Travers

bushfire & ecology

Biodiversity Assessment Report

10–20 High Street
Canterbury

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(REF: 18NBRS04U)

Biodiversity Assessment Report

10–20 High Street, Canterbury

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The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

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List of abbreviations

APZ	asset protection zone
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act (2016)*
BC Reg	*Biodiversity Conservation Regulation (2017)*
BCAR	Biodiversity Certification Assessment Report
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
BPA	bushfire protection assessment
BSSAR	Biodiversity Stewardship Site Assessment Report
CEEC	Critically endangered ecological community
CM Act	*Coastal Management Act 2016*
DAWE	Department of Agriculture, Water and the Environment
DCP	development control plan
DEC	NSW Department of Environment and Conservation (superseded by DECC from April 2007)
DECC	NSW Department of Environment and Climate Change (superseded by DECCW from October 2009)
DECCW	NSW Department of Environment, Climate Change and Water (superseded by OEH from April 2011)
DEWHA	Commonwealth Department of Environment, Water, Heritage & the Arts (superseded by SEWPAC)
DOEE	Commonwealth Department of Environment & Energy (superseded by DAWE February 2020)
DPIE	NSW Department of Planning, Industry and Environment
EEC	endangered ecological community
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act (1979)*
EPBC Act	*Environment Protection and Biodiversity Conservation Act (1999)*
FM Act	*Fisheries Management Act*
IBRA	Interim Biogeographic Regionalisation for Australia
LEP	local environmental plan
LGA	local government area
LLS Act	*Local Land Services Act (2013)*
NES	national environmental significance
NPW Act	*National Parks and Wildlife Act (1974)*
NRAR	Natural Resources Access Regulator (NSW)
NSW DPI	NSW Department of Industry and Investment
OEH	Office of Environment and Heritage (superseded by DPIE from August 2019)
PCT	plant community type
PFC	projected foliage cover
RFS	NSW Rural Fire Service
ROTAP	rare or threatened Australian plants
SAII	Serious And Irreversible Impacts
SEPP	State Environmental Planning Policy
SEWPAC	Commonwealth Dept. of Sustainability, Environment, Water, Population & Communities (superseded by DOEE)
SIS	species impact statement
SULE	safe useful life expectancy
TEC	threatened ecological community
TPZ	tree preservation zone
TSC Act	*Threatened Species Conservation Act (1995) – Superseded by the Biodiversity Conservation Act (2016)*
VMP	vegetation management plan

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Background 1

Travers bushfire & ecology has been engaged to undertake a biodiversity assessment report within Lots 1 & 2 DP 194469, Lots A & B DP 312359, Lot 1 DP 123147 & Lots 4-8 DP 8350, Napier, Frances & High Streets, Canterbury within Canterbury Bankstown local government area (LGA). The extent of these lots are shown in Figure 1 below. These lots are subject to a proposed development application and will hereafter be referred to as the 'study area'.

The area containing the proposed development, including demolition works, construction zones and services, and all associated impact on habitat features is hereafter referred to as the 'development footprint' (refer to Figure 4 which shows the impact areas).

The proposal shall be assessed under the *Biodiversity Conservation Act* (*BC Act*), 2016.

Figure 1 – Study area (red)

1.1 Proposed development

The planned development is currently in concept phase and involves upgrades to an existing primary school. This will likely include the demolition of some existing buildings and construction of new buildings including new library, hall, canteen, admin and classroom buildings, plus new covered walkways and seating area (as per Figure 2).

Since our initial biodiversity constraints report (May 2018), the proponent has sought permission for the removal of selected trees on site which has been approved by Canterbury City Council and the works have been undertaken. The removal of the trees is subject to the replacement planting of eighteen (18) trees to attain a minimum height of ten (10) metres at maturity in a more convenient location within the school grounds. This a replacement ratio of 3:1.

A further six (6) trees or 0.07 ha of vegetation is proposed for removal as shown on Figures 3 and 4.

The arborist report by MacKay Tree Management (September 2020 update) has been utilised to identify individual trees on site and where native species are located.

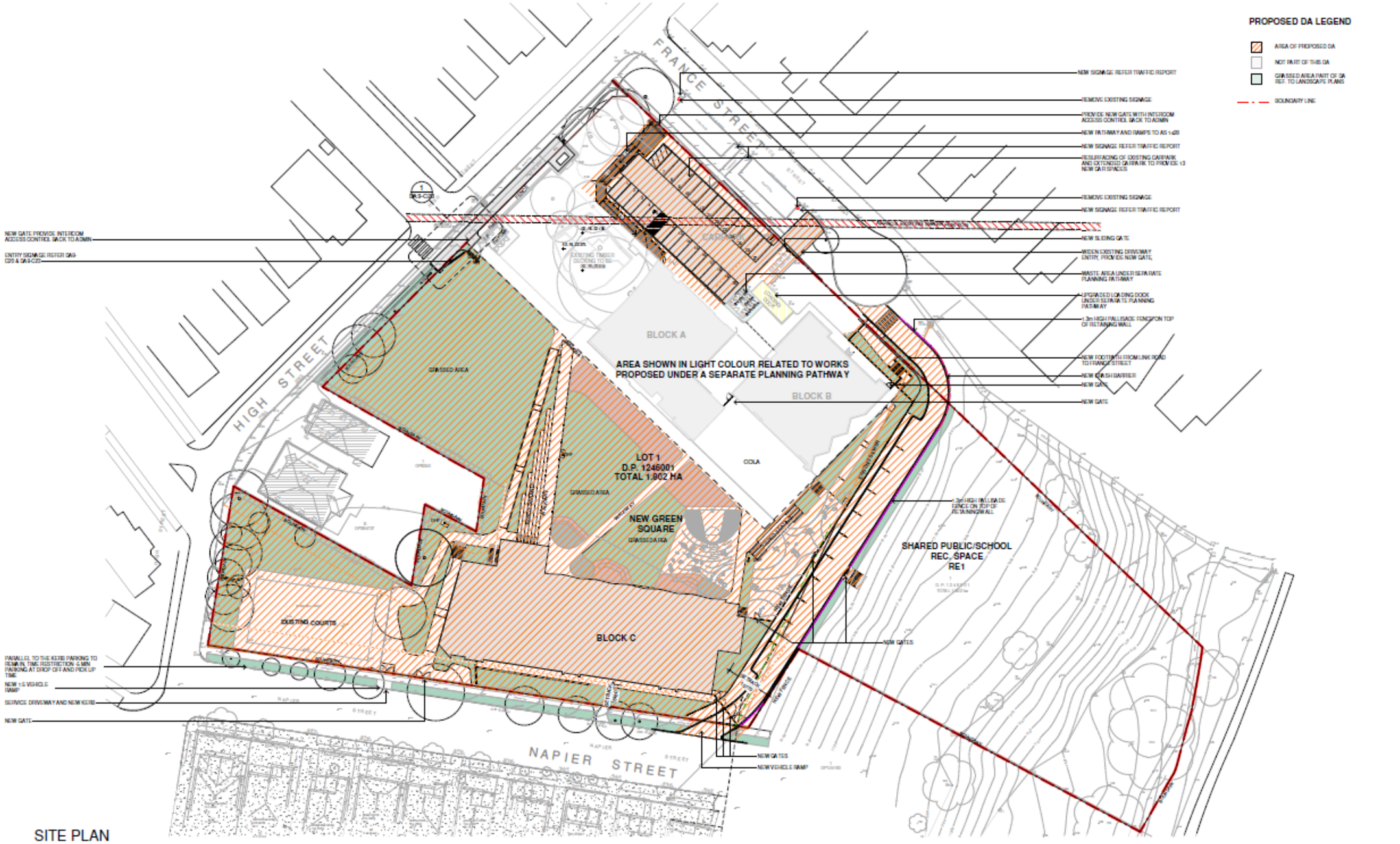

Figure 2 – Concept plan

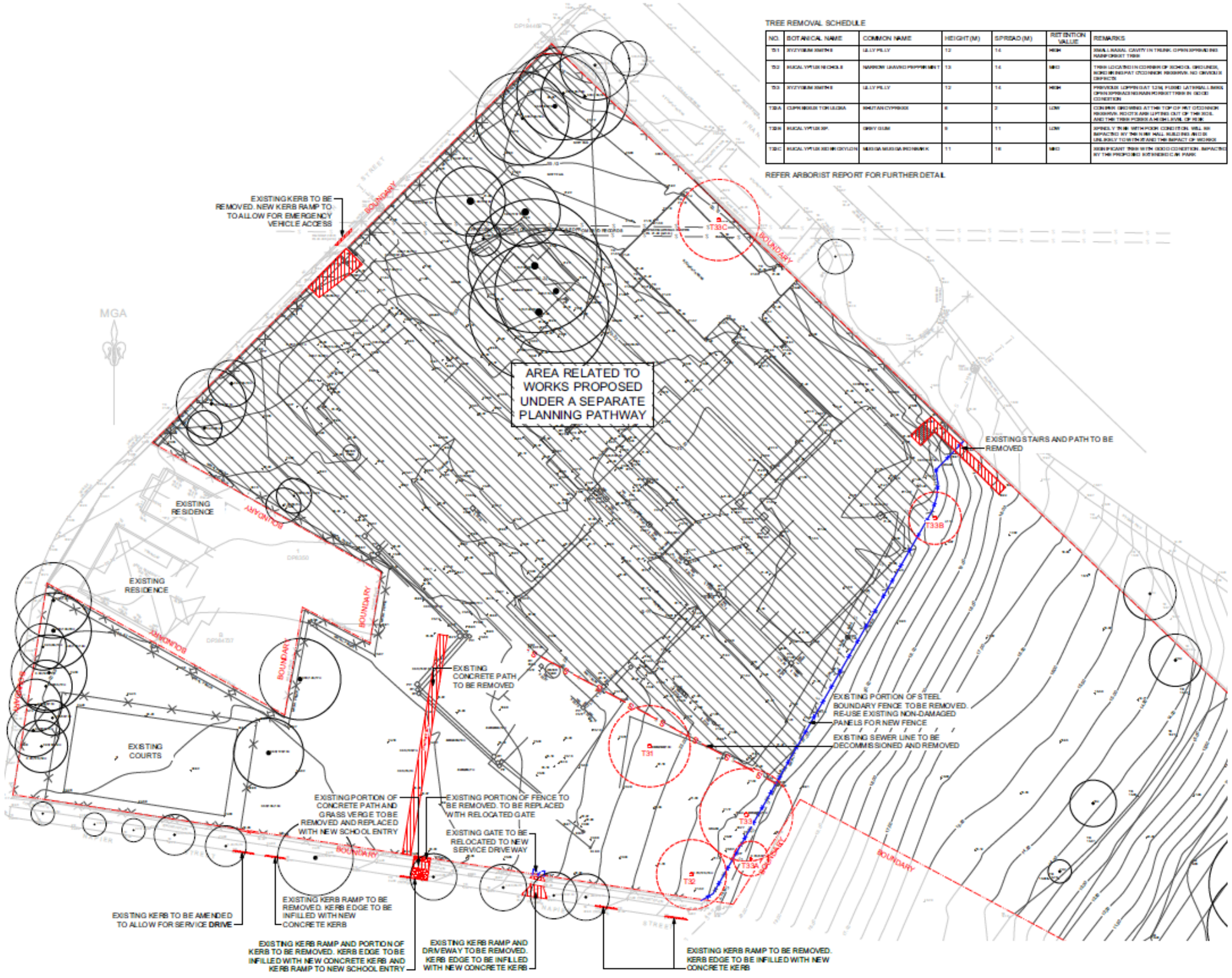

Figure 3 – Trees proposed for impact (demolition plan)

1.2 Site description

Table 1 provides a summary of the planning, cadastral, topographical, and disturbance details of the development footprint.

Table 1 - Site features

Location	Lots 1 & 2 DP 194469, Lots A & B DP 312359, Lot 1 DP 123147 & Lots 4-8 DP 8350, Napier, Frances & High Streets, Canterbury (refer to Figure 1)
Area	Approximately 1.939 ha
Local government area	Canterbury Bankstown
Zoning	The site is zoned R4 – High Density Residential, R3 – Medium Density Residential, and RE1 – Public Recreation.
Grid reference	325866 E 6245348 S
Elevation	Approximately 10-25m AHD
Topography	The site has a slope to the east with an average slope of around 3 degrees
Geology and soils	Geology; The western 65% of the site is upon Ashfield Shale, the remainder is on Quaternary alluvium. Soils; Gymea Soil Landscape over most of the site; Blacktown Soil Landscape over the north western tenth of the site.
Catchment, drainage and steam order	There are no creek lines or drainages within the development footprint. The site drains into Cup and Saucer Creek adjacent to the eastern boundary, and then into Cooks River.
Existing land use	There is an existing school on the property.
Connectivity features	There is very poor connectivity to the development footprint. There is existing development to the west, south and north. Cleared lawn occurs to the east along Cup and Saucer Creek.

Flora 2

2.1 Survey

Botanical survey was undertaken on 4 April 2018 over a time frame of approximately 2 hrs.

Botanical survey included a random meander in accordance with *Cropper* (1993) to gain a full species list of the plants within the site. A review of the *Atlas of NSW Wildlife* (OEH 2018) was undertaken prior to the site visit to determine threatened species previously recorded within 10 km of the study area, and relevant target searches were undertaken as suited.

All naturally occurring species were identified to species level where possible, and tabulated in Appendix 1.

2.2 Vegetation communities

The Native Vegetation of the Sydney Metropolitan Area OEH (2016) maps the vegetation within the site as Urban Exotic / Native.

All trees and shrubs within the study area are planted specimens which are unlikely to occur naturally within this location. If planted species were native to NSW, they were mapped with a polygon and assigned a Plant Community Type (PCT).

All native species were input into the Bionet vegetation classification tool to assist in determining the PCT on site. Given that the plantings are typically not from the locality, the PCT to be defined will be abnormal for the area. Based on the number of positive indicator species, the PCT came out most closely to PCT 695 - Blackbutt - Turpentine - Tallowwood shrubby open forest of the coastal foothills of the central NSW North Coast Bioregion.

Field verification of the study area found the following vegetation communities:

- Planted native vegetation, most similar to PCT 695 based on the planted native species.
- Exotic vegetation

Vegetation descriptions provided below are for those PCTs being potentially impacted.

Planted native vegetation

This vegetation community has been planted and contains a mix of local and non-local native species. Common trees include *Ficus microcarpa* var. “Hillii”, *Corymbia maculata*, *Eucalyptus microcorys, Eucalyptus nicholii* and *Eucalyptus scoparia.* The ground layer generally consists of managed lawn composed largely of *Pennisetum clandestinum* (Kikuyu grass) with occasional garden beds of mostly exotic species. The exception is provided in the far west of the site between the sports court and High Street which has a dense planting of *Lomandra longifolia* and some exotic weed species such as *Ligustrum sinense* and *Lantana camara.*

Photo 1 – Planted native vegetation in the north-west portion of the site

Photo 2 – Planted native vegetation in the west of the site adjacent to High Street

Photo 3 – Planted native vegetation in the southern portion of the school grounds

Photo 4 – Planted native vegetation in the far western portion of the study site between the sports court and High Street

Exotic vegetation

This describes all other vegetation on site that cannot be assigned a PCT as the species are considered non-native. Some examples include *Corymbia citriodora, Jacaranda mimosifolia, Cupressus torulosa* and *Bauhinia 'purpurea'.* This also includes the grassed areas in the southern portion of the study area as shown in Photo 5.

Photo 5 – Exotic lawns in the southern portion of the study area

2.3 Threatened flora species

BC Act – A search of the *Atlas of NSW Wildlife* (DPIE, 2020) indicated a list of species that have been recorded within a 10 km radius of the development footprint. These species are listed in Table 5 (Appendix 2) and are considered for potential habitat within the development footprint.

EPBC Act – A review of the schedules of the *EPBC Act* indicated the potential for a list of threatened flora species to occur within a 10 km radius of the development footprint. These species have also been listed in Table 5 for consideration of potential to occur.

Based on the habitat assessment within Table 5 (Appendix 2) it is considered that the development footprint provides no potential habitat for any naturally-occurring threatened flora species.

Three (3) threatened tree species were observed on site - *Eucalyptus nicholii*, *Eucalyptus scoparia* and *Syzygium paniculatum*. The approximate positions of those individuals are indicated on Figure 4. The individuals recorded on site are considered to be planted as these species have restricted distribution and/or habitat requirements and would not naturally occur within the site. It is therefore considered these individuals within the site are not important for the preservation of the naturally occurring populations of these species and are not of high conservation priority. The proposal will remove two (2) *Syzygium paniculatum* trees and one (1) *Eucalyptus nicholii.*

The arborist report identified two (2) specimens as *Syzygium smithii* which is an old name now recognised as *Acmena smithii.* It is often difficult to distinguish between *Acmena smithii* and *Syzygium paniculatum* without sufficient fruiting material. *TBE's* botanist, Dr George Plunkett identified specimens of *Syzygium paniculatum* on site, not *Acmena smithii.* This report has applied a cautious approach and recognising that the specimens are the threatened species and assessed them as such.

All other threatened species in both the BioNet (NSW) and *EPBC Act* coordinate search (National) were considered to have low potential suitable habitat within the study area because of previous clearing and landscaping works, past and ongoing land management practices, unsuitable soils or geology, unsuitable previous vegetation type, or large distance to known specimens.

The state test of significance assessment (Appendix 3) and a review of *EPBC Act* impact criteria (Appendix 4) has concluded that the proposed development will not have a significant impact on threatened flora species or TECs. Therefore, (a) a Species Impact Statement is not required in respect to flora for the proposal and (b) biodiversity offsetting is not required.

2.4 Endangered flora populations

Five (5) endangered flora populations are known to occur within 10km of the study area. These populations are:

- *Acacia prominens* in the Hurstville and Kogarah Local Government Areas
- *Pomaderris prunifolia* in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas
- *Prostanthera saxicola* population in Sutherland and Liverpool Local Government Areas
- *Wahlenbergia multicaulis* in the Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield Local Government Areas.
- *Marsdenia viridiflora* subsp. *viridiflora* population in the Bankstown, Blacktown, Camden, Campelltown, Fairfield, Holroyd, Liverpool and Penrith Local Government Areas.

Only *Wahlenbergia multicaulis* is recognised as an endangered flora population within the Canterbury LGA. No specimens of *Acacia bynoeana, Pomaderris prunifolia, Prostanthera saxicola, Wahlenbergia multicaulis* or *Marsdenia viridiflora* subsp. *viridiflora* were observed within the study area during the flora survey. Given the lack of any remnant vegetation and likelihood of natural regeneration, the species are unlikely to occur. Therefore, it is considered that these endangered populations do not occur within the study area.

2.5 Threatened ecological communities

The site contains no Threatened Ecological Communities (TECs) as listed under the NSW *BC Act* (2016) or the Commonwealth *EPBC Act* (1999).

The site is located within shale geology, and on the boundary of the Blacktown and Gymea soil landscapes. Prior to vegetation clearance of the site, the native vegetation could have been either Cumberland Plain Woodland or Cooks River / Castlereagh Ironbark Forest, however there are no real remnants in any strata remaining to accurately identify or differentiate.

As PCT 695 is planted native vegetation and atypical of its natural structure, it is not part of a TEC. PCT 695 is not recognised as a TEC in its natural state either.

Fauna 3

3.1 Habitat assessment

A fauna habitat assessment was undertaken during the botanical survey to identify the habitat types available, the quality and any specific or important features. Section 3.2 of the report describes the habitat values present.

The fauna assessment is based on desktop analysis, threatened species records (DPIE 2020) and habitat attributes identified during the flora survey. Particular note was taken to search for the following potential threatened fauna species habitat:

- Structures of notable potential or indicated use by subterranean microbat species.
- Hollow-bearing trees present.
- Presence of any raptor nests.

3.2 Habitat features

The following habitat was present:

- No hollow-bearing trees
- Nectar producing tree species, principally *Eucalyptus* and *Corymbia* spp.
- Large fruit-producing trees, principally *Syzygium paniculatum* and *Ficus* spp.
- No seed producing *Allocasuarina* trees
- No sandstone outcrops providing any notable shelter opportunity
- No ground hollows
- No native ground cover or terrestrial shelter opportunity
- No permanent water such as dams or creeks
- No drainages

Hollow-bearing trees were surveyed during the botanical survey. None were recorded.

3.3 Threatened fauna species

BC Act – A search of the *Atlas of NSW Wildlife* (DPIE, 2020) provided a list of threatened fauna species previously recorded within a 10 km radius of the development footprint. These species are listed in Table 6 (Appendix 2) and are considered for potential habitat within the study area.

EPBC Act – A review of the schedules of the *EPBC Act* identified a list of threatened fauna species or species habitat likely to occur within a 10 km radius of the development footprint. These species have also been listed in Table 6.

In accordance with Table 6 (Appendix 2) the following state and nationally listed threatened fauna species are considered to have suitable habitat with varying potential to occur within the study area. The state listed species will be considered in the test of significance (Appendix 3).

Table 2 – Threatened fauna species with suitable habitat present

Common name	*BC Act*	*EPBC Act*	Potential to occur
Grey-headed Flying-fox	V	V	✓
Eastern Bentwing-bat	V	-	✓
Green and Golden Bell Frog	E	V	unlikely
Little Lorikeet	V	-	unlikely
Swift Parrot	E	E	unlikely
Large-footed Myotis	V	-	unlikely

The state test of significance assessment (Appendix 3) and a review of EPBC impact criteria (Appendix 4) has concluded that the proposed development will not have a significant impact on threatened fauna species. Therefore, (a) a Species Impact Statement is not required in respect to fauna for the proposal and (b) biodiversity offsetting is not required.

Fisheries Management Act (FM Act) – No habitats suitable for threatened aquatic species were observed within the study area and as such the provisions of this act do not require any further consideration.

3.4 Protected migratory species (National)

The EPBC Act Protected Matters Report provides additionally listed terrestrial, wetland and marine migratory species of national significance likely to occur, or with habitat for these species likely to occur, within a 10km radius of the development footprint. The habitat potential of migratory species is considered in Table 6 (Appendix 2). The habitat potential of threatened migratory species are instead considered with other threatened species in Table 7 (Appendix 2).

Following a review of the impact criteria for protected migratory bird species under the *EPBC Act* (Appendix 4), it is concluded that the proposal will not likely significantly impact on any nationally listed protected migratory species with considered potential to occur.

3.5 Endangered fauna populations

- There are no endangered fauna populations identified specifically to the City of Canterbury LGA; however, the site does fall within the Sydney Metropolitan Catchment Management Authority area. An endangered population of White-fronted Chat (*Epthianura albifrons*) is identified to this area however this is made up of two known isolated sub-populations; one at Newington Nature Reserve on the Parramatta River and one at Towra Point Nature Reserve at Kurnell.

3.6 SEPP (Koala Habitat Protection) 2019

The Canterbury LGA does not fall under the SEPP (Koala Habitat Protection) 2019.

Figure 4 – Flora survey effort and results

Watercourses & Wetlands

4

4.1 Endangered wetland communities

A number of wetland communities have been listed as an 'endangered ecological community' under the NSW *BC Act*.

Impacts on wetland communities must be assessed under the *BC Act* and if present the management of wetland communities must be given due consideration in accordance with the objectives and principles of management as contained within the NSW Wetlands Policy (2010), and appropriate management as determined by NSW DPIE - Office of Water in their general terms of approval. This may include but not limited to the provision of buffers, management of stormwater runoff and maintenance of natural inflows or runoff into those wetland communities.

- Artesian springs ecological community
- Castlereagh Swamp Woodland Community
- Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions
- Coastal Upland Swamp in the Sydney Basin bioregion
- Coolibah–Black Box woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain and Mulga Lands bioregions
- Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
- Kurri sand swamp woodland in the Sydney Basin Bioregion
- Lagunaria swamp forest on Lord Howe Island
- Maroota Sands swamp forest
- Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion
- Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions
- Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
- The shorebird community occurring on the relict tidal delta sands at Taren Point
- Upland wetlands of the drainage divide of the New England Tableland Bioregion
- Wingecarribee Swamp

No endangered wetland communities were present within the study area and therefore a referral to NRAR is not required for impacts on waterfront land.

4.2 Groundwater dependent ecosystems (GDEs)

Groundwater dependent ecosystems are communities of plants, animals and other organisms whose extent and life processes are dependent on groundwater. Some examples of ecosystems which depend on groundwater are:

- wetlands;
- red gum forests, vegetation on coastal sand dunes and other terrestrial vegetation;
- ecosystems in streams fed by groundwater;
- limestone cave systems;

- springs; and
- hanging valleys and swamps.

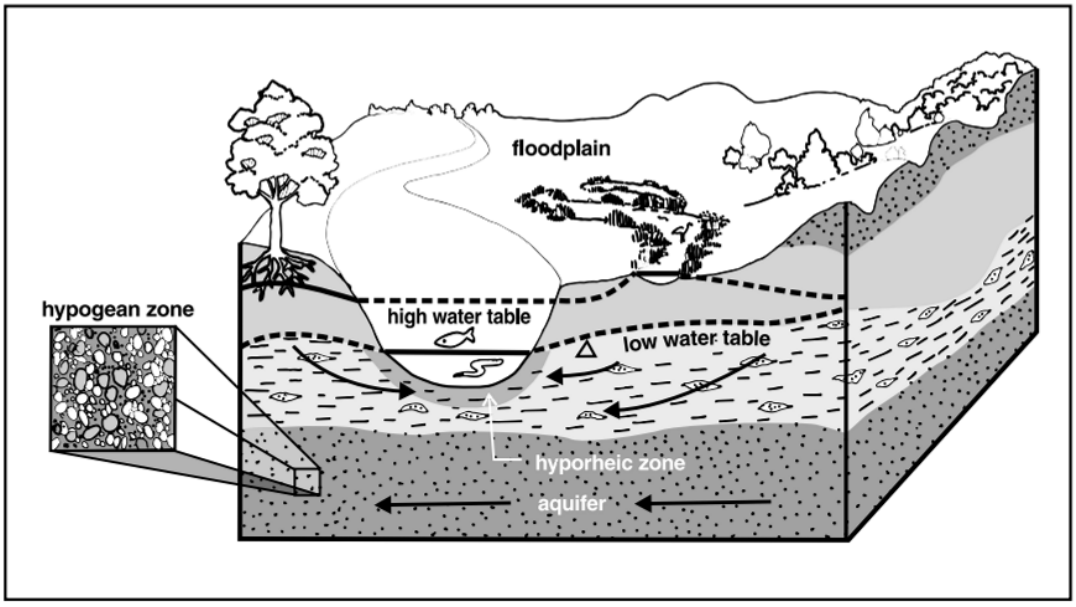

Figure 5 – Alluvial groundwater system discharging into a river

Groundwater dependent ecosystems are therefore ecosystems which have their species composition and their natural ecological processes determined by groundwater (NSW State Groundwater Dependent Ecosystems Policy April 2002).

Groundwater Dependent Ecosystems (GDEs) were not observed within the study area and therefore the policy does not require any further consideration. A referral to NRAR is not required for impacts on waterfront land.

4.3 Watercourse assessment

The proposed development will not impact on watercourses or drainage lines. Cup and Saucer Creek occurs outside and adjacent to the eastern boundary and will not be impacted by the proposal. A referral to NRAR is not required for impacts on waterfront land.

4.4 Coastal Management SEPP

The NSW DPE *Coastal Wetlands and Littoral Rainforests Area Map* (http://webmap.environment.nsw.gov.au/PlanningHtml5Viewer/?viewer=SEPP_CoastalManagement) identifies an area within the wetland as “coastal wetlands”, and a buffer area surrounding the margin of the wetland as “proximity area for coastal wetlands” (Figure 6).

As stated in the *State Environmental Planning Policy (Coastal Management) 2018*, development consent is required for any development within these areas and must not be given unless the consent authority is satisfied that sufficient measures have been, or will be, taken to protect, and where possible enhance, the biophysical, hydrological and ecological integrity of the coastal wetland. Additionally, within the “proximity area for coastal wetlands” area, development consent must not be given unless the consent authority is satisfied that the proposed development will not significantly impact on the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland.

The impacts of the current subdivision proposal are limited to lot fences and associated clearing within the proximity area for coastal wetlands. *Travers bushfire & ecology* consider

that this will not significantly impact on the quantity and quality of surface and ground water flows to and from the adjacent wetland.

Figure 6 – Coastal wetlands area map

Biodiversity Impact Assessment 5

5.1 Biodiversity Offsets Scheme (BOS)

The *BC Act* repeals the *Threatened Species Conservation Act 1995*, the *Nature Conservation Trust Act 2001* and the animal and plant provisions of the *National Parks and Wildlife Act 1974*. Together with the *Biodiversity Conservation Regulation 2017*, the *BC Act* establishes a new regulatory framework for assessing and offsetting biodiversity impacts on proposed developments and clearing. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme (BOS). Where development consent is granted, the authority may impose as a condition of consent an obligation to retire a number and type of biodiversity credits determined under the new Biodiversity Assessment Method (BAM).

Where development consent is granted, the authority may impose as a condition of consent an obligation to retire a number and type of biodiversity credits determined under the new Biodiversity Assessment Method (BAM).

The Biodiversity Offsets Scheme applies to:

- local development (assessed under Part 4 of the *Environmental Planning and Assessment Act 1979*) that triggers the Biodiversity Offsets Scheme Threshold or is likely to significantly affect threatened species based on the test of significance in section 7.3 of the *Biodiversity Conservation Act 2016*
- state significant development and state significant infrastructure projects, unless the Secretary of the Department of Planning, Industry and Environment and the environment agency head determine that the project is not likely to have a significant impact
- biodiversity certification proposals
- clearing of native vegetation in urban areas and areas zoned for environmental conservation that exceeds the Biodiversity Offsets Scheme threshold and does not require development consent
- clearing of native vegetation that requires approval by the Native Vegetation Panel under the *Local Land Services Act 2013*
- activities assessed and determined under Part 5 of the *Environmental Planning and Assessment Act 1979* (generally, proposals by government entities) if proponents choose to 'opt in' to the Scheme.

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

5.2 Threshold assessment

The BOS includes three (3) elements to the threshold test – an area trigger, a Biodiversity Values Land Map trigger and the Test of Significance. If impacts exceed at least one (1) of these triggers, the Biodiversity Offset Scheme applies to the proposed clearing.

5.2.1 Biodiversity Values Land Map

Biodiversity Values Land has not been mapped within the study area – an offset is not required under this trigger. Figure 7 below shows the site (red) in relation to those areas (coloured mauve) as having biodiversity values.

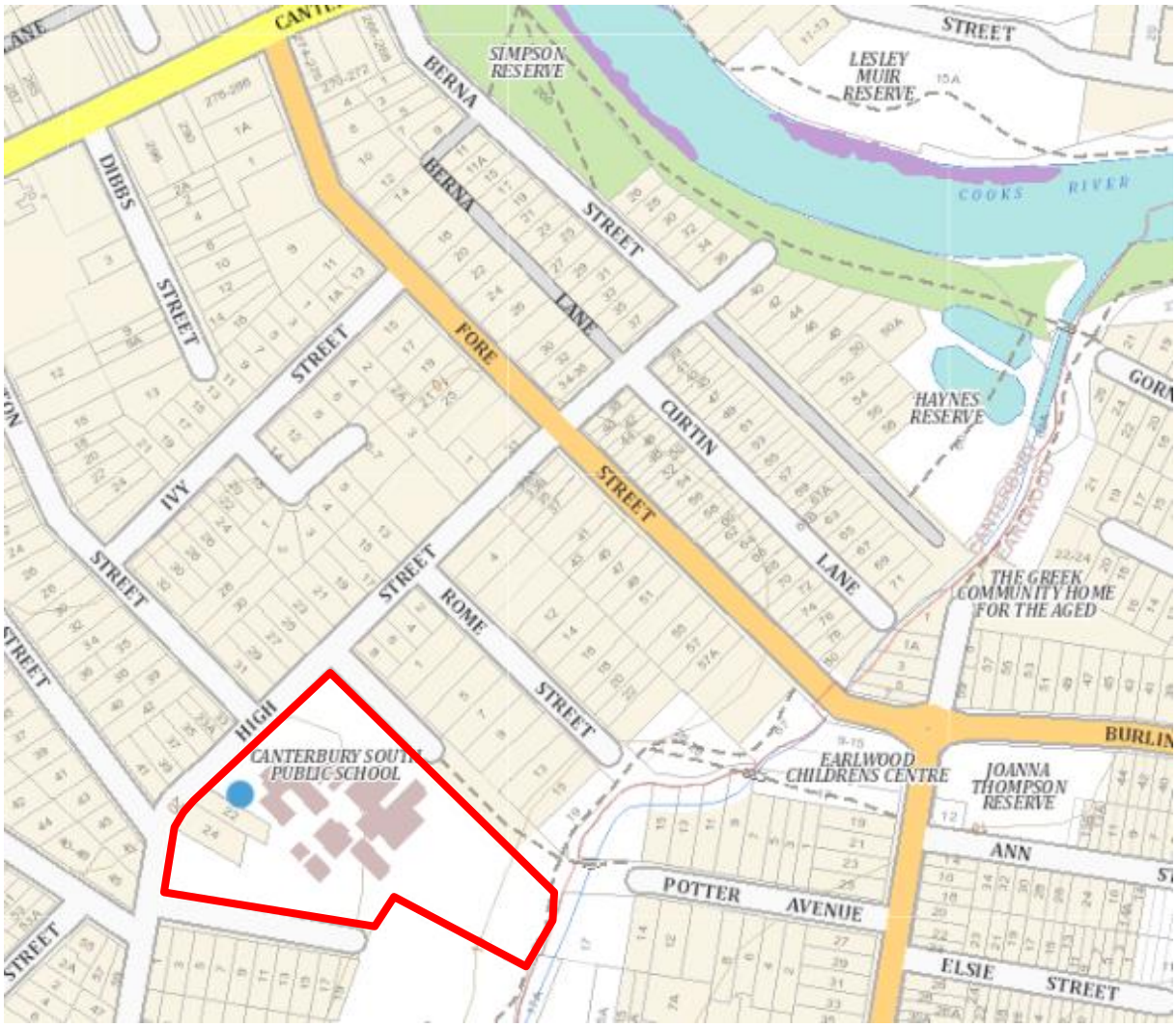

Figure 7 – Biodiversity values land (purple) relative to the study area (red)

(Source: DPIE – Biodiversity Values Map – Sept 2020)

5.2.2 Area clearing threshold

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

Table 3 – BOS entry threshold report

Date of Calculation	23/09/2020 3:31 PM	**BDAR Required***
Total Digitised Area	0.7 ha	
Minimum Lot Size Method	LEP	
Minimum Lot Size	0.05 ha	
Area Clearing Threshold	0.25 ha	
Area clearing trigger Area of native vegetation cleared	Unknown #	Unknown #
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no	no
Date of the 90 day Expiry	N/A	

Table 3 identifies that the BOS entry threshold report has determined the area threshold based on the minimum lot size of 0.05 ha, and the area clearing threshold for which the BOS applies is 0.25 ha. Clearing of 'native vegetation' that exceeds 0.25 ha will require a biodiversity offset to be obtained. Note that 'native vegetation' includes planted native species. The development proposal will not impact more than 0.07 ha of native vegetation therefore offsetting will not be required under this trigger.

5.2.3 Test of Significance

The state test of significance assessment (Appendix 3) has concluded that the proposed development will not have a significant impact on threatened species or TECs. Therefore, biodiversity offsetting is not triggered under this third threshold.

5.3 Serious and irreversible impacts on biodiversity values

Development consent cannot be granted for non-State significant development under Part 4 of the *Environmental Planning and Assessment Act 1979* (NSW) if the consent authority is of the opinion it is likely to have serious and irreversible impacts (SAII) on biodiversity values. The determination of SAII is to be made in accordance with principles prescribed section 6.7 of the *BC Regulation* (2017).

As the proposal will not trigger the BOS, an assessment of SAII entities is not required.

5.4 Potential ecological impacts

The direct, indirect and cumulative ecological impacts have been considered in respect to recorded biodiversity, threatening processes and extent of impact as a result of the proposed works:

5.4.1 BC Reg Prescribed impacts

The following potential impacts on biodiversity values as a result of the proposal are prescribed (subject to subclause (2) of the *BC Reg.*) as biodiversity impacts to be assessed under the biodiversity offsets scheme:

- Karst, caves, crevices, cliffs and other geological features of significance,
- Rocks,
- Human made structures,
- Non-native vegetation,

- Connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range,
  a) The proposal will only impact six (6) trees which do not contribute to a connected corridor for fauna movement or seed dispersal.
- Movement of threatened species that maintains their lifecycle,
- 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),
- Wind turbine strikes on protected animals,
- Vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community

The proposal impacts non-native vegetation which may provide foraging habitat for fauna. Given the absence of hollows within the trees, it is unlikely to support any breeding habitat for species such as threatened microbats and other highly mobile species.

5.4.2 Direct impacts

The direct impacts of the proposal within the development footprint are considered as:

- Removal of 0.07 ha of planted native vegetation commensurate with PCT 695,
- Removal of seasonal fruit and nectar producing trees for foraging by birds and flying-foxes
- Six (6) trees are proposed for removal; *Syzygium paniculatum* x2, *Cupressus torulosa* x1, *Eucalyptus nicholii* x1, *Eucalyptus sp.* x1 and *Eucalyptus sideroxylon* x1.

5.4.3 Indirect impacts

The potential indirect impacts of the proposal are considered as:

- Reduced cross-site movements by small bird species such as passerines,
- Reduced seed bank of native species.

5.4.4 Cumulative impacts

The potential cumulative impacts (combined results of past, current and future activities) of the proposal are considered as:

- Cumulative loss of native vegetation
- Cumulative loss of foraging habitat for native fauna

5.5 Avoid actions

The development plan allows for the avoidance of impact on the following biodiversity values on site:

- The impacts have been sited to reduce the number of trees being removed; only six (6) trees are required for removal, covering an area of 0.07 ha.
- Development has been located to maximise usage of already cleared areas, and to minimise impacts on planted native vegetation.

5.6 Mitigation measures

The following mitigation measures are recommended to avoid, minimise or ameliorate the above potential ecological impacts, address threatening processes and to guide a more positive ecological outcome for threatened species and their associated habitats.

(a) It is recommended that eighteen (18) trees be replanted in addition to (a) to compensate the loss of an additional six (6) being impacted by the proposal.

(b) Trees and tall shrubs to be planted, (a) and (b), should naturally occur in the locality of Cumberland Plain Woodland or Cooks River / Castlereagh Ironbark Forest origin.

(c) Any proposed landscaping should consider a 50% mix of landscaping species and locally occurring natives and avoid planting of species that become problematic in local bushland.

Conclusions 6

Ecological survey and assessment have been undertaken in accordance with relevant legislation including the *Environmental Planning and Assessment Act 1979*, the *Biodiversity Conservation Act 2016*, the commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the *Fisheries Management Act 1994*.

In respect of matters required to be considered under the *Environmental Planning and Assessment Act 1979* and relating to the species / provisions of the *Biodiversity Conservation Act 2016*, no threatened fauna species, three (3) threatened flora species *Eucalyptus scoparia, Eucalyptus nicholii* and *Syzygium paniculatum*, no endangered populations and no TECs were recorded within the study area. The proposal will remove two (2) *Syzygium paniculatum* trees and one (1) *Eucalyptus nicholii,* all of which are planted.

The state assessment of significance (Appendix 3) has concluded that the proposed development will not have a significant impact on any threatened species, populations or TECs. Therefore, (a) a Species Impact Statement is not required for the proposal and (b) biodiversity offsetting is not required.

Offsetting under the Biodiversity Offsets Scheme (BOS) is not required for the proposal as:

- The study area is not located on lands mapped as Biodiversity Values Land.
- The proposed clearing of 0.07 ha of native vegetation is less than the area clearing threshold of 0.25 ha.
- The test of significance concludes a not-significant impact on threatened entities.

In respect of matters required to be considered under the *Environment Protection and Biodiversity Conservation Act 1999*, no threatened fauna species, no protected migratory bird species, three (3) threatened flora species *Eucalyptus scoparia, Eucalyptus nicholii* and *Syzygium paniculatum* and no TECs were recorded within the study area.

The individuals recorded on site are considered to be planted and would not naturally occur within the site. It is therefore considered these individuals are not important for the preservation of the naturally occurring populations of these species and are not of conservation priority. No further threatened flora species have been observed or are considered likely to occur in a natural state.

The proposal is not considered to have a significant impact on matters of national environmental significance. As such a referral to Department of Environment and Energy should not be required.

In respect of matters relative to the *Fisheries Management Act 1994*, no suitable habitat for threatened marine or aquatic species was observed within the development footprint and there are no matters requiring further consideration under this Act.

Whilst fauna survey has not been undertaken, it is considered that the habitat attributes within the study area do not provide any significant or unique habitat of breeding importance for any threatened fauna species. Remnant and planted vegetation may provide low key foraging value.

Appendix 1
Flora Species List

Table 4 – Flora species recorded (Appendix 1)

Family	Scientific name	Common name
TREES		
Sterculiaceae	*Brachychiton acerifolius*	Illawarra Flame Tree
Cupressaceae	*Chamaecyparis* sp. (cultivar)*	Cypress
Lauraceae	*Cinnamomum camphora**	Camphor Laurel
Rutaceae	*Citrus* sp.* (Cultivar)	-
Myrtaceae	*Corymbia citriodora*	Lemon-scented Gum
Cupressaceae	*Cupressus torulosa** (Cultivar)	Bhutan Cypress
Eleocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash
Malaceae	*Eriobotrya japonica**	Loquat
Myrtaceae	*Eucalyptus microcorys*	Tallowwood
Myrtaceae	***Eucalyptus nicholii***	**Narrow-leaved Black Peppermint**
Myrtaceae	*Eucalyptus paniculata*	Grey Ironbark
Myrtaceae	*Eucalyptus punctata*	Grey Gum
Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany
Myrtaceae	***Eucalyptus scoparia***	**Wallangarra White Gum**
Myrtaceae	*Eucalyptus sideroxylon*	Red Ironbark
Myrtaceae	*Eucalyptus* spp.	Eucalyptus
Moraceae	*Ficus microcarpa* (Cultivar)*	Hill's Weeping Fig
Bignoniaceae	*Jacaranda mimosifolia**	Jacaranda
Lythraceae	*Lagerstroemia indica* (Cultivar)*	Crepe Myrtle
Hamamelidaceae	*Liquidambar styraciflua**	Sweetgum
Arecaceae	*Livistona australis*	Cabbage Tree Palm
Myrtaceae	*Lophostemon confertus*	Brush Box
Myrtaceae	*Melaleuca diosmifolia*	-
Myrtaceae	*Melaleuca styphelioides*	Prickly-leaved Tea Tree
Meliaceae	*Melia azedarach*	White Cedar
Moraceae	*Morus nigra**	Black Mulberry
Oleaceae	*Olea europaea subsp. europaea**	Common Olive Tree
Fabaceae	*Phanera purpurea**	Orchid tree
Arecaceae	*Phoenix canariensis**	Canary Island Date Palm
Rosaceae	*Prunus persica**	Peach Tree
Myrtaceae	*Syncarpia glomulifera*	Turpentine
Myrtaceae	***Syzygium paniculatum***	**Magenta Lilly Pilly**
SHRUBS		
Fabaceae	*Acacia floribunda*	White Sally
Fabaceae	*Acacia longifolia*	
Fabaceae	*Acacia podalyriifolia*	Queensland Silver Wattle
Myrtaceae	*Callistemon viminalis*	Weeping Bottlebrush
Asteraceae	*Chrysanthemoides monilifera subsp. rotundata**	Bitou Bush
Lamiaceae	*Clerodendron* sp.* (Cultivar)	-
Asteliaceae	*Cordyline* spp.*	Cordyline
Proteaceae	*Grevillea banksii*	Banks's Grevillea
Proteaceae	*Grevillea glossadenia x venusta*	Grevillea 'Orange marmalade'
Oleaceae	*Ligustrum lucidum**	Large-leaved Privet
Myrtaceae	*Melaleuca armillaris subsp. armillaris*	Bracelet Honey Myrtle

Family	Scientific name	Common name
Apocynaceae	*Plumeria obtusa* (Cultivar)*	Frangipani
Rosaceae	*Rosa sp. (cultivar)**	Rose
GROUNDCOVERS		
Alliaceae	*Agapanthus spp.**	
Amaranthaceae	*Amaranthus viridis**	Green Amaranth
Iridaceae	*Aristea ecklonii**	
Asparagaceae	*Asparagus aethiopicus**	Asparagus Fern
Asteraceae	*Bidens pilosa**	Cobbler's Pegs
Brassicaceae	*Brassica spp.**	Brassica
Bromeliaceae	*Bromelia sp.* (Cultivar)*	Bromeliads
Carophyllaceae	*Cerastium glomeratum**	Mouse-ear Chickweed
Poaceae	*Cynodon dactylon*	Common Couch
Iridaceae	*Dietes bicolor**	
Poaceae	*Digitaria sanguinalis**	Crab Grass
Poaceae	*Ehrharta erecta**	Panic Veldtgrass
Poaceae	*Eleusine indica**	Crowsfoot Grass
Poaceae	*Eragrostis curvula**	African Lovegrass
Fumariaceae	*Fumaria muralis subsp. muralis**	Wall Fumitory
Asteraceae	*Hypochaeris radicata**	Flatweed
Balsaminaceae	*Impatiens walleriana**	Busy Lizzie
Convolvulaceae	*Ipomoea batatas**	Sweet Potato
Asteraceae	*Lactuca spp.**	Lettuce
Asparagaceae	*Liriope spicata**	Lilyturf
Lomandraceae	*Lomandra longifolia*	Spiky-headed Mat-rush
Malvaceae	*Malva neglecta**	Dwarf Mallow
Malvaceae	*Modiola caroliniana**	Red-flowered Mallow
Davalliaceae	*Nephrolepis cordifolia**	Fish-bone Fern
Asteraceae	*Osteospermum fruticosum**	Shrubby daisy bush
Oxalidaceae	*Oxalis corniculata**	Creeping Oxalis
Poaceae	*Paspalum dilatatum**	Paspalum
Poaceae	*Pennisetum clandestinum**	Kikuyu, Kikuyu Grass
Plantaginaceae	*Plantago lanceolata**	Ribwort
Portulacaceae	*Portulaca oleracea*	Purslane
Lamiaceae	*Rosemarinus officinalis* (Cultivar)*	Rosemary
Poaceae	*Saccharum officinarum**	Sugarcane
Malvaceae	*Sida rhombifolia**	Paddy's Lucerne
Solanaceae	*Solanum tuberosum**	Potato
Asteraceae	*Soliva sessilis**	Bindii
Asteraceae	*Sonchus oleraceus**	Common Sow-thistle
Araceae	*Spathiphyllum sp.* (Cultivar)	Peace Lily
Poaceae	*Sporobolus africanus**	Parramatta Grass
Poaceae	*Stenotaphrum secundatum**	Buffalo Grass
Asteraceae	*Taraxacum officinale**	Dandelion
Fabaceae/faboideae	*Trifolium dubium**	Yellow Suckling Clover
Campanulaceae	*Wahlenbergia gracilis*	Australian Bluebell
VINES		
Asclepiadaceae	*Araujia sericifera**	Mothvine
Fabaceae/faboideae	*Phaseolus vulgaris* (Cultivar)*	Bean, String Bean
* denotes exotic species		

It should be noted that not all garden, cultivar or landscape species have been identified as part of this assessment.

Species in **bold** are threatened under the *BC Act.*

Appendix 2
Threatened Flora & Fauna Habitat Assessment

Table 5 - Threatened flora species habitat assessment (Appendix 2)

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Acacia bynoeana DPIE EPBC	E1	V	Erect or spreading shrub to 0.3m high growing in heath and dry sclerophyll Open Forest on sandy soils. Often associated with disturbed areas such as roadsides. Distribution limits N-Newcastle S-Berrima.	x	x	-	-	x	x
Acacia pubescens DPIE EPBC	V	V	Spreading shrub 1-4m high open sclerophyll growing in open forest and woodlands on clay soils. Distribution limits N-Bilpin S-Georges River.	x	x	-	-	x	x
Acacia terminalis subsp. *terminalis* DPIE EPBC	E1	E	Erect shrub to 2m tall, flowers from March to July. Occurs in eucalypt woodland or forest, usually in sandy soil on creek banks, hillslopes or in shallow soil in rock crevices and sandstone platforms on cliffs. Typically restricted to the Port Jackson and eastern suburbs of Sydney.	x	x	-	-	x	x
Allocasuarina glareicola EPBC	E1	E	Small shrub 1-2m high growing in open sclerophyll forest on lateritic soils derived from tertiary alluviums. Distribution limits Castlereagh NR region.	x	x	-	-	x	x
Caladenia tessellata DPIE EPBC	E1	V	Terrestrial orchid. Clay-loam or sandy soils. LHCCREMS guidelines suggest the species grows in Map Unit 34 – Coastal Sand Wallum Woodland - Heath. Flowers in September – November. Distribution limits N-Swansea S-south of Eden.	x	x	-	-	x	x
Callistemon linearifolius DPIE	V	-	Shrub to 4m high. Dry sclerophyll forest on coast and adjacent ranges. Distribution limits N-Nelson Bay S-Georges River.	x	x	-	-	x	x
Camarophyllopsis kearneyi DPIE	E1	-	Small gilled fungus Known only from Lane Cove Bushland Park in Sydney.	x	x	-	-	x	x

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Cryptostylis hunteriana EPBC	V	V	Saprophytic orchid. Grows in swamp heath on sandy soils. Distribution limits N-Gibraltar Range S-south of Eden.	x	x	-	-	x	x
Darwinia biflora DPIE EPBC	V	V	Erect or spreading shrub to 0.8m high. Grows in heath or understorey of woodland on or near shale-capped ridges underlain by Hawkesbury sandstone. Distribution limits N-Gosford S-Cheltenham.	x	x	-	-	x	x
Deyeuxia appressa DPIE EPBC	E1	E	Erect grass to 0.9m high. Grows on wet ground. Distribution limits N-Hornsby S-Bankstown.	x	x	-	-	x	x
Dillwynia tenuifolia DPIE	V	-	Erect shrub 0.6-1m high. Grows in Woodlands and Open Forest on sandstone shale or laterite. Distribution limits N-Howes Valley S-Cumberland Plain.	x	x	-	-	x	x
Epacris purpurascens var. *purpurascens* DPIE	V	-	Erect shrub to 1.5m high growing in sclerophyll forest and scrub and near creeks and swamps on Sandstone. Distribution limits N-Gosford S-Blue Mountains.	x	x	-	-	x	x
Eucalyptus camfieldii DPIE \	V	V	Stringybark to 10m high. Grows on coastal shrub heath and woodlands on sandy soils derived from alluviums and Hawkesbury sandstone. Distribution limits N-Norah Head S-Royal NP.	x	x	-	-	x	x
Eucalyptus nicholii DPIE	V	-	This species is widely planted as an urban street tree and in gardens but is quite rare in the wild. It is confined to the New England Tablelands of NSW, where it occurs from Nundle to north of Tenterfield, largely on private property.	✓ Planted specimen	x	-	-	✓ Only as planted specimen	x

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Eucalyptus scoparia DPIE	E1	V	Smooth-barked tree only known from vicinity of Bald Rock.	✓ Planted specimen	x	-	-	✓ Only as planted specimen	x
Genoplesium baueri DPIE EPBC	E1	E	A terrestrial orchid that grows in sparse sclerophyll forest and moss gardens over sandstone. Flowers Feb – Mar Distribution limits N – Hunter Valley S – Nowra	x	x	-	-	x	x
Grevillea beadleana DPIE	E1	E	Spreading shrub, up to 2.5 m. grows in eucalypt forest on granite in the Northern Tableland of NSW.	x	x	-	-	x	x
Hibbertia stricta subsp. *furcatula* DPIE	E1	-	Small shrub 0.8-1.3m tall. Flowers from Jul-Dec. Grows in Dry Sclerophyll Forest and woodland over sandstone. Known from one population along the Woronora River gorge area and one population near Nowra.	x	x	-	-	x	x
Hygrocybe anomala var. *inanthinomarginata* DPIE	V	-	Small gilled fungus known only from Lane Cove Bushland Park, Blue Mountains National Park and Royal National Park.	x	x	-	-	x	x
Hygrocybe aurantipes DPIE	V	-	Small gilled fungus known only from Lane Cove Bushland Park and Blue Mountains National Park.	x	x	-	-	x	x
Hygrocybe collucera DPIE	E1	-	Small gilled fungus known only from Lane Cove Bushland Park.	x	x	-	-	x	x
Hygrocybe griseoramosa DPIE	E1	-	Small gilled fungus known only from Lane Cove Bushland Park.	x	x	-	-	x	x

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Hygrocybe lanecovensis DPIE	E1	-	Small gilled fungus known only from Lane Cove Bushland Park.	x	x	-	-	x	x
Hygrocybe reesiae DPIE	V	-	Small gilled fungus known only from Lane Cove Bushland Park and Blue Mountains National Park on moss covered banks under closed canopy.	x	x	-	-	x	x
Hygrocybe rubronivea DPIE	V	-	Known in a few locations including in Lane Cove Bushland Park and the Blue Mountains in NSW and in areas of south-east Queensland. Little information exists for populations outside Lane Cove Bushland Park. Occurs in gallery warm temperate forests dominated by *Acmena smithii, Backhousia myrtifolia, Glochidion ferdinandi* and *Pittosporum undulatum*. Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss. Does not produce above ground fruiting bodies (fungus) all year round. Fruiting bodies begin appearing mid May to mid-July sometimes to August.	x	x	-	-	x	x
Hypsela sessiliflora DPIE	E1	Ext.	Prostrate herb, rooting at nodes, growing in damp places on the Cumberland Plain.	x	x	-	-	x	x
Leptospermum deanei DPIE	V	V	Shrub to 5m high. Grows on forested slopes. Distribution limits Near watershed of Lane Cove River.	x	x	-	-	x	x

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Leucopogon exolasius DPIE	V	V	Erect shrub to 2m high. Rocky hillsides and creek banks in Sydney Sandstone Gully Forest. Confined to Woronora and Georges Rivers and Stokes Creek.	x	x	-	-	x	x
Maundia triglochinoides DPIE	V	-	A reed-like herb which grows in swamps and shallow fresh water on clay. Distribution Limits N-Qld border S-Wyong.	x	x	-	-	x	x
Melaleuca biconvexa DPIE EPBC	V	V	Tall shrub. Grows in wetlands adjoining perennial streams and on the banks of those streams, generally within the geological series known as the Terrigal Formation. Distribution limits N-Port Macquarie S-Jervis Bay.	x	x	-	-	x	x
Melaleuca deanei DPIE	V	V	Shrub to 3m high. Grows in heath on sandstone. Distribution limits N-Gosford S-Nowra.	x	x	-	-	x	x
Pelargonium sp. *Striatellum* EPBC	E1	E	Herb to 90cm tall which grows in damp places especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance. Varied distribution from SE NSW to QLD.	x	x	-	-	x	x
Persoonia hirsuta DPIE EPBC	E1	E	Erect to decumbent shrub. Grows in dry sclerophyll forest and woodland on Hawkesbury sandstone with infrequent fire histories. Distribution limits N-Glen Davis S-Hill Top.	x	x	-	-	x	x
Persoonia nutans DPIE	E1	E	Erect to spreading shrub. Grows in dry sclerophyll forest and woodland on laterite and alluvial sands. Distribution limits Cumberland Plain.	x	x	-	-	x	x
Pimelea curviflora var. *curviflora* DPIE EPBC	V	V	Woody herb or sub-shrub to 0.2-1.2m high. Grows on Hawkesbury sandstone near shale outcrops. Distribution Sydney.	x	x	-	-	x	x

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Pimelea spicata DPIE EPBC	E1	E	Decumbent or erect shrub to 0.5m high. Occurs principally in woodland on soils derived from Wianamatta Shales. Distribution limits N-Lansdowne S-Shellharbour.	x	x	-	-	x	x
Prostanthera marifolia DPIE	E4A	CE	Erect shrub to 0.3m high. Woodland dominated by Eucalyptus sieberi and Corymbia gummifera. In deeply weathered clay soil with ironstone nodules. Has been recorded previously in the Sydney Harbour region.	x	x	-	-	x	x
Pterostylis saxicola DPIE EPBC	E1	E	Terrestrial orchid. Grows in shallow sandy soil above rock shelves, usually near Wianamatta / Hawkesbury transition. Distribution limits N-Hawkesbury River S-Campbelltown.	x	x	-	-	x	x
Pultenaea aristata DPIE	V	V	A small shrub, mostly 20-40cm tall. Restricted to the Woronora Plateau, a small area between Helensburgh, south of Sydney, and Mt Kiera above Wollongong. Occurs in either dry sclerophyll woodland or wet heath on sandstone. Flowers in winter and spring.	x	x	-	-	x	x
Pultenaea pedunculata DPIE	E1	-	Prostrate shrub. Grows in dry sclerophyll forest and disturbed sites. Confined to Prestons and Villawood in NSW.	x	x	-	-	x	x
Syzygium paniculatum DPIE EPBC	V	V	Small tree. Subtropical and littoral rainforest on sandy soil. Distribution limits N-Forster S-Jervis Bay.	✓ Planted specimen	x	-	-	✓ Only as planted specimen	x
Tetratheca glandulosa DPIE	V	-	Spreading shrub to 0.2m high. Sandy or rocky heath or scrub. Distribution limits N-Mangrove Mountain S-Port Jackson.	x	x	-	-	x	x

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Tetratheca juncea DPIE	V	V	Prostrate shrub to 1m high. Dry sclerophyll forest and heath. Distribution limits N-Bulahdelah S-Port Jackson.	x	x	-	-	x	x
Thelymitra sp. 'Kangaloon' *(Thelymitra kangaloonica)* EPBC	E4A	CE	A terrestrial orchid with dark blue flowers, presented in mid-late spring. Only known from the Robertson area in the Southern Highlands. Often in association with the endangered ecological community *Temperate Highland Peat Swamps on Sandstone.*	x	x	-	-	x	x
Thesium australe EPBC	V	V	Erect herb to 0.4m high. Root parasite. Themeda grassland or woodland often damp. Distribution limits N-Tweed Heads S-south of Eden.	x	x	-	-	x	x
Wilsonia backhousei DPIE	V	-	Perennial subshrub with procumbent branches. Grows in coastal saltmarshes. *Wilsonia backhousei* is salt tolerant and is found in intertidal saltmarshes and, more rarely, on seacliffs. In New South Wales *Wilsonia backhousei* is scattered along the coast, reaching a northern limit at Wamberal Lagoon. In the Sydney region there has been a considerable decline in the abundance of the species over the last 100yrs, largely as a result of loss of habitat. Distribution limits N-Sydney S-South of Eden.	x	x	-	-	x	x
Zannichellia palustris DPIE	E1	-	Submerged herb. Fresh or slightly saline stationary or slow-flowing water. Distribution limits N-Tweed Heads S-Newcastle.	x	x	-	-	x	x

DPIE	-	Denotes species listed within 10km of the development footprint on the *Atlas of NSW Wildlife*
EPBC	-	Denotes species listed within 10km of the development footprint in the *EPBC Act* habitat search
V	-	Denotes vulnerable listed species under the relevant Act

Scientific name DATABASE SOURCE1	***BC Act***	***EPBC Act***	**Growth form and habitat requirements** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and / or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	

E or E1	- Denotes endangered listed species under the relevant Act
E4A or CE	- Denotes critically endangered listed species under the relevant Act
NOTE:	1. This field is not considered if no suitable habitat is present within the development footprint 2. 'records' refer to those provided by the *Atlas of NSW Wildlife* 3. 'nearby' or 'recent' records are species specific accounting for home range, dispersal ability and life cycle

Table 6 - Threatened fauna species habitat assessment (Appendix 2)

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Wallum Froglet *Crinia tinnula* DPIE	V	-	Found in acidic paperbark swamps and wallum country with dense groundcover. Breeds in temporary and permanent pools and ponds of high acidity. *Distribution Limit: N-Tweed Heads S-Kurnell.*	x	x	-	-	x	x
Giant Burrowing Frog *Heleioporus australiacus* EPBC	V	V	Inhabits open forests and riparian forests along non-perennial streams, digging burrows into sandy creek banks. *Distribution Limit: N-Near Singleton S-South of Eden.*	x	x	-	-	x	x
Stuttering Frog *Mixophyes balbus* EPBC	E	V	Terrestrial inhabitant of rainforest and wet sclerophyll forests. *Distribution Limit: N-near Tenterfield S-South of Bombala*.	x	x	-	-	x	x
Red-crowned Toadlet *Pseudophryne australis* DPIE	V	-	Prefers sandstone areas, breeds in grass and debris beside non-perennial creeks or gutters. Individuals can also be found under logs and rocks in non-breeding periods. *Distribution Limit: N-Pokolbin. S-near Wollongong.*	x	x	-	-	x	x
Green and Golden Bell Frog *Litoria aurea* DPIE EPBC	E	V	Prefers the edges of permanent water, streams, swamps, creeks, lagoons, farm dams and ornamental ponds. Often found under debris. *Distribution Limit: N-Byron Bay S-South of Eden.*	x	Marginal	✓	x	Unlikely	✓
Southern Bell Frog *Litoria raniformis* EPBC	E	V	Prefers the edges of permanent water, streams, swamps, creeks, lagoons, farm dams and ornamental ponds. Often found under debris. *Distribution limit: N-ACT Bay. S-Albury.*	x	x	-	-	x	x

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Rosenberg's Goanna *Varanus rosenbergi* DPIE	V	-	Hawkesbury sandstone outcrop specialist. Inhabits woodlands, dry open forests and heathland sheltering in burrows, hollow logs, rock crevices and outcrops. *Distribution Limit: N-Nr Broke. S-Nowra Located in scattered patches near Sydney, Nowra and Goulburn.*	x	x	-	-	x	x
Broad-headed Snake *Hoplocephalus bungaroides* EPBC	E	V	Sandstone outcrops, exfoliated rock slabs and tree hollows in coastal and near coastal areas. *Distribution Limit: N-Mudgee Park. S-Nowra.*	x	x	-	-	x	x
Freckled Duck *Stictonetta naevosa* DPIE	V	-	Occurs mainly within the Murray-Darling basin and the channel country within large cool temperate to sub-tropical swamps, lakes and floodwaters with cumbungi, lignum or melaleucas. *Distribution Limit: N- Tenterfield. S-Albury.*	x	x	-	-	x	x
Superb Fruit-dove *Ptilinopus superbus* DPIE	V	-	Rainforests, adjacent mangroves, eucalypt forests, scrubland with native fruits. *Distribution Limit: N-Border Ranges National Park. S-Bateman's Bay.*	x	x	-	-	x	x
White-throated Needletail [MS] *Hirundapus caudacutus* *DPIE EPBC*	-	V	Airspace over forests, woodlands, farmlands, plains, lakes, coasts, towns; companies often forage along favoured hilltops and timbered ranges. Breeds Siberia, Himalayas, east to Japan. Summer migrant to eastern Australia. *Distribution limit: N-Tweed Heads. S-South of Eden.*	x	Marginal	✓	✓	Unlikely	✓

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Spotted Harrier *Circus assimilis* DPIE	V	-	Utilises grassy plains, crops and stubblefields; saltbush, spinifex associations; scrublands, mallee, heathlands; open grassy woodlands. *Distribution Limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x
White-bellied Sea Eagle (*Haliaeetus leucogaster*) DPIE	V	-	Occupies coasts, islands, estuaries, inlets, large rivers, inland lakes and reservoirs. *Sedentary; dispersive. N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x
Red Goshawk *Erythrotriorchis radiatus* DPIE EPBC	E	V	Inhabits tall open forests and woodlands. Breeds in tall trees adjacent to watercourses of wetlands. *Distribution limit: N-Border Ranges National Park. S-Foster.*	x	x	-	-	x	x
Little Eagle *Hieraaetus morphnoides* DPIE	V	-	Utilises plains, foothills, open forests, woodlands and scrublands; river red gums on watercourses and lakes. *Distribution Limit - N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x
Square-tailed Kite *Lophoictinia isura* DPIE	V	-	Utilises mostly coastal and sub-coastal open forest, woodland or lightly timbered habitats and inland habitats along watercourses and mallee that are rich in passerine birds. *Distribution Limit: N-Goondiwindi. S-South of Eden.*	x	x	-	-	x	x
Eastern Osprey *Pandion cristatus* DPIE	V	-	Utilises waterbodies including coastal waters, inlets, lakes, estuaries and offshore islands with a dead tree for perching and feeding. *Distribution Limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Black Falcon *Falco subniger* DPIE	V	-	Inhabits plains, grasslands, foothills, timbered watercourses, wetland environs, crops; occasionally over towns and cities. *N-Tweed Heads. S-South of Eden*	x	x	-	-	x	x
Bush Stone-curlew *Burhinus grallarius* DPIE	E	-	Utilises open forests and savannah woodlands, sometimes dune scrub, savannah and mangrove fringes. *Distribution Limit: N-Border Ranges National Park. S-Near Nowra.*	x	x	-	-	x	x
Gang-gang Cockatoo *Callocephalon fimbriatum* DPIE	V	-	Prefers wetter forests and woodlands from sea level to > 2,000m on the Great Dividing Range, timbered foothills and valleys, timbered watercourses, coastal scrubs, farmlands and suburban gardens. *Distribution Limit: mid north coast of NSW to western Victoria.*	x	x	-	-	x	x
Major Mitchell's Cockatoo *Cacatua leadbeateri* DPIE	V	-	Commonly found within the arid interior of Australia within desert scrubs, open woodland, mallee, mulga, and Callitris woodlands. *Distribution limit: N-Goodooga. S-Albury.*	x	x	-	-	x	x
Glossy Black-Cockatoo *Calyptorhynchus lathami* DPIE	V	-	Open forests with *Allocasuarina* species and hollows for nesting. *Distribution Limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x
Little Lorikeet *Glossopsitta pusilla* DPIE	V	-	Inhabits forests, woodlands; large trees in open country; timbered watercourses, shelterbeds, and street trees. *Distribution Limit: N-Tweed Heads. S-South of Eden*.	x	Marginal	x	✓	Unlikely	✓

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Swift Parrot *Lathamus discolour* DPIE EPBC	E	E	Inhabits eucalypt forests and woodlands with winter flowering eucalypts. *Distribution Limit: N-Border Ranges National Park. S-South of Eden*.	x	Marginal	x	✓	Unlikely	✓
Turquoise Parrot *Neophema pulchella* DPIE	V	-	Inhabits coastal scrubland, open forest and timbered grassland, especially ecotones between dry hardwood forests and grasslands. *Distribution Limit: N-Near Tenterfield. S-South of Eden.*	x	x	-	-	x	x
Orange-bellied Parrot *Neophema chrysogaster* EPBC	E	E	Favours small islands, peninsulas in coastal areas; with saltmarsh plants; coastal pastures, golf courses; crops of millet and sunflowers; dunes, beaches. *Distribution Limit: N-Southern Sydney coast. S-South of Eden.*	x	x	-	-	x	x
Barking Owl *Ninox connivens* DPIE	V	-	Inhabits principally woodlands but also open forests and partially cleared land and utilises hollows for nesting. *Distribution Limits: N-Border Ranges National Park. S-Eden.*	x	x	-	-	x	x
Powerful Owl *Ninox strenua* DPIE	V	-	Forests containing mature trees for shelter or breeding and densely vegetated gullies for roosting. *Distribution Limits: N-Border Ranges National Park. S-Eden.*	x	x	-	-	x	x
Grass Owl *Tyto longimembris* DPIE	V	-	Inhabits grassland, coastal heath and lignum swamps, sheltering in dense grass tussocks by day. *Distribution Limit: N-Tweed Heads. S-Lithgow.*	x	x	-	-	x	x

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Masked Owl *Tyto novaehollandiae* DPIE	V	-	Open forest and woodlands with cleared areas for hunting and hollow trees or dense vegetation for roosting. *Distribution Limit: N-Border Ranges National Park. S-Eden.*	x	x	-	-	x	x
Sooty Owl *Tyto tenebricosa* DPIE	V	-	Tall, dense, wet forests containing trees with very large hollows. *Distribution Limit: N-Border Ranges National Park. S-South of Eden.*	x	x	-	-	x	x
Eastern Bristlebird *Dasyornis brachypterus* EPBC	E	E	Coastal woodlands, dense scrubs and heathlands, especially where low heathland borders taller woodland or dense tall tea-tree. *Distribution Limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x
Regent Honeyeater *Xanthomyza Phrygia* DPIE EPBC	E4A	CE	Found in temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts. *Distribution Limit: N-Urbanville. S-Eden.*	x	Marginal	✓	x	Not likely	x
White-fronted Chat *Epithianura albifrons* DPIE	V	-	Found in open damp ground, grass clumps, fence lines, heath, samphire saltmarshes, mangroves, dunes, saltbush plains. *Distribution Limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x
Painted Honeyeater *Grantiella picta* EPBC	V	V	A nomadic bird occurring in low densities within open forest, woodland and scrubland feeding on mistletoe fruits. Inhabits primarily Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. *Distribution Limit: N-Boggabilla. S-Albury with greatest occurrences on the inland slopes of the Great Dividing Range.*	x	x	-	-	x	x

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Black-chinned Honeyeater *Melithreptus gularis gularis* DPIE	V	-	Found in woodlands containing box-ironbark associations and River Red Gums, also drier coastal woodlands of the Cumberland Plain and Hunter Richmond and Clarence. *Distribution Limit: N-Cape York Pen. Qld. S-Victor H. Mt Lofty Ra & Flinders Ra. SA.*	x	x	-	-	x	x
Varied Sittella *Daphoenositta chrysoptera* DPIE	V	-	Open eucalypt woodlands / forests (except heavier rainforests); mallee, inland acacia, coastal tea-tree scrubs; golf courses, shelterbelts, orchards, parks, scrubby gardens. *Distribution Limit: N-Border Ranges National Park. S-South of Eden*.	x	x	-	-	x	x
Dusky Woodswallow *Artamus cyanopterus cyanopterus* DPIE	V	-	Found 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. Prefers habitat with an open understorey. Often observed in farmland tree patches or roadside remnants. *Widespread in eastern, southern and southwestern Australia.*	x	x	-	-	x	x
Scarlet Robin *Petroica boodang* DPIE	V	-	Found in foothill forests, woodlands, watercourses; in autumn-winter, more open habitats: river red gum woodlands, golf courses, parks, orchards, gardens. *Distribution Limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Flame Robin *Petroica phoenicea* DPIE	V	-	Summer: forests, woodlands, scrubs, from sea-level to *c.* 1800 m. Autumn-winter: open woodlands, plains, paddocks, golf courses, parks, orchards. *Distribution Limit: N northern NSW tablelands. S-South of Eden.*	x	x	-	-	x	x
Pink Robin *Petroica rodinogaster* DPIE	V	-	Found in dense gullies, rainforests and open forests, dispersing into drier more open habitats in winter. *Distribution Limit: N-Sydney. S-South of Eden.*	x	x	-	-	x	x
Spotted-tailed Quoll *Dasyurus maculatus* DPIE EPBC	V	E	Dry and moist open forests containing rock caves, hollow logs or trees. *Distribution Limit: N-Mt Warning National Park. S-South of Eden.*	x	x	-	-	x	x
Southern Brown Bandicoot *Isoodon obesulus* EPBC	E	E	Utilises a range of habitats containing thick ground cover - open forest, woodland, heath, cleared land, urbanised areas and regenerating bushland. *Distribution Limit: N-Kempsey. S-South of Eden.*	x	x	-	-	x	x
Koala *Phascolarctos cinereus* DPIE EPBC	V	V	Inhabits both wet and dry eucalypt forest on high nutrient soils containing preferred feed trees. *Distribution Limit: N-Tweed Heads. S-South of Eden.*	x	x	-	-	x	x
Eastern Pygmy Possum *Cercatetus nanus* DPIE	V	-	Found in a variety of habitats from rainforest through open forest to heath. Feeds on insects but also gathers pollen from banksias, eucalypts and bottlebrushes. Nests in banksias and myrtaceous shrubs. *Distribution Limit: N-Tweed Heads. S-Eden.*	x	x	-	-	x	x

Common name *Scientific name* DATABASE SOURCE	*BC Act*	*EPBC Act*	Preferred habitat *Distribution limit*	Recorded on site (✓)	If not recorded on site				Considered in test of significance (✓) Refer to Appendix 3
					Suitable habitat present (✓)	Nearby and/or high number of record(s) (✓) *Notes 1,2 & 3*	Record(s) from recent years (✓) *Notes 1,2 & 3*	Potential to occur	
Greater Glider *Petauroides volans* EPBC	-	V	Favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species. Population density is optimal at elevation levels at 845 m above sea level. Prefer overstorey basal areas in old-growth tree stands. Highest abundance typically in taller, montane, moist eucalypt forests, with relatively old trees and abundant hollows *Distribution Limit: N-Border Ranges National Park. S- South of Eden.*	x	x	-	-	x	x
Brush-tailed Rock-wallaby *Petrogale penicillata* EPBC	E	V	Found in rocky gorges with a vegetation of rainforest or open forests to isolated rocky outcrops in semi-arid woodland country. *Distribution Limit: N-North of Tenterfield. S-Bombala.*	x	x	-	-	x	x
Grey-headed Flying-fox *Pteropus poliocephalus* DPIE EPBC	V	V	Found in a variety of habitats including rainforest, mangroves, paperbark swamp, wet and dry open forest and cultivated areas. Forms camps commonly found in gullies and in vegetation with a dense canopy. *Distribution Limit: N-Tweed Heads. S-Eden.*	x	✓	✓	✓	✓	✓
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris* DPIE	V	-	Rainforests, sclerophyll forests and woodlands. *Distribution Limit: N-North of Walgett. S-Sydney.*	x	x	-	-	x	x

Common name *Scientific name* DATABASE SOURCE	*BC Act*	*EPBC Act*	Preferred habitat *Distribution limit*	Recorded on site (✓)	If not recorded on site				Considered in test of significance (✓) Refer to Appendix 3
					Suitable habitat present (✓)	Nearby and/or high number of record(s) (✓) *Notes 1,2 & 3*	Record(s) from recent years (✓) *Notes 1,2 & 3*	Potential to occur	
East-coast Freetail Bat *Micronomus norfolkensis* DPIE	V	-	Inhabits open forests and woodlands foraging above the canopy and along the edge of forests. Roosts in tree hollows, under bark and buildings. *Distribution Limit: N-Woodenbong. S-Pambula.*	x	x	-	-	x	x
Large-eared Pied Bat *Chalinolobus dwyeri* DPIE EPBC	V	V	Warm-temperate to subtropical dry sclerophyll forest and woodland. Roosts in caves, tunnels and tree hollows in colonies of up to 30 animals. *Distribution Limit: N-Border Ranges National Park. S-Wollongong.*	x	x	-	-	x	x
Eastern Falsistrelle *Falsistrellus tasmaniensis* DPIE	V	-	Recorded roosting in caves, old buildings and tree hollows. *Distribution Limit: N-Border Ranges National Park. S-Pambula.*	x	x	-	-	x	x
Little Bentwing-bat *Miniopterus australis* DPIE	V	-	Roosts in caves, old buildings and structures in the higher rainfall forests along the south coast of Australia. *Distribution Limit: N-Border Ranges National Park. S-Sydney.*	x	x	-	-	x	x
Eastern Bentwing-bat *Miniopterus orianae oceanensis* DPIE	V	-	Prefers areas where there are caves, old mines, old buildings, stormwater drains and well-timbered areas. *Distribution Limit: N-Border Ranges National Park. S-South of Eden.*	x	Sub-optimal	✓	✓	✓	✓

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Large-footed Myotis *Myotis macropus* DPIE	V	-	Roosts in caves, mines, tunnels, buildings, tree hollows and under bridges. Forages over open water. *Distribution limits: N-Border Ranges National Park. S-South of Eden.*	x	Sub-optimal	x	✓	Unlikely	✓
Greater Broad-nosed Bat *Scoteanax rueppellii* DPIE	V	-	Inhabits areas containing moist river and creek systems, especially tree lined creeks. *Distribution Limit: N-Border Ranges National Park. S-Pambula.*	x	x	-	-	x	x
New Holland Mouse *Pseudomys novaehollandiae* EPBC	-	V	Occurs in heathlands, woodlands, open forest and paperbark swamps and on sandy, loamy or rocky soils. Coastal populations have a marked preference for sandy substrates, a heathy understorey of leguminous shrubs less than 1m high and sparse ground litter. Recolonise of regenerating burnt areas. *Distribution Limit: N-Border Ranges National Park. S-South of Eden.*	x	x	-	-	x	x
The Golden Sun Moth *Synemon plana* DPIE	E	-	Inhabits natural treeless grasslands containing *Austrodanthonia carphoides. Distribution limit: Southern Tablelands and South West Slopes.*	x	x	-	-	x	x
Cumberland Plain Land Snail *Meridolum corneovirens* DPIE	E	-	Inhabits remnant eucalypt woodland of the Cumberland Plan. Shelters under logs, debris, clumps of grass, around base of trees and burrowing into loose soil. *Distribution Limit: Cumberland Plain of Sydney Basin Region.*	x	x	-	-	x	x

Common name ***Scientific name*** DATABASE SOURCE	***BC Act***	***EPBC Act***	**Preferred habitat** ***Distribution limit***	**Recorded on site (✓)**	**If not recorded on site**				**Considered in test of significance (✓) Refer to Appendix 3**
					Suitable habitat present (✓)	**Nearby and/or high number of record(s) (✓)** *Notes 1,2 & 3*	**Record(s) from recent years (✓)** *Notes 1,2 & 3*	**Potential to occur**	
Dural Land Snail *Pommerhelix duralensis* EPBC	-	E	Inhabits shale-influenced habitat along the north-western fringes of the Cumberland Plan on shale-sandstone transitional landscapes. Occur in low abundance and shelters under logs, debris, and leaf litter. *Distribution Limit: St Albans to Mulgoa with most records from The Hills LGA.*	x	x	-	-	x	x

DPIE	-	Denotes species listed within 10km of the study area on the *Atlas of NSW Wildlife*
EPBC	-	Denotes species listed within 10km of the study area in the *EPBC Act* habitat search
V	-	Denotes vulnerable listed species under the relevant Act
E	-	Denotes endangered listed species under the relevant Act
E4A/CE	-	Denotes critically endangered listed species under the relevant Act
NOTE:	1.	This field is not considered if no suitable habitat is present within the study area
	2.	'records' refer to those provided by the *Atlas of NSW Wildlife*
	3.	'nearby' or 'recent' records are species specific accounting for home range, dispersal ability and life cycle

A detailed assessment in accordance with Section 1.7 of the *EPA Act* will be completed for these species in Appendix 3 of this report.

Table 7 provides an assessment of potential habitat within the study area for nationally *protected* migratory fauna species recorded within 10km on the *EPBC Act* Protected Matters Tool. Nationally *threatened* migratory species are instead considered in Table 6.

Table 7 – Protected migratory bird habitat assessment (Appendix 2)

Common name ***Scientific name***	**Preferred habitat** ***Migratory breeding***	**Suitable habitat present (✓)**	**Recorded on site (✓)**	**Comments**
Oriental Cuckoo (*Cuculus optatus*)	It mainly inhabits forests, occurring in coniferous, deciduous and mixed forest. It feeds mainly on insects and their larvae, foraging for them in trees and bushes as well as on the ground.	x	-	-
Orange-bellied Parrot (*Neophema chrysogaster)*	On the mainland favours small islands, peninsulas in coastal areas, with saltmarsh plants, coastal pastures, gold courses, crop of millet and sunflowers, dunes and beaches. In NSW inhabits tidal flats, salt marshes and heath, and pastures close to shore. *Breeds in south-west Tasmania during November- December. Migrates north in March-April.*	x	-	-
Rainbow Bee-eater (*Merops ornatus*)	Open woodlands with sandy, loamy soil; sandridges, sandspits, riverbanks, road cuttings, beaches, dunes, cliffs, mangroves, rainforest, woodlands, golf courses. *Breeding resident in northern Australia. Summer breeding migrant to south east and south west Australia.*	x	-	-
Black-faced Monarch (*Monarcha melanopsis*)	Rainforests, eucalypt woodlands; coastal scrubs; damp gullies in rainforest, eucalypt forest; more open woodland when migrating. *Summer breeding migrant to coastal south east Australia, otherwise uncommon*.	x	-	-
Spectacled Monarch (*Monarcha trivirgatus*)	Understorey of mountain / lowland rainforest, thickly wooded gullies, waterside vegetation, mostly well below canopy. *Summer breeding migrant to south-east Qld and north-east NSW down to Port Stephens from Sept/Oct to May. Uncommon in southern part of range.*	x	-	-
Satin Flycatcher (*Myiagra cyanoleuca*)	Heavily vegetated gullies in forests, taller woodlands, usually above shrub-layer; during migration, coastal forests, woodlands, mangroves, trees in open country, gardens. *Breeds mostly south east Australia and Tasmania over warmer months, winters in north east Qld.*	x	-	-
Rufous Fantail (*Rhipidura rufifrons*)	Undergrowth of rainforests / wetter eucalypt forests / gullies; monsoon forests, paperbarks, sub-inland and coastal scrubs; mangroves, watercourses; parks, gardens. On migration, farms, streets buildings. *Breeding migrant to south east Australia over warmer months. Altitudinal migrant in north east NSW in mountain forests during warmer months.*	x	-	-
Yellow Wagtail (*Motacilla flava*)	The yellow wagtail typically forages in damp grassland and on relatively bare open ground at edges of rivers, lakes and wetlands, but also feeds in dry grassland and in fields of cereal crops.	x	-	-

Appendix 3
Test of Significance

Flora and fauna survey and habitat assessments of the study area have resulted in the identification of suitable habitat for the following threatened biodiversity that was recorded present or considered otherwise with varying potential to occur. The potential for any direct or indirect impacts on species has been considered and noted.

Table 8 – Threatened flora impact summary (Appendix 3)

Scientific name	*BC Act*	Potential to occur	Potential habitat impact
Eucalyptus scoparia	E1	Planted on site	No specimens proposed for removal
Eucalyptus nicholii	V	Planted on site	One (1) specimen to be removed
Syzygium paniculatum	E1	Planted on site	Two (2) specimens to be removed

Table 9 – Threatened fauna impact summary (Appendix 3)

Common name	*BC Act*	Potential to occur	Potential habitat impact
Grey-headed Flying-fox	V	✓	Direct – on potential seasonal foraging
Large Bent-winged Bat	V	✓	Direct – on potential foraging and unlikely roosting/breeding
Green and Golden Bell Frog	E	Unlikely	Direct – on potential foraging
Little Lorikeet	V	Unlikely	Direct – on potential seasonal foraging
Swift Parrot	E	Unlikely	Direct – on potential foraging
Large-footed Myotis	V	Unlikely	Direct – on potential foraging and unlikely roosting

Endangered populations

- *Acacia prominens* in the Hurstville and Kogarah Local Government Areas
- *Pomaderris prunifolia* in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas
- *Prostanthera saxicola* population in Sutherland and Liverpool Local Government Areas
- *Wahlenbergia multicaulis* in the Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield Local Government Areas.
- *Marsdenia viridiflora* subsp. *viridiflora* population in the Bankstown, Blacktown, Camden, Campelltown, Fairfield, Holroyd, Liverpool and Penrith Local Government Areas.

Only *Wahlenbergia multicaulis* is listed in the Canterbury LGA. The species was not observed during the botanical survey.

Threatened ecological communities

There are no endangered ecological communities within the development footprint or nearby that would be indirectly impacted by the proposal.

BC ACT 2016 - SECTION 7.3
TEST OF SIGNIFICANCE

As outlined in Section 7.2 of the *BC Act* 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 threshold if the BOS applies to the impacts of the development on biodiversity values, or
(c) It is carried out in a declared area of outstanding biodiversity value.

With respect to (a) above, and outlined in Section 7.3 of the *BC Act,* the following *test of significance* is a set of five main considerations, with sub-considerations for determining whether proposed development or activity 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,

The direct and indirect impacts of the proposal are considered within Section 5.4.

With consideration to the relative direct and indirect impacts on all threatened species with varying potential to occur, it is considered that the proposal is unlikely to disrupt the life cycle for any of these listed species such that a viable local population would be placed at risk of extinction. Species recorded present during survey, previously recorded nearby or with high potential to occur and requiring further discussion given potential impacts are further discussed in detail below.

Summary of threatened species recorded

Eucalyptus nicholii

This species is a small to medium sized tree with rough bark that is persistent to the small branches. Grows in woodland in the Northern Tablelands of NSW from Walcha to Glen Innes. Often found growing on porphyry or granitic soils. This species is commonly planted as a street or parkland tree throughout NSW. A detailed search observed several specimens on site. One (1) individual is expected to be removed.

Species that planted and well outside of their natural range are unlikely to contribute to the genetic viability of the species and thus should be excluded as being regarded as important. If the species was planted in its natural range, the specimen would be considered important. The specimens occur well outside of its natural habitat and appears to have been planted as a landscaping tree. As this species occurs outside its natural population distribution it is not considered to be a viable local population within the guidelines of the NPWS (NPWS Information Circular No 2, 1996). The loss of one (1) tree is not considered to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

Eucalyptus scoparia

This species is a tree to 15m tall with smooth white powdery bark, island type oil glands in the long narrow leaves, white flowers, and hemispherical to campanulate cup shaped fruits 4–6 mm wide. This species is confined to granitic soils in the mountains of south-eastern Queensland in the vicinity of Wallangarra. This species is commonly planted as a street or parkland tree throughout NSW. No specimens are proposed for removal.

It is considered that the action proposed is not 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.

Syzygium paniculatum

This species is a shrub or small tree growing between 5 and 8m tall. It has a dense crown of opposite, lanceolate glossy leaves. These leaves are about 6cm long with either a short fine point or bluntly pointed, the upper surface of the leaf being dark green while the underside is paler (Fairly and Moore 1989). Young leaves and stems are often reddish in colour. Flowers are a mass of white stamens and the fruit is a purplish-red oval berry (Fairly and Moore 1989). This species is distinguished from other *Syzygium* species by the presence of pockets in the leaf axils and polyembryonic fruit. *Syzygium paniculatum* is found predominantly along the coast on headlands and ranges. It is usually found growing in or near subtropical and littoral rainforests on sandy soils, stabilised dunes near the sea or sheltered gullies, especially near watercourses (Fairly and Moore 1989; Harden 1994).

The species has not potential habitat on site, however a number of planted specimens occur. The proposal is expected to remove two (2) specimens.

As this species has been planted outside its natural habitat it is not considered to be a viable local population within the guidelines of the NPWS (NPWS Information Circular No 2, 1996). It is considered that the action proposed is not 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.

Summary of threatened fauna species with potential habitat

Little Lorikeet (*Glossopsitta pusilla*)

Little Lorikeets mostly occur in dry, open eucalypt forests and woodlands. Little Lorikeets are gregarious, usually foraging in small flocks, often with other species of lorikeet. They feed primarily on nectar and pollen in the tree canopy, particularly on profusely-flowering eucalypts, but also on a variety of other species including Melaleucas and mistletoes.

There is no evidence of regular migration, but Little Lorikeets are generally considered to be nomadic (Higgins 1999), with irregular large or small influxes of individuals occurring at any time of year, apparently related to food availability. Long term investigations indicate that breeding birds are resident from April to December, and even during their non-resident period, they may return to the nest area for short periods if there is some tree-flowering in the vicinity (Courtney & Debus 2006).

Approximately 3 cm diameter nest hollows are located mostly in living, smooth-barked eucalypts, and are kept open by the activities of the occupants, which use their beaks to bite away living bark from around the opening. When nest hollows are deserted, e.g. after storm-damage to trees, hollows can close over within 14 months (Courtney & Debus 2006). Nest hollows are occasionally located in dead trees, but birds generally desert hollows within two

years of tree death. Nest-hollows are used “traditionally”, with the same hollow (not necessarily by the same individuals) (Courtney & Debus 2006). The breeding season extends from May to September (Higgins 1999) and, if eucalypt nectar and pollen are available throughout this period, two broods of fledglings can be raised in a season.

The major threats to Little Lorikeets are loss of breeding sites and food resources from ongoing land clearing. New nest hollows are not being recruited at a rate that compensates this loss.

It is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and ‘locally nomadic’ movements are suspected of breeding pairs. The Little Lorikeet roosts in treetops, often distant from feeding areas but nests in proximity to feeding areas if possible. The 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.

The development footprint provides only seasonal foraging habitat for Little Lorikeet as no suitable roosting or hollows for breeding habitat is present. Seasonal foraging habitat may be impacted. However, this is otherwise well represented in the surrounding locality such that removal of habitat will not significantly impact on a local population. It is recommended that foraging habitat is replaced by locally native flowering eucalypts within landscaping areas.

Swift Parrot (*Lathamus discolor*)

This species feeds mainly on nectar and lerp from eucalypt flowers, particularly Blue Gum (*Eucalyptus globulus*). On the mainland, the Swift Parrot congregates where winter flowering species occur such as Red Ironbark (*Eucalyptus sideroxylon*), White Box (*Eucalyptus albens*), Yellow Gum (*Eucalyptus leucoxylon*) and Swamp Gum (*Eucalyptus ovata*) (Brown, 1989). This species also occurs within Swamp Mahogany *(Eucalyptus robusta)* or Spotted Gum *(Corymbia maculata)* dominated communities along the coast. The Swift Parrot is a migratory species that breeds in Tasmania and its offshore islands in summer. In late March almost the entire population migrates to mainland Australia spreading from Victoria through to central and coastal NSW and south east Queensland (Schodde and Tidemann, 1986).

Swift Parrot was not recorded survey. However, the development footprint provides minimal foraging with only two recorded winter flowering eucalypts. However, this is otherwise well represented in the surrounding locality such that removal of habitat will not significantly impact on a local population. It is recommended that foraging habitat is replaced by locally native winter flowering eucalypts within landscaping areas.

The site is not located in an area mapped as Swift Parrot important habitat. The proposal is not likely to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

Green and Golden Bell Frog (*Litoria aurea*)

An aquatic species, the Green and Golden Bell Frog is frequently active during the day and is a voracious, cannibalistic species (Cogger 1992). It forages among vegetation within or at the edges of permanent waterbodies. Tadpoles feed on single-celled organisms and adults feed on insects and other arthropods (SFNSW 1995).

Breeding occurs in late spring through summer (Cogger 1992). The call of males is a long deep sonorous drone followed by several short grunts (Barker *et al.* 1995). Males call while floating in water and often the whole chorus is synchronized (Barker *et al.* 1995). Spawn forms a loose mass of eggs among the floating vegetation (Barker *et al.* 1995).

The Green and Golden Bell Frog is largely aquatic and is found among vegetation within or at the edges of permanent water (Cogger 1992). It is frequently active during the day and can be found under debris on low, frequently flooded river flats (Cogger 1992). Farm dams and swamps with reed beds and rivers with good reed beds along the banks are also considered potential habitat areas (SFNSW 1995). This species is capable of utilising open and disturbed areas where regenerating vegetation and debris provide cover.

No breeding habitat is present onsite. The site may provide dispersal habitat however considered to be quite unlikely as it provides almost no shelter. The proposal is unlikely to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

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

Grey-Headed Flying-foxes are canopy feeding frugivores and nectarivores, inhabiting a wide range of habitats including rainforest, mangroves, paperbark forests, wet and dry sclerophyll forests and cultivated areas. This species roosts in camps, which may contain tens of thousands of individuals.

Camps are commonly formed in gullies, typically not far from water and usually in vegetation with a dense canopy (Tidemann 1998). Camps can be found in riparian rainforest patches, Melaleuca stands, mangroves, riparian woodland or modified vegetation in urban areas. Loyalty to a site is high and some camps in NSW have been used for over a century (NSW NPWS 2001). Some camps are used at the same time every year by hundreds of thousands of flying-foxes while others are used sporadically by a few hundred individuals (Strahan 1995). Generally foraging is within 20km of camps but individuals are known to commute up to 50km to a productive food source.

The development footprint provides only seasonal foraging habitat for the Grey-headed Flying-fox as no suitable roosting or subsequent breeding habitat is present. Foraging habitat is otherwise well represented in the surrounding locality such that removal of habitat will not significantly impact on a local population. It is recommended that foraging habitat is replaced by locally native flowering eucalypts within landscaping areas.

No breeding habitat is present onsite therefore the proposal is unlikely to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

Large Bent-winged Bat (*Miniopterus australis*)

The Large Bent-winged Bat forages above and below the canopy within open forests and woodlands, feeding on small flying insects, predominantly moths (Dwyer 1995). The Large Bent-winged Bat is known to roost in a range of habitats including stormwater channels, under bridges, occasionally in buildings, old mines and, in particular, caves (Dwyer 1995). Caves are an important resource for this species, particularly for breeding where maternity caves must have suitable temperature, humidity and physical dimensions to permit breeding (Dwyer 1995). Roost sites in tree hollows have not been reported within the literature reviewed. This species has not been identified as utilising culverts for maternity roosts. Maternity roosts rather are occupied by up to 100 000 females with only 12 maternity roosts known throughout the complete range (Hoy & Hall 2008).

It is considered that the development footprint provides suitable foraging only habitat for the Large Bent-winged Bat. The Large Bent-winged Bat would forage more predominantly above the canopy and down in more open areas. Concentrated activity is likely in some locations such as along the creek, forest fringes and trails, well away from the development site.

Whilst foraging by this species may be more concentrated in some habitats (most based on structure and insect activity) no specific valued habitat features within the study area are identified. No important roosting or breeding habitat is likely present within the study area. Roosting locations are expected to occur throughout the locality and many of these are likely within man-made structures which are well represented beyond the site.

Given the highly mobile nature of this species, the absence of any important habitat, their known ability to move across and utilise some urban landscapes and that the proposed development will not inhibit local movements and dispersal, this species will not be significantly impacted by the proposed habitat clearance.

Southern Myotis (*Myotis macropus*)

The Southern Myotis inhabits cool temperate, temperate, sub-tropical and tropical rainforests and wet and dry sclerophyll forests (Richards 1995b). This species roost in colonies in caves, mines, tunnels, under bridges and buildings, in dense foliage in tropical areas (Richards 1995b) and in tree hollows (Menkhorst 1995).

Colonies usually consist of 10-15 individuals but may include over several hundred animals (Richards 1995b). Within these breeding colonies males establish territories, excluding other males and forming a harem of females during breeding periods (Richards 1995b). When not breeding, males roost alone but still defend their territory from other males (Richards 1995b). Colonies are always found near water bodies as the species feeds predominantly over water.

The Southern Myotis feeds on a wide range of insects, including water boatmen, mayflies, beetles, flies, grasshoppers and moths, as well as small fish (Robson 1984, Vestjens and Hall 1977). This species will forage just above the water surface, raking its feet through the water to catch Mosquito Fish (*Gambusia affinis*) and insects (Dwyer 1970).

Given the highly mobile nature of this species, the absence of any important habitat, their known ability to move across and utilise some urban landscapes and that the proposed development will not inhibit local movements and dispersal, it is unlikely to have an adverse effect on the life cycle of the species such that a viable local population 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, or

The planted native vegetation on site does not form part of an endangered or critically endangered ecological community.

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

No endangered or critically endangered ecological communities occur on site or will be modified in composition by the proposal.

(c) In relation to the habitat of threatened species or ecological community:

It is considered that the habitat attributes of the development footprint provide known or potential habitat for *Eucalyptus scoparia, Eucalyptus nicholii, Syzygium paniculatum,* Green and Golden Bell Frog, Swift Parrot, Grey-headed Flying-fox, Little Lorikeet, Large Bent-winged Bat and Southern Myotis.

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

The development footprint will require the removal of six (6) trees over an area of 0.07 ha. Two (2) *Syzygium paniculatum* trees and one (1) *Eucalyptus nicholii* are proposed for removal.

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

The entire school grounds and surrounding area (2km radius in figure below) contains urban planted native / exotics which are relatively sparse. The proposal will see the removal of six (6) trees. This will not fragment or isolate areas or habitat.

2km radius circle from site showing the sparse nature of trees

Therefore, it is considered that known habitat for a threatened species, population or ecological community within the local area and region is unlikely to become isolated or fragmented as a result of the proposal.

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

In respect to threatened fauna with potential to occur, the proposed area of impact is not of high quality, of any breeding importance or central to the home range requirements of any species such that behaviour or ecology of these species will be significantly altered in any way.

The three (3) threatened flora specimens proposed for removal are planted and outside of their natural range, therefore not considered highly important.

The proposal will impact a total of six (6) native trees only and an area of 0.07 ha that will not cause isolation of fragmentation to the habitat of any species.

Overall, the proposed impact is considered very low given the urban nature and planted material.

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

The development footprint is not within any declared area of outstanding biodiversity value. Therefore, the proposal will not have any adverse effects 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.

A key threatening process is defined as a process that threatens, or could threaten, the survival or evolutionary development of species, populations or ecological communities.

The current list of key threatening processes, and whether the proposed activity is recognised as a threatening process, is shown below.

Table 10 – Key threatening processes (Appendix 3)

Listed key threatening process	Development a threatening process?		
	Likely	**Possible**	**Unlikely**
Aggressive exclusion of birds by Noisy Miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic Climate Change			✓

Listed key threatening process	Development a threatening process?		
	Likely	Possible	Unlikely
Bushrock removal			✓
Clearing of native vegetation	✓		
Competition and habitat degradation by feral goats			✓
Competition and grazing by the feral European Rabbit (*Oryctolagus cuniculus*)			✓
Competition from feral honeybees			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in, or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners			✓
High frequency fire resulting in the disruption of life-cycle processes in plants and animals and loss of vegetation structure and composition			✓
Herbivory and environmental degradation caused by feral deer			✓
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)			✓
Invasion and establishment of the Cane Toad (*Bufo marinus*)			✓
Invasion, establishment and spread of *Lantana camara*			✓
Invasion of native plant communities by bitou bush & boneseed *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of native plant communities by African Olive (*Olea europaea* subsp. *cuspidata*)			✓
Invasion of the Yellow Crazy Ant (*Anoplolepis gracilipes*)			✓
Loss of Hollow-bearing trees			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation and hybridisation by feral dogs (*Canis lupus*			✓

Listed key threatening process	Development a threatening process?		
	Likely	Possible	Unlikely
familiaris)			
Predation by the European Red Fox (*Vulpes vulpes*)			✓
Predation by the Feral Cat (*Felis catus*)			✓
Predation by Gambusia holbrooki Girard, 1859 (plague minnow or mosquito fish)			✓
Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition & disease transmission from Feral pigs (*Sus scofa*)			✓
Removal of dead wood and dead trees			✓

The above key threatening processes have been considered in reference to the proposal. It was considered that the proposal may contribute to a small degree to those processes as described below. It was not considered that the proposal will have a large or significant impact on any of the key threatening processes considering the urban nature, and that the vegetation on site appears to be all planted. Some mitigation measures have been listed under each process to minimise or reduce such impacts upon those processes.

Summary of "likely" or "possible" Key Threatening Processes

This section identifies what mitigation measures can be implemented to address threatening processes.

Clearing of native vegetation

The proposal is of a class of development recognised as a threatening process, despite the proposal impacting planted vegetation. It is generally recommended that all sites should aim to achieve a maintain or improve outcome on the quality and quantity of native vegetation cover through protection and restoration measures. Section 5.6 of the document lists some proposed mitigation measures to compensate the clearing of native vegetation.

Appendix 4
EPBC significance assessment criteria

EPBC Act Significance Assessment Criteria

Under the *EPBC Act* an action will require approval from the Australian Government Environment Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance. The following significant impact criteria were sourced from the *EPBC Act* Policy Statement 1.1 (May 2006):

CRITICALLY ENDANGERED AND ENDANGERED SPECIES

Significant impact criteria

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- Lead to a long-term decrease in the size of a population;
- Reduce the area of occupancy of the species;
- Fragment an existing population into two or more populations;
- Adversely affect habitat critical to the survival of a species;
- Disrupt the breeding cycle of a population;
- Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;
- Introduce disease that may cause the species to decline; or
- Interfere with the recovery of the species.

>> What is a population of a species?

A 'population of a species' is defined under the *EPBC Act* as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:
- a geographically distinct regional population, or collection of local populations; or
- a population, or collection of local populations, that occurs within a particular bioregion.

>> What is habitat critical to the survival of a species or ecological community?

'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:
- For activities such as foraging, breeding, roosting, or dispersal;
- For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
- To maintain genetic diversity and long-term evolutionary development; or
- For the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the Minister under the *EPBC Act.*

VULNERABLE SPECIES

Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of an important population of a species;
- reduce the area of occupancy of an important population;
- fragment an existing important population into two or more populations;
- adversely affect habitat critical to the survival of a species;
- disrupt the breeding cycle of an important population;
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;
- introduce disease that may cause the species to decline; or
- interfere substantially with the recovery of the species.

>> What is an important population of a species?

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- Key source populations either for breeding or dispersal;
- Populations that are necessary for maintaining genetic diversity; and/or
- Populations that are near the limit of the species range.

CRITICALLY ENDANGERED AND ENDANGERED ECOLOGICAL COMMUNITIES

Significant impact criteria

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- Reduce the extent of an ecological community;
- Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;
- Adversely affect habitat critical to the survival of an ecological community;
- Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;
- Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;
- Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
  - assisting invasive species, that are harmful to the listed ecological community, to become established; or
  - causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community; or
- Interfere with the recovery of an ecological community.

MIGRATORY SPECIES

Significant impact criteria

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;
- Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

>> What is important habitat for a migratory species?

An area of 'important habitat' for a migratory species is:

a) Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
b) Habitat that is of critical importance to the species at particular life-cycle stages; and/or
c) Habitat utilised by a migratory species which is at the limit of the species range; and/or
d) Habitat within an area where the species is declining.

>> What is an ecologically significant proportion?

Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, what is an 'ecologically significant proportion' of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species' population status, genetic distinctiveness and species-specific behavioural patterns (for example, site fidelity and dispersal rates).

>> What is the population of a migratory species?

'Population', in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia.