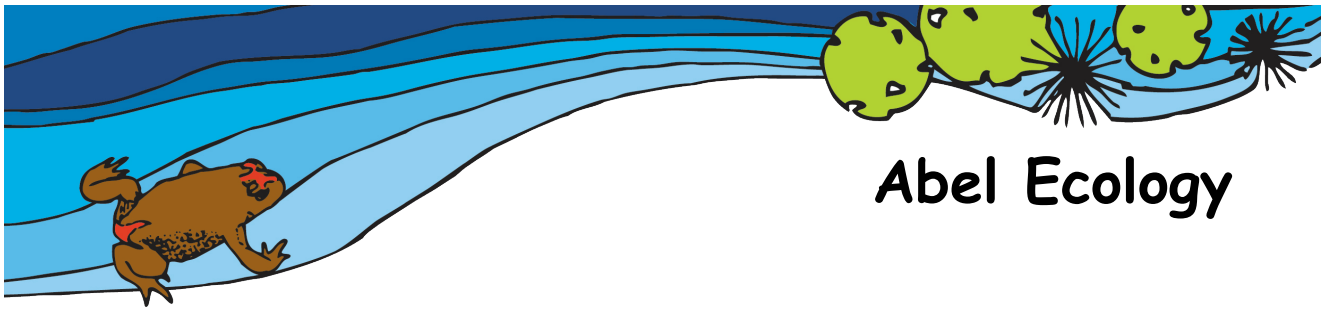

Prescribed Ecology Actions Report (PEAR)

for

Pacific Hills Christian School
Lot 1, DP 1087960

Prepared for:	**Pacific Hills Christian School**
Report No:	**AE19-REP-2072-ISS 1**
Prepared by:	**Abel Ecology**
Date:	**25 October 2019**

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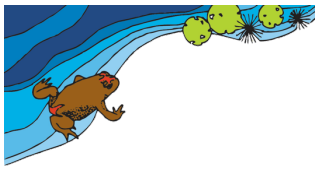

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Document History

Report	Version	Prepared by	Technical Review by	Proofread by	Submission	
					Method	Date
Report	Draft A	Dr Alison Hewitt		Steven Smith	Dropbox	15 Oct 19
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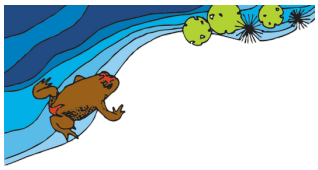
Report	Issue 2	Dr Alison Hewitt	Dr Danny Wotherspoon	Steven Smith	Dropbox	25 Oct19



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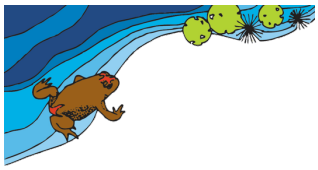

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List of Abbreviations

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

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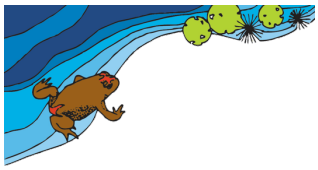


Executive summary

The proposed New Hope School development is for children with autism and moderate intellectual disabilities. Due to the placement of buildings an amended bush fire asset protection zone is required. Approximately 0.21 ha of Blackbutt Gully Forest (Hornsby Shire Council LEP terrestrial vegetation mapping) will be removed or reduced to 15% canopy cover in an area adjacent to playing fields at the north of the school campus.

A biodiversity survey was carried out at Lot 1 DP 1087960, 9-15 Quarry Road, Dural 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). Five-part tests are included, and the assessment meets requirements of the Hornsby Shire Council's Flora and Fauna Assessment Guidelines (2006), now somewhat superceded by the NSW State Government's *Biodiversity Conservation Act (2016)*.

The following three considerations are triggers for entry into the Biodiversity Assessment Method.

1. Threshold 1: The proposal does not exceed the clearing threshold area as described in clause 7.2 of the BC Regulation 2017.

2. Threshold 2: The proposal does not undertake clearing of native vegetation or any prescribed activities (clause 6.1 of the BC Regulation 2017) on land shaded in the Biodiversity Values Land Map

3. Threshold 3: The proposal is not likely to significantly affect any threatened species or Endangered or Critically Endangered Species.

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. Five-part tests indicate no significant impact on threatened flora or fauna by this proposal.

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

The provisions of the EPBC Act 1999 do not apply to this proposal and it does not require referral to the Commonwealth.

Recommendations:
a) No Biodiversity Development Assessment Report is required.

b) Prepare a Vegetation management Plan to control construction of the APZ, including specifications such as, for example:

1. Retention of two large blackbutts as located in Figure 8 if the APZ structure is not compromised;
2. Mark a continuous line for the limit of clearing along the APZ boundary/ creekline prior to any APZ clearing;
3. Removal of saplings, understorey and *Pinus radiata* up to the APZ boundary (Figure 2);
4. Retention of some fallen timber and rocks within the APZ area as habitat for locally occurring Dural Woodland Snail;
5. Strict erosion control measures on account of the slope and the location above a creekline:
   - spraygrass to include native Microlaena seed and a soil binder, or rolled turf with pins for stability;
   - or, jute matting and bales pegged in place.
6. A weed control program to address the high threat weeds in the APZ area with potential to invade the adjacent creekline;
7. Replacement trees from the locally occurring natives be planted elsewhere on site.

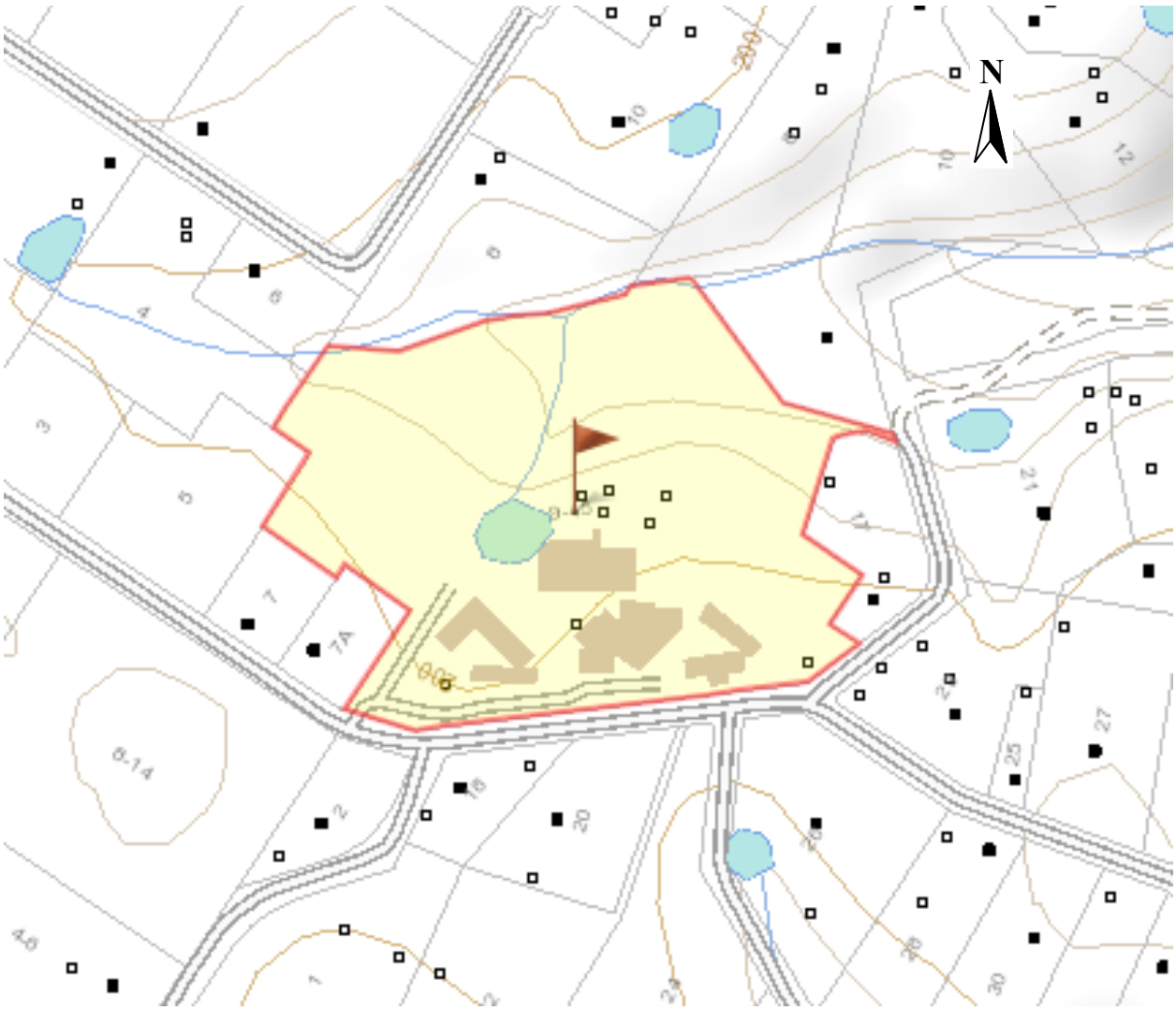


Figure 1. Locality map for 9-15 Quarry Road, Dural.

Site location

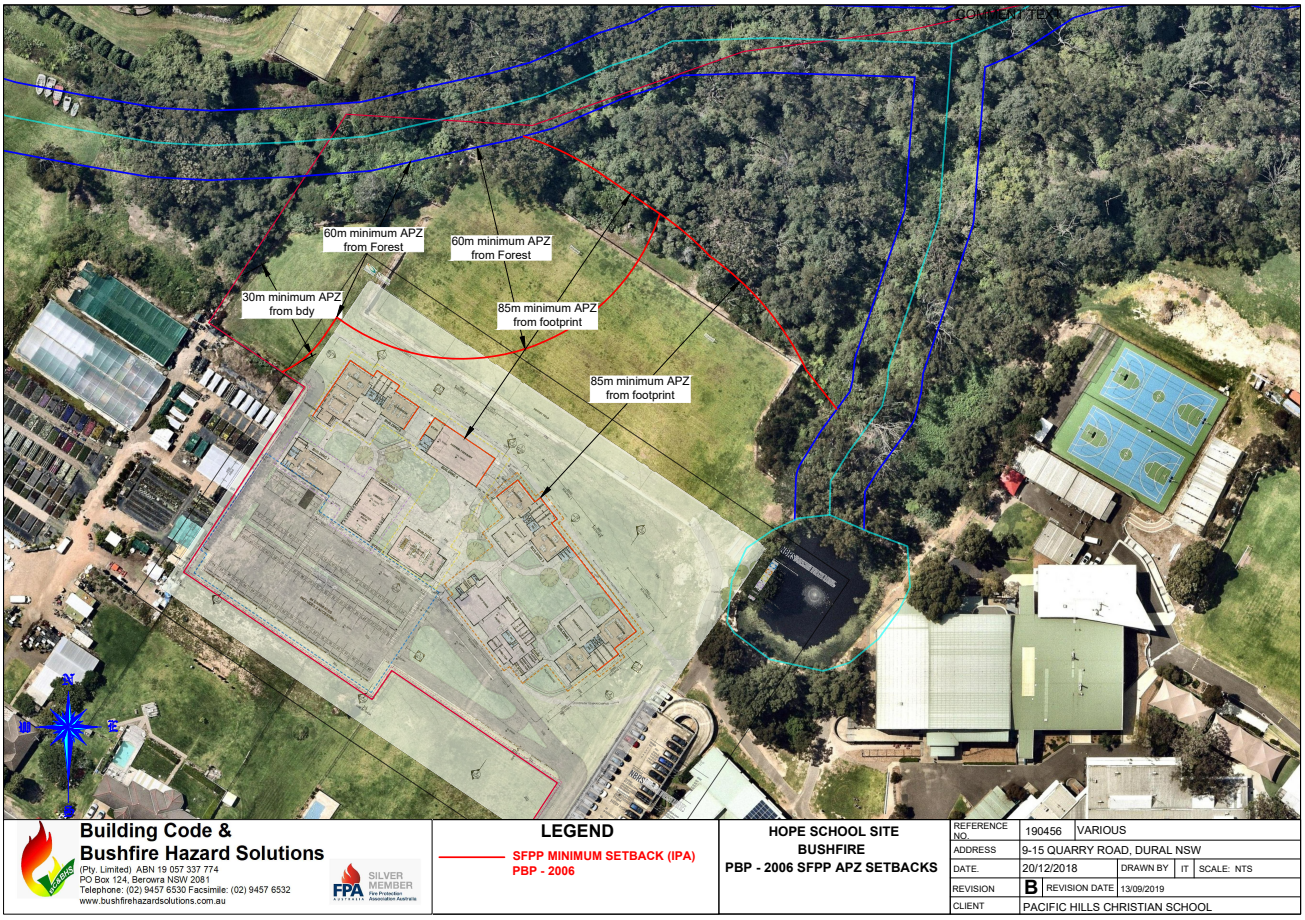


Figure 2. Area within site to be affected (Image courtesy of Building Code & Bushfire Hazard Solutions).

Figure 3. Aerial photo of the site and local area.

Key

Site location

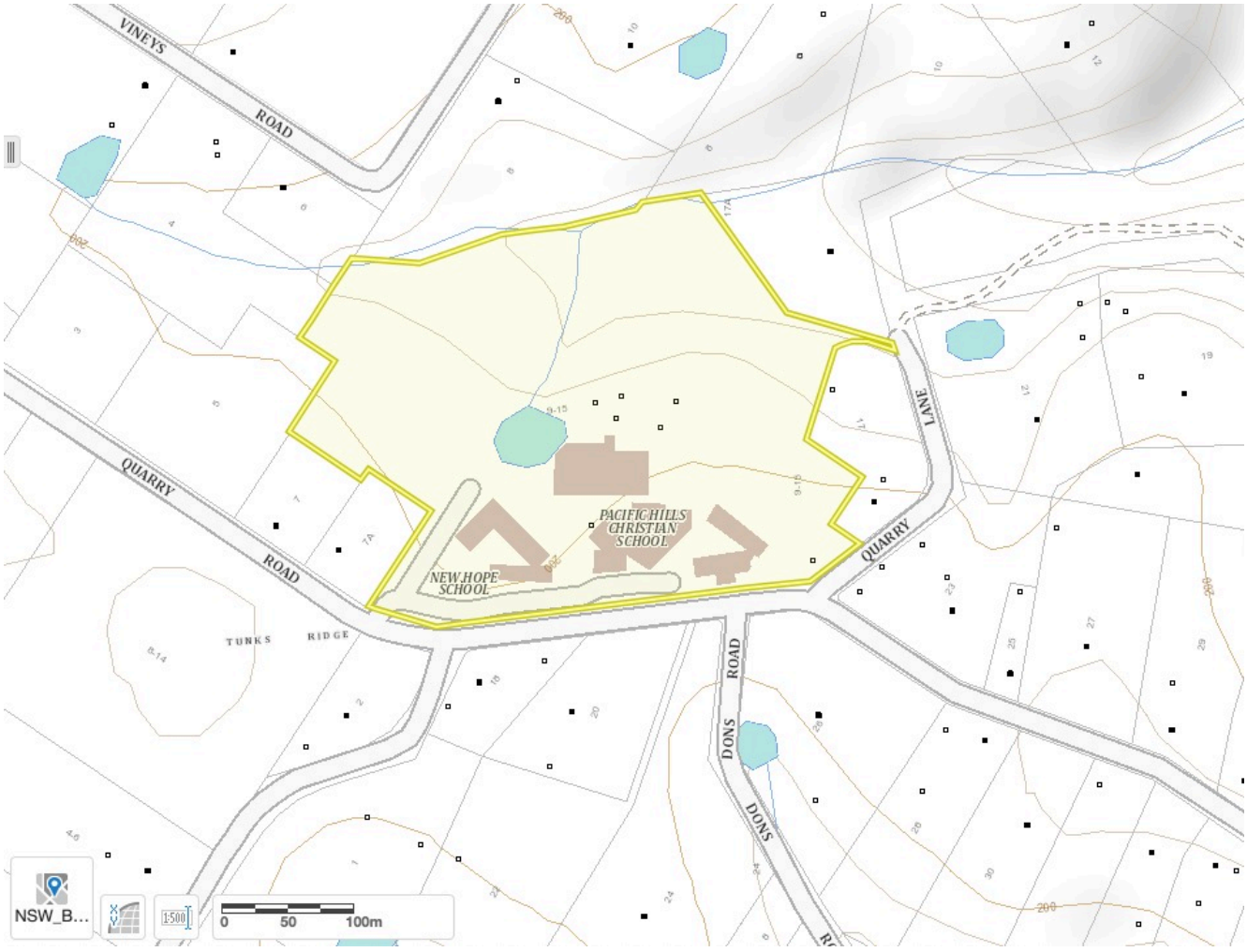


Figure 4. Biodiversity values map.

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

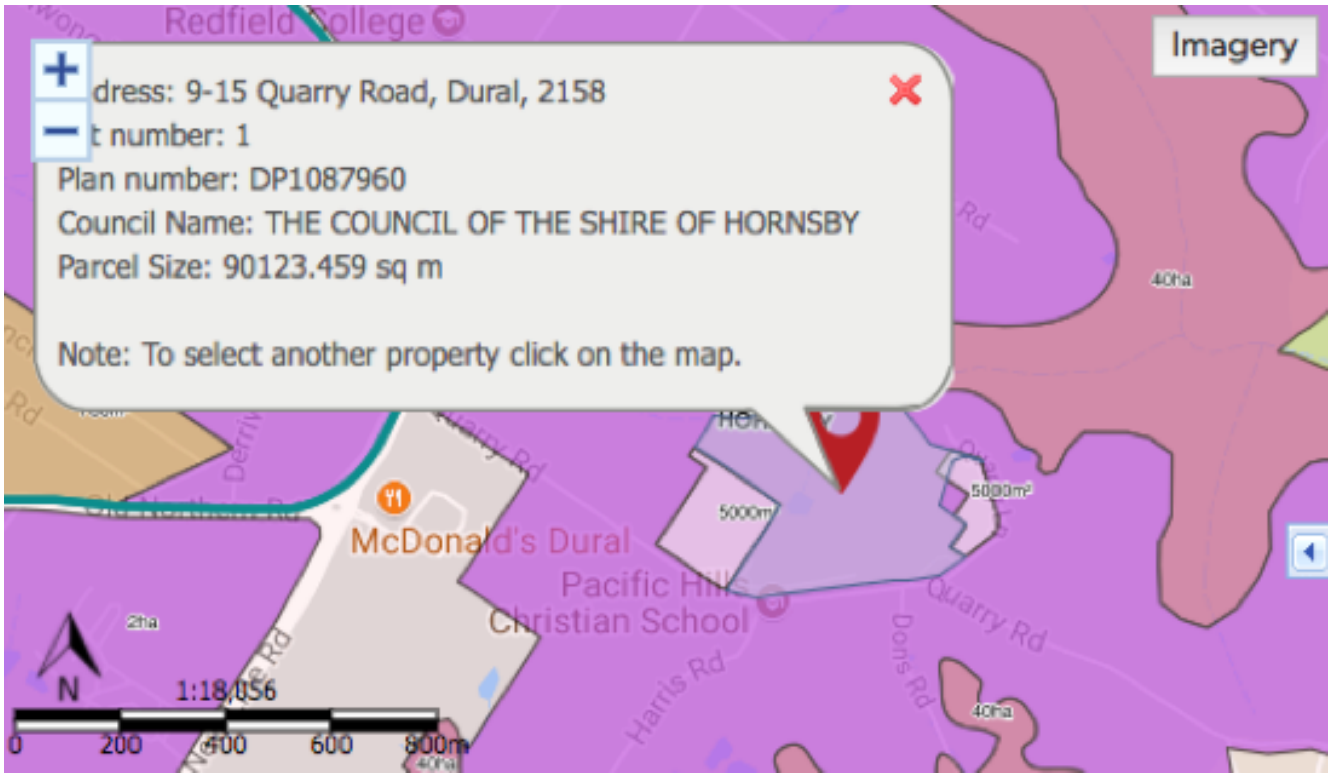


Figure 5. Site LEP zone map.

Key

- X - 5000 m² : Range [5000 - 9999 sqm] (pub. 2013-09-27) — X
- Z - 2 ha : Range [20000 - 49999 sqm (2 - 4.9 ha)] (pub. 2013-09-27) — Z
- AB - 40 ha : Range [100000 - 499999 sqm (10 - 49.9 ha)] (pub. 2013-09-27) — AB

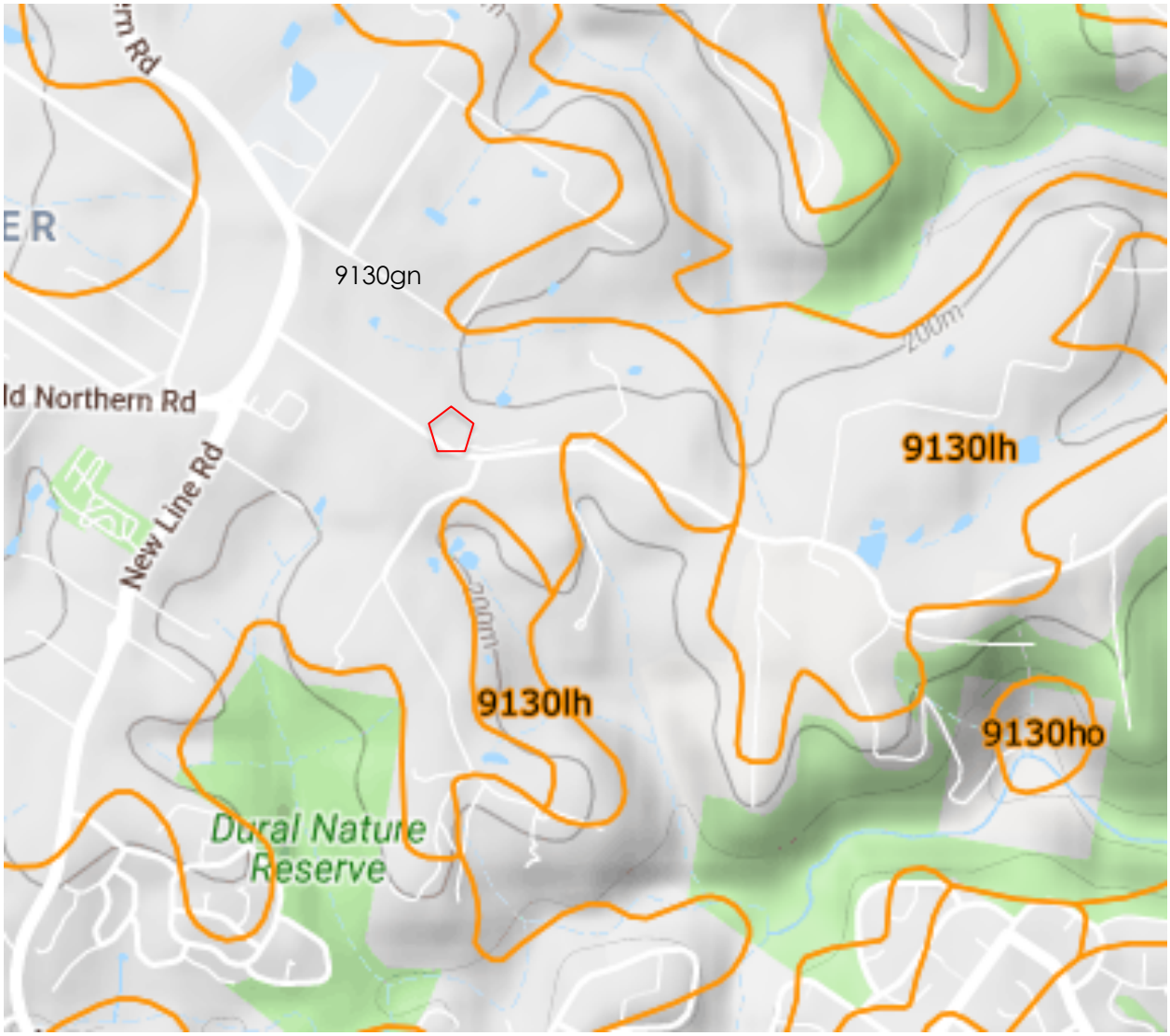


Figure 6. Soil Landscapes of site and surrounding area.

Site location

Key
9130lh = Lucas Heights
9130ho = Hornsby
9130gn = Glenorie

Map extract from the eSpade website https://www.environment.nsw.gov.au/eSpade2Webapp

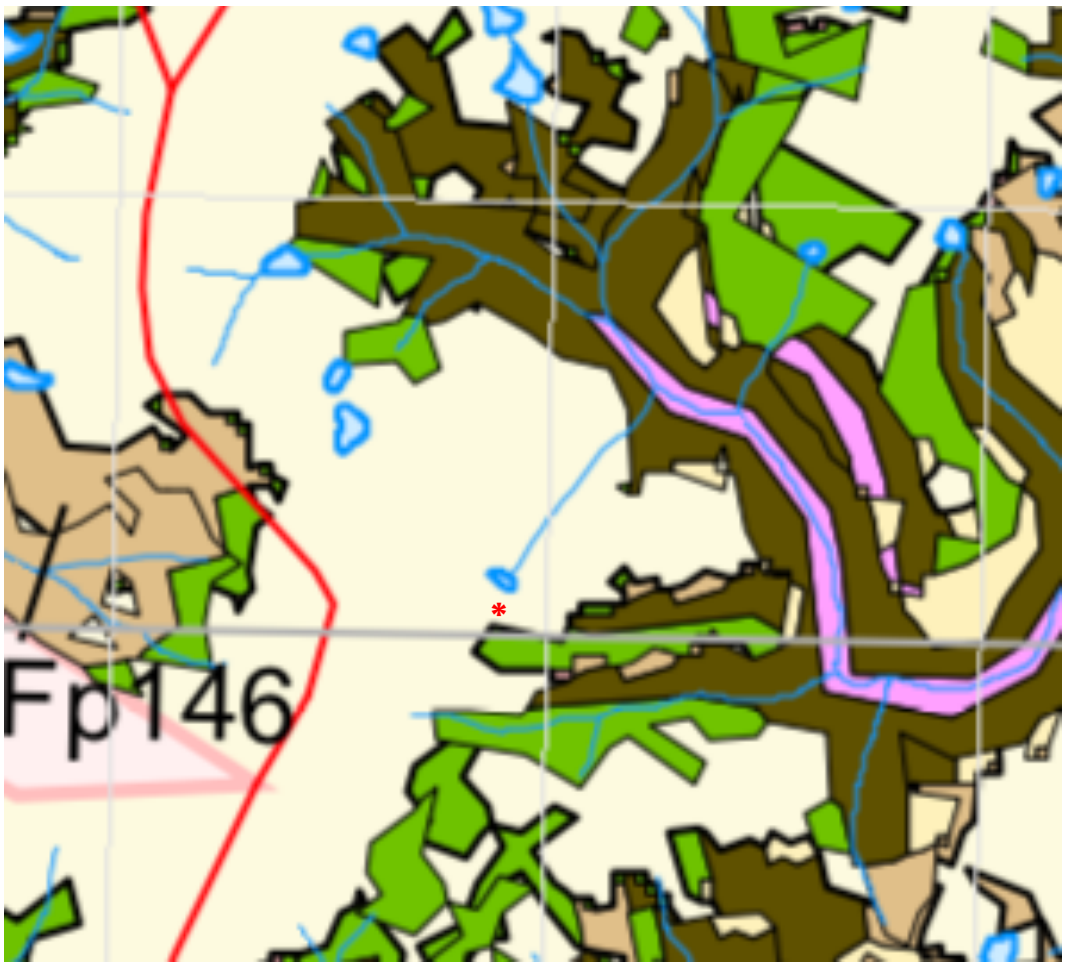


Figure 7. Vegetation and habitat map for the site.

* Approximate site location	
Hinterland Sandstone Gully Forest	DSF p142
Modified or disturbed land	NV
Sandstone Riparian Scrub	FoW p58
Sydney Hinterland Transition Woodland	DSF p146
Sydney Turpentine Ironbark Forest	WSF p87

Source. Tozer *et al*. (2010) *Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands*. *Cunninghamia*, 11(3): 359-406

Figure 8. Location of two large blackbutt trees (*Eucalyptus pilularis*) for retention if possible.

1. Introduction

1.1 Legislative context

This Prescribed Ecology Actions Report (PEAR) 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 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) or an approval under Part 5 of that 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 9-15 Quarry Road, Dural ('the site' – Figure 1) was undertaken on 2 October 2019. This Prescribed Ecology Actions Report investigates whether the impacts of the proposal to remove vegetation for an Asset protection Zone associated with new school buildings will trigger any of the three 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.

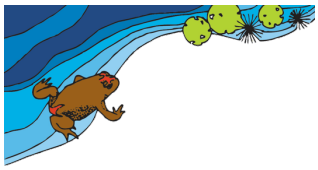
Hornsby Shire Council's Flora and Fauna Assessment Guidelines for Development Proposals asks that developments be assessed in relation to SREP 20 and SEPP 19.

1.1.1 SREP 20

In relation to Sydney Regional Environment Plan, the proposal will impact the environment and the catchment by way of clearing and increased runoff. Management of the APZ by way of a vegetation management plan to prevent erosion and reduce runoff will be required to satisfy the objectives of SREP 20.

1.1.2 SEPP 19

In relation to SEPP 19, the property is not on or adjacent to land zoned as public open space so SEPP19 does not apply.



1.1.3 SEPP 44 Koala habitat protection

The site is in Management Area 2 under the Approved Koala Recovery Plan 2008.
The canopy trees in the area of survey include *Eucalyptus pilularis, Eucalyptus piperita* and*, Eucalyptus resinifera.*
Red Mahogany *resinifera* is a Secondary Food Tree species less than 15% of the site.
The nearest koala record is 3.8km south in Cherrybrook, dated 30th October 2012.
The most recent koala record is 7th March 2018, being 3.8km east in Westleigh.
There was no evidence of koalas on the site surveyed.
The site is not Potential Koala Habitat.
We note that some local records are of escapees form the Pennant Hills Koala Park.

1.1.4 Scope of the Hornsby Council Flora and Fauna Guidelines

Hornsby Council Guidelines for Flora and Fauna Assessment section 2 indicate potential matters to address. The proposal is considered as follows:

Works	**Impact**
The proposed building envelope and private open space areas and pathways.	Nil
Driveways, roads and utility service/trenches required.	Nil
Drainage systems and onsite stormwater detention basins.	Within existing structures
Wastewater disposal areas.	Not applicable
Bushfire Asset Protection Zones.	Yes, addressed in this report
Landform modification - cut and fill areas.	Nil
Construction phase disturbance areas eg stockpiles, vehicle and machinery access.	Controlled by CEMP

WSUD works in the stormwater on site detention dam are within existing engineered structures so there is no potential for ecological impacts.

The proposed buildings and works are within existing cleared open space so have no direct impacts on ecological values.

Standard consent conditions for erosion and sediment controls will ensure that no indirect ecological impacts occur.

1.2 The proposal

The proposal (Figure 2) is to reduce vegetation within a 60 m Asset Protection Zone prior to completion and occupation of new school buildings on site.

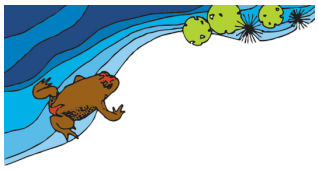


Table 1. Details of lot size and size of proposed native vegetation clearing.

Component of site	Area m²	Proportion of the site %
Whole site	101, 000	100
Extent of proposed native vegetation clearing	2,100	0.021

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)
Asset Protection Zone Survey map (2018) Building Code and Bushfire Hazard Solutions Pty Ltd
Hornsby Shire Council Vegetation Mapping via a phone call to Council's Gary Mahony
Hornsby Shire Council (2006) Flora and Fauna Assessment Guidelines for Development Applications
JK Geotechnics (2018) 'Geotechnical Investigation Report for proposed new Hope School at 7-9 Quarry Rd, Dural'.
Keystone Ecological (2017) 'Senior School Vegetation Management Plan' Ref HSC 16-797
19189_WSUD Strategy_REV2, Appendix B, MUSIC-Link Report
NSW Biodiversity Values Map
NSW planning portal
OEH Atlas of NSW Wildlife
OEH eSpade soil maps
Schedules to the BC Act 2016
Schedules to the EPBC Act 1999
Tozer (2010) *Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands*. *Cunninghamia*, 11(3): 359-406

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 is the area set out in Column 2 of the Table to that clause (Table 2 below) opposite the minimum lot size applicable to the land to be cleared in Column 1 of that Table.

Clearing of native vegetation will trigger entry into the offsets scheme if clearing is greater than the assessment threshold. To determine the correct threshold from Table 2 below, the appropriate minimum lot size of land must be selected. The minimum lot size of land can be found on the NSW planning portal https://www.planningportal.nsw.gov.au/find-a-property/property/.

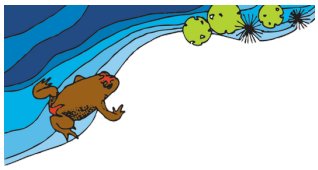


Table 2: Areas section 7.2(4) Biodiversity Conservation Regulation 2017.

	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 RU2 and the minimum lot size for this lot is 2 ha or 20,000 m^2. Row B in Table 2 is appropriate for this proposal, as the proposed clearing of native vegetation is less than 0.5 ha.

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

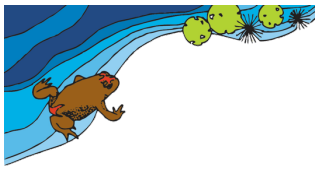
The second threshold can be triggered by clearing on the Biodiversity Values Map (Figure 5) https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap

Response
No part of the site is included on the Biodiversity Values Map (Figure 4). Threshold two is not breached.

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.

(b) the impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range,

Response
The development is unlikely to have a significant impact on connectivity of habitat for any threatened species.

(c) the impacts of development on movement of threatened species that maintains their lifecycle,

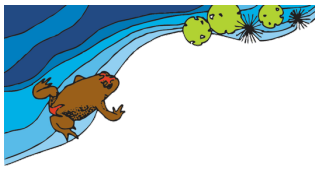
Response
The proposal is unlikely to have a significant impact on the movement of threatened species as required for their lifecycle.

(d) the impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining or other development),

Response
No significant impact from the proposal is anticipated on water quality, water bodies and hydrological processes that sustain threatened species or threatened ecological communities.

(e) the impacts of wind turbine strikes on protected animals,

Response
Wind turbines are not part of the proposal.



(f) the impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

Response

The proposal will not significantly increase vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

(2) The additional biodiversity impacts prescribed by this clause (above)*:*
(a) are prescribed for the purposes of assessment and biodiversity assessment reports under the Act, but are not additional biodiversity impacts for the purposes of calculating the number and class of biodiversity credits that are required under a biodiversity assessment report to be retired to offset the residual impact on biodiversity values of proposed development, proposed clearing of native vegetation or proposed biodiversity certification of land, and
(b) may be taken into account in the determination of the biodiversity credits required to be retired (or other conservation measures required to be taken) under a planning approval or vegetation clearing approval or under a biodiversity certification of land.

None of the prescribed biodiversity impacts described above (a, b, c, d, e, or f) are included in the proposal.

Conclusion

The threshold two trigger for entry into the Biodiversity offsets scheme is not activated by the proposal. A Biodiversity Development Assessment Report is not required.

3. Landscape features of the site and the locality

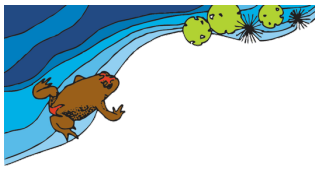
3.1 Site description

For the purposes of this report, the site (Figure 1) is defined by the property boundaries of Lot 1 DP1087960. It is approximately 10.2 ha. in size and the elevation is approximately 200 m above sea level.

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

The site is levelled by fill and constructed sandstone rock walls. School buildings, playing fields and associated infrastructure front Quarry Road to the south. Adjacent properties (Figure 1) are a mix of wholesale nursery to the west, rural residential to the east and a bushland corridor to the north.

The area below the macropond, basketball courts and hockey fields at the north of the property falls steeply in parts into creek headwaters flowing into Tunks Creek. Tunks Creek drains eastward through Berowra Valley National Park eventually joining Berowra Creek



Slopes in the bushland gully area proposed to be removed for the APZ have slopes of between approximately 10 and 40 degrees.
Stormwater management is by engineered structures and natural flow to the creekline north.

The vegetation (Figure 7) is described in detail in Section 5 below and fauna habitat is detailed in Section 5 below.

3.2 History of the site

The site at Quarry Road was purpose built in 1986. The school has a longer history from an original site located elsewhere in Pennant Hills established in 1979.

New Hope School is separate from Pacific Hills Christian School with proposed numbers of 72 students and 32 staff.

Existing full school numbers consist of:

- 1394 students, of which 26 are New Hope students.
- 260 staff, of which 17are New Hope staff.

3.3 Geology and soils

The mapped soil landscapes for the site and locality are displayed in Figure 6.

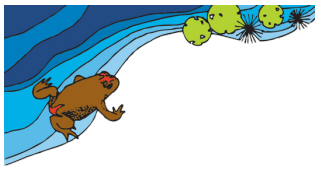
The Soil Landscape is mapped as 9030gn, or Glenorie Soils.

Glenorie Soil landscapes are underlain by Wianamatta Group Ashfield shale and Bringelly shales. They occur over Hawkesbury sandstone with a shale influence (from shale lenses in the sandstone or from proximity to Wianamatta Group shales). Soils have a low wet strength, high aluminium toxicity, high acidity and high erosion potential.

This is consistent with Geotechnical Investigation Report Dec 2018 by JK Geotechnics identifying acidic soils of silty clays and underlying weathered sandstones.

The dominant landform elements are low rolling and steep hills that undulate 5-20%.

Nearby soil profile 912 from a mid-slope position in this soil landscape describes Solodic soils sandstone-quartz lithology, sedimentary loamy sand of weak pedality, moderate to well drained.



3.4 Landscape features

3.4.1 Site landscape features

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

Table 3. Site landscape features.

Vegetation	The gully area to the north on site is 'Hinterland Sandstone Gully Forest' by Tozer et al. (2010) or 'Blackbutt Gully Forest' by Hornsby Shire Council vegetation mapping.
Non-native vegetation	Planted landscapes and pine trees on site have potential for foraging habitat for threatened species of bats and birds.
Human structures	No buildings are to be demolished. Buildings on site have very little potential as bat roosts.
Wetlands/dams/watercourse	A 1st order stream drains east across the north of the property. A macropond drains north into the creek.
Karst, caves, crevices and other geological features of significance	N/A
Roads	Vehicle traffic and road mortality - No road kill was observed on the site.

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:

Licensed Report of all Valid Records of Threatened (listed on *BC Act 2016*) or Commonwealth listed Entities for a 10 x 10 km square centred on the site (selected area [North: -33.65 West: 150.99 East: 151.09 South: -33.75]). Records since 01 Jan 1999 until 30 Sept 2019 returned a total of 820 records of 51 threatened flora and fauna species.

Data from the BioNet Atlas website holds records from a number of custodians, is only indicative and cannot be considered a comprehensive inventory. It may also contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded to 0.01°). Copyright the State of NSW through the Office of Environment and Heritage.

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).

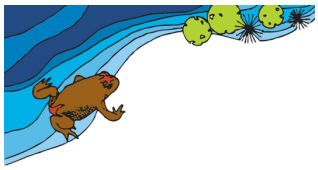


Table 4: BioNet threatened flora & fauna species records for a 5 km radius of the site since 1 Jan 1999.

Scientific Name	Common Name	NSW status	Comm. status
Heleioporus australiacus	Giant Burrowing Frog	V	V
Pseudophryne australis	Red-crowned Toadlet	V	
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	C
Hieraaetus morphnoides	Little Eagle	V	
Lophoictinia isura	Square-tailed Kite	V	
Callocephalon fimbriatum	Gang-gang Cockatoo	V	
Callocephalon fimbriatum	Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local Government Areas	E2,V	
^^Calyptorhynchus lathami	Glossy Black-Cockatoo	V	
Glossopsitta pusilla	Little Lorikeet	V	
Lathamus discolor	Swift Parrot	E1	CE
Ninox connivens	Barking Owl	V	
Ninox strenua	Powerful Owl	V	
Daphoenositta chrysoptera	Varied Sittella	V	
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	
Petroica boodang	Scarlet Robin	V	
Dasyurus maculatus	Spotted-tailed Quoll	V	E
Phascolarctos cinereus	Koala	V	V
Petaurus norfolcensis	Squirrel Glider	V	
Petauroides volans	Greater Glider		V
Pteropus poliocephalus	Grey-headed Flying-fox	V	V

Scientific Name	Common Name	NSW status	Comm. status
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	
Myotis macropus	Southern Myotis	V	
Scoteanax rueppellii	Greater Broad-nosed Bat	V	
Vespadelus troughtoni	Eastern Cave Bat	V	
Pommerhelix duralensis	Dural Land Snail	E1	E
Hibbertia superans		E1	
Tetratheca glandulosa		V	
Epacris purpurascens var. purpurascens		V	
Leucopogon fletcheri subsp. fletcheri		E1	
Acacia bynoeana	Bynoe's Wattle	E1	V
Acacia pubescens	Downy Wattle	V	V
Grammitis stenophylla	Narrow-leaf Finger Fern	E1	
Lasiopetalum joyceae		V	V
Darwinia biflora		V	V
Darwinia peduncularis		V	
Eucalyptus camfieldii	Camfield's Stringybark	V	V
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V
Eucalyptus scoparia	Wallangarra White Gum	E1	V
Kunzea rupestris		V	V
Melaleuca deanei	Deane's Paperbark	V	V

Scientific Name	Common Name	NSW status	Comm. status
Rhodamnia rubescens	Scrub Turpentine	E4	
Syzygium paniculatum	Magenta Lilly Pilly	E1	V
Persoonia hirsuta	Hairy Geebung	E1	E
Persoonia mollis subsp. maxima		E1	E
Pomaderris brunnea	Brown Pomaderris	E1	V
Galium australe	Tangled Bedstraw	E1	
Pimelea curviflora var. curviflora		V	V
Miniopterus australis	Little Bent-winged Bat	V	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	

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

Scientific Name	Common Name	NSW status	Comm. status
Callocephalon fimbriatum	Gang-gang Cockatoo	V	
Callocephalon fimbriatum	Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local Government Areas	E2,V	
Glossopsitta pusilla	Little Lorikeet	V	
Lathamus discolor	Swift Parrot	E1	CE
Tyto novaehollandiae	Masked Owl	V	
Ninox strenua	Powerful Owl	V	
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	

Scientific Name	Common Name	NSW status	Comm. status
Falsistrellus tasmaniensis	**Eastern False Pipistrelle**	**V**	
Myotis macropus	**Southern Myotis**	**V**	
Scoteanax rueppellii	**Greater Broad-nosed Bat**	**V**	
Miniopterus australis	**Little Bent-winged Bat**	**V**	
Miniopterus orianae oceanensis	**Large Bent-winged Bat**	**V**	
Chalinolobus dwyeri	**Large-eared Pied Bat**	**V**	**V**
Persoonia hirsuta	**Hairy Geebung**	**E1**	**E**
Persoonia mollis subsp. maxima		**E1**	**E**
Pommerhelix duralensis	**Dural Land Snail**	**E1**	**E**

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.

Targeted surveys were made for threatened flora species (Table 5).

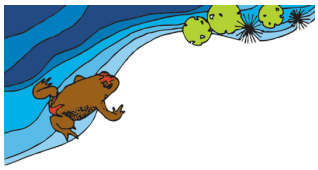
4.2 Field work effort

Over the one day of fieldwork a total of 5 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)
2 Oct 2019	12:30 – 17:00	26	Vegetation survey	4.5 x 1
Total				4.5

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. Targeted surveys were made for *Persoonia hirsuta* and *Persoonia mollis* subsp. *maxima* (See Appendix 5).

Vegetation quality is assessed as described below (Section 4.4). The plant community/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.

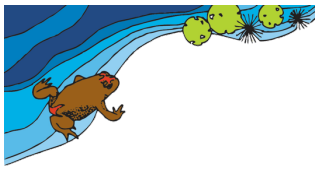
Four main qualitative classes of vegetation integrity are recognised. There is variation within each class, and in addition the class boundaries are somewhat fluid where one grades into the other.

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.

4.5.1 Diurnal fauna searches

Opportunistic observations and call recordings were made as an indication of types of species using the site. This involved:

a) Opportunistic observations and identification of calls of species, and search for indirect evidence such as nests, feathers, scratchings and feeding signs for birds.
b) Noting 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.

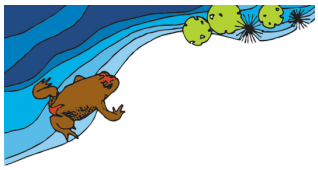
Native flora may include species local to the area (occurring in local remnants). Structure and species composition will depend upon locally occurring communities.

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

4.7 Limitations of the survey

This survey was conducted in the Spring 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 warm and dry.



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 were 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
Name	Alison Hewitt	Alison Hewitt

5. Survey Results: Vegetation and habitat description

5.1 Site vegetation and habitat

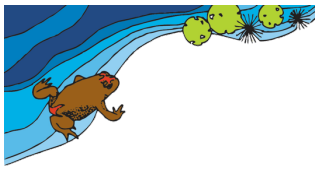
Hornsby Shire Council has mapped the area to the north of the macropond on the property as Blackbutt Gully Forest. This is identified in the Hornsby Shire Council Native Vegetation Communities Update (2008) as a locally significant community and described as a tall-open forest in which the main tree species are *Eucalyptus pilularis*, *Angophora costata* and *Syncarpia glomulifera*. Other less common tree species are *Corymbia gummifera*, *Eucalyptus piperita*, *Eucalyptus resinifera, Eucalyptus sparsifolia* with occasional *Eucalyptus punctata* and *Eucalyptus saligna*.

Tozer et al. (2010) have mapped the area as Hinterland Sandstone Gully Forest DSF p142.

A site inspection on 2 Oct. 2019 confirmed the area to be consistent with both map units as described. Dominant canopy trees are *Syncarpia glomulifera*, *Angophora costata* and *Eucalyptus pilularis* with one *Eucalyptus resinifera* noted. Lower storey trees and shrubs included *Ceratopetalum gummiferum*, *Banksia serrata*, *Acacia implexa, Persoonia linearis* and *Pittosporum undulatum*. Groundcovers included *Leucopogon juniperinus*, *Calochlaena dubia*, *Dianella caerulea* and *Entolasia stricta*.

Some large old *Pinus radiata* are planted within the APZ area.

An area around the on-site constructed macropond has natural vegetation present – *Acacia implexa*, *Eucalyptus pilularis* and *Typha orientalis*; and appears to have been supplementally planted with *Acacia decurrens*, *Casuarina cunninghamiana*, **Clivia minata*, *Melaleuca linariifolia*, *Leptospermum petersonii, Persicaria decipiens* and *Lomandra longifolia.*



A weed plume is evident in the creekline, forest area comprising **Ageratina adenophora* (Crofton weed), **Lantana camara* (Lantana), **Morus alba* (Mulberry), **Tradescantia fluminensis, *Zantedeschia aethiopica* and a dense seedling bank of **Ligustrum sinense* (privet).

Appendix 2 shows the complete list of flora recorded on site.

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)	Several large blackbutt (*Eucalyptus pilularis*) on site and in adjoining bushland, some along the creekline noted with active hollows.
Tree regeneration and Tree stem-size diversity	All canopy species regenerating
Logs, woody debris and litter cover	Logs, woody debris and leaf litter – common in the gully below the playing fields. Absent within the school building and playground areas
Food resources	Persoonia, Eucalyptus, Corymbia and Acacia provide food resources of blossoms and seeds. High cover of fallen and rotting material is present near the base of remnant trees.

The vegetation community is Blackbutt Gully Forest or Hinterland Sandstone Gully Forest. There is no endangered ecological community associated with this vegetation type.

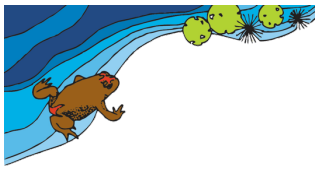
The vegetation within this zone is classified as good integrity vegetation.

5.2 Species and Communities of conservation concern

While no threatened species or ecological communities have been recorded on site, the hollow bearing trees in the creekline immediately off site may afford breeding sites for threatened bird species recorded in the wider 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). The person 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.

High threat weeds recorded on site include:
* *Ageratina adenophora* (crofton weed)
* *Araujia sericifera* (Moth vine)
* *Lantana camara* (lantana)
* *Ligustrum lucidum* (small leaf privet)
* *Pinus radiata* (Radiata pine)
* *Senecio madagascariensis* (fireweed)
* *Tradescantia fluminensis*

6. Survey Results: Fauna

6.1 Species of conservation concern

No threatened species were recorded for the site.

6.2 Fauna results

A total of 17 species were detected, including 1 mammal and 16 birds.

Species listed as 'likely to occur' in the area are presented in Appendix 4. Note that the majority of the 'Expected Species' would occur on the site due to the presence 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.

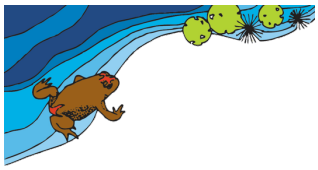
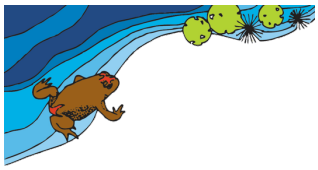
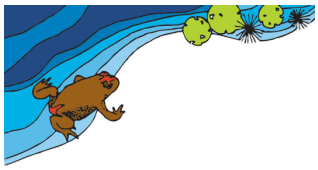


Table 9. List of fauna detected on the site.

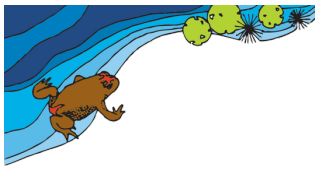
Birds			
Australian Wood Duck	*1. Chenonetta jubata*	O	
Pacific Black Duck	*1. Anas superciliosa*	O	
White-faced Heron	*1. Egretta novaehollandiae*		
Australian White Ibis	*1. Threskiornis molucca*		
Collared Sparrowhawk	*1. Accipiter cirrocephalus*		
Brown Goshawk	*1. Accipiter fasciatus*		
Nankeen 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*		
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*		
Sulphur-crested Cockatoo	*1. Cacatua galerita*		
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*	O	
Crimson Rosella	*1. Platycercus elegans*	O	
Eastern Rosella	*1. Platycercus eximius*	O	
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*	O	
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*		



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*	O	
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*	O	
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*	O	
Willie Wagtail	*1. Rhipidura leucophrys*		
Olive-backed Oriole	*1. Oriolus sagittatus*		
Black-faced Cuckoo-shrike	*1. Coracina novaehollandiae*		
Grey Butcherbird	*1. Cracticus torquatus*		
Australian Magpie	*1. Cracticus tibicen*	O	
Pied Currawong	*1. Strepera graculina*		
Australian Raven	*1. Corvus coronoides*	O	
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*	O	
Common Myna*	*1. Sturnus tristis*	O	
N =	16		



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 Freetail-bat	*1. Mormopterus 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*		
Eastern Bentwing-bat	*1. Miniopterus schreibersii 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*	O	
Brown Hare*	*1. Lepus capensis*		
Horse*	*1. Equus caballus*		
N=	1		



Key

*	=	Introduced fauna
O	=	Observed

6.3 Fauna Summary

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

Mammals

One mammal species was detected on the site.
Species not recorded during the survey but likely to occur on the site include brush tailed possums, mice.

Reptiles

No reptile species were detected on the site.
Species not recorded during the survey but likely to occur on the site include red bellied black snake.

Frogs

No frog species were detected on the site.
Species not recorded during the survey but likely to occur on the site include Peron's tree frog and Striped Marsh Frog.

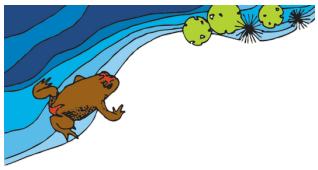
Birds

Sixteen bird species was detected on the site.
Species not recorded during the survey but likely to occur on the site include Willie wagtails, Eastern spinebill, New Holland honeyeater and white-throated treecreeper.

6.4 Microbats

Foraging Habitat

This site provides potentially suitable foraging habitat for eight of the nine possible threatened species. *Kerivoula papuensis* is only likely to forage in areas within a few kilometres of rainforest or rainforest gullies.



Roosting Habitat

This site has no obvious tree hollows that provide suitable roosting habitat for *Falsistrellus tasmaniensis, Mormopterus 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 schreibersii 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

Rabbits were noted on site. The location within urban areas would also indicate dogs and cats. Foxes are also likely though not noted. Feral avian fauna including Noisy miners, starlings and bulbuls would also be present.

7. Discussion of results

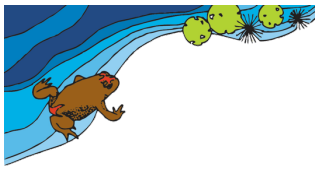
The northern perimeter area of the school contains and adjoins an area of 'Hinterland Sandstone Gully Forest' vegetation, or locally termed 'Blackbutt Gully Forest' (HSC Vegetation Map Units). The site is in good condition but with a weed plume present. An area of this forest along the northern perimeter of a hockey field is to be cleared/ thinned as an Asset protection Zone for the proposed new school buildings. Some large *Eucalyptus pilularis* within this zone are evident and would provide roost and blossom resources for local fauna. Those along the creekline, outside of the proposed APZ were noted with active hollows.

The risk of erosion with vegetation removal is of concern in this area given the proximity to the creek, the slope and the local soil landscape's propensity to erosion. Erosion below the macropond is noted which appears to have arisen following recent weed removal works.

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.

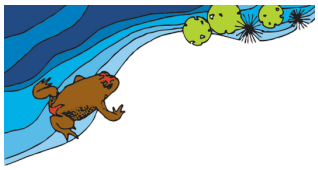


Under Section 7.3 of the *Biodiversity Conservation Act* several factors (listed in Appendix 1) need to be considered in deciding whether there is likely to be a Significant effect on threatened species, populations or ecological communities, or their habitats. If there is likely to be a significant effect on threatened species, 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 10. Summary of the five-part tests shown in full in Appendix 1.

Species/Communities	Recorded on site	State listing BC Act '16	C-wealth listing EPBC Act '99	Result
Forest birds				
Gang-gang Cockatoo *Callocephalon fimbriatum*	No	Sch 2, Vul.	-	No significant effect
Little Lorikeet *Glossopsitta pusilla*		Sch 2, Vul.	-	
Swift Parrot *Lathamus discolor*		Sch 1, End.	Critically Endangered	
Large Forest Owls				
Powerful Owl *Ninox strenua*	No	Sch 2, Vul.	-	No significant effect
Masked Owl *Tyto novaehollandiae*		Sch 2, Vul.	-	
Arboreal Mammals				
Grey-headed Flying-fox *Pteropus poliocephalus*	No	Sch. 2, Vul.	Vulnerable	No significant effect
Insectivorous bats				
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*	No	Sch. 2, Vul.	-	No significant effect
Eastern Freetail-bat *Mormopterus norfolkensis*		Sch. 2, Vul.	-	
Large-eared Pied Bat *Chalinolobus dwyeri*		Sch. 2, Vul.	Vulnerable	
Eastern False Pipistrelle *Falsistrellus tasmaniensis*		Sch. 2, Vul.	-	
Little Bentwing-bat *Miniopterus australis*		Sch. 2, Vul.	-	
Eastern Bentwing-bat *Miniopterus schreibersii oceanensis*		Sch. 2, Vul.	-	
Southern Myotis *Myotis macropus*		Sch. 2, Vul.	-	
Greater Broad-nosed Bat *Scoteanax rueppellii*		Sch. 2, Vul.	-	



Species/Communities	Recorded on site	State listing BC Act '16	C-wealth listing EPBC Act '99	Result
Threatened invertebrates				
Dural Woodland Snail *Pommerhelix duralensis*	No	Sch. 1, End.	Endangered	No significant effect
Plants				
Hairy Geebung *Persoonia hirsuta*	No	Sch. 1, End.	Endangered	No significant effect
Persoonia mollis subsp. *maxima*	No	Sch. 1, End.	Endangered	

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

9. Planning Instruments

9.1 LEP and DCP Locally significant species or vegetation communities

Hornsby Shire Council Biodiversity Conservation Strategy and LEP Terrestrial Biodiversity maps recognises 'Blackbutt Gully Forest' as a locally significant community.

Approximately 0.23 Ha of the Blackbutt Gully forest will be reduced to 15% canopy cover to meet requirements of the APZ for the proposed development on the site.

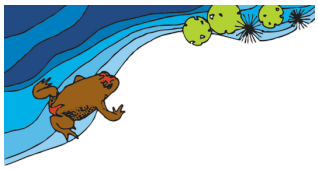
9.2 *Environment Protection and Biodiversity Conservation Act 1999*

9.2.1 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 summarised below.

World Heritage Properties	None
National Heritage Places	None
Wetlands of International Improrttance	None
Great Barrier Reef Marine Park	None
Commonwealth Marine Areas	None
Listed Threatened Ecological Communities	Seven
Listed Threatened Species	47
Listed Migratory Species	16
Commonwealth Land	None
Commonwealth Heritage Places	None
Critical Habitats	None
Commonwealth Reserves	None
State and Territory Reserves	Two
Regional Forest Agreements	None
Nationally Important Wetlands	None

There were no listed threatened ecological communities or threatened species recorded on site. The provisions of the EPBC Act do not apply to this proposal.



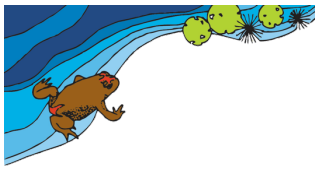
10. Conclusion and Recommendations

None of the three thresholds are triggered as follows:
1. Area of clearing
2. Biodiversity Land Map – clearing or prescribed biodiversity impacts
3. Five Part Tests.

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

It is recommended that a Vegetation management Plan be prepared to control construction of the APZ, including specifications such as, for example:

1. Retention of two large blackbutts as located in Figure 8 if the APZ structure is not compromised;
2. Mark a continuous line for the limit of clearing along the APZ boundary/ creekline prior to any APZ clearing;
3. Removal of saplings, understorey and *Pinus radiata* up to the APZ boundary (Figure 2);
4. Retention of some fallen timber and rocks within the APZ area as habitat for locally occurring Dural Woodland Snail;
5. Strict erosion control measures on account of the slope and the location above a creekline:
   - spraygrass to include native Microlaena seed and a soil binder, or rolled turf with pins for stability;
   - or, jute matting and bales pegged in place.
6. A weed control program to address the high threat weeds in the APZ area with potential to invade the adjacent creekline;
7. Replacement trees of locally occurring native species to be planted elsewhere on site.



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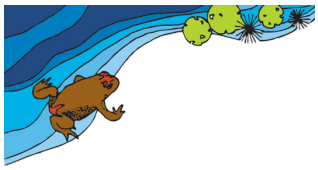


Appendix 1. Five-part tests

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
Glossopsitta pusilla	Little Lorikeet	V	
Lathamus discolor	Swift Parrot	E	CE
Callosephalon fimbriatum	Gang gang Cockatoo	V	-
Ninox strenua	Powerful Owl	V	-
Tyto novaehollandiae	Masked Owl	V	-
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Mormopterus norfolkensis	Eastern Freetail-bat	V	
Chalinolobus dwyeri	Large-eared Pied Bat	V	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	
Miniopterus australis	Little Bentwing	V	
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	
Scientific Name	**Common Name**	**NSW status**	**Comm. status**

Scoteanax rueppellii	Greater Broad-nosed Bat	V	
Myotis macropus	Southern Myotis	V	
Persoonia hirsuta		E	E
Persoonia mollis subsp. *maxima*		E	E
Pommerhelix duralensis	Dural Woodland Snail	E	E

Where applicable threatened populations are considered as threatened species in the following five part tests.

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.

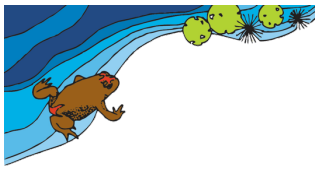
(2) To avoid doubt, subsection (1) (b) does not apply to development that is an activity subject to environmental impact assessment under Part 5 of the *Environmental Planning and Assessment Act 1979*.

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:

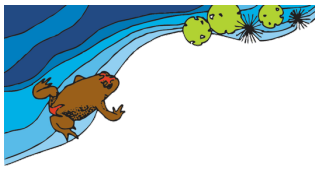
(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(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.



Forest Birds

Key
CE = Critically Endangered
E = Endangered
V = Vulnerable

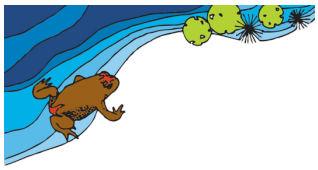
Scientific name	Common name	NSW status	Comm. status
Glossopsitta pusilla	Little Lorikeet	V	-
Lathamus discolor	Swift Parrot	E	CE
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-

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*.
- Nesting season extends from May to September. In years when flowering is prolific, Little Lorikeet pairs can breed twice, producing 3-4 young per attempt. However, the survival rate of fledglings is unknown.

Swift Parrot *Lathamus discolor*
http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10455

- Migrates to the Australian south-east mainland between March and October.
- On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations.
- Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*.
- Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*.
- Return to some foraging sites on a cyclic basis depending on food availability.



- Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum *Eucalyptus globulus*.

Gang gang cockatoo *Callocepahlon fimbriatum*
https://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.

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:

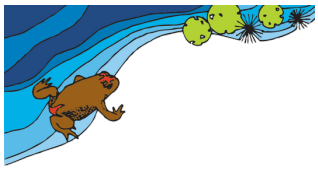
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

No. While the proposal will modify an area of foraging habitat for these species, the extent of habitat modification is minor compared to adjacent and nearby bushland areas. The proposal is unlikely to effect the life cycles of these species such that a viable local population will be placed at risk of extinction.

Loss or modification of suitable habitat for the Asset Protection Zone around the new proposed school buildings is unlikely to have an adverse effect on the life cycle of any threatened forest bird such that a local viable population will 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
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 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

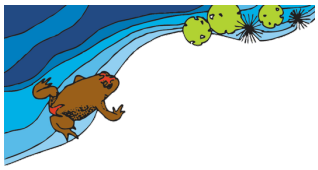
Up to 0.23 ha of natural vegetation containing suitable foraging habitat will be modified or removed to satisfy the conditions of a 60m Asset protection Zone (APZ) for the proposal. The ground level will be mulched litter and trees will be reduced to <15% canopy cover.

(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. Continuous habitat will remain to the north and all these species are mobile and can easily travel to other areas of habitat.

(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,
Negligible.

Criterion	Comment
Area and quality of habitat within the locality (maps, photos, survey)	The locality is a rural/suburban matrix with areas of natural vegetation remaining on/around residential properties and businesses. Berowra Valley National Park is connected to the site via bushland creek corridors.
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 and adjacent properties that have not been cleared. The feeding resource to be cleared for the APZ is minimal.
Role of habitat to be affected in sustaining habitat connectivity in the locality	Site habitat provides additional area connected to protected reserve vegetation to the north east.
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.	While a weed plume is present, the majority of the site shows low signs of disturbance. Areas of low disturbance feature good quality natural vegetation. A selection of canopy trees may remain for the bushfire Asset Protection Zone.

(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),



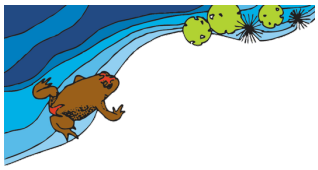
No. No area of outstanding biodiversity value has been specifically declared for these species.

(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.

Yes. Clearing of eucalypts is a key threatening process for Little lorikeet, Swift parrot and Gang-gang Cockatoos. The nature and extent of clearing is minor.

Conclusion

The proposed activity is unlikely to have a significant effect on Little lorikeet, Swift parrot and Gang-gang Cockatoos. Therefore a Biodiversity Development Assessment Report is not recommended.



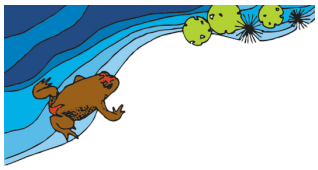
Nocturnal raptors

Key
CE = Critically Endangered
E = Endangered
V = Vulnerable

Scientific name	Common name	NSW status	Comm. status
Ninox strenua	Powerful Owl	V	-
Tyto novaehollandiae	Masked Owl	E	CE

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 She-oak *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.



Masked Owl *Tyto novaehollandiae*
http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10455

- 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.

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

No. While the proposal will modify an area of foraging habitat for these species, the extent of habitat modification is minor compared to adjacent and nearby bushland areas. The proposal is unlikely to effect the life cycles of these species such that a viable local population will be placed at risk of extinction.

Loss or modification of suitable habitat for the Asset Protection Zone around the new proposed school buildings is unlikely to have an adverse effect on the life cycle of any threatened nocturnal raptor such that a local viable population will be placed at risk of extinction.

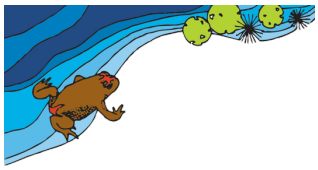
No breeding habitat will be lost.

(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
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 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

Up to 0.23 ha of natural vegetation containing suitable foraging habitat will be modified or removed to satisfy the conditions of a 60m Asset protection Zone (APZ) for the proposal. The ground level will be mulched litter and trees will be reduced to <15% canopy cover.

(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. Continuous habitat will remain to the north and all these species are highly mobile and can easily travel to other areas of habitat.

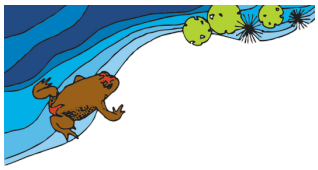
(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
Negligible.

Criterion	Comment
Area and quality of habitat within the locality (maps, photos, survey)	The locality is a rural/suburban matrix with areas of natural vegetation remaining on/around residential properties and businesses. Berowra Valley National Park is connected to the site via bushland creek corridors.
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 and adjacent properties that have not been cleared. The feeding resource to be cleared for the APZ is minimal.
Role of habitat to be affected in sustaining habitat connectivity in the locality	Site habitat provides additional area connected to protected reserve vegetation to the north east.
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.	While a weed plume is present, the majority of the site shows low signs of disturbance. Areas of low disturbance feature good quality natural vegetation. A selection of canopy trees may remain for the bushfire Asset Protection Zone.

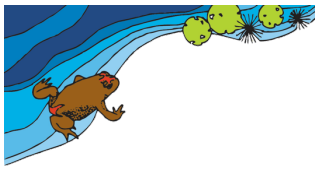
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),
No. No area of outstanding biodiversity value has been specifically declared for this species.

(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.
Yes. Clearing of native vegetation is a key threatening process for Powerful Owl and Masked Owl. The nature and extent of clearing is minor.

Conclusion



The proposed activity is unlikely to have a significant effect on Powerful Owl and Masked Owl. Therefore, a Biodiversity Development Assessment Report is not recommended.



Grey-headed Flying-fox

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

Key
V = Vulnerable
P = Protected

Habitat and ecology
http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10697

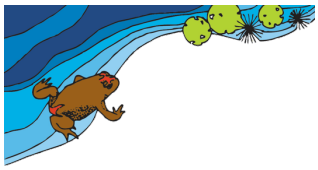
- Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.
- Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation 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.

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

No. While the proposal will modify an area of foraging habitat for this species, the extent of habitat modification is minor compared to habitat on site, adjacent and nearby bushland areas. The proposal is unlikely to effect the life cycles of the species such that a viable local population will be placed at risk of extinction.



Loss or modification of suitable habitat for the Asset Protection Zone around the new proposed school buildings is unlikely to have an adverse effect on the life cycle of the Grey-headed Flying-fox such that a local viable population will 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
Not applicable. This test is for a 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 threatened species.

(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

Up to 0.23 ha of natural vegetation containing suitable foraging habitat trees will be modified or removed to satisfy the conditions of a 60m Asset protection Zone (APZ) for the proposal. The ground level will be mulched litter and trees will be reduced to <15% canopy cover.

(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. Continuous habitat will remain to the north and all these species are highly mobile and can easily travel to other areas of habitat.

(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,
Negligible.

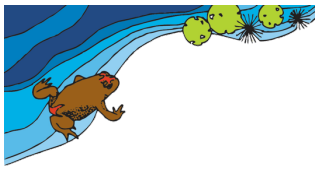
Criterion	Comment
Area and quality of habitat within the locality (maps, photos, survey)	The locality is a rural/suburban matrix with areas of natural vegetation remaining on/around residential properties and businesses. Berowra Valley National Park is connected to the site via bushland creek corridors.
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 and adjacent properties that have not been cleared. The feeding resource to be cleared for the APZ is minimal.
Role of habitat to be affected in sustaining habitat connectivity in the locality	Site habitat provides additional area connected to protected reserve vegetation to the north east.
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.	While a weed plume is present, the majority of the site shows low signs of disturbance. Areas of low disturbance feature good quality natural vegetation. A selection of canopy trees may remain for the bushfire Asset Protection Zone.

(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. No area of outstanding biodiversity value has been specifically declared for this species.

(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.
Yes. Clearing of native vegetation is a key threatening process for Grey-headed Flying-fox. The extent of effect is minor.

Conclusion

The proposed activity is unlikely to have a significant effect on Grey-headed Flying-fox. Therefore a Biodiversity Development Assessment Report is not recommended.



Insectivorous bats

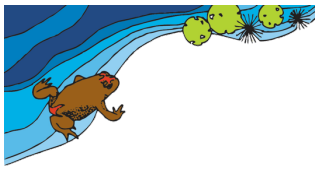
Scientific name	Common name	NSW status	Comm. status
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P	
Mormopterus norfolkensis	Eastern Freetail-bat	V,P	-
Chalinolobus dwyeri	Large-eared Pied Bat	V,P	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V,P	-
Miniopterus australis	Little Bentwing-bat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

Key
V = Vulnerable
P = Protected

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 maily 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



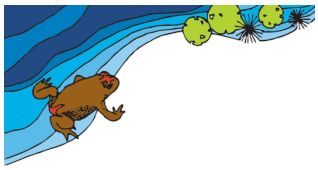
unit area of wing indicates manoeuvrable flight. This species probably forages for small, flying insects below the forest canopy. Likely to hibernate through the coolest months. It is uncertain whether mating occurs early in winter or in spring.

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.

Little Bentwing-bat *Miniopterus australis*
http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10533
Little Bentwing-bat prefers moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites with the Common Bentwing-bat and, in winter, the two species may form mixed clusters. In NSW the largest maternity colony is in close association with a large maternity colony of Eastern Bentwing-bats (Miniopterus schreibersii) and appears to depend on the large colony to provide the high temperatures needed to rear its young. Maternity colonies form in spring and birthing occurs in early summer. Males and juveniles disperse in summer. Only five nursery sites /maternity colonies are known in Australia.

Eastern Bentwing-bat *Miniopterus schreibersii 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.

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.



Southern Myotis *Myotis macropus*
https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10549
Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. In NSW females have one young each year usually in November or December.

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

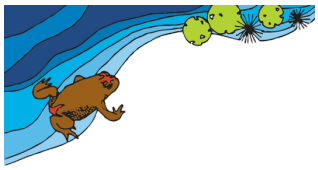
No. While the proposal will modify an area of foraging habitat for these species, the extent of habitat modification is minor compared to the adjoining bushland areas. Bats will continue to forage within and around the APZ. The macropond will be retained and will continue to provide an open water body for Southern Myotis. The proposal is unlikely to effect the life cycles of these species such that a viable local population will be placed at risk of extinction.

Breeding habitat will not be affected.

(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
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 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
Up to 0.23 ha of natural vegetation containing suitable foraging habitat will be modified or removed to satisfy the conditions of a 60m Asset protection Zone (APZ) for the proposal. The ground level will be mown lawn and trees will be reduced to <15% canopy cover. The macropond will be retained and will continue to provide an open water body for Southern Myotis.



(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. Continuous habitat will remain to the north and all these species are highly mobile and can easily travel to other areas of habitat.

(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,
Negligible.

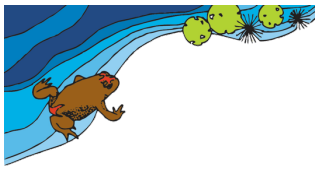
Criterion	Comment
Area and quality of habitat within the locality (maps, photos, survey)	The locality is a rural/suburban matrix with areas of natural vegetation remaining on/around residential properties and businesses. Berowra Valley National Park is connected to the site via bushland creek corridors.
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 and adjacent properties that have not been cleared. The feeding resource to be cleared for the APZ is minimal.
Role of habitat to be affected in sustaining habitat connectivity in the locality	Site habitat provides additional area connected to protected reserve vegetation to the north east.
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.	While a weed plume is present, the majority of the site shows low signs of disturbance. Areas of low disturbance feature good quality natural vegetation. A selection of canopy trees may remain for the bushfire Asset Protection Zone.

(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. No area of outstanding biodiversity value has been specifically declared for these species.

(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.
Yes. Clearing of native vegetation is a key threatening process for threatened bats. The extent is minor.

Conclusion

The proposed activity is unlikely to have a significant effect on Yellow-bellied Sheathtail-bat, Eastern Freetail-bat, Large-eared Pied Bat, Eastern False Pipistrelle, Little Bentwing-bat, Eastern Bentwing-bat, Southern Myotis or Greater Broad-nosed Bat. Therefore a Biodiversity Development Assessment Report is not recommended.



Threatened Plants

Botanical name	NSW status	Comm. status
Persoonia hirsuta	E	E
Persoonia mollis subsp. *maxima*	E	E

No threatened plants species were recorded in site surveys 2nd Oct 2019.

Key
E = Endangered

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:

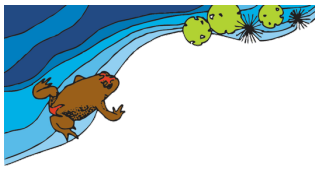
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

No.
No threatened plants have been recorded on site. No threatened plants were recorded during the current field work and targeted survey for *Persoonia hirsuta* and *Persoonia mollis* subsp. *maxima*. While many threatened plants have been recorded in the locality, this is largely due to the proximity to Berowra Valley National Park and other extensive areas of natural vegetation. The proposal is unlikely to have an adverse effect on the life cycle of any of these species such that a viable local population will 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
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 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
Up to 0.23 ha of natural vegetation will be modified or removed to satisfy the conditions of a 60m



Asset protection Zone (APZ) for the proposal. The ground level will be mulched litter and trees will be reduced to <15% canopy cover. If these species appear they may be retained within the APZ.

(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. While this area over a gully to the north of the school was deemed potentially suitable for threatened *Persoonia mollis* subsp. *maxima* and *Persoonia hirsuta*, these species were not present on site.

(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,
Nil.

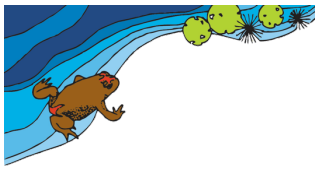
Criterion	Comment
Area and quality of habitat within the locality (maps, photos, survey)	The locality is a rural/suburban matrix with areas of natural vegetation remaining on/around residential properties and businesses. Berowra Valley National Park is connected to the site via bushland creek corridors.
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 and adjacent properties that have not been cleared.
Role of habitat to be affected in sustaining habitat connectivity in the locality	Site habitat provides additional area connected to protected reserve vegetation to the north-east.
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.	While a weed plume is present, the majority of the site shows low signs of disturbance. Areas of low disturbance feature good quality natural vegetation.

(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. No area of outstanding biodiversity value has been specifically declared for these species

(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.
Yes. Clearing of native vegetation is a key threatening process for threatened plants. The extent is minor.

Conclusion

The proposed activity is unlikely to have a significant effect on *Persoonia hirsuta* and *Persoonia mollis* subsp. *maxima*. Therefore a Biodiversity Development Assessment Report is not recommended.



Invertebrates

Scientific name	Common name	NSW status	Comm. status
Pommerhelix duralensis	Dural Woodland Snail	E	E

Key
E = Endangered

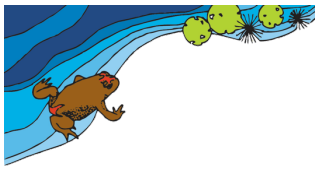
Dural Woodland Snail *Pommerhelix duralensis*
https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20283

- The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris.
- It favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. The species has also been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris.
- Migration and dispersal is limited, with overnight straight-line distances of under 1 metre identified in the literature and studies. The species is active from approximately one hour after dusk until dawn and no confirmed diurnal activity is reported. It exhibits no roost-site behaviour.
- The species is known to aestivate, and secretes an epiphragm to protect against dessication.
- The main food sources are hyphae and fruiting bodies of native fungi. It is possible other detritus may be consumed.
- Reproduction rates are very low, with few eggs (about 32) per season. Mortality is 90% in the first year, and 99.8% within four-five years.

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
No.
There are no records of the Dural Woodland Snail from the site and no threatened snails were recorded on site. However, targeted surveys were not conducted and given the contiguous habitat with the site to adjacent and higher quality habitat, there is potential for the local populations range to extend within the study site. The proposal to clear the edges of the north side of the property for an APZ is however, unlikely to have an adverse effect on the life cycle of the Dural Woodland Snail such that a viable local population will 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
Not applicable. This test is for a 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 threatened species.

(c) in relation to the habitat of a threatened species or ecological community:
(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The Dural Woodland snail is known to shelter under rocks, inside curled up bark, beneath leaves and light woody debris, particularly in areas of accumulated litter over exposed sandstone and at the bases of trees with an affinity for shale/ sandstone boundaries. This is the right habitat for this locally occurring species.

Up to 0.23 ha of natural vegetation will be modified or removed to satisfy the conditions of a 60m Asset protection Zone (APZ) for the proposal. The ground level will be mulched litter with potential to retain some woody debris and rocks and trees will be reduced to <15% canopy cover.

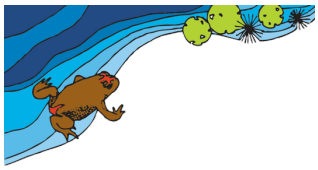
(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

No. While this area over a gully to the north of the school was deemed potentially suitable for threatened *Pommerhelix duralensis* the clearing will extend a narrow strip around an already inhospitable environment. It will not fragment areas of vegetation.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
The key habitat features are surface rock and woody litter and bark. Those materials may be retained in the APZ. A very small area of tree canopy and shrubs will be removed for the APZ.

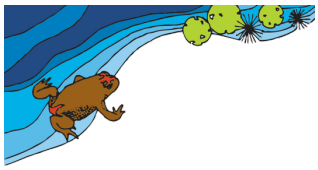
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),
No. No area of outstanding biodiversity value has been specifically declared for this species.

(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.
Removal of woody debris (foraging and refuge habitat) is listed as a key threat to the species. That habitat can be retained within the APZ.



Conclusion

The proposed activity is unlikely cause extinction of any local population so the activity is unlikely to have a significant effect on Dural Woodland Snail. Therefore a Biodiversity Development Assessment Report is not recommended.



Appendix 2. Flora species list

The grid reference for this locality is 33.696002 South, 151.039091 East (datum GDA94)

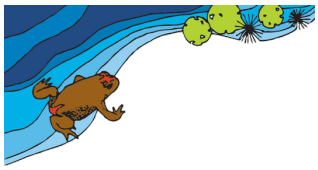
Acacia implexa	
Acacia decurrens	
* *Ageratina edenophora*	HTW
Allocasuarina torulosa	
* *Anagallis arvensis*	
Angophora costata	
* *Araujia sericifera*	HTW
Asplenium australsicum	
# *Banksia integrifolia*	
Banksia serrata	
Calochalena dubia	
Casuarina cunninghamiana	
Ceratopetalum gummiferum	
# *Clivia miniata*	
Cyathea cooperi	
Dianella caerulea	
Entolasia stricta	
Eucalyptus pilularis	
Eucalyptus piperita	
Eucalyptus resinifera	
* *Euphorbia peplus*	
* *Fumaria muralis*	
# *Howea fosteriana*	
Kennedia rubicunda	
Ozothamnus diosmifolius	
# *Leptospermum petersonii*	
Leucopogon juniperinus	
* *Lantana camara*	HTW
* *Ligustrum lucidum*	HTW
Leucopogon juniperinus	
Lomandra longifolia	
Melaleuca linariifolia	
* *Morus alba*	
Oplismenus aemulus	
Pandorea pandorana	
Persicaria decipiens	
Persoonia linearis	
* *Pinus radiata*	HTW
Pittosporum undulatum	
Pteridium esculentum	
* *Sonchus oleraceus*	
Parsonisa straminea	
* *Senecio madagascariensis*	HTW
* *Solanum mauritianum*	
Syncarpia glomulifera	
* *Taraxacum officinale*	
* *Tradescantia fluminensis*	HTW
Typha orientalis	
Viola hederacea	
* *Zantedeschia aethiopica*	

Key

* introduced species

planted

HTW High threat weeds



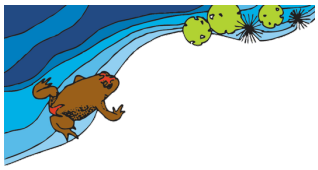
Appendix 3. Expected fauna species in the Sydney Basin

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

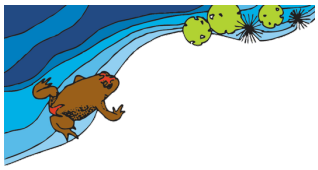
Common Name	Scientific Name
Green Tree Frog	*Litoria caerulea*
Blue Mountains Tree Frog	*Litoria citropa*
Bleating Tree Frog	*Litoria dentata*
Eastern Dwarf Tree Frog	*Litoria fallax*
Jervis Bay Tree Frog	*Litoria jervisiensis*
Broad-palmed Frog	*Litoria latopalmata*
Peron's Tree Frog	*Litoria peronii*



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

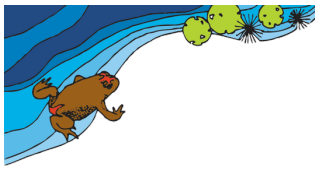
Common Name	Scientific Name
Diamond Python	*Morelia spilota spilota*
Common Death Adder	*Acanthophis antarcticus*
Yellow-faced Whip Snake	*Demansia psammophis*
Common Tree Snake	*Dendrelaphis punctulatus*
Golden-crowned Snake	*Cacophis squamulosus*
Eastern Small-eyed Snake	*Cryptophis nigrescens*
Red-naped 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*
Copper-tailed Skink	*Ctenotus taeniolatus*



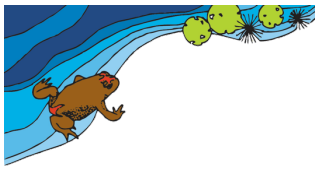
Common Name	Scientific Name
Mainland She-oak Skink	*Cyclodomorphus michaeli*
Pink-tongued Skink	*Cyclodomorphus gerrardii*
Cunningham's Skink	*Egernia cunninghami*
Black Rock Skink	*Egernia saxatilis*
White's Skink	*Liopholis whitii*
Eastern Water-skink	*Eulamprus quoyii*
Barred-sided Skink	*Eulamprus 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

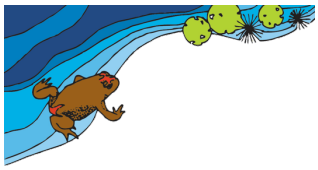
Common Name	Scientific Name
Brown Quail	*Coturnix ypsilophora*
Black Swan	*Cygnus atratus*
Australian Wood Duck	*Chenonetta jubata*
Mallard	*Anas platyrhynchos*
Pacific Black Duck	*Anas superciliosa*
Grey Teal	*Anas gracilis*
Chestnut Teal	*Anas castanea*
Australasian Grebe	*Tachybaptus novaehollandiae*
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*
Black-shouldered Kite	*Elanus axillaris*
Whistling Kite	*Haliastur sphenurus*



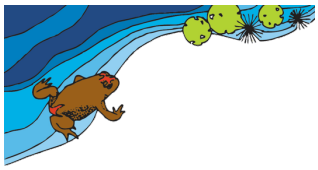
Common Name	Scientific Name
Wedge-tailed Eagle	*Aquila audax*
White-bellied Sea-eagle	*Haliaeetus leucogaster*
Swamp Harrier	*Circus approximans*
Brown Goshawk	*Accipiter fasciatus*
Collared Sparrowhawk	*Accipiter cirrocephalus*
Brown Falcon	*Falco berigora*
Australian Hobby	*Falco longipennis*
Nankeen 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*
Channel-billed Cuckoo	*Scythrops novaehollandiae*
Asian Koel	*Eudynamys scolopaceus*
Southern Boobook	*Ninox novaeseelandiae*



Common Name	Scientific Name
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*
Eastern Yellow Robin	*Eopsaltria australis*
Eastern Whipbird	*Psophodes olivaceus*
Crested Shrike-tit	*Falcunculus frontatus*
Golden Whistler	*Pachycephala pectoralis*



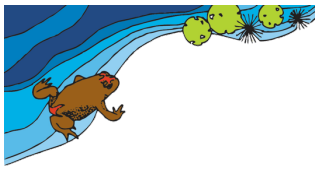
Common Name	Scientific Name
Rufous Whistler	*Pachycephala rufiventris*
Grey Shrike-thrush	*Colluricincla harmonica*
Black-faced Monarch	*Monarcha melanopsis*
Leaden Flycatcher	*Myiagra rubecula*
Restless Flycatcher	*Myiagra inquieta*
Magpie-lark	*Grallina cyanoleuca*
Rufous Fantail	*Rhipidura rufifrons*
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*



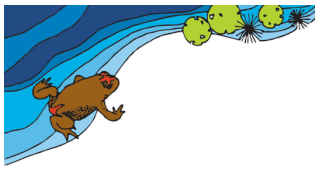
Appendix 4. Habitat requirements for locally-occurring threatened fauna species

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	No 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.	No 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 foraging habitat occurs on 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	Suitable foraging habitat occurs on the site.

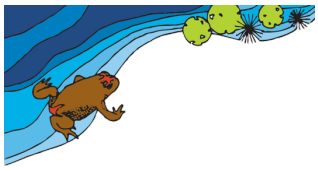


Common name ***Scientific name*** Schedule listing	Preferred habitat	Comment
Barking Owl *Ninox connivens* BC Act, Sch. 2, Vul.	Found in open forests, woodlands, dense scrubs, river red gums and other large trees near watercourses.	No suitable natural habitat occurs on the site.
Powerful Owl *Ninox strenua* 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 foraging habitat occurs on 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 foraging habitat occurs on 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

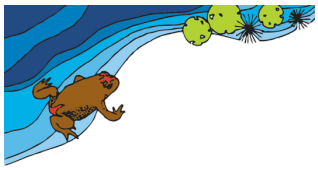
Common name ***Scientific name*** Schedule listing	Preferred habitat	Comment
Spotted-tailed Quoll *Dasyurus maculatus* BC Act, Sch. 2, Vul. EPBC Act, End.	Occurs mostly in sclerophyll forest and woodlands as well as coastal heath lands and rainforests. Requires suitable den sites such as hollows or caves 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 Freetail-bat *Mormopterus 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
Eastern Bentwing-bat *Miniopterus schreibersii 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.	Suitable foraging 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.
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris* BC Act, Sch. 2, Vul.	Roosts singly or in groups in tree hollows or in buildings. Forages over a wide range.	Suitable foraging habitat occurs on the site.

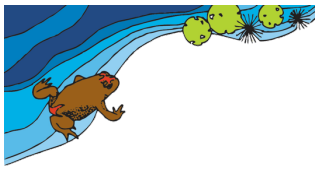
Invertebrates

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.	No 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.

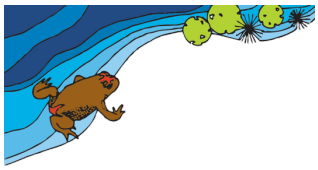


Appendix 5. Habitat requirements for locally-occurring threatened plant species

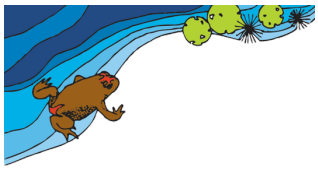
Botanical name **Conservation status**	**Habitat description**	**Suitable habitat on site**
Acacia asparagoides ROTAP, 2R	Grows in dry sclerophyll forest or occasionally heath on sandstone.	No
Acacia baueri subsp. aspera ROTAP, 2RC – BC Act, Sch. 2, Vul.	Grows in low heath, often on exposed sandstone 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.	No
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.	No
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



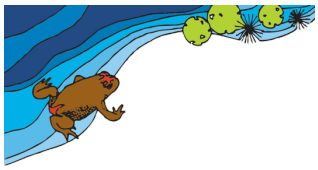
Botanical name Conservation status	Habitat description	Suitable habitat on site
Ancistrachne maidenii ROTAP, 2KC - BC Act, Sch. 2, Vul.	Grows on sandstone soils; north of Sydney.	No
Angophora crassifolia ROTAP, 2RCa	Locally frequent but restricted to the Ku-ring-gai Plateau region.	No
Asterolasia elegans 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.	No
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



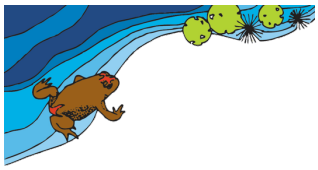
Botanical name **Conservation status**	**Habitat description**	**Suitable habitat on site**
Cynanchum elegans ROTAP, 3ECi BC Act, Sch. 1, End. EPBC Act, End.	Rare, recorded from rainforest gullies scrub and scree slopes; from the Gloucester district to the Wollongong area and inland to Mt Dangar.	No
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.	No
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 Mtns.	No
Genoplesium baueri BC Act, Sch. 1, End.	Prefers sandy dry Eucalyptus habitats	No

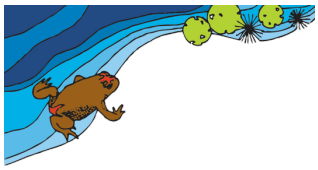


Botanical name **Conservation status**	**Habitat description**	**Suitable habitat on site**
Grammitis stenophylla BC Act, Sch. 1, End.	Prefers moist shaded gullies, typically grows on rocks near moss.	No
Grevillea caleyi BC Act, Sch. 1, End. EPBC Act, End.	Grows on sandy soil with lateritic influences, 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 indry 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
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

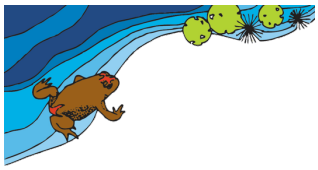


Botanical name **Conservation status**	**Habitat description**	**Suitable habitat on site**
Hymenophyllum lyallii (was *Sphaerocionium lyallii*) ROTAP, 3RC – +	Grows on rocks or trees in moist rainforest in the Blue Mtns and ranges of the south coast.	No
Hymenophyllum pumilum ROTAP, 3RC -	Epiphytic in 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
Leucopogon fletcheri subsp. fletcheri ROTAP, 2RC - BC Act, Sch. 1, End.	Grows in woodland on lateritic soils; rare, in the Springwood area.	No

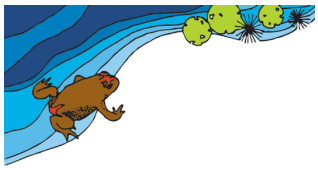
Botanical name Conservation status	Habitat description	Suitable habitat on site
Lissanthe sapida ROTAP, 3RCa	Grows in open woodland and dry sclerophyll forest, on rocky sandstone ridges and hillsides on sandy soil; occasional, from Bargo to Coloul Ra. and Blackheath.	No
Lomandra brevis ROTAP, 2RC -	Grows 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
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



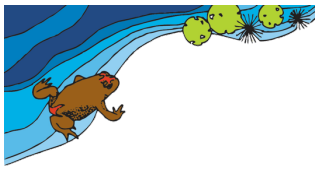
Botanical name Conservation status	Habitat description	Suitable habitat on site
Persoonia hirsuta/revoluta ROTAP, 3KCi BC Act, Sch. 1, End. EPBC Act, End.	Grows in woodland to dry sclerophyll forest on sandstone; both subspecies occurring as isolated individuals or very small populations.	Yes
Persoonia 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.	Yes
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
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
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



Botanical name Conservation status	Habitat description	Suitable habitat on site
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
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
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



Botanical name **Conservation status**	**Habitat description**	**Suitable habitat on site**
Syzygium paniculatum BC Act, Sch. 1, End. EPBC Act, Vul.	Rainforest and open forest near riparian zones.	No
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
Wilsonia backhousei BC Act, Sch. 2, Vul.	Grows in coastal saltmarshes; chiefly in the Sydney district, also common at Jervis Bay.	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

EPBC Act 1999:

CE = Critically Endangered
E = Endangered
V = Vulnerable
EP = Endangered Population

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

Appendix 6. 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 30 April 2020
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 2019

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.

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.