunt in forested areas, catching moths and other flying insects above the tree tops.	51	Unlikely – lack of suitable roosting habitat in the study area	No
Mixophyes balbus	Stuttering Frog	E1	V	Rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Monarcha melanopsis	Black-faced Monarch	-	M	In NSW, occurs around the eastern slopes and tablelands of the Great Divide, inland to Coutts Crossing, Armidale, Widden Valley, Wollemi National Park and Wombeyan Caves. It is rarely recorded farther inland. 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	No – no suitable habitat in the study area and lack of records in the locality	No
Monarcha trivirgatus	Spectacled Monarch	-	M	Mountain/lowland rainforest, wooded gullies, riparian vegetation including mangroves.	0	No – no suitable habitat in the study area and	No

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
						lack of records in the locality	
Motacilla flava	Yellow Wagtail	-	M	Regular summer migrant to mostly coastal Australia. In NSW recorded Sydney to Newcastle, the Hawkesbury and inland in the Bogan LGA. Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Myiagra cyanoleuca	Satin Flycatcher	-	M	In NSW, widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains. Eucalypt-dominated forests, especially near wetlands watercourses, and heavily vegetated gullies.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Myotis macropus	Southern Myotis	V	-	In NSW, found in the coastal band. It is rarely found more than 100 km inland, except along major rivers. Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 20m.	9	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Ninox connivens	Barking Owl	V	-	Woodland and open forest, including fragmented remnants and partly cleared farmland, wetland and riverine forest.	5	No – no suitable habitat in the study area and lack of records in the locality	No
Ninox strenua	Powerful Owl	V	-	Woodland, open sclerophyll forest, tall open wet forest and rainforest.	87	No – no suitable habitat in the study area and lack of records in the locality	No. Impacts are negligible for this highly mobile species.
Numenius madagascariensis	Eastern Curlew	-	CE, M	Summer migrant to Australia. Primarily coastal distribution in NSW, with some scattered inland records. Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms,	0	No – no suitable habitat in the study area and lack of records in the locality	No

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.			
Petauroides volans	Greater Glider	-	V	In Eastern Australia, it is found from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest). Eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Petrogale penicillata	Brush-tailed Rock-wallaby	E1	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Petroica boodang	Scarlet Robin	V	-	Inhabits dry eucalypt forests and woodlands. Requires abundant logs and fallen timber.	2	No – no suitable habitat in the study area and lack of records in the locality	No
Petroica rodinogaster	Pink Robin	V	-	Inhabits rainforest and tall, open eucalypt forests with dense vegetated gullies.	1	No – no suitable habitat in the study area and lack of records in the locality	No
Phascolarctos cinereus	Koala	V	V	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands in eucalypt woodlands and forests.	4	Unlikely, not observed during site inspection	No - area to be impacted not considered primary habitat.
Pluvialis squatarola	Grey Plover	-	M	Mudflats, saltmarsh, tidal reefs and estuaries.	2	No – no suitable habitat in the study area.	No

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Polytelis swainsonii	Superb Parrot	V	V	Found in inland NSW. Inhabits Box-Gum, Box-Cypress-pine and Boree Woodlands vegetation communities.	1	No – no suitable habitat in the study area and lack of records in the locality	No
Pommerhelix duralensis	Dural Land Snail	E1	E	Shale-sandstone transitional landscapes. Found in Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest; Turpentine-Ironbark Forest; Shale/Sandstone Transition Forest; Turpentine Ironbark Margin Forest; Hinterland Sandstone Gully Forest; and Sydney Hinterland Transition Woodland.	31	No – no suitable habitat in the study area.	No
Prototroctes maraena	Australian Grayling	-	V	Coastal rivers and streams, fresh and brackish coastal lagoons.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Pseudomys novaehollandiae	New Holland Mouse	-	V	Fragmented distribution across eastern NSW. Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Pseudophryne australis	Red-crowned Toadlet	V	-	Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter. Breeding congregations occur in dense vegetation and debris beside ephemeral creeks and gutters. Red-crowned Toadlets have not been recorded breeding in waters that are even mildly polluted or with a pH outside the range 5.5 to 6.5. Eggs are laid in moist leaf litter, from where they are washed by heavy rain. Disperses outside the breeding period, when they are found under rocks and logs on sandstone ridges and forage amongst leaf-litter.	17	Unlikely – lack of suitable habitat in the study area	No

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	129	No breeding or roosting habitat. May occasionally forage within the study area.	No. Impacts are negligible for this highly mobile species
Rhipidura rufifrons	Rufous Fantail	-	M	Coastal and near coastal districts of northern and eastern Australia, including on and east of the Great Divide in NSW. Wet sclerophyll forests, subtropical and temperate rainforests. Sometimes drier sclerophyll forests and woodlands.	0	No – no suitable habitat in the study area and lack of records in the locality	No
Rostratula australis	Australian Painted Snipe	E1	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Swamps, dams and nearby marshy areas.	0	Unlikely – lack of suitable habitat in the study area	No
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	It forages for insects above the canopy in eucalypt forests, and closer to the ground in more open country. It is dependent on suitable hollow-bearing trees to provide roost sites. The species has also been recorded using caves and abandoned sugar glider nests as roost sites. Breeding occurs between December and mid-March.	14	Potential, marginal foraging habitat available in the study area	No
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	Both sides of the great divide, from the Atherton Tableland in Qld to north-eastern Victoria, mainly along river systems and gullies. In NSW it is widespread on the New England Tablelands. Woodland, moist and dry eucalypt forest and rainforest.	13	Potential, marginal foraging habitat available in the study area	No
Stagonopleura guttata	Diamond Firetail	V	-	Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects. Groups separate into small colonies to breed, between August and January. Nests are globular structures built either in the	1	Unlikely – lack of suitable habitat in the study area	No

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting.			
Synemon plana	Golden Sun Moth	E1	CE	Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by Austrodanthonia spp. (wallaby grasses).	0	No – no suitable habitat in the study area and lack of records in the locality	No
Thinornis rubricollis rubricollis	Hooded Plover (eastern)	E4A	V	Forages in sand, rocks and coastal lagoons for marine worms, molluscs, crustaceans, insects, water plants and seeds. At night they favour the upper zones of beaches for roosting. In eastern Australia, Hooded Plovers usually breed from August to March on sandy ocean beaches, between the high-water mark and the base of the fore-dunes. The nest is a scrape in the sand near debris.	0	Unlikely – lack of suitable habitat in the study area	No
Tringa nebularia	Common Greenshank	-	M	Summer migrant to Australia. Recorded in most coastal regions of NSW; also, widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions. 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 in the study area	No
Tyto novaehollandiae	Masked Owl	V	-	Often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt	3	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species

Scientific name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of Records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				forested gullies, using large tree hollows or sometimes caves for nesting.			
Tyto tenebricosa	Sooty Owl	V	-	Roosts by day in the hollow of a tall forest tree or in heavy vegetation; hunts by night for small ground mammals or tree-dwelling mammals such as the *Pseudocheirus peregrinus* (Common Ringtail Possum) or *Petaurus breviceps* (Sugar Glider). Nests in very large tree-hollows.	1	Unlikely – lack of suitable habitat in the study area	No. Impacts are negligible for this mobile species
Vespadelus troughtoni	Eastern Cave Bat	V	-	A cave-roosting species; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals. Little is understood of its feeding or breeding requirements or behaviour.	1	Unlikely – lack of suitable roosting habitat in the study area	No

Table 9: Likelihood of occurrence of threatened flora species within 5 km of the study area

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence on site	Impact assessment required
Acacia bynoeana	Bynoe's Wattle	E1	V	Found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. Heath or dry sclerophyll forest on sandy soils.	6	Unlikely - suitable habitat not identified within the study area.	No
Acacia gordonii	-	E1	E	Sclerophyl forest and healthlands amongst or within rock platforms on sandstone outcrops.	0	Unlikely - suitable habitat not identified within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence on site	Impact assessment required
Acacia pubescens	Downy Wattle	V	V	Restricted to the Sydney region around the Bankstown-Fairfield-Rookwood and Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. Open woodland and forest, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. Occurs on alluviums, shales and at the intergrade between shales and sandstones.	15	Unlikely - suitable soils not identified within the study area.	No
Allocasuarina glareicola	-	E1	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool. Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla* and *Melaleuca decora*.	0	Unlikely - suitable habitat not identified within the study area.	No
Asterolasia elegans	-	E1	E	*Asterolasia elegans* is restricted to a few localities on the NSW Central Coast north of Sydney, in the Baulkham Hills, Hawkesbury and Hornsby LGAs. It is found in sheltered forests on mid- to lower slopes and valleys, in or adjacent to gullies.	0	Unlikely - suitable habitat not identified within the study area.	No
Caladenia tessellata	Thick-lipped Spider-orchid			The Thick Lip Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s. The species occurs on the coast in Victoria from east of Melbourne to almost the NSW border. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.	0	Unlikely - suitable habitat not identified within the study area.	No
Cynanchum elegans	White-flowered Wax Plant	E1	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in the Illawarra region, and as far west as Merriwa in the upper Hunter River valley. 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	0	Unlikely - suitable habitat not identified within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence on site	Impact assessment required
				(Spotted Gum) open forest and woodland; and *Melaleuca armillaris* (Bracelet Honeymyrtle) scrub.			
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	*Cryptostylis hunteriana* is known from a range of vegetation communities including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); where it appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta*). Occurs in Coastal Plains	0	Unlikely - suitable habitat not identified within the study area.	No
Cynachum elegans	White-flowered Wax Plant	E1	E	*Asterolasia elegans* is restricted to a few localities on the NSW Central Coast north of Sydney, in the Baulkham Hills, Hawkesbury and Hornsby LGAs. It is found in sheltered forests on mid- to lower slopes and valleys, in or adjacent to gullies.	0	Unlikely - suitable habitat not identified within the study area.	No
Darwinia biflora	-	V	V	Woodland, open forest or scrub-heath on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone.	99	Unlikely - suitable habitat not identified within the study area.	No
Epacris purpurascens var. purpurascens	-	V	-	*Epacris purpurascens* var. *purpurascens* has been recorded between Gosford in the north to Avon Dam in the south, in a range of habitats, but most have a strong shale soil influence. Flowers July to September on the Coast, mainly October to November on Tablelands.	182	Unlikely - suitable habitat not identified within the study area.	No
Eucalyptus camfieldii	Camfield's Stringybark	V	V	Coastal heath on shallow sandy soils overlying Hawkesbury sandstone, mostly on exposed sandy ridges.	1	Unlikely - suitable habitat not identified within the study area.	No
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	This species is sparsely distributed but widespread on the New England Tablelands from Nundle to north of Tenterfield, being most common in central portions of its range. Found largely on private property and roadsides, and occasionally in conservation reserves. Planted as urban trees, windbreaks	3	Unlikely - suitable habitat not identified within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence on site	Impact assessment required
				and corridors. Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock.			
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	Unlikely - suitable habitat not identified within the study area.	No
Eucalyptus sp. Cattai	-	E4A	CE	Eucalyptus sp. Cattai occurs in the area between Colo Heights and Castle Hill, north western Sydney. It occurs as a rare emergent in scrub, heath and low woodland on sandy soils, usually as isolated individuals or occasionally in small groups. The sites at which it occurs are generally flat and on ridge tops and associated soils are laterised clays overlying sandstone. Suitable habitat unlikely to exist in the locality.	0	Unlikely - suitable habitat not identified within the study area.	No
Genoplesium baueri	Bauer's Midge Orchid	E1	E	Has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens. Dry sclerophyll forest and moss gardens over sandstone.	0	Unlikely - suitable habitat not identified within the study area.	No
Grammitis stenophylla	Narrow-leaf Finger Fern	E1	-	Rainforest and moist eucalypt forest, usually near streams, on rocks or in trees.	1	Unlikely - suitable habitat not identified within the study area.	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	Unlikely - suitable habitat not identified within the study area.	No
Haloragodendron lucasii	-	E1	E	Confined to a very narrow distribution on the north shore of Sydney. Dry sclerophyll forest and low open woodland on sheltered slopes near creeks, in moist sandy loam soils.	0	Unlikely - suitable habitat not identified within the study area.	No
Hibbertia superans	-	E1	-	*Hibbertia superans* mainly occurs in the north west Sydney region between Baulkham Hills and Wisemans Ferry, with a disjunct occurrence near Mt Boss (inland from Kempsey) on the Mid North Coast of NSW. In the Sydney region	52	Unlikely - suitable habitat not identified within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence on site	Impact assessment required
				it occurs in dry sclerophyll forest on sandstone ridgetops while the northern occurrence is on granite. Flowers July to December.			
Lasiopetalum joyceae	-	V	V	Restricted to the Hornsby Plateau south of the Hawkesbury River, between Berrilee and Duffys Forest. Heath on lateritic to shale ridgetops over sandstone.	0	Unlikely - suitable habitat not identified within the study area.	No
Leptospermum deanei	Deane's Tea-tree	V	V	Hornsby, Warringah, Ku-ring-gai and Ryde LGAs in the Sydney region. Woodland, riparian scrub and open forest on lower hill slopes or near creeks, on sand or sandy alluvial soil.	0	Unlikely - suitable habitat not identified within the study area.	No
Leucopogon fletcheri subsp. *fletcheri*	-	E1	-	Restricted to north-western Sydney between St Albans in the north and Annangrove in the south, within the local government areas of Hawkesbury, Baulkham Hills and Blue Mountains. This species occurs in dry eucalypt woodland or in shrubland on clayey lateritic soils, generally on flat to gently sloping terrain along ridges and spurs	19	Unlikely - suitable habitat not identified within the study area.	No
Macadamia integrifolia	Macadamia Nut	P	V	Not known to occur naturally in the wild in NSW. Occurs in drier subtropical rainforest.	0	Unlikely - suitable habitat not identified within the study area.	No
Melaleuca biconvexa	Biconvex Paperbark	V	V	Grows in low lying areas on alluvial soils. It is found between Jervis Bay to Wyong.	0	Unlikely - suitable habitat not identified within the study area.	No
Melaleuca deanei	Deane's Melaleuca	V	V	Found in heath on sandstone and associated with woodland on broad ridge tops and slopes on sandy loam and lateritic soils. Potential habitat may exist in the locality.	11	Unlikely - suitable habitat not identified within the study area.	No
Olearia cordata	-	V	V	Inhabits dry open sclerophyll forest and open shrubland on sandstone ridges.	0	Unlikely - suitable habitat not identified within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence on site	Impact assessment required
Persicaria elatior	Knotweed	V	V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). Beside streams and lakes, swamp forest or disturbed areas.	0	Unlikely - suitable habitat not identified within the study area.	No
Persoonia hirsuta	Hairy Geebung	E1	E	Scattered distribution around Sydney, from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	15	Unlikely - suitable habitat not identified within the study area.	No
Persoonia mollis subsp. maxima	-	E1	E	Restricted to the Hornsby Heights-Mt Colah area north of Sydney. Dry to wet sclerophyll forest, in deep sheltered gullies or steep upper hillsides on Hawkesbury Sandstone.	11	Unlikely - suitable habitat not identified within the study area.	No
Pimelea curviflora var. curviflora	-	V	V	Confined to the coastal area of the Sydney and Illawarra regions between northern Sydney and Maroota in the north-west and Croom Reserve near Albion Park in the south. Woodland, mostly on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes.	34	Unlikely - suitable habitat not identified within the study area.	No
Pimelea spicata	Spiked Rice-flower	E1	E	Two disjunct areas; the Cumberland Plain (Marayong and Prospect Reservoir south to Narellan and Douglas Park) and the Illawarra (Landsdowne to Shellharbour to northern Kiama). Well-structured clay soils. *Eucalyptus moluccana* (Grey Box) communities and in areas of ironbark on the Cumberland Plain. Coast Banksia open woodland or coastal grassland in the Illawarra.	0	Unlikely - suitable habitat not identified within the study area.	No
Pomaderris brunnea	Brown Pomaderris	E1	V	In NSW, found around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands. Moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	1	Unlikely - suitable habitat not identified within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence on site	Impact assessment required
Pterostylis gibbosa	Illawarra Greenhood	E1	E	Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra). Open forest or woodland, on flat or gently sloping land with poor drainage.	0	Unlikely - suitable habitat not identified within the study area.	No
Pterostylis saxicola	Sydney Plains Greenhood	E1	E	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines, adjacent to sclerophyll forest or woodland on shale/sandstone transition soils or shale soils.	0	Unlikely - suitable habitat not identified within the study area.	No
Pultenaea parviflora	-	E1	V	Endemic to the Cumberland Plain. Dry sclrophyll forest, especially Castlereagh Ironbark Forest, Shale Gravel Transition Forestand transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.	0	Unlikely - suitable habitat not identified within the study area.	No
Rhizanthella slateri	Eastern Ungerground Orchid	V	E	A highly crpytic species which lives completely below the soil surface. Occurs in less than 10 known locations in NSW including Bulahdelah, the Watagans, Blue Mountains, Wiseman's Ferry and Agnes Banks.	0	Unlikely - suitable habitat not identified within the study area.	No
Rhodamnia rubescens	Scrub Turpentine, Brown Malletwood	CE	CE	Typically occurs in coastal regions north from Batemans Bay, NSW to areas inland of Bundaberg, QLD. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	0	Unlikely - suitable habitat not identified within the study area.	No
Rhodomyrtus psidioides	Native Guava	CE	CE	Occurs from Broken Bay, NSW to Maryborough, QLD. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	0	Unlikely - suitable habitat not identified within the study area.	No
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Subtropical and littoral rainforest on gravels, sands, silts and clays.	7	Unlikely - suitable habitat not identified within the study area.	No
Tetratheca glandulosa	Glandular Pink-bell	V	-	Associated with ridgetop woodland habits on yellow earths also in sandy or rocky heath and scrub. Often associated with sandstone / shale interface where soils have a stronger clay influence. Flowers July to November.	62	Unlikely - suitable habitat not identified within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence on site	Impact assessment required
Thesium australe	Austral Toadflax	V	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands. Grassland on coastal headlands or grassland and grassy woodland away from the coast.	0	Unlikely - suitable habitat not identified within the study area.	No
Zieria involucrata	-	E	V	Primarly located on Hakesbury sandstone. It is found in sheltered slopes and vallies of drier communities.	0	Unlikely - suitable habitat not identified within the study area.	No

BC ACT STATUS:X – EXTINCT, CE = CRITICALLY ENDANGERED; E = ENDANGERED; E1 = ENDANGERED; E2 = ENDANGERED POPULATION; EPBC ACT STATUS: CE = CRITICALLY ENDANGERED, E = ENDANGERED, V = VULNERABLE, M = MIGRATORY

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