D21/78776

Abel Ecology

Prescribed Ecological Actions Report (PEAR)

For a Planning Proposal

Marsden High School
22 Winbourne Street
West Ryde NSW 2114

Proposed recreational facility

Prepared for:	**School Infrastructure NSW**
Report No:	**AE21-REP-2253-Issue 2 Planning Proposal**
Prepared by:	**Abel Ecology**
Date:	**10 May 2021**

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Document History

Report	Version	Prepared by	Technical Review by	Proofread by	Submission	
					Method	Date
Report	Draft A	Dr Danny Wotherspoon		Denise McNamara	Dropbox	08 Mar 21
Report	Issue 1	Dr Danny Wotherspoon		Denise McNamara	Dropbox	01 Apr 21
Report	Issue PP	Dr Danny Wotherspoon		Denise McNamara	Dropbox	16 Apr 21
Report	Issue PP2	Dr Danny Wotherspoon		Jane Bonwick	Dropbox	10May 21

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List of Abbreviations

ALS	Actual Lot Size
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016*
BCR	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
d.b.h.	Diameter at breast height (~1.4 metres)
EEC	Endangered Ecological Community
ESD	Ecologically Sustainable Development
LEP	Local Environmental Plan
LGA	Local Government Area
MLS	Minimum Lot Size

Note regarding maps in this report

The diagrams/site maps used in this report have been supplied by and are used with the permission of NSW Health Infrastructure.

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Executive summary

The proposal is to rezone the land from SP2 to RE1 and E2.

A biodiversity survey was carried out at Marsden High School to assess the likely impacts of the proposal on species and ecological communities present on the site, and whether the proposal requires a Biodiversity Development Assessment Report (BDAR) because it is a likely trigger to entry into the Biodiversity Offsets Scheme identified in s. 7.4 of the *Biodiversity Conservation Act 2016*.

This report also describes whether there is likely to be any significant effect on any endangered ecological community, endangered population, threatened species or their habitats, as per the listings in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) (Commonwealth legislation).

The areas to be affected are landscape plantings and mown playing fields.

The following three considerations are triggers for entry into the Biodiversity Assessment Method for a Part 3 proposal.

Threshold Trigger 1: Exceeding the clearing threshold on an area of native vegetation
Threshold Trigger 2: Development or a prescribed activity is carried out on land included in the Biodiversity Values Land Map.
Threshold Trigger 3: A "significant effect" on threatened species or ecological communities

There is no impediment to this proposal in the scope of this report. None of the three thresholds for entry into the Biodiversity Offsets Scheme are triggered by the proposal.

A report prepared using the Biodiversity Assessment Method is not recommended.

Recommendations:

- A Biodiversity Development Assessment Report (BDAR) is not required.
- Loss of trees that could in future provide hollows for fauna habitat needs to be replaced with fauna nest boxes erected within the retained forest.
- Light spill from floodlights needs to be avoided by shielding so that direct light does not shine into the forest area.

Figure 1. Aerial view of site.

Site location

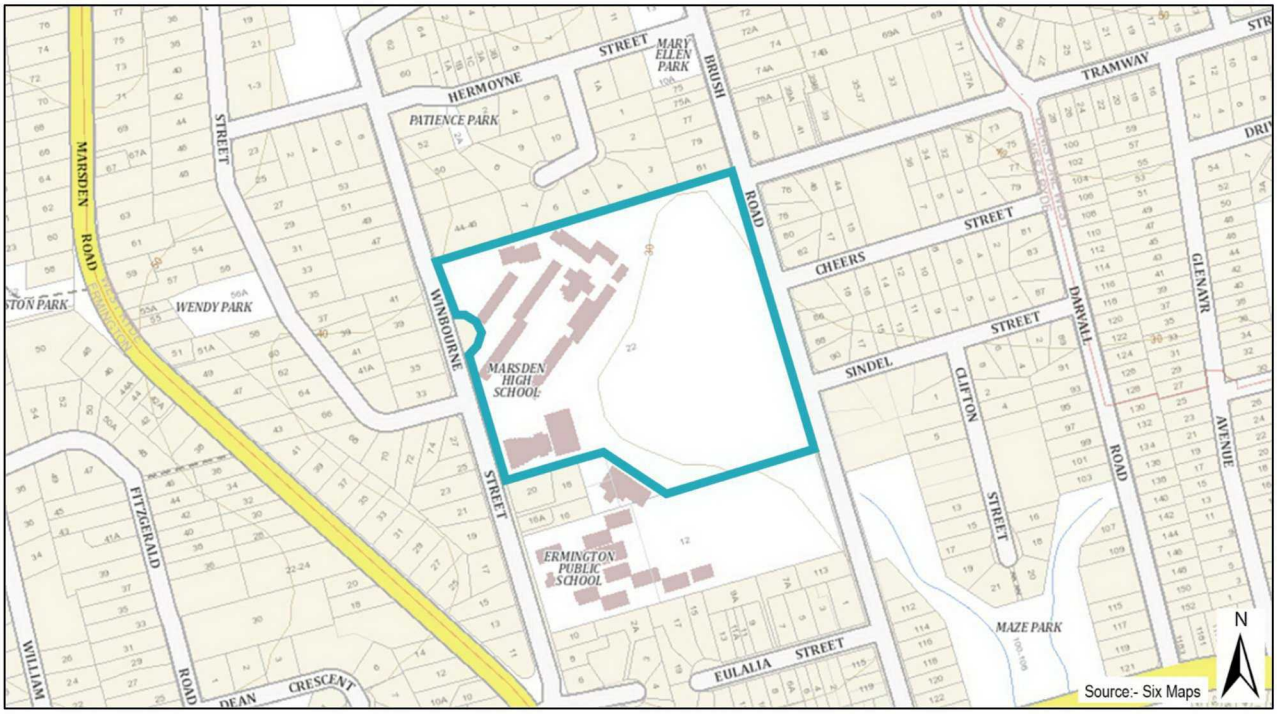

Figure 2. Topographic view of site.

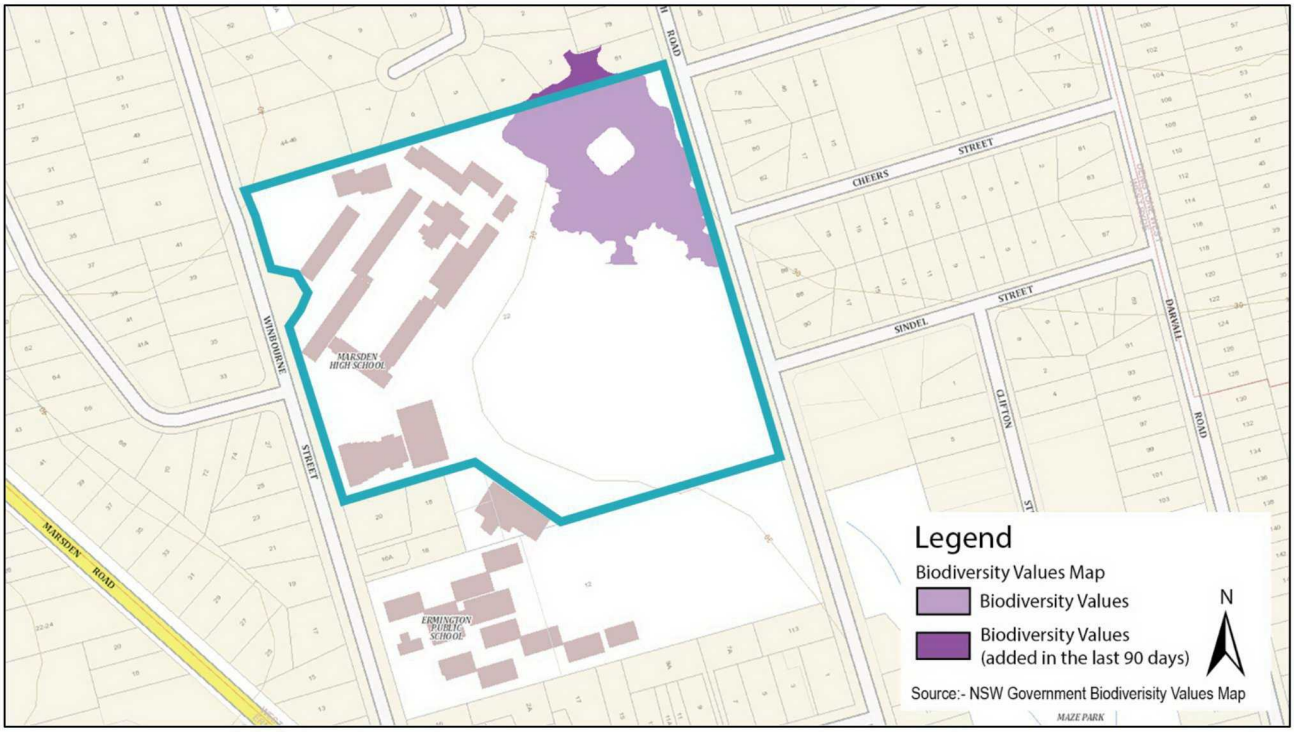

Figure 3. Locality and Biodiversity Value Map of site.

Key

Site location

https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

Figure 4. Proposal diagram

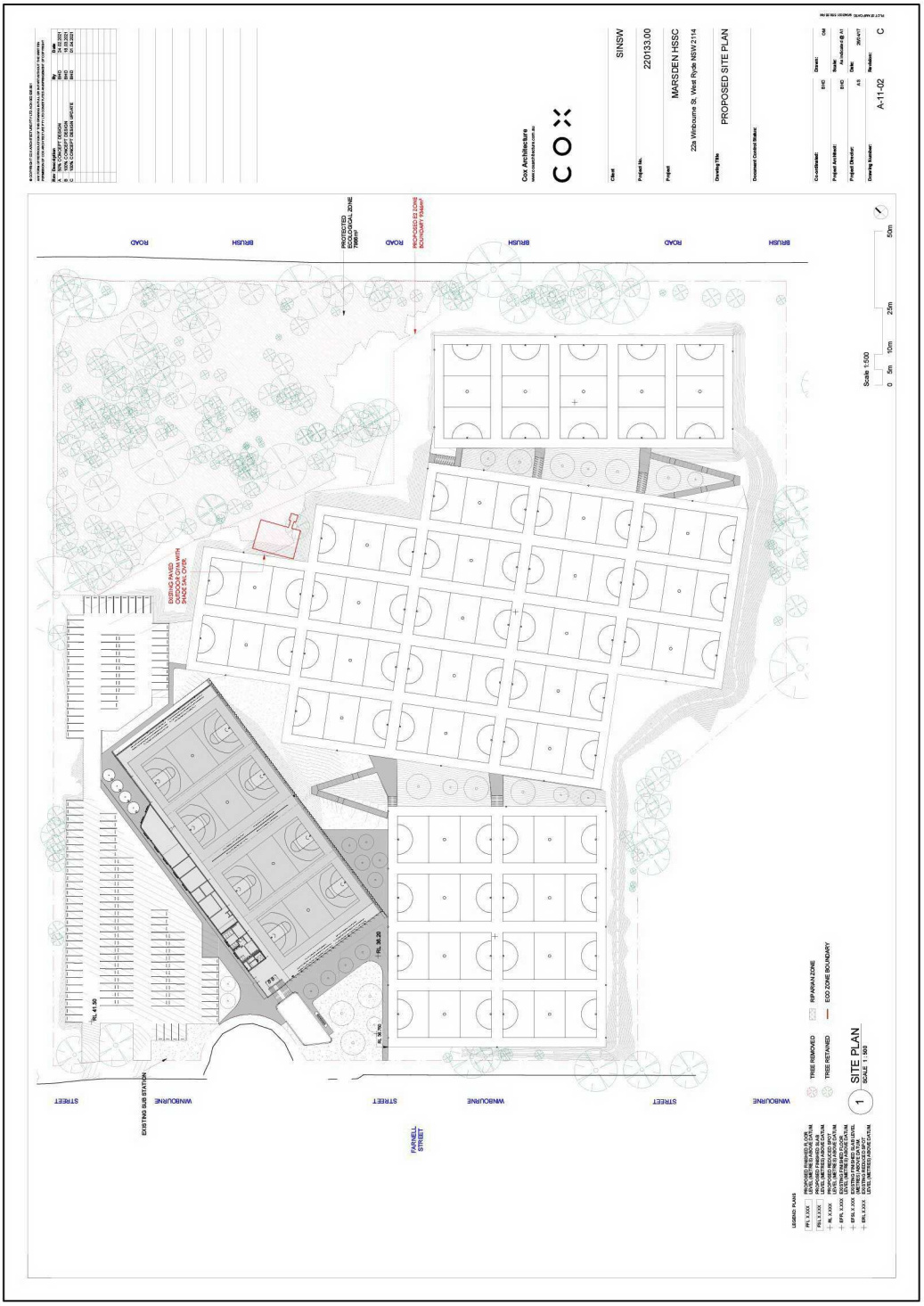

Figure 5. Proposal diagram with proposed E2 zone boundary.

Figure 6. Area of Blue Gum High Forest on the site.

The remainder of the site is mown lawns and landscape plantings.

Figure 7. Aerial photo with Vegetation map, Ecological and bushfire constraints on the site.

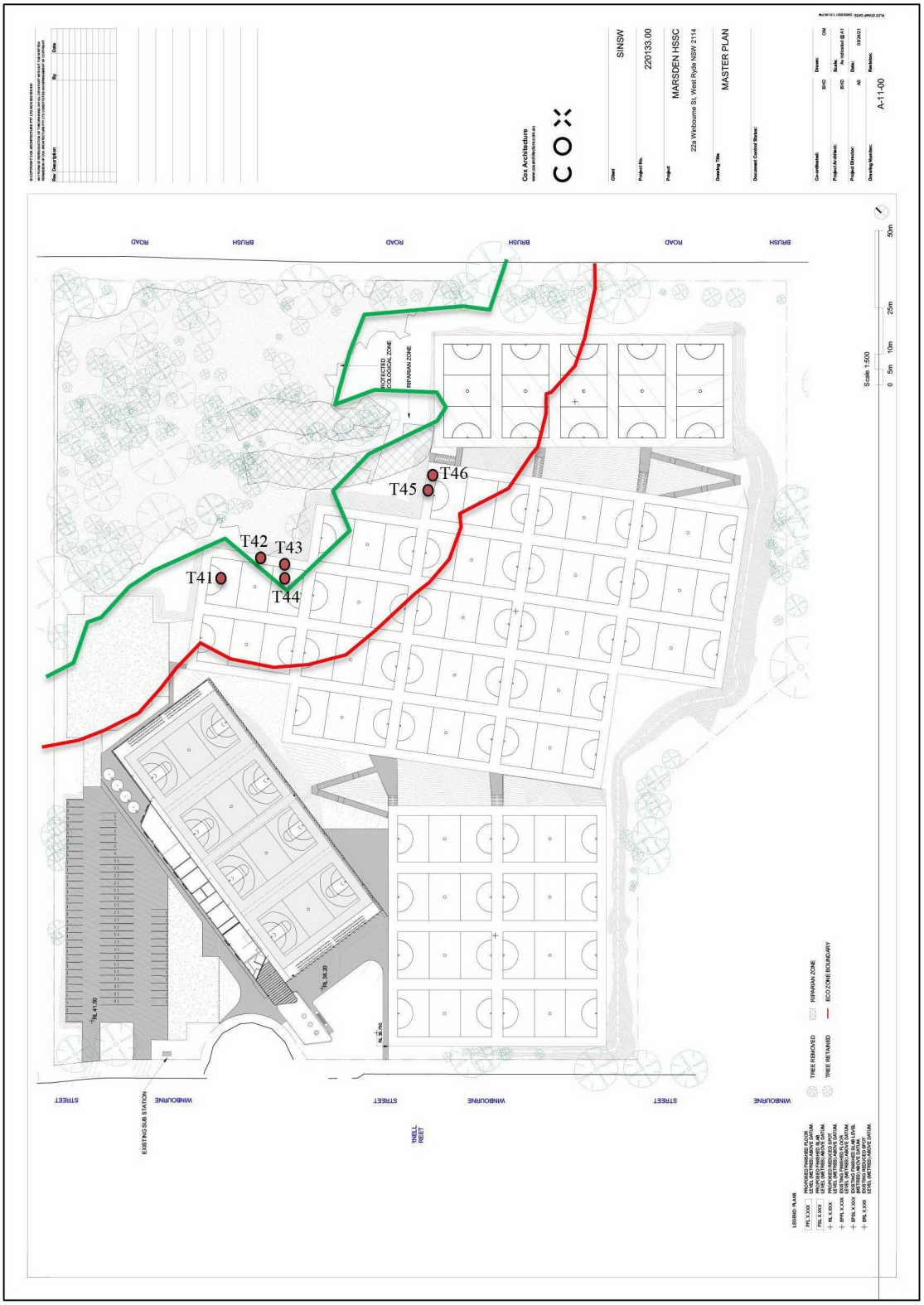

Figure 8. Vegetation and habitat map for the site.

Vegetation contributing to Bushfire Hazard

Bushfire attack line 10kW/m²

Tree site locations and numbers

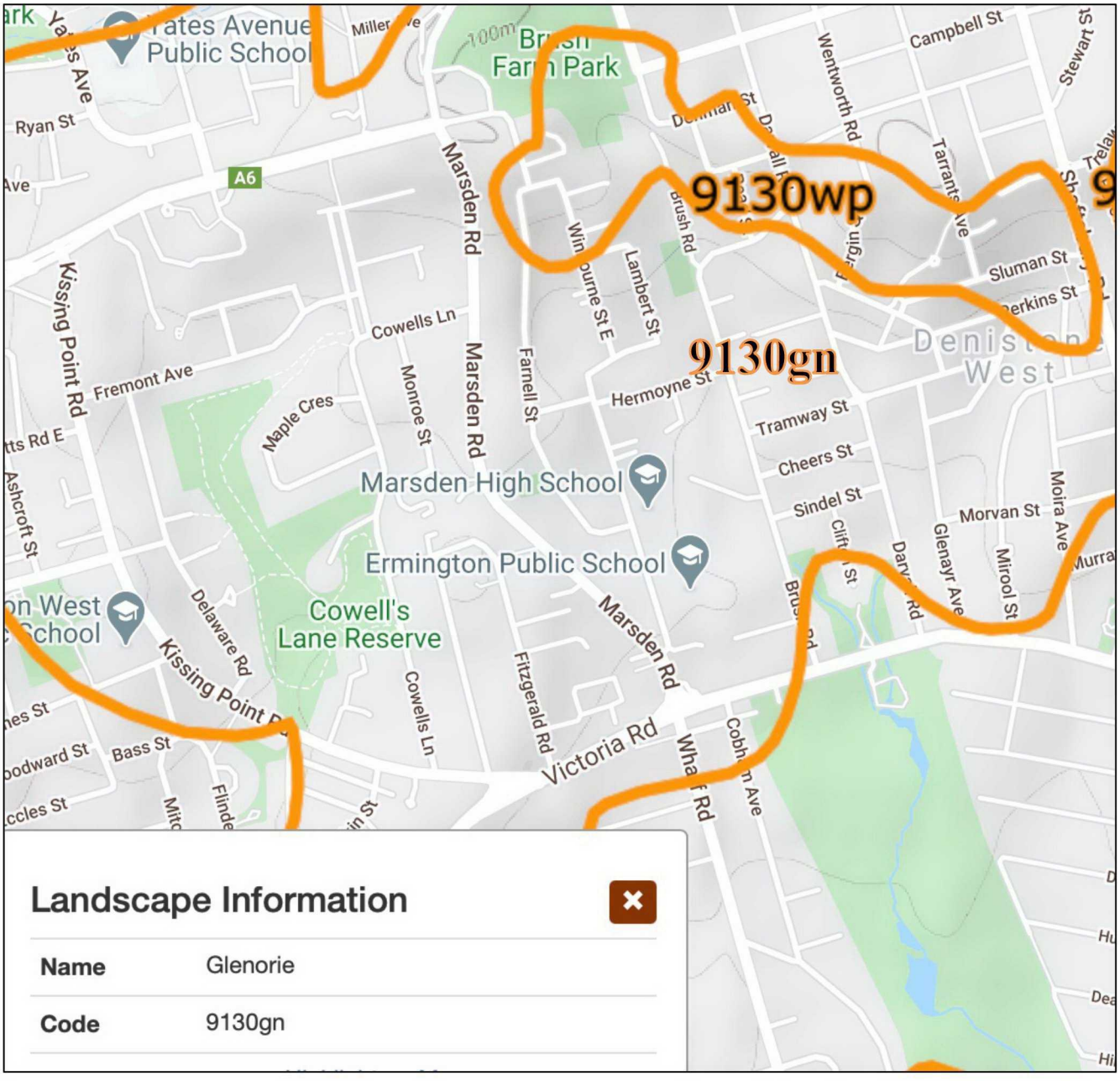

Figure 9. Soil Landscapes of site and surrounding area.

Map extract from the eSpade website: https://www.environment.nsw.gov.au/eSpade2WebApp

Figure 10. Site 1943 air photo.

1. Introduction

1.1 Legislative context

This Prescribed Ecological Actions Report meets the requirements of the *Biodiversity Conservation Act 2016* to enable a Council or other consent or determining authority to assess a proposed development or activity under Part 3 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The authority must consider the following three Biodiversity Offset Scheme Development Thresholds.

Threshold Trigger 1: Exceeding the clearing threshold on an area of native vegetation,

Threshold Trigger 2: Development or a prescribed activity is carried out on land included in the Biodiversity Values Land Map,

Threshold Trigger 3: A "significant effect" on threatened species or ecological communities.

A biodiversity survey of the proposed development site at Marsden High School ('the site' – Figure 1, Figure 2, Figure 3,) was undertaken on 14 and 22 December 2020 and 2 March 2021. This Prescribed Ecology Actions Report investigates whether the impacts of proposal to redevelop the site will trigger either of the two thresholds to entry into the Biodiversity Offsets Scheme, thereby requiring a Biodiversity Development Assessment Report.

This assessment addresses both 'endangered' and 'vulnerable', as required by the Biodiversity Conservation Act 2016 (BCA 2016). Throughout this report 'threatened' refers to those species and communities listed as 'endangered' or 'vulnerable' in Schedules 1 & 2 of the BC Act 2016.

If any of the three thresholds are triggered, then a Biodiversity Development Assessment Report (BDAR) must be prepared by an accredited assessor for the Authority to issue a consent or an approval and a calculation of offsetting required.

1.2 The proposal

The proposal (Figure 4, Figure 5) consists of rezoning the land from SP2 to RE1 and E2 to permit with consent a future development application for recreational use which may include:

a) demolition of existing structures,
b) buildings,
c) stormwater detention areas,
d) carparks and driveways,
e) outdoor courts and landscape areas,
f) link up to sewage system,
g) clearing planted and landscape native and exotic vegetation, but not affecting the area marked as purple on the Biodiversity Values Map,
h) bushfire asset protection zone,
i) utilities within the site.

Table 1. Details of lot size and size of proposed native and landscape planting vegetation clearing.

Component of site	Area m²	Proportion of the site %
Whole site	54,820	100
Extent of proposed native vegetation and exotic landscape clearing	6,387	11.3
Extent of clearing of vegetation native to NSW	3,403	6.0

1.3 Sources of information used in this assessment

Literature reviewed in order to assess possible issues relating to this site include:

- Air photo (SIX maps),
- Survey map,
- Vegetation map,
- Schedules to the BC Act 2016,
- Schedules to the EPBC Act 1999,
- OEH Atlas of NSW Wildlife.

2. Biodiversity offsets scheme thresholds 1 and 2

2.1 Threshold One: Biodiversity Conservation Regulation 2017 Development area assessment thresholds

Clearing of native vegetation is declared by clause 7.2(1) to exceed the biodiversity offsets scheme threshold if the area proposed to be cleared exceeds the minimum lot size applicable to the land to be cleared.

Clearing of native vegetation will trigger entry into the offsets scheme if clearing is greater than the assessment threshold. The minimum lot size of land can be found on the NSW planning portal https://www.planningportal.nsw.gov.au/find-a-property/property/.

As a Part 3 development proposal this criterion is relevant.

Table 2: Areas section 7.2(4) Biodiversity Conservation Regulation 2017.

	Land to be considered	**Assessment threshold**
	Minimum lot size of land	**Area of clearing**
A	Less than 1 hectare	0.25 hectare or more
B	Less than 40 hectares but not less than 1 hectare	0.5 hectare or more
C	Less than 1,000 hectares but not less than 40 hectares	1 hectare or more
D	1,000 hectares or more	2 hectares or more

The parcel of land is zoned SP2 and the minimum lot size for this lot is the actual Lot size.
The size of the lot is approximately 56,570 m^2, and row B is appropriate for this proposal. The area of clearing is less than the threshold of 0.5 hectares.

Conclusion
The proposed clearing does not exceed the threshold and entry into the BC Act offset scheme is not required as a result of clearing.

2.2 Threshold Two: Clearing or prescribed activities as listed in the Biodiversity Conservation Regulation 2017 on land included on the Biodiversity Values Map

Part of the site contains land included on the Biodiversity Values Map. The second threshold can be triggered by clearing on the Biodiversity Values Map (Figure 3).
https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

No clearing is proposed on land included in the Biodiversity Values Map.

If one of more of the following prescribed activities are included directly or indirectly on land included on the Biodiversity Values Map as part of the proposal/proposed activity the Biodiversity Offsets Scheme will apply.

The following extracts are from the *Biodiversity Conservation Regulation 2017*:

Part 7 Biodiversity assessment and approvals under Planning Act
7.1 Biodiversity offsets scheme threshold (section 7.4)
(1) Proposed development exceeds the biodiversity offsets scheme threshold for the purposes of Part 7 of the Act if it is or involves:
(a) the clearing of native vegetation of an area declared by clause 7.2 as exceeding the threshold, or
(b) the clearing of native vegetation, or other action prescribed by clause 6.1, on land included on the Biodiversity Values Map published under clause 7.3.

Part 6 Biodiversity offsets scheme
Division 6.1 General
6.1 Additional biodiversity impacts to which scheme applies (sections 6.3 and 6.6 (2) BCR)
(1) The impacts on biodiversity values of the following actions are prescribed (subject to subclause (2)) as biodiversity impacts to be assessed under the biodiversity offsets scheme:
(a) the impacts of development on the following habitat of threatened species or ecological communities:
(i) karst, caves, crevices, cliffs and other geological features of significance,
(ii) rocks,
(iii) human made structures,
(iv) non-native vegetation,

Response

No impacts from the proposal will occur on karsts, caves, crevices, cliffs or other geological features of significance, or rocks, human made structures or non-native vegetation that were present on site and are habitat for threatened species or ecological communities.

3. Landscape features of the site and the locality

3.1 Site description

For the purposes of this report, the site is defined by the Lot boundaries (Figure 2). It is 5.482 ha. in size and the elevation is 30 m above sea level.

The site is sloped to the southeast, with levelled and filled playing fields.

There is an open drainage line in the northeast corner that is piped under the playing field, to discharge from the southeast corner, then piped under the road and discharge into Maze Park.

The adjacent properties to the east and west are urban residential and the site adjoins Ermington Public School to the south and residential to the north.

https://www.planningportal.nsw.gov.au/find-a-property/

3.2 History of the site

The site was cleared agricultural land in 1943 (Figure 10) and since has been developed as a High School with playing fields.

3.3 Geology

The geology on the site consists of Wianamatta Group Ashfield Shale and Bringelly Shale formations. The Ashfield Shale is comprised of laminite and dark grey shale. Bringelly Shale consists of shale, calcareous claystone, laminite, fine to medium grained lithic-quartz sandstone (Herbert, 1983).

3.4 Site Soils

Site soils are Glenorie 9030gn, shallow to moderately deep (<100 cm) Red Podzolic Soils (Dr2.11) on crests; moderately deep (70–150 cm) Red and Brown Podzolic Soils (Dr2.11, Dr2.21, Db1.11, Db1.21) on upper slopes; deep (>200 cm) Yellow Podzolic Soils (Dy5.11) and Gleyed Podzolic Soils (Dg4.11) along drainage lines.

Dominant Soil Materials
gn1 Friable dark brown loam. This is generally a dark brown, friable loam, silt loam or silty clay loam with moderately to strongly pedal structure and porous rough-faced ped fabric. This material occurs as topsoil (A1 horizon).

gn2 Hardsetting brown clay loam. This is commonly a clay loam to fine sandy clay loam with an apedal massive or weakly pedal structure and an earthy or porous, rough-faced ped fabric. This material occurs as an A2 horizon and is occasionally hardsetting when exposed at the surface.
gn3 Whole-coloured, reddish-brown, strongly pedal clay. This is medium clay with strongly pedal structure and smooth-faced, dense, ped fabric. It generally occurs as subsoil (B horizon).
Texture is generally medium clay but may range from silty clay to heavy clay.

gn4 Mottled grey plastic clay. This is a grey, mottled, medium to heavy clay with strongly pedal structure and dense, smooth ped fabric. It commonly occurs as deep subsoil.

gn5 Brownish-grey plastic silty clay. This is commonly brownish-grey, plastic silty clay which is often saturated and exhibits apedal massive structure. It usually occurs as subsoil (B horizon).
Colour is dark brown (10YR 3/3) often becoming brownish-grey (10YR 4/1) with dark brown mottles at depth. This material is moderately sticky and very plastic when moist. The pH ranges from moderately acid (pH 5.0) to slightly acid (pH 6.5). Rock and charcoal fragments are absent and roots are rare.

The mapped soil landscapes for the site and locality are displayed in Figure 9.

3.5 Landscape features

The majority of the site is a planted landscape that includes exotic and native species of trees and shrubs. The vegetation in the north east corner is remnant forest that has a mown understorey and a drainage line largely vegetated by weeds.

The proposed tree removal diagram A-11-01 - Tree Removal Plan and the tree schedule provided by Bradshaw (2020) was ground-truthed (Figure 7).

The trees tagged T1 to T40 and T50 to T83 are all planted specimens of no particular ecological significance. A number of those such as exotic conifers are incorrectly identified but that is of minor concern. The group of Acacias mapped as 47A may be removed as senescent and a hazard.

The five trees T41, T42, T43, T44 and T46 Sydney Blue Gum *Eucalyptus saligna* are at the edge of the remnant forest and part of that community but not part of the mapped Biodiversity Values Area.

The following landscape features are present on the site (Table 3).

Table 3. Site landscape features

Vegetation	The entire site has been cleared or disturbed. There are few remnant local native trees. A patch of local native vegetation has regenerated in the northeast corner of the site adjacent to a drainage line.
Non-native vegetation	The landscape has potential for foraging habitat for threatened species of bats and birds.
Human structures	Buildings to be demolished have very little potential as bat roosts.
Wetlands/dams/watercourse	A watercourse as a Strahler first order stream runs through the forest area but is piped for most of the site.
Karst, caves, crevices and other geological features of significance	None
Roads	Vehicle traffic and road mortality - no road kill was observed near the site.

3.6 Biodiversity Values area

The Biodiversity Values area is mapped to largely cover an area of regrowth Blue Gum High Forest (Figure 3). However, within the purple area of the map is cleared ground with construction erected as a shade sail and exercise equipment (Figure 5). The proposed E2 zone area (Figure 5) will more closely represent the native vegetation and provide areas for regeneration that will be protected in the future.

4. Field survey methods

4.1 BioNet Atlas of NSW Wildlife website search

Records from the BioNet Atlas of NSW Wildlife website were accessed using the following search criteria:

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -33.75 West: 151.02 East: 151.12 South: -33.85] recorded since 01 Jan 2000 until 03 Mar 2021 returned a total of 16,391 records of 66 species.

These species (Table 4) were considered in designing field survey targets and methods. Unsuitable candidates were eliminated on the basis of habitat requirements (Appendix 4 and Appendix 5).

Table 4: BioNet threatened flora & fauna species records for a 5 km radius of the site since 1 Jan 2000.

Scientific Name	Common Name	NSW status	Comm. status	Potential habitat on site
Pseudophryne australis	Red-crowned Toadlet	V,P		No
Litoria aurea	Green and Golden Bell Frog	E1,P	V	No
Hirundapus caudacutus	White-throated Needletail	P	V,C,J,K	No
Botaurus poiciloptilus	Australasian Bittern	E1,P	E	No
Ixobrychus flavicollis	Black Bittern	V,P		No
Circus assimilis	Spotted Harrier	V,P		No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V,P		No
Hieraaetus morphnoides	Little Eagle	V,P		Yes
Pandion cristatus	Eastern Osprey	V,P,3		No
Callocephalon fimbriatum	Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local Government Areas	E2,V,P,3		Yes

Scientific Name	Common Name	NSW status	Comm. status	Potential habitat on site
Callocephalon fimbriatum	Gang-gang Cockatoo	V,P,3		Yes
^^*Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2		No
Glossopsitta pusilla	Little Lorikeet	V,P		Yes
Lathamus discolor	Swift Parrot	E1,P,3	CE	No
Ninox connivens	Barking Owl	V,P,3		Yes
Ninox strenua	Powerful Owl	V,P,3		Yes
Tyto longimembris	Eastern Grass Owl	V,P,3		No
Tyto novaehollandiae	Masked Owl	V,P,3		Yes
Anthochaera phrygia	Regent Honeyeater	E4A,P	CE	No
Epthianura albifrons	White-fronted Chat	V,P		Yes
Epthianura albifrons	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V,P		Yes
Daphoenositta chrysoptera	Varied Sittella	V,P		No
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V,P		No
Petroica boodang	Scarlet Robin	V,P		No
Petroica phoenicea	Flame Robin	V,P		No
Dasyurus maculatus	Spotted-tailed Quoll	V,P	E	No
Phascolarctos cinereus	Koala	V,P	V	No
Petauroides volans	Greater Glider	P	V	No
Pteropus poliocephalus	Grey-headed Flying-fox	V,P	V	Yes

Scientific Name	Common Name	NSW status	Comm. status	Potential habitat on site
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P		Yes
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V,P		Yes
Chalinolobus dwyeri	Large-eared Pied Bat	V,P	V	Yes
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V,P		Yes
Myotis macropus	Southern Myotis	V,P		Yes
Scoteanax rueppellii	Greater Broad-nosed Bat	V,P		Yes
Miniopterus australis	Little Bent-winged Bat	V,P		Yes
Miniopterus orianae oceanensis	Large Bent-winged Bat	V,P		Yes
Pommerhelix duralensis	Dural Land Snail	E1	E	Yes
Wahlenbergia multicaulis	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2		Yes
Wilsonia backhousei	Narrow-leafed Wilsonia	V		No
^^*Hibbertia spanantha*	Julian's Hibbertia	E4A,2	CE	No
Tetratheca glandulosa		V		No
Epacris purpurascens var. purpurascens		V		No
Dillwynia tenuifolia		V		Yes
Acacia clunies-rossiae	Kanangra Wattle	V		Yes
Acacia pubescens	Downy Wattle	V	V	Yes
Lasiopetalum joyceae		V	V	No

Scientific Name	Common Name	NSW status	Comm. status	Potential habitat on site
Callistemon linearifolius	Netted Bottle Brush	V,3		Yes
Darwinia biflora		V	V	No
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	No
Melaleuca deanei	Deane's Paperbark	V	V	No
Rhodamnia rubescens	Scrub Turpentine	E4A		Yes
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	Yes
Pomaderris prunifolia	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2		Yes
Pimelea curviflora var. curviflora		V	V	No
Zannichellia palustris		E1		No

Table 5: Threatened species targeted in survey and 5 part tests.

Scientific Name	Common Name	NSW status	Comm. status	Potential habitat on site
Hieraaetus morphnoides	Little Eagle	V		Yes
Callocephalon fimbriatum	Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local Government Areas	E2,V		Yes
Callocephalon fimbriatum	Gang-gang Cockatoo	V,P,3		Yes
Glossopsitta pusilla	Little Lorikeet	V,P		Yes
Ninox connivens	Barking Owl	V,P		Yes
Ninox strenua	Powerful Owl	V,P		Yes
Tyto novaehollandiae	Masked Owl	V,P		Yes
Epthianura albifrons	White-fronted Chat	V,P		Yes
Epthianura albifrons	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V		Yes
Pteropus poliocephalus	Grey-headed Flying-fox	V,P	V	Yes
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P		Yes
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V,P		Yes
Chalinolobus dwyeri	Large-eared Pied Bat	V,P	V	Yes
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V,P		Yes
Myotis macropus	Southern Myotis	V,P		Yes
Scoteanax rueppellii	Greater Broad-nosed Bat	V,P		Yes
Miniopterus australis	Little Bent-winged Bat	V,P		Yes

Scientific Name	Common Name	NSW status	Comm. status	Potential habitat on site
Miniopterus orianae oceanensis	Large Bent-winged Bat	V,P		Yes
Pommerhelix duralensis	Dural Land Snail	E1	E	Yes
Wahlenbergia multicaulis	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2		Yes
Dillwynia tenuifolia		V		Yes
Acacia clunies-rossiae	Kanangra Wattle	V		Yes
Acacia pubescens	Downy Wattle	V	V	Yes
Callistemon linearifolius	Netted Bottle Brush	V		Yes
Rhodamnia rubescens	Scrub Turpentine	E4A		Yes
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	Yes
Pomaderris prunifolia	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2		Yes
Blue Gum High Forest in the Sydney Basin Bioregion	Blue Gum High Forest in the Sydney Basin Bioregion	E2	CE	Yes

Species for which suitable habitat occurs on the site within the range of the species but which did not appear in the Atlas record were added to Appendix 4 and Appendix 5.

A general survey was made for relevant threatened fauna species and comprehensive flora survey made (Table 5).

4.2 Field work effort

Over the one day of fieldwork a total of 13 hours were spent undertaking survey work on the site and surrounding habitat areas.

Table 6. Survey dates and weather conditions.

Date	Time	Temperature (°C)	Task	Hours (hrs x no. people)
14 Dec 20	0930-1330	21˚C, raining	Vegetation and fauna survey	4 x 2 = 8
22 Dec 20	0955-1340	28˚C raining	Vegetation and fauna survey	3.5 x 1 = 3.5
1 MAR 21	1520-1705	31˚C fine	Vegetation and fauna survey	1.5 x 1 = 1.5
Total				13

Survey effort was concentrated within the site boundaries, although adjacent surrounding vegetation was noted (Figure 3).

4.3 Flora survey method, vegetation community and habitat classification

A flora survey was conducted to compile vegetation descriptions and species lists for the site. A comprehensive plant survey and one quadrat survey were made for threatened species (See Appendix 5).

Vegetation quality is assessed as described below (Section 4.4). The plant communities on site were classified according to the NSW VIS.

4.4 Simplified vegetation integrity assessment

On-site vegetation may be described according to a simplified vegetation integrity classification for each vegetation zone / habitat type. The simplified vegetation integrity assessment is based upon a modified version of the vegetation integrity assessment described in the NSW Biodiversity Assessment Method (BAM) 2017. This simplified assessment is based upon a qualitative assessment; no quantitative assessment was undertaken and no vegetation integrity score is calculated. The assessment requires the assessor to compare the observed vegetation with the vegetation type presumed to be present prior to 1750 (high quality native vegetation). Vegetation with good or moderate integrity usually provide higher quality habitat for a diverse range of indigenous species.

Four main qualitative classes of vegetation integrity are recognised. There is variation within each class, and in addition the class boundaries are somewhat fluid where one grades into the other.

Good integrity vegetation
Characteristics: Relatively high indigenous species diversity, diversity of flora species growth form (mix of trees, shrubs and groundcovers etc), diversity of tree size, canopy layer regeneration observed,

fallen logs present on the ground, dead vegetative litter (leaves, twigs etc) cover present, weed invasion absent or minimal

Moderate integrity vegetation
Characteristics: Remnants and regenerating areas that have experienced disturbance but appear to retain the capability of recovery. Weed invasion may be moderate.

Poor integrity vegetation
Characteristics: The vegetation is highly disturbed. It typically consists of scattered trees/shrubs or clumps of trees and shrubs. Tree size diversity significantly reduced. The groundcover layer is comprised of a mix of indigenous species and exotic species. Fallen logs rare to absent, ground vegetative litter lacking.

Cleared class
Characteristics: Indigenous canopy species are absent and the indigenous understorey (shrubs/climbers/scramblers/groundcovers) are approximately less than 50%.

Note: some vegetation types naturally lack some of the characteristics. For example, trees are rare to absent in saltmarshes, sedge swamps, alpine herbfields and arid shrublands. However, providing the other characteristics are consistent with a natural undisturbed area of the same vegetation type then these vegetation types are classified as having "good integrity".

4.5 Fauna survey method

The methods of survey undertaken to detect the various faunal groups or their habitat are outlined below. Locations for specific survey methods are shown in Figure 6. Targeted surveys were made for threatened species based on records of sightings from the BioNet Atlas website, and the Ecologist's knowledge.

Dates, weather and temperatures of all fieldwork were recorded and are tabulated in Table 6 above.

4.5.1 Diurnal fauna searches

Searching, opportunistic observations and call recording provides an indication of types of species using a site. These methods are used to identify and record live animals, or record indirect evidence of animal presence on the site. On occasions, specific surveys may be conducted for a targeted group or species, such as searching the margins of a dam for frogs. Generally though, birds, reptiles, frogs and mammals, or evidence of them, may all be present in the same habitat at the time of survey, therefore searching for these faunal groups is generally run concurrently.

This involved:

a) Searching shelter sites, basking sites, opportunistic observation, and assessment of shelter site diversity suitability for reptiles.
b) Searching shelter sites, calling sites, egg deposition sites, spotlighting and triangulation on calling males for frogs.
c) Opportunistic observations and identification of calls of species, and search for indirect evidence such as nests, feathers, scratchings and feeding signs for birds.
d) Searching for indirect evidence, such as diggings, droppings, runways and burrows, and opportunistic observations for mammals.

While rigorous surveys are likely to find more species, high species richness for birds can be recorded in a relatively short amount of time. Bird surveys are used as a simple indicator of other parameters, such as biodiversity and the functioning of the ecosystem.

4.6 Species likely to occur

Species to be listed as 'likely to occur' or 'expected' (see Appendix 3), are common species generally found in the region, which are likely to occur on site if suitable habitat is present.

Native flora may include species local to the area (occurring in local remnants). Structure and species composition will depend upon locally occurring communities.

Expected species are common and, by definition, are not threatened species.

4.7 Limitations of the survey

This survey was conducted in the summer season. This was not suitable for winter migrants or species of winter-flowering orchids that lose their aerial stems after fruiting.

The weather conditions were variable, including rain and fine warm weather.

Species that may use the site were not detected during the survey for the following reasons:

a) The species was present during the survey but was not detected due to dormancy, inactivity or cryptic habits.
b) The species use the site at other times of the year, but was not present during the survey due to being nomadic or migratory.

4.8 Staff associated with the field work

Table 7. Staff associated with field work and analysis of field work.

	Field work	Analysis of field work
Dr Danny Wotherspoon	Vegetation and fauna survey	Dr Danny Wotherspoon, Mark Sherring
Mark Sherring	Vegetation and fauna survey	Dr Danny Wotherspoon, Mark Sherring
Alex McKenzie	Vegetation and fauna survey	Dr Danny Wotherspoon

5. Survey Results: Vegetation and habitat description

5.1 Site vegetation and habitat

The site contains three vegetation and habitat zones which are described below. Those comprise

- Mown lawns,
- Landscape gardens and tree plantings,
- Regrowth natural forest.

The distribution of vegetation/habitat zones on the site and surrounding areas is shown in Figure 6, Figure 7, Figure 8.

Hollow bearing trees are generally found in the forest zone.

There is generally a lack of fallen logs and dead wood/coarse woody debris as a result of site maintenance.

Other site habitat characteristics are described below.

Appendix 2 shows the list of flora found on the site.

5.1.1 Vegetation and habitat/zone 1 Forest

The forest area has regrown since 1943 to cover the north east corner of the site adjacent to the drainage line and along the eastern boundary of the site. Much of the understorey is mown and the drainage line is generally weedy.

Important habitat features that have significance for fauna occupation of the site are discussed below (Table 3). These include both site disturbance and natural features.

Table 8. Significant features and observations for the site.

Significant features	Observations
Frequency of large trees (approx. > 80 cm DBH)	Rare.
Tree regeneration and tree stem-size diversity	Some tree regeneration. Stem size varies by species and growth rate.
Logs, woody debris and litter cover	Logs, woody debris and leaf litter – low.
Food resources	Eucalyptus and Acacia provide food resources of blossoms and seeds. Low cover of fallen and rotting material is present near the base of larger trees.

The vegetation community is Blue Gum High Forest, a Critically Endangered Ecological Community listed under both the *NSW Biodiversity Conservation Act 2016* and the Commonwealth Environment Protection and *Biodiversity Conservation Act 1999*.

The vegetation within this zone is classified as moderate integrity vegetation. There are no threatened species within this zone.

5.1.2 Vegetation and habitat/zone 2 Landscape gardens and planted trees

A diversity of native and exotic species of trees has been planted in about the 1970s as landscaping for the site. The trees are relatively young ecologically with no hollows for fauna occupation. The garden beds and planted areas are maintained so the ground cover is mulched or mown.

Important habitat features that have significance for fauna occupation of the site are discussed below (Table 3). These include both site disturbance and natural features.

Table 9. Significant features and observations for the site.

Significant features	Observations
Frequency of large trees (approx. > 80 cm DBH)	None.
Tree regeneration and tree stem-size diversity	No tree regeneration, stem size varies by species and growth rate.
Logs, woody debris and litter cover	Logs, woody debris and leaf litter – low.
Food resources	Eucalyptus and Acacia provide food resources of blossoms and seeds. Other species provide fruits of various sorts. Low cover of fallen and rotting material is present near the base of larger trees.

The vegetation within this zone is classified as poor integrity vegetation. There are no threatened species within this zone.

5.2 Species and Communities of conservation concern

The vegetation community is Blue Gum High Forest, a Critically Endangered Ecological Community listed under both the *NSW Biodiversity Conservation Act 2016* and the Commonwealth Environment Protection and *Biodiversity Conservation Act 1999*.

The proposal avoids this area so no clearing is proposed within the biodiversity values map area.

5.3 Weeds

The *NSW Noxious Weeds Act 1993* has been repealed and the *Biosecurity Act 2015* has replaced it. The *Biosecurity Act 2015* requires each landholder and/or occupier to control biosecurity matter (weeds) on their property. The landholder and/or occupier is to develop an effective control strategy and plan to ensure they meet their General Biosecurity Duty.

The General Biosecurity Duty (GBD) is imposed on any person who deals with biosecurity matter (weeds), and who knows (or ought reasonably to know) of the biosecurity risk posed (or likely to be posed), has a biosecurity duty to ensure that the risk associated with those weeds is prevented, eliminated or minimised - so far as is reasonably practicable. A requirement is that all public and private land owners or managers and all other people who deal with weed species (biosecurity matter) must use the most appropriate approach to prevent, eliminate or minimise the negative impact (biosecurity risk) of those weeds.

Council may issue a Biosecurity Direction when any owner/occupier fails in their biosecurity duty to control weeds on their land. The owner/occupier must comply with this biosecurity direction. A penalty notice or prosecution may follow if the owner/occupier fails to comply with the Biosecurity Direction.

A range of weeds occurs within the forest area particularly along the drainage line.

6. Survey Results: Fauna

6.1 Species of conservation concern

A number of threatened species occur in the area and have potential habitat on the site (Table 5). Those species are assumed to be present for the purpose of the impact assessment. The habitat is the Blue Gum High Forest, which will be retained on the site.

6.2 Fauna results

A total of 14 species were detected, including one frog, no mammals, ten birds and three reptiles. Species listed as 'likely to occur' in the area are presented in Appendix 4. Note that the majority of the 'Expected Species' would not occur on the site due to the lack of habitat, but do occur in the area.

All the species listed as 'likely to occur' are common throughout the locality and the region. It is unlikely that protected species will be affected at a local, regional or state-wide scale by the proposal.

The habitats for threatened species that occur in the area are tabulated in Appendix 5.

The habitats for threatened species that occur in the area are tabulated in Appendix 5.

Table 10. List of fauna detected on the site

Common Name	Scientific Name	Conservation Status	Recorded AE
Frogs			
Common Eastern Froglet	*1. Crinia signifera*		W
Brown-striped Frog	*1. Limnodynastes peronii*		
Red-crowned Toadlet	*1. Pseudophryne australis*		
Bleating Tree Frog	*1. Litoria dentata*		
Eastern Dwarf Tree Frog	*1. Litoria fallax*		
Broad-palmed Frog	*1. Litoria latopalmata*		
Peron's Tree Frog	*1. Litoria peronii*		
Laughing Tree Frog	*1. Litoria tyleri*		
Verreaux's Tree Frog	*1. Litoria verreauxii*		
N=	9		1

Common Name	Scientific Name	Conservation Status	Recorded AE
Reptiles			
Broad Tailed Gecko	*1. Phyllurus platurus*		
Scaly-foot Lizard	*1. Pygopus lepidopodus*		
Red-throated Skink	*1. Acritoscincus platynota*		
Fence Skink	*1. Cryptoblepharus virgatus*		
Coppertail Skink	*1. Ctenotus taeniolatus*		
Eastern Water-skink	*1. Eulamprus quoyii*		O
Dark-flecked Garden Sunskink	*1. Lampropholis delicata*		
Pale-flecked Garden Sunskink	*1. Lampropholis guichenoti*		O
Weasel Skink	*1. Saproscincus mustelinus*		
Eastern Blue-tongued Skink	*1. Tiliqua scincoides*		O
Jacky Lizard	*1. Amphibolurus muricatus*		
Bearded Dragon	*1. Pogona barbata*		
Red Bellied Black Snake	*1. Pseudechis porphyriacus*		
N=	13		3

Common Name	Scientific Name	Conservation Status	Recorded AE
Birds			
Australian Wood Duck	*1. Chenonetta jubata*		O
Pacific Black Duck	*1. Anas superciliosa*		
White-faced Heron	*1. Egretta novaehollandiae*		
Australian White Ibis	*1. Threskiornis molucca*		
Collared Sparrowhawk	*1. Accipiter cirrocephalus*		
Brown Goshawk	*1. Accipiter fasciatus*		
Nankeen Kestrel	*1. Falco cenchroides*		
Purple Swamphen	*1. Porphyrio porphyrio*		
Dusky Moorhen	*1. Gallinula tenebrosa*		
Eurasian Coot	*1. Fulica atra*		
Masked Lapwing	*1. Vanellus miles*		
Rock Dove*	*1. Columba livia*		O
Spotted Turtle-dove*	*1. Streptopelia chinensis*		
Crested Pigeon	*1. Ocyphaps lophotes*		
Glossy Black-cockatoo	*1. Calyptorhynchus lathami*		
Yellow-tailed Black-cockatoo	*1. Calyptorhynchus funereus*		
Galah	*1. Eolophus roseicapilla*		
Long-billed Corella	*1. Cacatua tenuirostris*		O
Sulphur-crested Cockatoo	*1. Cacatua galerita*		O
Gang-gang Cockatoo	*1. Callocephalon fimbriatum*		
Scaly-breasted Lorikeet	*1. Trichoglossus chlorolepidotus*		
Rainbow Lorikeet	*1. Trichoglossus haematodus*		O
Musk Lorikeet	*1. Glossopsitta concinna*		
Australian King-parrot	*1. Alisterus scapularis*		
Crimson Rosella	*1. Platycercus elegans*		
Eastern Rosella	*1. Platycercus eximius*		
Asian Koel	*1. Eudynamys scolopaceus*		
Channel-billed Cuckoo	*1. Scythrops novaehollandiae*		
Southern Boobook	*1. Ninox novaeseelandiae*		
Tawny Frogmouth	*1. Podargus strigoides*		
Laughing Kookaburra	*1. Dacelo novaeguineae*		O
Sacred Kingfisher	*1. Todiramphus sanctus*		
Dollarbird	*1. Eurystomus orientalis*		
Satin Bowerbird	*1. Ptilonorhynchus violaceus*		
Superb Fairy-wren	*1. Malurus cyaneus*		
Variegated Fairy-wren	*1. Malurus lamberti*		
Spotted Pardalote	*1. Pardalotus punctatus*		
White-browed Scrubwren	*1. Sericornis frontalis*		
Brown Gerygone	*1. Gerygone mouki*		
White-throated Gerygone	*1. Gerygone albogularis*		

Common Name	Scientific Name	Conservation Status	Recorded AE
Birds			
White-throated Treecreeper	*1. Cormobates leucophaea*		
Brown Thornbill	*1. Acanthiza pusilla*		
Yellow Thornbill	*1. Acanthiza nana*		
Striated Thornbill	*1. Acanthiza lineata*		
Buff-rumped Thornbill	*1. Acanthiza reguloides*		
Red Wattlebird	*1. Anthochaera carunculata*		O
Little Wattlebird	*1. Anthochaera chrysoptera*		
Noisy Friarbird	*1. Philemon corniculatus*		
Bell Miner	*1. Manorina melanophrys*		
Noisy Miner	*1. Manorina melanocephala*		
Lewin's Honeyeater	*1. Meliphaga lewinii*		
Yellow-faced Honeyeater	*1. Lichenostomus chrysops*		
White-plumed Honeyeater	*1. Lichenostomus penicillatus*		
White-naped Honeyeater	*1. Melithreptus lunatus*		
New Holland Honeyeater	*1. Phylidonyris novaehollandiae*		
Eastern Spinebill	*1. Acanthorhynchus tenuirostris*		
Eastern Yellow Robin	*1. Eopsaltria australis*		
Eastern Whipbird	*1. Psophodes olivaceus*		
Golden Whistler	*1. Pachycephala pectoralis*		
Rufous Whistler	*1. Pachycephala rufiventris*		
Grey Shrike-thrush	*1. Colluricincla harmonica*		
Magpie-lark	*1. Grallina cyanoleuca*		
Rufous Fantail	*1. Rhipidura rufifrons*		
Grey Fantail	*1. Rhipidura fuliginosa*		
Willie Wagtail	*1. Rhipidura leucophrys*		
Olive-backed Oriole	*1. Oriolus sagittatus*		
Black-faced Cuckoo-shrike	*1. Coracina novaehollandiae*		
Grey Butcherbird	*1. Cracticus torquatus*		O
Australian Magpie	*1. Cracticus tibicen*		O
Pied Currawong	*1. Strepera graculina*		
Australian Raven	*1. Corvus coronoides*		
House Sparrow	*1. Passer domesticus*		
Red-browed Finch	*1. Neochmia temporalis*		
Welcome Swallow	*1. Hirundo neoxena*		
Silvereye	*1. Zosterops lateralis*		
Common Blackbird*	*1. Turdus merula*		
Common Starling*	*1. Sturnus vulgaris*		
Common Myna*	*1. Sturnus tristis*		O
N =	78		10

Common Name	Scientific Name	Conservation Status	Recorded AE
Mammals			
Brown Antechinus	*1. Antechinus stuartii*		
Long-nosed Bandicoot	*1. Perameles nasuta*		
Common Wombat	*1. Vombatus ursinus*		
Sugar Glider	*1. Petaurus breviceps*		
Common Ringtail Possum	*1. Pseudocheirus peregrinus*		
Common Brushtail Possum	*1. Trichosurus vulpecula*		
Eastern Grey Kangaroo	*1. Macropus giganteus*		
Swamp Wallaby	*1. Wallabia bicolor*		
Grey-headed Flying-fox	*1. Pteropus poliocephalus*		
Yellow-bellied Sheathtail-bat	*1. Saccolaimus flaviventris*		
White-striped Freetail-bat	*1. Austronomus australis*		
Eastern Coastal Free-tail Bat	*1. Micronomus norfolkensis*		
Large-eared Pied Bat	*1. Chalinolobus dwyeri*		
Gould's Wattled Bat	*1. Chalinolobus gouldii*		
Chocolate Wattled Bat	*1. Chalinolobus morio*		
Eastern False Pipistrelle	*1. Falsistrellus tasmaniensis*		
Golden-tipped Bat	*1. Kerivoula papuensis*		
Little Bentwing-bat	*1. Miniopterus australis*		
Large Bent-winged Bat	*1. Miniopterus orianae oceanensis*		
Southern Myotis	*1. Myotis macropus*		
Lesser Long-eared Bat	*1. Nyctophilus geoffroyi*		
Gould's Long-eared Bat	*1. Nyctophilus gouldi*		
Greater Broad-nosed Bat	*1. Scoteanax rueppellii*		
Eastern Broad-nosed Bat	*1. Scotorepens orion*		
Large Forest Bat	*1. Vespadelus darlingtoni*		
Eastern Forest Bat	*1. Vespadelus pumilus*		
Southern Forest Bat	*1. Vespadelus regulus*		
Large Forest Eptesicus	*1. Vespadelus darlingtoni*		
Little Forest Eptesicus	*1. Vespadelus vulturnus*		
Little Forest Bat	*1. Vespadelus vulturnus*		
Bush Rat	*1. Rattus fuscipes*		
House Mouse*	*1. Mus musculus*		
Black Rat*	*1. Rattus rattus*		
Dog*	*1. Canis lupus familiaris*		
Fox*	*1. Vulpes vulpes*		
Cat*	*1. Felis catus*		
Rabbit*	*1. Oryctolagus cuniculus*		
N=	37		0

Invertebrates			
Cumberland Plain Land Snail	*1. Meridolum corneovirens*	BC Act, Sch. 1, End.	
Dural Woodland Snail	*1. Pommerhelix duralensis*	BC Act, Sch. 1, End. EPBC Act, End.	
N=	2		0

Key

* = Introduced fauna
O = Observed
W = Calls heard

6.3 Fauna Summary

The number of species from each faunal group, listed as 'likely to occur' can be seen in Appendix 3.

Mammals

No mammal species were detected on the site.

Common species such as ringtail and brushtail possum and common microbats are expected to occupy the site.

The maintenance regime and highly disturbed nature of the site precludes either a great mammal species diversity or abundance.

Reptiles

Three reptile species were detected on the site.

Species not recorded during the survey but likely to occur on the site include leaf-tailed gecko and red-bellied black snake.

The maintenance regime and highly disturbed nature of the site precludes either a great reptile species diversity or abundance.

Frogs

One frog species was detected on the site.

The maintenance regime and highly disturbed nature of the site precludes either a great reptile species diversity or abundance.

Species not recorded during the survey but likely to occur on the site include Peron's Tree Frog and Striped Marsh Frog.

Birds

Bird species detected on the site totalled ten.

The maintenance regime and highly disturbed nature of the site precludes either a great bird species diversity or abundance.

Species not recorded during the survey but likely to occur on the site include mudlark (pee wee) and spur-winged plover.

6.4 Microbats

Foraging Habitat

Four threatened species of microbats are recorded in the locality. This site provides potentially suitable foraging habitat for seven of the nine possible threatened species. *Myotis macropus* (syn. *Myotis adversus*) has no suitable foraging habitat in the form of open water bodies. *Kerivoula papuensis* is only likely to forage in areas within a few kilometres of rainforest or rainforest gullies.

Roosting Habitat

This site has few tree hollows that provide suitable roosting habitat for *Falsistrellus tasmaniensis, Micronomus norfolkensis, Scoteanax rueppellii, Myotis macropus, Miniopterus australis* and *Saccolaimus flaviventris*. This site has no caves, culverts, or bridges, but does have buildings and other suitable (often human-made) structures that provide potentially suitable roosting habitat for *Chalinolobus dwyeri, Miniopterus orianae oceanensis, Myotis macropus. Kerivoula papuensis* normally roosts in hanging bird nests or trees in rainforest gullies so is very unlikely to roost in the surveyed site.

6.5 Feral fauna

Rats, foxes, feral birds such as rock pigeons and Indian Mynah, domestic dogs and cats all affect the native fauna populations.

7. Discussion of results

The majority of the site is landscaped and has been revegetated since farm use in the 1940s. Urban development has generally precluded regeneration of natural habitat. However, a small patch of Blue Gum High Forest has regenerated in the northeast corner along a drain. The forest has been subject to long term weed control by dedicated school staff, so it has resulted in a relatively high number of native plant species being recorded on the forest.

The landscape planting is diverse, including native species not locally occurring and many exotic species. Those are relatively young so provide little fauna habitat in the form of hollows in trees.

The proposal largely avoids the Blue Gum High Forest so that community is unlikely to suffer direct impacts. An indirect impact is that loss of the adjacent landscape will reduce the structural vegetation that provides some buffer value for the regenerated forest.

Connectivity both upstream and downstream is minimal or absent. Flying fauna can move to nearby patches of bushland but the nature of the proposal will have minimal effect on such fauna movements.

Weed indicator species are present, indicating a high disturbance regime on the site. Native faunal indicator species, small forest birds and kookaburra, are consistent with an open forest habitat. Feral indicator species, Red Fox, indicates that native fauna abundance is likely to be low. Ecological services for the site e.g. bioturbators, pollinators, seed dispersers are present and functioning at a low level due to mowing under the forest canopy and weed cover in the drain line.

8. Impact on biodiversity: Threshold 3

8.1 Threshold 3: Five-part test summary

Habitat requirements for locally occurring threatened faunal species, and the presence or absence of such habitat on the site, is tabulated in Appendix 4. Threatened plant species, listed in the BC Act and the EPBC Act, are shown in Appendix 5.

Under Section 7.3 of the *Biodiversity Conservation Act* several factors (listed in Appendix 1) need to be considered in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats. If there is likely to be a significant effect on threatened species, etc, the proposal must be accompanied by a Biodiversity Development Assessment Report.

While the overall proposal incorporates mitigating considerations and offsets, these are not taken into account in determining the outcome of the five-part tests.

Table 11. Summary of the five-part tests shown in full in Appendix 1.

Scientific Name	Common Name	NSW status	Comm. status	Result of five part test
Hieraaetus morphnoides	Little Eagle	V,P		No significant effect
Callocephalon fimbriatum	Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local Government Areas	E2,V,P,3		No significant effect
Callocephalon fimbriatum	Gang-gang Cockatoo	V,P,3		No significant effect
Glossopsitta pusilla	Little Lorikeet	V,P		No significant effect
Ninox connivens	Barking Owl	V,P,3		No significant effect
Ninox strenua	Powerful Owl	V,P,3		No significant effect
Tyto novaehollandiae	Masked Owl	V,P,3		No significant effect
Pteropus poliocephalus	Grey-headed Flying-fox	V,P	V	No significant effect
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P		No significant effect
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V,P		No significant effect
Chalinolobus dwyeri	Large-eared Pied Bat	V,P	V	No significant effect
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V,P		No significant effect
Myotis Macropus	Southern Myotis	V,P		No significant effect
Scoteanax rueppellii	Greater Broad-nosed Bat	V,P		No significant effect
Miniopterus australis	Little Bent-winged Bat	V,P		No significant effect
Miniopterus orianae oceanensis	Large Bent-winged Bat	V,P		No significant effect
Pommerhelix duralensis	Dural Land Snail	E1	E	No significant effect

Scientific Name	Common Name	NSW status	Comm. status	Result of five part test
Wahlenbergia multicaulis	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2		No significant effect
Dillwynia tenuifolia		V		No significant effect
Acacia clunies-rossiae	Kanangra Wattle	V		No significant effect
Acacia pubescens	Downy Wattle	V	V	No significant effect
Callistemon linearifolius	Netted Bottle Brush	V,3		No significant effect
Rhodamnia rubescens	Scrub Turpentine	E4A		No significant effect
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	No significant effect
Pomaderris prunifolia	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2		No significant effect
Blue Gum High Forest in the Sydney Basin Bioregion	Blue Gum High Forest in the Sydney Basin Bioregion	E2	CE	No significant effect

There is no significant effect likely, so a Biodiversity Development Assessment Report is not required.

9. Planning Instruments

9.1 *Environment Protection and Biodiversity Conservation Act 1999*

9.1.1 Protected matters

The Protected Matters Search Tool was used to find relevant Matters of National Environmental Significance (MNES) on or near the site. The outputs are shown in (Appendix 6).

Blue Gum High Forest in the Sydney Basin is protected under Commonwealth legislation by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) and is listed as Critically Endangered. The provisions of the EPBC Act apply to this proposal. The outcome is not significant, however, and does not require referral to the Commonwealth.

9.1.2 Criteria Critically Endangered and Endangered Ecological Communities

An action has, will have, or is likely to have a significant impact on a critically endangered or endangered ecological community if it does, will, or is likely to:

a) lead to a long-term adverse effect on an ecological community, or	No, the forest will be retained.
b) reduce the extent of a community, or	No, the forest will be retained.
c) fragment an occurrence of the community, or	No, the forest will be retained.
d) adversely affect habitat critical to the survival of an ecological community, or	No, the forest will be retained.
e) modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for the community's survival, or	No, the forest will be retained.
f) result in invasive species that are harmful to the critically endangered or endangered community becoming established in an occurrence of the community*, or	No, the forest will be retained.
g) interfere with the recovery of an ecological community.	No, the forest will be retained.

(*Introducing an invasive species into the occurrence may result in that species becoming established. An invasive species may harm a critically endangered or endangered ecological community by direct competition, modification of habitat, or predation.)

The proposal avoids impact on the Blue Gum High Forest and an assessment of significance found that a significant effect is not likely.

9.2 Planning for Bushfire Protection

The proposal has been designed with an asset protection zone that extends from the intact forest such that the Blue Gum High Forest remains intact.

10.Conclusion and Recommendations

None of the three relevant thresholds for a Part 3 proposal are triggered as follows:

Threshold Trigger 1: Exceeding the clearing threshold on an area of native vegetation.
Threshold Trigger 2: Development or a prescribed activity is carried out on land included in the Biodiversity Values Land Map.
Threshold Trigger 3: A "significant effect" on threatened species or ecological communities.

Therefore, a Biodiversity Development Assessment Report (BDAR) is not required.

Recommendations

Loss of trees that could in future provide hollows for fauna habitat needs to be replaced with fauna nest boxes erected within the retained forest.

Light spill from floodlights needs to be avoided by shielding so that direct light does not shine into the forest area.

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Appendix 1. Five-part tests

While the overall proposal incorporates mitigating considerations and offsets, these are not taken into account in determining the outcome of the **five-part** tests.

The Assessment of Significance (Office of Environment and Heritage (OEH)) states that "*Proposed measures that mitigate, improve or compensate for the action, development or activity should not be considered in determining the degree of the effect on threatened species, populations or ecological communities, unless the measure has been used successfully for that species in a similar situation.*"

Species addressed are as follows:

Scientific Name	Common Name	NSW status	Comm. status	Potential habitat on site
Hieraaetus morphnoides	Little Eagle	V		Yes
Callocephalon fimbriatum	Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local Government Areas	E2,V		Yes
Callocephalon fimbriatum	Gang-gang Cockatoo	V,P,3		Yes
Glossopsitta pusilla	Little Lorikeet	V,P		Yes
Ninox connivens	Barking Owl	V,P		Yes
Ninox strenua	Powerful Owl	V,P		Yes
Tyto novaehollandiae	Masked Owl	V,P		Yes
Pteropus poliocephalus	Grey-headed Flying-fox	V,P	V	Yes
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P		Yes
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V,P		Yes
Chalinolobus dwyeri	Large-eared Pied Bat	V,P	V	Yes
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V,P		Yes
Myotis macropus	Southern Myotis	V,P		Yes

Scientific Name	Common Name	NSW status	Comm. status	Potential habitat on site
Scoteanax rueppellii	Greater Broad-nosed Bat	V,P		Yes
Miniopterus australis	Little Bent-winged Bat	V,P		Yes
Miniopterus orianae oceanensis	Large Bent-winged Bat	V,P		Yes
Pommerhelix duralensis	Dural Land Snail	E1	E	Yes
Wahlenbergia multicaulis	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2		Yes
Dillwynia tenuifolia		V		Yes
Acacia clunies-rossiae	Kanangra Wattle	V		Yes
Acacia pubescens	Downy Wattle	V	V	Yes
Callistemon linearifolius	Netted Bottle Brush	V		Yes
Rhodamnia rubescens	Scrub Turpentine	E4A		Yes
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	Yes
Pomaderris prunifolia	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2		Yes
Blue Gum High Forest in the Sydney Basin Bioregion	Blue Gum High Forest in the Sydney Basin Bioregion	E2	CE	Yes

7.2 Development or activity "likely to significantly affect threatened species"

1) For the purposes of this Part, development or an activity is **"likely to significantly affect threatened species"** if:
   a) it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3, or
   b) the development exceeds the biodiversity offsets scheme threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or
   c) it is carried out in a declared area of outstanding biodiversity value.
2) To avoid doubt, subsection (1) (b) does not apply to development that is an activity subject to environmental impact assessment under Part 5 of the *Environmental Planning and Assessment Act 1979*.

7.3 Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats

1) The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:
   a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction
   b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:
      (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction
      (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,
   c) in relation to the habitat of a threatened species or ecological community:
      (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
      (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
      (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
   d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),
   e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Diurnal Raptors

Scientific name	Common name	NSW status	Comm. status
Hieraaetus morphnoides	Little Eagle	V	-

Little Eagle *Hieraaetus morphnoides*
http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=20131

- Occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used.
- Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.
- Lays two or three eggs during spring, and young fledge in early summer.
- Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.

Woodland Birds

Scientific name	Common name	NSW status	Comm. status
Glossopsitta pusilla	Little Lorikeet	V	-

Little Lorikeet *Glossopsitta pusilla*
http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=20111

- Forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.
- Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species.
- Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards.
- Gregarious, travelling and feeding in small flocks (<10), though often with other lorikeets. Flocks numbering hundreds are still occasionally observed and may have been the norm in past centuries.
- Roosts in treetops, often distant from feeding areas.
- Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like *Allocasuarina*.

Scientific name	Common name	NSW status	Comm. status
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-

Gang-gang Cockatoo *Callocephalon fimbriatum*
http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10975

- In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests.
- In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.
- May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora*) woodland and occasionally in temperate rainforests.
- Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.

Scientific name	Common name	NSW status	Comm. status
Ninox connivens	Barking Owl	V	-

Barking Owl *Ninox connivens*
https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10561

- Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils.
- Roosts in shaded portions of tree canopies, including tall mid storey trees with dense foliage such as *Acacia* and *Casuarina* species. During nesting season, the male perches in a nearby tree overlooking the hollow entrance.
- Preferentially hunts small arboreal mammals such as Squirrel Gliders and Common Ringtail Possums, but when loss of tree hollows decreases these prey populations the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Can catch bats and moths on the wing, but typically hunts by sallying from a tall perch.
- Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats.
- Two or three eggs are laid in hollows of large, old trees. Living eucalypts are preferred though dead trees are also used. Nest sites are used repeatedly over years by a pair, but they may switch sites if disturbed by predators (e.g. goannas).
- Nesting occurs during mid-winter and spring, being variable between pairs and among years. As a rule of thumb, laying occurs during August and fledging in November. The female incubates for 5 weeks, roosts outside the hollow when chicks are 4 weeks old, then fledging occurs 2-3 weeks later. Young are dependent on their parents for several months.

- Territorial pairs respond strongly to recordings of Barking Owl calls from up to 6 km away, though humans rarely hear this response farther than 1.5 km. Because disturbance reduces the pair's foraging time, and can pull the female off her eggs even on cold nights, recordings should not be broadcast unnecessarily nor during the nesting season.

Scientific name	Common name	NSW status	Comm. status
Ninox strenua	Powerful Owl	V	-

Powerful Owl *Ninox strenua*
https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10562

- The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest.
- The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black Sheoak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species.
- The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. There may be marked regional differences in the prey taken by Powerful Owls. For example, in southern NSW, Ringtail Possum make up the bulk of prey in the lowland or coastal habitat. At higher elevations, such as the tableland forests, the Greater Glider may constitute almost all of the prey for a pair of Powerful Owls. Flying foxes are important prey in some areas; birds comprise about 10-50% of the diet depending on the availability of preferred mammals. As most prey species require hollows and a shrub layer, these are important habitat components for the owl.
- Pairs of Powerful Owls demonstrate high fidelity to a large territory, the size of which varies with habitat quality and thus prey densities. In good habitats a mere 400 can support a pair; where hollow trees and prey have been depleted the owls need up to 4000 ha.
- Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m) guarding them, often choosing a dense "grove" of trees that provide concealment from other birds that harass him.
- Powerful Owls are monogamous and mate for life. Nesting occurs from late autumn to mid-winter, but is slightly earlier in north-eastern NSW (late summer - mid autumn). Clutches consist of two dull white eggs and incubation lasts approximately 38 days.

Scientific name	Common name	NSW status	Comm. status
Tyto novaehollandiae	Masked Owl	V	-

Masked Owl *Tyto novaehollandiae*
https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10820

- Lives in dry eucalypt forests and woodlands from sea level to 1100 m.
- A forest owl, but 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 forested gullies, using large tree hollows or sometimes caves for nesting.

Scientific name	Common name	NSW status	Comm. status
Pteropus poliocephalus	Grey-headed Flying-fox	V	V

Grey-headed Flying-fox *Pteropus poliocephalus*
http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10697

- Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.
- Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.
- Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young.
- Annual mating commences in January and conception occurs in April or May; a single young is born in October or November.
- Site fidelity to camps is high; some camps have been used for over a century.
- Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km.
- Feed on the nectar and pollen of native trees, in particular *Eucalyptus, Melaleuca* and *Banksia*, and fruits of rainforest trees and vines.
- Also forage in cultivated gardens and fruit crops.

Insectivorous bats

Scientific name	Common name	NSW status	Comm. status
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-
Mormopterus norfolkensis	Eastern Freetail-bat	V	-
Chalinolobus dwyeri	Large-eared Pied Bat	V	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-
Miniopterus australis	Little Bent-winged Bat	V	
Miniopterus orianae oceanensis	Eastern Bentwing-bat	V	-
Myotis macropus	Southern Myotis	V	
Scoteanax rueppellii	Greater Broad-nosed Bat	V	Near Threatened

Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*
http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10741

- Roosts singly or in groups of up to six, in tree hollows and buildings.
- in treeless areas they are known to utilise mammal burrows.
- When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees
- Appears to defend an aerial territory.
- Breeding has been recorded from December to mid-March, when a single young is born.
- Seasonal movements are unknown.
- There is speculation about a migration to southern Australia in late summer and autumn.

Eastern Freetail-bat *Mormopterus norfolkensis*
http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10544

- Eastern Freetail-bat occurs 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.

Large-eared Pied Bat *Chalinolobus dwyeri*
http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10157

- Large-eared Pied Bat roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features.
- Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs.
- They remain loyal to the same cave over many years.
- Found in well-timbered areas containing gullies.
- The relatively short, broad wing combined with the low weight per unit area of wing indicates manoeuvrable flight.
- This species probably forages for small, flying insects below the forest canopy.
- Likely to hibernate through the coolest months.
- It is uncertain whether mating occurs early in winter or in spring.

Eastern False Pipistrelle *Falsistrellus tasmaniensis*
http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10331

- Prefers moist habitats, with trees taller than 20 m.
- Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.
- Hibernates in winter.
- Females are pregnant in late spring to early summer.

Eastern Bentwing-bat *Miniopterus orianae oceanensis*
http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10534

- 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.
- This species has recently been renamed to *Miniopterus orianae oceanensis* or the large bent-winged bat, from Miniopterus schreibersii subsp. oceanensis or the eastern bent-wing bat.

Greater Broad-nosed Bat *Scoteanax rueppellii*
http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10748

- Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.
- Although this species usually roosts in tree hollows, it has also been found in buildings.
- Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects.
- This species has been known to eat other bat species.
- Little is known of its reproductive cycle, however a single young is born in January.
- Prior to birth, females congregate at maternity sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young.

Key

CE	Critically Endangered
E	Endangered
V	Vulnerable
P	Protected

Habitat and ecology

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

No. None of these species were observed on the site.

The habitat is degraded with threatening processes that have been acting for more than 70 years so it is highly unlikely that the species remain on the site or could persist under the present threat regime.

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

Not applicable. This test is for a group of threatened species.

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable. This test is for a group of threatened species.

c. in relation to the habitat of a threatened species, population or ecological community:

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

Edge effect in the form of changes to soil hydrology and nutrient status may occur on the downslope side of any construction. Edge effect as invasion by exotic vegetation is possible. Any edge effect will impact on areas previously degraded by clearing and weeds so is unlikely to have any discernable change to the local habitat.

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

No. The site habitat is already fragmented.
An area of degraded continuous habitat exists downstream of the site, however no impact is expected for this area.
Discontinuous habitat will remain to the north and south of the site.

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

No habitat will be removed from the Biodiversity Values forest area.

Criterion	Comment
Area and quality of habitat within the locality	The locality is an urban matrix with areas of often-degraded natural vegetation remaining in small fragments in residential areas.
Area and quality of habitat on site in relation to the area and quality of habitat in the locality	Similar habitat is available on nearby small patches.
Role of habitat to be affected in sustaining habitat connectivity in the locality	Site habitat provides some connectivity to fragmented vegetation to the north, and south. Development of the site is not expected to affect these species' ability to transfer genetic material across the landscape.
Ecological integrity of habitat to be affected on site, in relation to the ecological integrity, tenure and security of the habitat which will remain both on site and in locality	The entire site is disturbed, however canopy species remain and herbaceous species remain suppressed by mowing. The whole of the site shows signs of long term intensive disturbance but regeneration has occurred. The site condition is typical across the locality.

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

No. Critical habitat has not been declared for these species.

e. whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

No. The proposed development will require the clearing of native vegetation as landscape planting only, which is not a key threatening process relevant to these species. Key threatening processes are listed under the TSC Act, 1995 and the Commonwealth's EPBC Act, 1999. However, the extent of clearing is scattered across the site.

Conclusion

The proposed activity is unlikely to have a significant effect on *Hieraaetus morphnoides, Callocephalon fimbriatum, Glossopsitta pusilla, Ninox connivens, Ninox strenua, Tyto novaehollandiae, Pteropus poliocephalus, Saccolaimus flaviventris, Micronomus norfolkensis, Chalinolobus dwyeri, Falsistrellus tasmaniensis, Myotis Macropus, Scoteanax rueppellii, Miniopterus australis, Miniopterus orianae oceanensis,* or *Pommerhelix duralensis*

A BDAR is not recommended.

THREATENED ECOLOGICAL COMMUNITY

Scientific name	NSW status	Comm. status
Blue Gum High Forest in the Sydney Basin Bioregion	CE	CE

Key
CE Critically Endangered

Habitat and ecology

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

Not applicable. This five-part test is for a critically endangered ecological community.

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

There is currently (Final Determination 2011) less than 200 ha of this community. None of the local occurrence (approximately 1ha) of this critically endangered ecological community will be either removed or modified on the site.

Area extant in total = 200ha
Area of occupancy = 3,700ha (estimate).
Local occurrence (on site) = 1 ha.

This critically endangered ecological community appears to be reasonably extensive in the locality, so its local occurrence is unlikely to be placed at risk of extinction by the proposal.

The entire site has been disturbed. Original vegetation remains as canopy trees and a regenerated diversity of natives. No recruitment is possible with the current mowing regime. The extent of the community will be reduced by loss of five trees, but works are excluded from the mapped biodiversity layer.

The five trees to be removed T41, T42, T43, T44 and T46 Sydney Blue Gum *Eucalyptus saligna* are at the edge of the remnant forest and part of that community but not part of the mapped Biodiversity Values Area.

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

No.
The composition of this critically endangered ecological community will be retained on the site. This critically endangered ecological community within the site will not be substantially and adversely modified by the proposal. It also occurs reasonably commonly in the locality and the local occurrence will not be placed at risk of extinction.

c. in relation to the habitat of a threatened species, population or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity,

The five trees to be removed T41, T42, T43, T44 and T46 Sydney Blue Gum *Eucalyptus saligna* are at the edge of the remnant forest and part of that community but not part of the mapped Biodiversity Values Area.
None of the mapped biodiversity values area which is the Blue Gum High Forest will be removed. Species of this community that occur in the landscape planting that is to be removed will not affect either the composition or function or structure of the community.

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

No.
Habitat for this critically endangered ecological community occurs to the south and north of the site. Habitat will remain off-site in the locality to the north and south of the site.

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

Negligible. Species of this community that occur beyond the Biodiversity Values Area or in the landscape planting that is to be removed will not affect either the composition or function or structure of the community.

Criterion	Comment
Area and quality of habitat within the locality	The locality is an urban matrix with areas of often-degraded natural vegetation remaining in small fragments in residential areas.
Area and quality of habitat on site in relation to the area and quality of habitat in the locality	Similar habitat is available on nearby small patches.
Role of habitat to be affected in sustaining habitat connectivity in the locality	Site habitat provides some connectivity to fragmented vegetation to the north, and south. Development of the site is not expected to affect these species' ability to transfer genetic material across the landscape.
Ecological integrity of habitat to be affected on site, in relation to the ecological integrity, tenure and security of the habitat which will remain both on site and in locality.	The entire site is disturbed, however canopy species remain and herbaceous species remain suppressed by mowing. The whole of the site shows signs of long term intensive disturbance but regeneration has occurred. The site condition is typical across the locality.

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

No.
Critical habitat has not been declared for this critically endangered ecological community.
None of the mapped biodiversity values area which is the Blue Gum High Forest will be removed.

e. whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Yes.
The proposed development will require the clearing of native vegetation being five trees at the edge of the forest and as landscape planting. Key threatening processes are listed under the TSC Act, 1995 and the Commonwealth's EPBC Act, 1999. However, the extent of clearing is scattered across the site.

Conclusion

The proposed activity is unlikely to have a significant effect on Blue Gum High Forest. Therefore, a BDAR is not recommended.

Woodland plant Species

Key

E Endangered
V Vulnerable

Scientific Name Conservation status	Common name	Conservation status	Conservation status	Recorded on site
Wahlenbergia multicaulis	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2		No
Dillwynia tenuifolia		V		No
Acacia clunies-rossiae	Kanangra Wattle	V		No
Acacia pubescens	Downy Wattle	V	V	No
Callistemon linearifolius	Netted Bottle Brush	V		No
Rhodamnia rubescens	Scrub Turpentine	E4A		No
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	No
Pomaderris prunifolia	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2		No

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

No.
None of these species were observed on the site.
The habitat is degraded with threatening processes that have been acting for more than 70 years so it is highly unlikely that the species remain on the site or could persist under the present threat regime.

g. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

iii. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

Not applicable. This test is for a group of threatened species.

iv. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction

Not applicable. This test is for a group of threatened species.

h. in relation to the habitat of a threatened species, population or ecological community:

iv. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

Edge effect in the form of changes to soil hydrology and nutrient status may occur on the downslope side of any construction. Edge effect as invasion by exotic vegetation is possible. Any edge effect will impact on areas previously degraded by clearing and weeds so is unlikely to have any discernable change to the local habitat.

v. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

No.
The site habitat is already fragmented. An area of degraded continuous habitat exists downstream of the site, however no impact is expected for this area.
Discontinuous habitat will remain to the north and south of the site.

vi. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

No habitat will be removed from the forest area.

Criterion	Comment
Area and quality of habitat within the locality	The locality is an urban matrix with areas of often-degraded natural vegetation remaining in small fragments in residential areas.
Area and quality of habitat on site in relation to the area and quality of habitat in the locality	Similar habitat is available on nearby small patches.
Role of habitat to be affected in sustaining habitat connectivity in the locality	Site habitat provides some connectivity to fragmented vegetation to the north, and south. Development of the site is not expected to affect these species' ability to transfer genetic material across the landscape.
Ecological integrity of habitat to be affected on site, in relation to the ecological integrity, tenure and security of the habitat which will remain both on site and in locality.	The entire site is disturbed, however canopy species remain and herbaceous species remain suppressed by mowing. The whole of the site shows signs of long term intensive disturbance but regeneration has occurred. The site condition is typical across the locality.

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

No.
Critical habitat has not been declared for these species.

j. whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

No.
The proposed development will require the clearing of native vegetation as landscape planting only, which is not a key threatening process relevant to these species. Key threatening processes are listed under the TSC Act, 1995 and the Commonwealth's EPBC Act, 1999. However, the extent of clearing is scattered across the site.

Conclusion

The proposed activity is unlikely to have a significant effect on *Wahlenbergia multicaulis, Dillwynia tenuifolia, Acacia clunies-rossiae, Acacia pubescens, Callistemon linearifolius, Rhodamnia rubescens, Syzygium paniculatum* or *Pomaderris prunifolia.*

A BDAR is not recommended.

Appendix 2. Flora species list

The grid reference for this locality is 151.071263 East, -33.80378 North (Geographic GDA94)
GDA2020 Easting 321464.329 Northing 6257929.381

Key
* introduced species
# native species not endemic to the remnant plant community
NEALW – National Environmental Alert List Weeds
PW – Priority weeds
WONS – Weeds of National significance

Table 12: Quadrat plant list

Origin	Genus	Species	Common name
Local native	Acacia	parramattensis	Black Wattle
Local native	Acacia	mearnsii	Early Black Wattle
Local native	Acacia	implexa	Mountain Hickory Wattle
Local native	Acacia	fimbriata	Fringed Wattle
Local native	Acacia	binervia	Coastal Myall
Local native	*Acmena*	*smithii*	Lilly Pilly
Local native	Allocasuarina	torulosa	Forest She Oak
Local native	*Alocasia*	*brisbanensis*	Cunjevoi
Local native	Alpinia	caerulea	Native Ginger
Local native	*Angophora*	*costata*	Sydney Red Gum
Local native	Aphanopetalum	resinosum	Gum Vine
Local native	Brachychiton	acerifolius	Illawarra Flame Tree
Local native	Breynia	oblongifolia	Breynia
Local native	*Casuarina*	*glauca*	Swamp She-Oak
Local native	*Cayratia*	*clematidea*	Slender Grape
Local native	*Ceratopetalum*	*apetalum*	Coachwood
Local native	*Commelina*	*cyanea*	Scurvy Weed
Local native	Cordyline	stricta	

Origin	Genus	Species	Common name
Local native	Corymbia	maculata	Spotted Gum
Local native	Cyathea	australis	Tree Fern
Local native	*Dianella*	*caerulea*	Dianella
Local native	Dichondra	repens	Kidney Weed
Local native	Dodonaea	triquetra	Hop Bush
Local native	Doryanthes	excelsa	Gymea Lily
Local native	Elaeocarpus	reticulatus	Blueberry Ash
Local native	*Eucalyptus*	*saligna*	Sydney Blue Gum
Local native	Eucalyptus	punctata	Grey Gum
Local native	Eucalyptus	paniculata	Grey Ironbark
Local native	Eucalyptus	robusta	Swamp Mahogany
Local native	*Eucalyptus*	*pilularis*	Blackbutt
Local native	*Ficus*	*coronata*	Sandpaper Fig
Local native	*Ficus*	*rubiginosa*	Port Jackson Fig
Local native	*Geranium*	*homeanum*	Cranesbill
Local native	Glochidion	ferdinandi	Cheese Tree
Local native	Glycine	tabacina	Glycine
Local native	Homolanthus	populifolius	Bleeding Heart
Local native	Livistona	australis	Cabbage Tree Palm
Local native	Lomandra	longifolia	Matt Rush
Local native	*Melaleuca*	*styphelioides*	Prickly Paperbark
Local native	*Melia*	*azedarach*	White Cedar
Local native	Microlaena	stipoides	Weeping Grass
Local native	*Oplismenus*	*aemulus*	Basket Grass
Local native	*Pandorea*	*pandorana*	Wonga Wonga Vine
Local native	*Pittosporum*	*undulatum*	Sweet Pittosporum
Local native	Pittosporum	multiflorum	Orange Thorn
Local native	Pittosporum	revolutum	Rough Fruited Pittosporum

Origin	Genus	Species	Common name
Local native	Sigesbeckia	orientalis	Indian Weed
Local native	Solanum	aviculare	Kangaroo Apple
Local native	*Syncarpia*	*glomulifera*	Turpentine
Local native	Syzygium	australe	Lilly Pilly
Local native	*Toona*	*ciliata*	Red Cedar
Local native	Trema	tomentosa var aspera	Native Peach
Local native	*Tristaniopsis*	*laurina*	Water Gum
Native #	Grevillea	robusta	Silky Oak
Native #	Corymbia	citriodora	Lemon scented Gum
Native #	*Eucalyptus*	*microcorys*	Tallowwood
Native #	Archontophoenix	cunninghamiana	Bangalow Palm
Native #	Ficus	macrophylla	Moreton Bay Fig

Local native plants n=53

Table 13: General plant list for the forest

Genus	Species	Common
Acacia	parramattensis	Black Wattle
Acacia	mearnsii	Early Black Wattle
Acacia	implexa	Mountain Hickory Wattle
Acacia	fimbriata	Fringed Wattle
Acacia	binervia	Coastal Myall
Allocasuarina	torulosa	Forest She Oak
Alpinia	caerulea	Native Ginger
Aphanopetalum	resinosum	Gum Vine
Archontophoenix	cunninghamiana	Bangalow Palm
Brachychiton	acerifolius	Illawarra Flame Tree
Breynia	oblongifolia	Breynia
Cordyline	stricta	Slender Palm Lily
Corymbia	citriodora	Lemon scented Gum
Corymbia	maculata	Spotted Gum
Cyathea	australis	Tree Fern
Dichondra	repens	Kidney Weed
Dodonaea	triquetra	Hop Bush
Doryanthes	excelsa	Gymea Lily
Elaeocarpus	reticulatus	Blueberry Ash
Eucalyptus	punctata	Grey Gum
Eucalyptus	paniculata	Grey Ironbark
Eucalyptus	robusta	Swamp Mahogany
Ficus	macrophylla	Moreton Bay Fig
Glochidion	ferdinandi	Cheese Tree
Glycine	tabacina	Glycine
Grevillea	robusta	Silky Oak
Homolanthus	populifolius	Bleeding Heart

Genus	Species	Common
Livistona	australis	Cabbage Tree Palm
Lomandra	longifolia	Matt Rush
Microlaena	stipoides	Weeping Grass
Pittosporum	multiflorum	Orange Thorn
Pittosporum	revolutum	Rough Fruited Pittosporum
Sigesbeckia	orientalis	Indian Weed
Solanum	aviculare	Kangaroo Apple
Syzygium	australe	Lilly Pilly
Trema	tomentosa var aspera	Native Peach

Table 14: Exotic weed plant list

Genus	Species	Common name
Acer	negundo	Box Elder maple
Acokanthera	oblongifolia	Poison Arrow plant.
Andredera	cordifolia	Madeira Vine
Asparagus	aethiopicus	Basket Asparagus
Bidens	pillosa	Farmers Friend
Canna	edulis	Canna Lily
Cardiospermum	grandiflorum	Balloon Vine
Celtis	sinensis	Hackberry
Cestrum	parqui	Green Cestrum
Ehrhardta	erecta	Panic Veldt Grass
Fumaria	sp.	Fumitory
Jacaranda	mimosifolia	Jacaranda
Ligustrum	lucidum	Broad Leaf Privet
Loquat	eriobotrya	Loquat
Nandina	domestica	Japanese Sacred Bamboo
Ochna	serrulata	Mickey Mouse Plant
Olea	europea ssp. cuspidata	African Olive
Parieteria	judaica	Pellitory
Passiflora	suberosa	Corky Passionfruit
Phoenix	sp.	Date Palm
Phyllanthus	tenellus	Phyllanthus
Pistacia	chinensis	Chinese Pistachio
Rumex	sagittata	Turkey Rhubarb
Senna	bicapsularis	Senna
Setaria	palmifolia	Palm Grass
Sida	rhombifolia	Paddys Lucerne
Tradescantia	fluminensis	Trad

Genus	Species	Common name
Tropaeolum	majus	Nasturtium
Verbena	bonariensis	Purple Top

Table 15: Appendix 2. Tree survey Brush Road and south east corner

Tree number	Plan number	Species
801	1	Casuarina glauca
802	2	Leptospermum petersonii
803	3	Eucalyptus grandis
804	4	Eucalyptus cinerea
805	5	Casuarina glauca
806	6	Eucalyptus robusta
807	7	Acacia (implexa)
808	8	Casuarina glauca
809	9	Eucalyptus robusta
810	10	Acacia (implexa)
811	11	Eucalyptus grandis
812	12	Melaleuca linearifolia
813	13	Eucalyptus (melanophloia or sideroxylon)
814	14	Eucalyptus grandis
815	15	Eucalyptus acmenoides
816	16	Eucalyptus acmenoides
817	17	Acacia parramattensis
818	18	Eucalyptus acmenoides (sapling)
819	19	Eucalyptus acmenoides (sapling)
820	20	Eucalyptus saligna
821	21	Olea europea subsp. Cuspidata*
822	22	Pittosporum undulatum
823	23	Acacia parramattensis
824	24	Acacia parramattensis
825	25	Acacia parramattensis
826	26	Acacia parramattensis
827	27	Grevillea robusta
828	28	Pittosporum undulatum
829	29	Eucalyptus saligna
830	30	Eucalyptus saligna
831	31	Eucalyptus acmenoides
832	32	Acacia parramattensis
833	33	Acacia parramattensis
834	34	Acacia parramattensis
835	35	Eucalyptus acmenoides (sapling)
836	36	Alphitonia excelsa

Tree number	Plan number	Species
837	37	Acacia parramattensis
838	38	Solanum mauritianum *
839	39	Acacia parramattensis (10 stems)
839	39	Acacia parramattensis
839	39	Acacia parramattensis
839	39	Acacia parramattensis
839	39	Acacia parramattensis
839	39	Acacia parramattensis
839	39	Acacia parramattensis
839	39	Acacia parramattensis
839	39	Acacia parramattensis
839	39	Acacia parramattensis
839	39	Acacia parramattensis
840	40	Acmena sp.
841	41	Syzygium sp. (cultivar, shrub)
842	42	Murraya paniculata (multi-stem)
843	43	Eucalyptus saligna
844	44	Eucalyptus saligna
845	45	Eucalyptus saligna
846	46	Leptospermum petersonii
847	47	Eucalyptus saligna
848	48	Eucalyptus saligna
849	49	Acacia parramattensis
850	50	Eucalyptus saligna
851	51	Pittosporum undulatum
852	52	Eucalyptus saligna
853	53	Eucalyptus deanei
854	54	Eucalyptus deanei
855	55	Eucalyptus deanei
856	56	Eucalyptus sp. - Red Gum
857	57	Eucalyptus paniculata
858	58	Eucalyptus (paniculata?)
859	59	Acacia parramattensis
860	60	Eucalyptus (paniculata?)
861	61	Pittosporum undulatum
862	62	Acacia parramattensis
863	63	Acacia parramattensis
864	64	Eucalyptus deanei

Appendix 3. Expected fauna species in the Sydney Basin

Mammals

Common name	Scientific name
White-striped Freetail-bat	*Austronomus australis*
Gould's Wattled Bat	*Chalinolobus gouldii*
Chocolate Wattled Bat	*Chalinolobus morio*
Lesser Long-eared Bat	*Nyctophilus geoffroyi*
Gould's Long-eared Bat	*Nyctophilus gouldi*
Bush Rat	*Rattus fuscipes*
Swamp Rat	*Rattus lutreolus*
Long-nosed Bandicoot	*Perameles nasuta*
Brown Antechinus	*Antechinus stuartii*
Dusky Antechinus	*Antechinus swainsonii*
Yellow-footed Antechinus	*Antechinus flavipes*
Common Wombat	*Vombatus ursinus*
Common Ringtail Possum	*Pseudocheirus peregrinus*
Sugar Glider	*Petaurus breviceps*
Feathertail Glider	*Acrobates pygmaeus*
Eastern Grey Kangaroo	*Macropus giganteus*
Large Forest Bat	*Vespadelus darlingtoni*
Little Forest Bat	*Vespadelus vulturnus*
Common Wallaroo	*Macropus robustus*
Red-necked Wallaby	*Macropus rufogriseus*
Swamp Wallaby	*Wallabia bicolor*
Common Brushtail Possum	*Trichosurus vulpecula*
Greater Glider	*Petauroides volans*
Short-beaked Echidna	*Tachyglossus aculeatus*
Fox	*Vulpes vulpes*
Black Rat	*Rattus rattus*
Rabbit	*Oryctolagus cuniculus*

Frogs

Common Name	Scientific Name
Green Tree Frog	*Litoria caerulea*
Blue Mountains Tree Frog	*Litoria citropa*
Bleating Tree Frog	*Litoria dentata*
Eastern Dwarf Tree Frog	*Litoria fallax*
Jervis Bay Tree Frog	*Litoria jervisiensis*
Broad-palmed Frog	*Litoria latopalmata*
Peron's Tree Frog	*Litoria peronii*

Common Name	Scientific Name
Leaf-green Tree Frog	*Litoria phyllochroa*
Tyler's Tree Frog	*Litoria tyleri*
Verreaux's Frog	*Litoria verreauxii*
Common Eastern Froglet	*Crinia signifera*
Eastern Banjo Frog	*Limnodynastes dumerilii*
Ornate Burrowing Frog	*Limnodynastes ornatus*
Brown-striped Frog	*Limnodynastes peronii*
Spotted Grass Frog	*Limnodynastes tasmaniensis*
Haswell's Froglet	*Paracrinia haswelli*
Smooth Toadlet	*Uperoleia laevigata*
Tyler's Toadlet	*Uperoleia tyleri*

Reptiles

Common Name	Scientific Name
Diamond Python	*Morelia spilota spilota*
Common Death Adder	*Acanthophis antarcticus*
Yellow-faced Whip Snake	*Demansia psammophis*
Common Tree Snake	*Dendrelaphis punctulatus*
Golden-crowned Snake	*Cacophis squamulosus*
Eastern Small-eyed Snake	*Cryptophis nigrescens*
Red-naped Snake	*Furina diadema*
Black-bellied Swamp Snake	*Hemiaspis signata*
Tiger Snake	*Notechis scutatus*
Red-bellied Black Snake	*Pseudechis porphyriacus*
Eastern Brown Snake	*Pseudonaja textilis*
Dwyer's Snake	*Parasuta dwyeri*
Bandy Bandy	*Vermicella annulata*
Blackish Blind Snake	*Ramphotyphlops nigrescens*
Wood Gecko	*Diplodactylus vittatus*
Lesueur's Velvet Gecko	*Oedura lesueurii*
Broad-tailed Gecko	*Phyllurus platurus*
Thick-tailed Gecko	*Underwoodisaurus milii*
Burton's Snake-lizard	*Lialis burtonis*
Common Scaly-foot	*Pygopus lepidopodus*
Jacky Lizard	*Amphibolurus muricatus*
Bearded Dragon	*Pogona barbata*
Punctate Worm-skink	*Anomalopus swansoni*
Eastern Blue-tongue	*Tiliqua scincoides*
Southern Rainbow-skink	*Carlia tetradactyla*
Cream-striped Shinning-skink	*Cryptoblepharus virgatus*
Robust Ctenotus	*Ctenotus robustus*

Common Name	Scientific Name
Copper-tailed Skink	*Ctenotus taeniolatus*
Mainland She-oak Skink	*Cyclodomorphus michaeli*
Pink-tongued Skink	*Cyclodomorphus gerrardii*
Cunningham's Skink	*Egernia cunninghami*
Black Rock Skink	*Egernia saxatilis*
White's Skink	*Liopholis whitii*
Eastern Water-skink	*Eulamprus quoyii*
Barred-sided Skink	*Eulamprus tenuis*
Dark-flecked Garden Sunskink	*Lampropholis delicata*
Pale-flecked Garden Sunskink	*Lampropholis guichenoti*
Weasel Skink	*Saproscincus mustelinus*
Red-throated Skink	*Acritoscincus platynota*
Three-toed Skink	*Saiphos equalis*
Lace Monitor	*Varanus varius*
Eastern Snake-necked Turtle	*Chelodina longicollis*

Birds

Common Name	Scientific Name
Brown Quail	*Coturnix ypsilophora*
Black Swan	*Cygnus atratus*
Australian Wood Duck	*Chenonetta jubata*
Mallard	*Anas platyrhynchos*
Pacific Black Duck	*Anas superciliosa*
Grey Teal	*Anas gracilis*
Chestnut Teal	*Anas castanea*
Australasian Grebe	*Tachybaptus novaehollandiae*
Great Crested Grebe	*Podiceps cristatus*
Hoary-headed Grebe	*Poliocephalus poliocephalus*
Little Pied Cormorant	*Microcarbo melanoleucos*
Little Black Cormorant	*Phalacrocorax sulcirostris*
Great Cormorant	*Phalacrocorax carbo*
Australian Pelican	*Pelecanus conspicillatus*
White-faced Heron	*Egretta novaehollandiae*
Little Egret	*Egretta garzetta*
White-necked Heron	*Ardea pacifica*
Great Egret	*Ardea alba*
Cattle Egret	*Ardea ibis*
Intermediate Egret	*Ardea intermedia*
Australian White Ibis	*Threskiornis molucca*
Straw-necked Ibis	*Threskiornis spinicollis*
Royal Spoonbill	*Platalea regia*

Common Name	Scientific Name
Black-shouldered Kite	*Elanus axillaris*
Whistling Kite	*Haliastur sphenurus*
Wedge-tailed Eagle	*Aquila audax*
White-bellied Sea-eagle	*Haliaeetus leucogaster*
Swamp Harrier	*Circus approximans*
Brown Goshawk	*Accipiter fasciatus*
Collared Sparrowhawk	*Accipiter cirrocephalus*
Brown Falcon	*Falco berigora*
Australian Hobby	*Falco longipennis*
Nankeen Kestrel	*Falco cenchroides*
Buff-banded Rail	*Gallirallus philippensis*
Purple Swamphen	*Porphyrio porphyrio*
Dusky Moorhen	*Gallinula tenebrosa*
Eurasian Coot	*Fulica atra*
Latham's Snipe	*Gallinago hardwickii*
Black-winged Stilt	*Himantopus himantopus*
Black-fronted Dotterel	*Elseyornis melanops*
Masked Lapwing	*Vanellus miles*
Silver Gull	*Chroicocephalus novaehollandiae*
Rock Dove	*Columba livia*
White-headed Pigeon	*Columba leucomela*
Spotted Turtle-dove	*Streptopelia chinensis*
Brown Cuckoo-dove	*Macropygia amboinensis*
Emerald Dove	*Chalcophaps indica*
Common Bronzewing	*Phaps chalcoptera*
Crested Pigeon	*Ocyphaps lophotes*
Bar-shouldered Dove	*Geopelia humeralis*
Wonga Pigeon	*Leucosarcia picata*
Topknot Pigeon	*Lopholaimus antarcticus*
Yellow-tailed Black-cockatoo	*Calyptorhynchus funereus*
Galah	*Eolophus roseicapilla*
Long-billed Corella	*Cacatua tenuirostris*
Little Corella	*Cacatua sanguinea*
Sulphur-crested Cockatoo	*Cacatua galerita*
Rainbow Lorikeet	*Trichoglossus haematodus*
Scaly-breasted Lorikeet	*Trichoglossus chlorolepidotus*
Musk Lorikeet	*Glossopsitta concinna*
Australian King-parrot	*Alisterus scapularis*
Crimson Rosella	*Platycercus elegans*
Eastern Rosella	*Platycercus eximius*
Fan-tailed Cuckoo	*Cacomantis flabelliformis*
Horsfield's Bronze-cuckoo	*Chalcites basalis*

Common Name	Scientific Name
Channel-billed Cuckoo	*Scythrops novaehollandiae*
Asian Koel	*Eudynamys scolopaceus*
Southern Boobook	*Ninox novaeseelandiae*
Barn Owl	*Tyto alba*
Tawny Frogmouth	*Podargus strigoides*
White-throated Nightjar	*Eurostopodus mystacalis*
Australian Owlet-nightjar	*Aegotheles cristatus*
White-throated Needletail	*Hirundapus caudacutus*
Laughing Kookaburra	*Dacelo novaeguineae*
Sacred Kingfisher	*Todiramphus sanctus*
Rainbow Bee-eater	*Merops ornatus*
Dollarbird	*Eurystomus orientalis*
Superb Lyrebird	*Menura novaehollandiae*
Satin Bowerbird	*Ptilonorhynchus violaceus*
Superb Fairy-wren	*Malurus cyaneus*
Variegated Fairy-wren	*Malurus lamberti*
Spotted Pardalote	*Pardalotus punctatus*
White-browed Scrubwren	*Sericornis frontalis*
Large-billed Scrubwren	*Sericornis magnirostra*
Brown Gerygone	*Gerygone mouki*
White-throated Gerygone	*Gerygone albogularis*
White-throated Treecreeper	*Cormobates leucophaea*
Brown Thornbill	*Acanthiza pusilla*
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*
Yellow Thornbill	*Acanthiza nana*
Striated Thornbill	*Acanthiza lineata*
Buff-rumped Thornbill	*Acanthiza reguloides*
Red Wattlebird	*Anthochaera carunculata*
Little Wattlebird	*Anthochaera chrysoptera*
Noisy Friarbird	*Philemon corniculatus*
Bell Miner	*Manorina melanophrys*
Noisy Miner	*Manorina melanocephala*
Lewin's Honeyeater	*Meliphaga lewinii*
Yellow-faced Honeyeater	*Lichenostomus chrysops*
White-plumed Honeyeater	*Lichenostomus penicillatus*
Brown-headed Honeyeater	*Melithreptus brevirostris*
White-naped Honeyeater	*Melithreptus lunatus*
New Holland Honeyeater	*Phylidonyris novaehollandiae*
Eastern Spinebill	*Acanthorhynchus tenuirostris*
Scarlet Honeyeater	*Myzomela sanguinolenta*
Jacky Winter	*Microeca fascinans*
Rose Robin	*Petroica rosea*

Common Name	Scientific Name
Eastern Yellow Robin	*Eopsaltria australis*
Eastern Whipbird	*Psophodes olivaceus*
Crested Shrike-tit	*Falcunculus frontatus*
Golden Whistler	*Pachycephala pectoralis*
Rufous Whistler	*Pachycephala rufiventris*
Grey Shrike-thrush	*Colluricincla harmonica*
Black-faced Monarch	*Monarcha melanopsis*
Leaden Flycatcher	*Myiagra rubecula*
Restless Flycatcher	*Myiagra inquieta*
Magpie-lark	*Grallina cyanoleuca*
Rufous Fantail	*Rhipidura rufifrons*
New Zealand Fantail	*Rhipidura fuliginosa*
Willie Wagtail	*Rhipidura leucophrys*
Spangled Drongo	*Dicrurus bracteatus*
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*
White-bellied Cuckoo-shrike	*Coracina papuensis*
Olive-backed Oriole	*Oriolus sagittatus*
Dusky Woodswallow	*Artamus cyanopterus*
Grey Butcherbird	*Cracticus torquatus*
Australian Magpie	*Cracticus tibicen*
Pied Currawong	*Strepera graculina*
Australian Raven	*Corvus coronoides*
White-winged Chough	*Corcorax melanorhamphos*
Apostlebird	*Struthidea cinerea*
Eurasian Skylark	*Alauda arvensis*
Australasian Pipit	*Anthus novaeseelandiae rogersi*
House Sparrow	*Passer domesticus*
Red-browed Finch	*Neochmia temporalis*
Double-barred Finch	*Taeniopygia bichenovii*
Mistletoebird	*Dicaeum hirundinaceum*
Welcome Swallow	*Hirundo neoxena*
Tree Martin	*Petrochelidon nigricans*
Fairy Martin	*Petrochelidon ariel*
Cicadabird	*Coracina tenuirostris*
Red-whiskered Bulbul	*Pycnonotus jocosus*
Australian Reed-warbler	*Acrocephalus australis*
Little Grassbird	*Megalurus gramineus*
Golden-headed Cisticola	*Cisticola exilis*
Silvereye	*Zosterops lateralis*
Eurasian Blackbird	*Turdus merula*
Common Starling	*Sturnus vulgaris*
Common Myna	*Sturnus tristis*

Appendix 4. Habitat requirements for locally-occurring threatened fauna species

Birds

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Australasian Bittern *Botaurus poiciloptilus* BC Act, Sch. 2, Vul.	Inhabits wetlands that generally have permanent fresh water and dense vegetation of sedges, rushes and reeds.	No suitable natural habitat occurs on the site.
Spotted Harrier *Circus assimilis* BC Act Sch. 2, Vul.	Occurs in grassy open woodland including acacia and mallee remnants, inland riparian woodland, grassland. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	No suitable natural habitat occurs on the site.
Little Eagle *Hieraaetus morphnoides* BC Act Sch. 2, Vul.	Occupies open Eucalypt forest, woodland or open woodland. She-oak or acacia woodlands and riparian woodlands are also used. Builds a stick nests in winter in tall living trees within remnant patches	Suitable natural habitat occurs on the site.
Square-tailed Kite *Lophoictinia isura* BC Act, Sch. 2, Vul.	Inhabits coastal forest and woodlands. Most commonly associated with ridge and gully forests dominated by Woollybutt, Spotted Gum or Peppermint Gum.	Suitable natural habitat occurs on the site.
Gang-gang Cockatoo *Callocephalon fimbriatum* BC Act, Sch. 2, Vul.	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands – also in urban areas including parks and gardens. Requires tree hollows for nesting	Suitable natural habitat occurs on the site.
Glossy Black-cockatoo *Calyptorhynchus lathami* BC Act, Sch. 2, Vul.	Found in open forests with Allocasuarina species and hollows for nesting.	No suitable natural habitat occurs on the site.
Little Lorikeet *Glossopsitta pusilla* BC Act, Sch. 2, Vul.	Inhabits the open forests and dead timber alongside watercourses. Also occurs in eucalypt forest in mountainous regions.	Suitable foraging habitat occurs on the site.
Swift Parrot *Lathamus discolor* BC Act, Sch. 2, Vul. EPBC Act, End.	Occurs in a variety of Eucalypt forests. Migrates from Tasmania to the mainland during the winter/autumn months to feed mostly on winter flowering Eucalypts	No suitable foraging habitat occurs on the site.
Barking Owl *Ninox connivens* BC Act, Sch. 2, Vul.	Found in open forests, woodlands, dense scrubs, river red gums and other large trees near watercourses.	Suitable natural habitat occurs on the site.

Common name ***Scientific name*** Schedule listing	**Preferred habitat**	**Comment**
Powerful Owl *Ninox strenua* BC Act, Sch. 2, Vul.	Pairs occupy permanent territories in mountain forests, gullies and forest margins, sparser hilly woodlands, coastal forests, woodlands and scrubs.	Suitable natural habitat occurs on the site.
Masked Owl *Tyto novaehollandiae* BC Act, Sch. 2, Vul.	Forests, open woodlands and farms with large trees, e.g. river red gums adjacent to cleared country.	Suitable natural habitat occurs on the site.
Sooty Owl *Tyto tenebricosa* BC Act, Sch. 2, Vul.	Tall, wet forests in sheltered mountain gullies, usually with an east and Southeast aspect.	No suitable natural habitat occurs on the site.
Speckled Warbler *Pyrrholaemus sagittatus* BC Act Sch. 2, Vul.	Inhabits Eucalypt dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy	No suitable natural habitat occurs on the site.
Varied Sittella *Daphoenositta chrysoptera* BC Act Sch. 2, Vul.	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland	No suitable natural habitat occurs on the site.
Dusky Woodswallow *Artamus cyanopterus cyanopterus* BC Act Sch. 2, Vul.	Often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests.	No suitable natural habitat occurs on the site.
Flame Robin *Petroica phoenicea* BC Act Sch. 2, Vul.	In NSW it breeds in upland moist eucalypt forests and woodlands, often on ridges and slopes, in areas of open understorey. It migrates in winter to more open lowland habitats such as grassland with scattered trees and open woodland on the inland slopes and plains	No suitable natural habitat occurs on the site.
Diamond Firetail *Stagonopleura guttata* BC Act Sch. 2, Vul	Mostly inhabits grassy eucalypt woodlands, also occurring in open forest and riparian areas within these. Feeds exclusively on the ground, occurring in flocks between five to 40+ birds	No suitable natural habitat occurs on the site.

Mammals

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Spotted-tailed Quoll *Dasyurus maculatus* BC Act, Sch. 2, Vul. EPBC Act, End.	Occurs mostly in sclerophyll forest and woodlands as well as coastal heath lands and rainforests. Requires suitable den sites such as hollows or caves and large areas of intact vegetation.	No suitable natural habitat occurs on the site.
Koala *Phascolarctos cinereus* BC Act, Sch. 2, Vul.	Eucalypt forests rich in Swamp Mahogany (E. robusta), Forest Red Gum (E. tereticornis), and Grey Gum (E. punctata).	No suitable natural habitat occurs on the site.
Yellow-bellied Glider *Petaurus australis* BC Act, Sch. 2, Vul.	Restricted to tall, mature sclerophyll forests in regions of high rainfall. Requires nesting hollows and a year-round supply of flowering trees.	No suitable natural habitat occurs on the site.
Squirrel Glider *Petaurus norfolcensis* BC Act, Sch. 2, Vul.	Inhabits dry sclerophyll forest and woodland. Requires abundant hollow-bearing trees and a mix of Eucalypts, acacias and Banksias. At least one floral species should flower heavily in the winter and one or more species of Eucalypts need to be smooth-barked.	No suitable natural habitat occurs on the site.
Grey-headed Flying-fox *Pteropus poliocephalus* BC Act, Sch. 2, Vul. EPBC Act, Vul.	Found in rainforest, wet and dry sclerophyll forest and mangroves. Camps are usually in gullies, close to water and in vegetation with a dense canopy. Feeds on a wide variety of flowering and fruiting plants.	Suitable foraging habitat occurs on the site.
Eastern Coastal Free-tail Bat *Micronomus norfolkensis* BC Act, Sch. 2, Vul.	Dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roosts mainly in tree hollows but will also roost under bark or in man-made structures.	Suitable foraging habitat occurs on the site.
Large-eared Pied Bat *Chalinolobus dwyeri* BC Act, Sch. 2, Vul.	Found in well-timbered areas containing gullies.	Suitable foraging habitat occurs on the site.
Eastern False Pipistrelle *Falsistrellus tasmaniensis* BC Act, Sch. 2, Vul.	Little known of habitat. Has been found roosting in stem holes of living Eucalypts	Suitable foraging habitat occurs on the site.

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Large Bent-winged Bat *Miniopterus orianae oceanensis* BC Act, Sch. 2, Vul.	Well-timbered valleys. Roosts in caves and storm-water channels and similar structures. Does not roost in tree hollows.	Suitable foraging habitat occurs on the site.
Southern Myotis *Myotis macropus* BC Act, Sch. 2, Vul.	Requires open areas of water over which it hunts. Roosts in caves, under bridges and buildings and sometimes in dense foliage in rainforests. May roost in tree hollows.	No suitable natural habitat occurs on the site.
Greater Broad-nosed Bat *Scoteanax rueppellii* BC Act, Sch. 2, Vul. EPBC Act, Lower risk (near threatened)	Found in woodlands, moist and dry sclerophyll forests and rainforests. Prefers gullies. Roosts in tree hollows only.	Suitable foraging habitat occurs on the site.

Invertebrates

Common name *Scientific name* Schedule listing	Preferred habitat	Comment
Cumberland Plain Land Snail *Meridolum corneovirens* BC Act, Sch. 1, End. EPBC Act, Vul.	Found amongst logs and debris in Cumberland Plain and Castlereagh woodlands.	Suitable natural habitat occurs on the site.
Dural Woodland Snail *Pommerhelix duralensis* EPBC Act, End.	Forested habitats that have good native cover and woody debris. Under rocks or inside curled-up bark. It does not burrow nor climb.	Suitable natural habitat occurs on the site.

Appendix 5. Habitat requirements for locally-occurring threatened plant species

Botanical name **Conservation status**	**Habitat description**	**Suitable habitat on site**
Acacia asparagoides ROTAP, 2R	Grows in dry sclerophyll forest or occasionally heath on sandstone.	No
Acacia baueri subsp. aspera ROTAP, 2RC – BC Act, Sch. 2, Vul.	Grows in low heath, often on exposed sandstone ridges.	No
Acacia bynoeana ROTAP, 3VC - BC Act, Sch. 1, End. EPBC Act, Vul.	Grows mainly in heath and dry sclerophyll forest, in sandy soils.	No
Acacia clunies-rossiae ROTAP, 2RC - t BC Act, Sch. 2, Vul.	Grows in dry sclerophyll forest, in valleys, on slopes and ridges, and along creeks.	Yes
Acacia flocktoniae ROTAP, 2VC - BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in dry sclerophyll forest on sandstone.	No
Acacia gordonii ROTAP, 2K BC Act, Sch. 1, End. EPBC Act, End.	Grows in dry sclerophyll forest and heath on sandstone outcrops.	No
Acacia pubescens ROTAP, 3VCa BC Act, Sch. 2, Vul. EPBC Act, Vul.	Usually grows in dry sclerophyll forest and woodland in clay soils. Often in roadside and railside bushland remnants.	Yes
Acacia terminalis subsp. terminalis ROTAP, 2RCi BC Act, Sch. 1, End. EPBC Act, End.	Scattered or locally common in scrub and open eucalypt woodland or forest, usually in sandy soil on creek banks, hillslopes or in shallow soil in rock crevices and sandstone platforms on cliffs.	No
Acrophyllum australe ROTAP, 2VCi BC Act, – Sch. 2, Vul. EPBC Act, Vul.	Grows in damp crevices in sandstone, usually near waterfalls. Restricted to the Blue Mtns, near Springwood, Linden, Woodford and Lawson.	No
Allocasuarina glareicola ROTAP, 2E BC Act, Sch. 1, End. EPBC Act, End.	Grows in open forest on lateritic soil; restricted to a few small populations in or near Castlereagh S.F., NE of Penrith.	No
Almaleea incurvata ROTAP, 2RC – t	Grows in swamps dominated by sedges and/or shrubs, on sandstone; restricted to the Blue Mtns.	No
Amperea xiphoclada var. papillata ROTAP, 3KC	Grows with other native sedges and rushes in swamps on sandstone at altitudes of greater than 600 m.	No
Ancistrachne maidenii ROTAP, 2KC - BC Act, Sch. 2, Vul.	Grows on sandstone soils; north of Sydney.	No

Botanical name Conservation status	Habitat description	Suitable habitat on site
Angophora crassifolia ROTAP, 2RCa	Locally frequent but restricted to the Ku-ring-gai Plateau region.	No
Asterolasia elegans ROTAP, 2ECa BC Act, Sch. 1, End. EPBC Act, End.	Grows in wet sclerophyll forest on moist hillsides, known from only one locality, north of Maroota.	No
Atkinsonia ligustrina ROTAP, 2RCa	Occurs in woodland and heath in exposed sites, a single plant often parasitic on the roots of many nearby plants; confined to a small area in the Blue Mtns.	No
Banksia conferta var. penicillata BC Act, Sch. 1, End.	Grows in dry sclerophyll forest or woodland, restricted to small populations in the Blue Mtns on sandstone cliffs or steep slopes and around rocky outcrops.	No
Blandfordia cunninghamii ROTAP, 3RCi	Grows in damp shallow sandy and peaty soils, often on sandstone cliff edges; chiefly in the Blue Mtns and Illawarra areas.	No
Blechnum gregsonii ROTAP, 2RCa	Pendent clumps found in cool rainforest, often in damp places near waterfalls, sometimes epiphytic; chiefly in the Blue Mtns and Illawarra coastal ranges.	No
Boronia fraseri ROTAP, 2RCa (UBBS 97 Recommend)	Grows mainly in wet sclerophyll forest and in rainforest in gullies on sandstone, chiefly in the Sydney region.	No
Boronia serrulata ROTAP, 2RC -	Grows in moist heath in sandy situations, chiefly in a coastal band in the Sydney district; record for the SWS in Jacobs & Pickard (1981) not substantiated.	No
Brasenia schreberi ROTAP, 3RC- +	Widespread but rarely common, found in shallow freshwater lagoons or backwaters.	No
Callistemon linearifolius ROTAP, 2RCi BC Act, Sch. 2, Vul.	Grows in dry sclerophyll forest on the coast and adjacent ranges, chiefly from Georges R. to the Hawkesbury R.	Yes
Callistemon shiressii ROTAP, 3RC -	Grows on shale ridges, in moist eucalypt forest and rainforest gullies, occasionally along riverbanks; chiefly from Colo R. to Gosford district, also Howes Valley to Bulga district.	No
Carex klaphakei BC Act, Sch. 1, End.	Known only from a few localities on Central Tablelands near Blackheath, Mt Werong and Penrose at 600–1200 m alt.	No
Chamaesyce psammogeton BC Act, Sch. 1, End.	Grows on dunes and sea strandlines.	No
Cryptostylis hunteriana BC Act, Sch. 2, Vul. EPBC Act, Vul.	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland.	No

Botanical name Conservation status	Habitat description	Suitable habitat on site
Cynanchum elegans ROTAP, 3ECi BC Act, Sch. 1, End. EPBC Act, End.	Rare, recorded from rainforest gullies scrub and scree slopes; from the Gloucester district to the Wollongong area and inland to Mt Dangar.	No
Cyphanthera scabrella ROTAP, 2RC -	Grows in dry or wet sclerophyll forest in sandstone-derived soil; restricted to Bilpin-Mt Wilson area in Blue Mtns.	No
Darwinia biflora ROTAP, 2VCa BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in heath on sandstone or in the understorey of woodland on shale-capped ridges; Cheltenham to Hawkesbury R., rare.	No
Darwinia diminuta ROTAP, 2RCi	Grows in heath or dry sclerophyll forest in poorly drained sandy soil; Manly to Ingleside and Loftus to Helensburgh, rare.	No
Darwinia fascicularis subsp. oligantha BC Act, Sch. 1, End. Pop. (Baulkham Hills)	Grows in heath or shallow soils; higher parts of the Blue Mtns.	No
Darwinia grandiflora ROTAP, 2RCi	Grows in dry sclerophyll forest and woodland on poorly drained sandy soil; Woronora Plateau and Illawarra region, rare.	No
Darwinia peduncularis ROTAP, 3RCi BC Act, Sch. 2, Vul.	Grows in dry sclerophyll forest on sandstone hillsides and ridges; Hornsby to Hawkesbury R. and west to Glen Davis, rare.	No
Deyeuxia appressa ROTAP, 2E BC Act, Sch. 1, End. EPBC Act, End.	Grows on wet ground; in the Hornsby area.	No
Deyeuxia microseta ROTAP, 3KC -	Grows in montane sclerophyll forest, especially wetter areas.	No
Dillwynia tenuifolia ROTAP, 2RCa BC Act, Sch. 2, Vul.	Grows in dry sclerophyll woodland on sandstone, shale or laterite; from Cumberland Plain, Blue Mtns to Howes Valley area.	Yes
Discaria pubescens ROTAP, 3RCa	In woodland and forest, often in rocky situations; widespread, but considered endangered.	No
Diuris aequalis ROTAP, 3VC - BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows among grass in sclerophyll forest, mainly in the ranges and tablelands; chiefly from Braidwood to Kanangra and Liverpool.	No
Epacris hamiltonii ROTAP, 2ECi BC Act, Sch. 1, End. EPBC Act, End.	Grows in skeletal sandy soils in sheltered damp rock situations on sandstone in the Blackheath area.	No
Epacris muelleri ROTAP, – 3RC -	Grows on skeletal soils on damp rock faces on sandstone in the Blue Mtns and Wollemi N.P.	No

Botanical name Conservation status	Habitat description	Suitable habitat on site
Epacris purpurascens var. purpurascens BC Act, Sch. 2, Vul.	Grows in sclerophyll forest, scrubs and swamps on sandstone from Gosford and Sydney districts.	No
Epacris sparsa ROTAP, 2VCi BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in sandy soil among rocks beside Grose R.	No
Epacris sparsa ROTAP, 2VCi BC Act, Sch. 2, Vul. EPBC Act, Vul.	Rare and localized, in mallee shrubland on skeletal sandy soil on sandstone; sporadic occurrences between Linden and Berrima.	No
Eucalyptus baeuerlenii ROTAP, 3RCa	Locally frequent but restricted, in wet forest or woodland in sheltered often sloping sites; from Wentworth Falls to Budawang Ra.	No
Eucalyptus benthamii ROTAP, 2VCi BC Act, Sch. 2, Vul. EPBC Act, Vul.	Restricted but locally abundant, in wet forest on sandy alluvial soils along valley floors; confined to the lower Nepean R. area.	No
Eucalyptus burgessiana ROTAP, 2RCa	Locally frequent but restricted, in mallee shrubland on skeletal sand on sandstone; restricted to lower Blue Mtns.	No
Eucalyptus camfieldii ROTAP, 2VCi BC Act, Sch. 2, Vul. EPBC Act, Vul.	Rare and localized, in coastal shrub heath on sandy soils on sandstone, often of restricted drainage; from Gosford to Royal N.P.	No
Eucalyptus cannonii ROTAP, 2VCi BC Act, Sch. 2, Vul.	Locally frequent but restricted, in sclerophyll woodland on shallow soil on rises; Rylstone to upper Wolgan Valley.	No
Eucalyptus copulans ROTAP, 2E BC Act, Sch. 1, End. EPBC Act, End.	Locally frequent but restricted, in sclerophyll woodland on shallow soil on rises; Rylstone to upper Wolgan Valley.	No
Eucalyptus cunninghamii ROTAP, 2RCa	Restricted but locally frequent, in mallee heath skeletal sandy soil on sandstone; confined to central Blue Mtns.	No
Eucalyptus sp. 'Cattai' BC Act, Sch. 1, End.	Grows as isolated trees or small groups of trees in scrub, heath and low woodland, in sandstone-derived soils.	No
Eucalyptus leuhmanniana ROTAP, 2RCa	Locally abundant but restricted, in mallee heath on shallow infertile sandy soils of poor drainage on sandstone; confined to coastal plateau between the Hawkesbury R. and Bulli.	No
Euphrasia bowdeniae ROTAP, 2VCit BC Act Sch. 2, Vul. EPBC Act, Vul.	Grows on sandstone cliffs in shallow soil on ledges or sometimes trailing over rock, in higher parts of Blue Mountains.	No

Botanical name Conservation status	Habitat description	Suitable habitat on site
Genoplesium baueri BC Act, Sch. 1, End.	Prefers sandy dry Eucalyptus habitats	No
Grammitis stenophylla BC Act, Sch. 1, End.	Prefers moist shaded gullies, typically grows on rocks near moss.	No
Grevillea caleyi BC Act, Sch. 1, End. EPBC Act, End.	Grows on sandy soil with lateritic influences, typically on ridges.	No
Microtis angusii BC Act, Sch. 1, End. EPBC Act, End.	Difficult to determine, growing among weeds and on a disturbed soil. Possibly prefers sandy soils with lateritic influences.	No
Gonocarpus longifolius ROTAP, 3RC -	Grows in shrub communities on sandstone; mainly on the ranges from Armidale to the Blue Mtns, east of Rylstone.	No
Goodenia rostrivalvis ROTAP, 2RCa	Grows on damp south-facing sandstone cliffs in Blue Mtns, in the Wentworth Falls area, rare.	No
Grevillea juniperina subsp. juniperina BC Act, Sch. 2, Vul.	Grows in open dry sclerophyll (eucalypt-dominated) forest or woodland, at altitudes of less than about 50 m, in sandy to clay-loam soils and red pseudolateritic gravels.	No
Grevillea longifolia ROTAP, 2RC -	Grows in moist areas of sclerophyll forest, often near creeks, on Hawkesbury sandstone; chiefly the southern half of Sydney Basin, and Woronora Plateau; possibly also in Lawson area.	No
Grevillea obtusiflora BC Act, Sch. 1, End. EPBC Act, End.	Grows in sandy loam soils in open low scrub beneath dry sclerophyll forest in the Kandos area.	No
Grevillea parviflora subsp. parviflora BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in heathy associations or shrubby woodland, in sandy or light clay soils usually over shale substrates.	No
Gyrostemon thesioides ROTAP, 2KC - BC Act Sch. 1, End.	Grows on hillsides and riverbanks, only from sites near Georges (30 yrs ago) and Nepean Rivers (90 yrs ago). May already be extinct.	No
Hakea constablei ROTAP, 2RCa	In dry sclerophyll forest on rocky outcrops, scattered in the Blue Mtns between 500–1100 m alt., from Bell to Mt Wilson, rare.	No
Haloragodendron lucasii BC Act, Sch. 1, End. EPBC Act, End.	Grows in dry sclerophyll open forest on sheltered slopes near creeks on sandstone; confined to Sydney area, rare.	No
Hibbertia hermanniifolia ROTAP, 3RCa	Open forest on sandstone; confined to Bents Basin (Nepean R), Yarrowitch district and the coastal ranges south from Wadbilliga N.P.; rare.	No
Hibbertia nitida ROTAP, 2RC -	Widespread on sandstone in the Sydney district.	No

Botanical name Conservation status	Habitat description	Suitable habitat on site
Hibbertia superans BC Act, Sch. 1, End.	Occurs in both open woodland and heathland, and appears to prefer open disturbed areas, such as tracksides.	No
Hymenophyllum lyallii (was *Sphaerocionium lyallii*) ROTAP, 3RC – +	Grows on rocks or trees in moist rainforest in the Blue Mtns and ranges of the south coast.	No
Hymenophyllum pumilum ROTAP, 3RC -	Epiphytic in cooler rainforest of the Blue Mtns and adjacent ranges; uncommon.	No
Isopogon fletcheri ROTAP, 2VCa BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in dry sclerophyll forest and heath on sandstone; confined to sheltered moist positions on the escarpment in the Blackheath district of the Blue Mtns, rare.	No
Isotoma sessiliflora (was *Hypsela sessiliflora*) ROTAP, 2X BC Act, Sch. 1, End.	Grows in damp places, on the Cumberland Plain, very rare.	No
Keraudrenia corollata var. denticulata ROTAP, 3RC -	Mostly on sandstone. Rare; recorded from near Grafton and west of Sydney.	No
Kunzea cambagei ROTAP, 2VCa BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in heath; known mainly from near Mt Werong and Berrima.	No
Kunzea rupestris ROTAP, 2VCa BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in heath on rock platforms; known only from between Lower Portland and Ku-ring-gai Chase N.P.	No
Lasiopetalum joyceae ROTAP, 2RC - BC ACT, Sch. 2, Vul. EPBC Act, Vul.	Grows in heath on sandstone; Hornsby Plateau.	No
Leionema lachnaeoides ROTAP, 2ECi BC Act, Sch. 1, End. EPBC Act, End.	Rare, from higher Blue Mtns, on barren rocky situations.	No
Lepidosperma evansianum BC Act, Sch. 2, Vul.	Grows on wet sandstone cliff faces.	No
Lepidosperma evansianum BC Act, Sch. 2, Vul. *Leptospermum rupicola* ROTAP, -3RC -	Grows in shrubby communities and heath on sandstone cliffs and escarpments.	No
Leucopogon exolasius ROTAP, 2VC - BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in woodland on sandstone, restricted to the Woronora and Grose Rivers and Stokes Creek, Royal N.P.	No

Botanical name Conservation status	Habitat description	Suitable habitat on site
Leucopogon fletcheri subsp. fletcheri ROTAP, 2RC - BC Act, Sch. 1, End.	Grows in woodland on lateritic soils; rare, in the Springwood area.	No
Lissanthe sapida ROTAP, 3RCa	Grows in open woodland and dry sclerophyll forest, on rocky sandstone ridges and hillsides on sandy soil; occasional, from Bargo to Coloul Ra. and Blackheath.	No
Lomandra brevis ROTAP, 2RC -	Grows in dry sclerophyll forest on sandstone-derived soils in the Sydney region; not common.	No
Lomandra fluviatilis ROTAP, 3RCa	Grows in creek beds on sandy soils; in the Royal N.P. to Colo R	No
Marsdenia viridiflora subsp. viridiflora BC Act, Sch. 1, End. Pop.	Grows in woodland and scrub; north from the Razorback Ra. (Bankstn, Blacktn, Camden, Campbelltn, Fairfield, Holroyd, Liverpool & Penrith LGAs)	No
Melaleuca deanei ROTAP, 3RC- BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in wet heath on sandstone; uncommon, in coastal districts from Berowra to Nowra.	No
Micromyrtus blakelyi ROTAP, 2VCi BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in heath in depressions on sandstone rock platforms; restricted to areas near the Hawkesbury R.	No
Micromyrtus minutiflora ROTAP, 2V BC Act, Sch. 1, End. EPBC Act, Vul.	Grows in dry sclerophyll forest in western part of the Cumberland Plain; rare.	No
Monotoca ledifolia ROTAP, 3RC - *Notochloe microdon* ROTAP, 2RC -	Grows in exposed sites in dry sclerophyll forest and shrubland on sandstone in the Woronora Plateau and Blue Mtns area.	No
Notochloe microdon ROTAP, 2RC -	Grows in moist shady areas of the Blue Mtns district.	No
Olearia cordata ROTAP, 2VCi BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in dry sclerophyll forest and open shrubland, on sandstone; chiefly from Wisemans Ferry to Wollombi.	No
Olearia quercifolia ROTAP, 3RC -	Grows in swampy or moist terrain; confined to the Blue Mtns.	No
Ozothamnus adnatus ROTAP, 3KC-	Grows in sclerophyll forest and woodland, usually on sandy soil; rare, south from Guyra district.	No

Botanical name **Conservation status**	**Habitat description**	**Suitable habitat on site**
Persoonia acerosa ROTAP, 2VC - BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in heath or dry sclerophyll forest on sandstone; central Blue Mtns south to Hill Top.	No
Persoonia bargoensis ROTAP, 2V BC Act, Sch. 1, End. EPBC Act, Vul.	Grows in woodland to dry sclerophyll forest, on sandstone and laterite; restricted to the Bargo area.	No
Persoonia hirsuta/revoluta ROTAP, 3KCi BC Act, Sch. 1, End. EPBC Act, End.	Grows in woodland to dry sclerophyll forest on sandstone; both subspecies occurring as isolated individuals or very small populations.	No
Persoonia laxa BC Act, Sch. 1, Ext. EPBC Act, Ext.	Considered extinct. Probably prefers heath or sclerophyll forest with sandy soils.	No
Persoonia mollis subsp. maxima ROTAP, 2E BC Act, Sch. 1, End. EPBC Act, End.	Grows in dry to wet sclerophyll forest on Hawkesbury sandstone, Cowan–Hornsby area.	No
Persoonia nutans ROTAP, 2ECi BC Act, Sch. 1, End. EPBC Act, End.	Grows in woodland to dry sclerophyll forest on laterite and alluvial sand; confined to the Cumberland Plain.	No
Pherosphaera fitzgeraldii (was *Microstrobos fitzgeraldii*) ROTAP, 2ECi BC Act, Sch. 1, End.	Usually grows on wet rocks within the spray of waterfalls or on ledges or in caves near waterfalls; restricted to southerly aspects on sandstone near waterfalls in the Katoomba to Wentworth Falls area of the Blue Mtns.	No
Philotheca obovalis (was *Eriostemon obovalis*) ROTAP, 3RCa	Grows in heath and dry sclerophyll forest on sandstone; chiefly in the Blue Mountains, also recorded for Kydra Mountain.	No
Pilularia novae-hollandiae BC Act, Sch. 1, End.	Widespread but not common in seasonally dry depressions and margins of marshes; may grow submerged.	No
Pimelea curviflora var. curviflora BC Act, Sch. 2, Vul. EPBC Act, Vul.	Confined to coastal areas around Sydney on sandstone.	No
Pimelea spicata ROTAP, 3ECi BC Act, Sch. 1, End. EPBC Act, End.	Grows on the coast from Lansdowne to Shellharbour and inland to Penrith; rare.	No
Platysace clelandii ROTAP, 2RCa	Grows among sandstone boulders in dry sclerophyll forest, from Glen Davis to Berowra.	No

Botanical name Conservation status	Habitat description	Suitable habitat on site
Pomaderris brunnea ROTAP, 2VC - BC Act, Sch. 2, Vul. EPBC Act, Vul.	In open forest, confined to the Colo R. and upper Nepean R.	No
Pomaderris prunifolia BC Act, Sch. 1, End.	Forest and woodland	Yes
Prostanthera cryptandroides BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows chiefly in the Lithgow to Sandy Hollow districts.	No
Prostanthera marifolia BC Act, Sch. 4, Ext A. EPBC Act, CE.	Occurs in sandy soils with clay-loam and ironstone on ridge tops.	No
Pseudanthus divaricatissimus ROTAP, 3RCa	Mostly from Muswellbrook to Bega, with outlying populations near Urbenville and Dubbo (Goonoo State Forest).	No
Pterostylis gibbosa ROTAP, 2E (X-WSyd) BC Act, Sch. 1, End. EPBC Act, End.	Grows among grass in sclerophyll forest; rare, chiefly in the southern parts of the central coast, with a disjunct population in the Hunter Valley.	No
Pterostylis saxicola ROTAP, (2E) BC Act, Sch. 1, End. EPBC Act, End.	Grows in shallow soil over sandstone sheets, often near streams; rare, from Picnic Point to Picton area.	No
Pultenaea sp. 'Genowlan Point' (NSW 417813) BC Act, Sch. 1, Crit. End. EPBC Act, Crit. End.	It is endemic to New South Wales and is only found at Genowlan Point in the Capertee Valley. At Genowlan Point, Pultenaea sp. 'Genowlan Point' (Allen s.n., 29 Nov. 1997) is restricted to well drained stoney soils.	No
Pultenaea glabra EPBC Act, Vul.	Grows in dry sclerophyll forest on sandstone; higher Blue Mtns and Glen Davis area.	No
Pultenaea parviflora ROTAP, 2E BC Act, Sch. 1, End. EPBC Act, Vul.	Grows in dry sclerophyll forest on Wianamatta Shale, laterite or alluvium, Cumberland Plain.	No
Pultenaea pedunculata BC Act, Sch. 1, End.	Grows in dry sclerophyll forest and disturbed sites on a variety of soils on the South Coast and edge of the Southern Tableland, but with disjunct restricted populations on Wianamatta Shale on the Cumberland Plain in N.S.W.	No
Pultenaea villifera var. villifera ROTAP, 3RC - BC Act, Sch. 1, End. Pop. (Lower Blue Mountains)	Grows in dry sclerophyll forest on sandy soil; lower Blue Mtns to Eden district.	No

Botanical name Conservation status	Habitat description	Suitable habitat on site
Rhizanthella slateri ROTAP, 3KC - BC Act, Sch. 2, Vul. EPBC Act, End.	Grows in sclerophyll forest in shallow to deep loams. Collections tend to be accidental and it is not possible to determine distribution accurately; recorded for the Blue Mtns, also Bulahdelah south to Dharug N.P.	No
Rhodamnia rubescens BC Act, Sch. 1, End.	Forest	Yes
Rupicola apiculata ROTAP, 2RCa	Grows in skeletal sandy soils in damp situations on sandstone rock ledges between 700–1100 m alt.; restricted to the Blue Mtns.	No
Rupicola ciliata ROTAP, 2RC – t	Grows in skeletal sandy soils in rock crevices, on rock ledges and beneath cliff overhangs in Kurrajong Heights, Bilpin to lower Yarramun Creek areas in the Blue Mtns.	No
Rupicola sprengelioides ROTAP, 2RC – t	Restricted to skeletal sandy soils on sandstone ledges, cliff faces and rocky ground, in the Burragorang Valley.	No
Sprengelia monticola ROTAP, 2RC – t	Grows on wet rock faces and ledges or cliff bases on sandstone in the Blue Mtns.	No
Syzygium paniculatum BC Act, Sch. 1, End. EPBC Act, Vul.	Rainforest and open forest near riparian zones.	Yes
Tetratheca glandulosa ROTAP, – 2VC - BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in sandy or rocky heath or scrub, from Mangrove Mtn to the Blue Mtns and Sydney.	No
Tetratheca neglecta ROTAP, 3RC -	Grows in sandy heath and dry sclerophyll forest; chiefly in the Sydney district, south to Robertson.	No
Thesium australe ROTAP, 3VCi BC Act, -Sch. 2, Vul. EPBC Act, Vul.	Grows in grassland or woodland, often in damp sites; widespread but rare and possibly endangered.	No
Tylophora woollsii ROTAP, 2E BC Act, Sch. 1, End. EPBC Act, End.	Grows in wet sclerophyll forest and rainforest in the Clouds Creek area near Nymboida and in sclerophyll forest near Parramatta; rare.	No
Velleia perfoliata ROTAP, 2VC - BC Act, Sch. 2, Vul. EPBC Act, Vul.	Grows in heath on shallow sandy soil over sandstone; confined to the Hawkesbury district to the upper Hunter Valley.	No
Veronica lithophila (was *Parahebe lithophila*) ROTAP, 2RC -	Grows on cliffs or rock exposures, in pockets of soil over sandstone or quartzite; Blue Mtns-Colong region at 650–870 m alt., uncommon.	No
Wahlenbergia multicaulis BC Act, Sch. 1, End.	Woodland	Yes
Wilsonia backhousei BC Act, Sch. 2, Vul.	Grows in coastal saltmarshes; chiefly in the Sydney district, also common at Jervis Bay.	No

Botanical name **Conservation status**	**Habitat description**	**Suitable habitat on site**
Zannichellia palustris BC Act, Sch. 1, End.	A submerged aquatic plant. Grows in fresh or slightly saline stationary or slowly flowing water.	No
Zieria covenyi BC Act, Sch. 1, End. EPBC Act, End.	Grows in eucalypt woodland on sandy soils; known only from Narrow Neck Peninsular in the Blue Mtns N.P.	No
Zieria involucrata ROTAP, 2VCa BC Act, Sch. 1, End. EPBC Act, Vul.	Grows in wet sclerophyll forest, chiefly in the Lower Blue Mtns; rare.	No
Zieria murphyi ROTAP, 2VC-	Grows in dry sclerophyll forest in sandy soils; on the ranges from Mt Tomah to Penrose district.	No
Zieria prostrata BC Act, Sch. 1, End. EPBC Act, End.	Restricted to low coastal heaths, near Coffs Harbour; rare.	No

Key		
BC Act 2016: Sch1 = Schedule 1: Endangered species Part 1: endangered species Part 2: endangered populations Part 3: endangered ecological communities Part 4: species presumed extinct Sch2 = Schedule 2: Vulnerable species		**ROTAP Codes** 1 Known by one collection only 2 Geographic range in Australia < 100Km 3 Geographic range in Australia > 100Km E Endangered V Vulnerable R Rare X Extinct K Poorly known C Reserved a > or = 1000 plants reserved i < 1000 plants reserved t Total known population reserved - Reserved population size unknown + Overseas occurrence
EPBC Act 1999: CE = Critically Endangered E = Endangered V = Vulnerable EP = Endangered Population		

Appendix 6. Matters of National Environmental Significance

The Protected Matters Search Tool was used to find relevant Matters of National Environmental Significance (MNES) on or near the site.

One Listed Threatened Ecological Communities are recorded in the area that occurs on the site: Blue Gum High Forest in the Sydney Basin Bioregion.

This ecological community is protected under Commonwealth legislation by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) and is listed as Critically Endangered.

Australian Government
Department of Agriculture, Water and the Environment

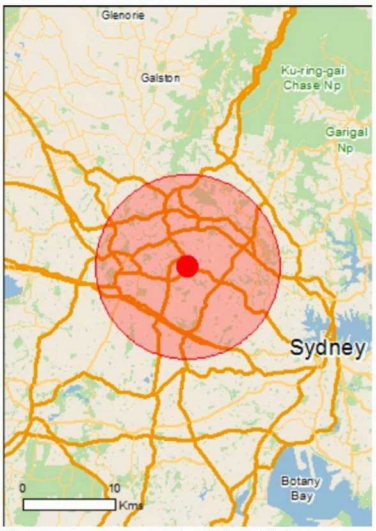
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

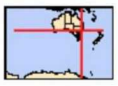
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 04/03/21 12:07:43



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates
Buffer: 10.0Km



Appendix 7. Company Profile

Abel Ecology has been in the biodiversity consulting business since 1991, starting in the Sydney Region, and progressively more state wide in New South Wales since 1998, and now also in Victoria.

During this time extensive expertise has been gained with regard to Master Planning, Environmental Impact assessments including flora and fauna, bushfire reports, Vegetation Management Plans, Management of threatened species, Review of Environmental Factors, Species Impact Statements, Biodiversity Development Assessment Reports and as Expert Witness in the Land and Environment Court.

We have done consultancy work for industrial and commercial developments, golf courses, civil engineering projects, tourist developments as well as residential and rural projects. This process has also generated many connections with relevant government departments and city councils in NSW. Our team consists of four scientists and two administrative staff, plus casual assistants as required.

Licences

- NPWS s132C Scientific licence number is SL100780 expires 31 July 2021
- NPWS GIS data licence number is CON95034
- DG NSW Dept of Primary Industries Animal Care and Ethics Committee Approval expires 8 November 2021
- DG NSW Dept of Primary Industries Animal Research Authority expires 8 November 2021

The Consultancy Team

Dr Danny Wotherspoon

Grad Dip Bushfire Protection (University of Western Sydney 2012)
PhD (researching Cumberland Plain vegetation and fauna habitat, at Centre for Integrated Catchment Management, University of Western Sydney, 2008)
Planning for Bushfire Protection Certificate course (University of Technology, 2006)
Consulting Planners Bushfire Training Course (Planning Institute of Australia, 2003)
MA (Macquarie University, 1991)
Wildlife Photography Certificate (Sydney Technical College, 1987)
Herpetological Techniques Certificate (Sydney Technical College, 1986)
Applied Herpetology Certificate (Sydney Technical College, 1980)
Dip Ed (University of New England, 1978)
BSc (Zoology, Ecology) University of New England 1974)

Dr Daniel McDonald

B. Ag Sc; M. Agr; PhD (The University of Sydney)
Cert IV – GIS (Riverina TAFE)
Daniel is an accredited Biobanking Assessor (0075) and an accredited BAM assessor (BAAS17056)
Quantified Tree Risk Assessment (QTRA) and Visual Tree Assessment (VTA), White Card

Daniel is an experienced ecologist with expertise in fauna, plant species identification, vegetation assessment, agriculture, arboriculture, conservation genetics and seed collection and preservation. He is accredited both for BAM assessments, BioBanking assessments and Biodiversity Certification. His present research interest is in Eastern Suburbs Banksia Scrub and fragmented endangered ecological communities.

Mark Mackinnon

Qualifications: B Env. Sci. (Hons), Grad Dip Bushfire Protection.

MEIANZ, White Card

Accredited Practitioner Level 2 - Bushfire Planning & Design (BPAD), Accreditation number 36395.

Mark is a passionate and enthusiastic scientist who thrives in the field of natural resource management. In the last 6 years, Mark has worked for a number of inter-state government agencies and environmental consultancies. He has experience in threatened species, fire ecology, bushfire management, pest plant and animals, and landscape restoration. In particular he specializes in ornithology and bushfire management. Mark has a number of specialized field-based skills including: simple and complex tree climbing, working at heights, general firefighter departmental fire accreditation, venomous snake and reptile handling, immunization to handle bat species, and an A - class bird banding licence with mist-net endorsement. Mark is also skilled in ArcGIS mapping, first-aid, four -wheel-driving.

Dr Alison Hewitt
B. Sc. (Hons), PhD.
MESA, MAPS, MASBS, Snr 1st Aid cert, White card.
Alison has researched and published on the reproductive biology and ecology of Australian Melaleuca species, native plant responses to fire and the vegetation of western Sydney. Alison's interests include plant ecology and flora survey methodology, bush regeneration, plant identification and gardening. Alison teaches Botany and Ecology sessionally with Western Sydney University.

Dr Stephanie A Clark
BAppSc (Biochemistry), MSc, PhD

Member of the IUCN SSC Mollusc Specialist Group. Research Associate at both the Field Museum of Natural History, Chicago, IL, USA and The Australian Museum, Sydney, NSW.

Stephanie has been interested in the taxonomy, systematics and conservation of invertebrates particularly molluscs since the late 1970's when she first started volunteering at the Australian Museum.

She has been an ecological consultant specialising in invertebrates since 1997. She has worked for private developers, mining companies, local community groups and local, state and federal government agencies in three countries (Australia, USA and Canada) and has been an expert witness for the NSW Land and Environment Court.

Stephanie's PhD researched the taxonomy, systematics and conservation of the NSW listed snail Meridolum corneovirens (Cumberland Plain Land Snail). She has given presentations to local, national and international conferences in Australia, Germany and USA. She has field experience in 16 countries, all states of Australia and 40 US states. Stephanie's has published more than 30 scientific papers in national and international journals and described more than 155 species and 10 genera.

Mark Sherring

BM, MAABR, Cert. Hort., Cert. Bush Regen, Cert. Rural Ops, White Card.

Member of the Australian Association of Bush Regenerators

Mark has extensive knowledge and experience of plant species in New South Wales. He has built up his expert knowledge on NSW native plant species over the many years that he has practised as a Botanist. He is regularly asked to contribute to the extensive (ongoing) flora surveys of the Sydney Basin and Blue Mountains carried out by the Royal Botanic Gardens, Sydney. Mark has extensive field survey experience, having worked for over ten years in various plant-related roles. His role in Abel Ecology is to provide expert advice on flora and on the full range of flora management issues encountered and in the design and management of environmental monitoring projects.

