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Flora and Fauna Assessment

880 Londonderry Road

LONDONDERRY

AUGUST 2019 UPDATE

11th August 2019

SUMMARY

Fraser Ecological Consulting has been contracted Mr. Mark Cohen to prepare an assessment of a dwelling on terrestrial ecology located at 880 Londonderry Road Londonderry in the Penrith City local government area.

The assessment has been conducted in accordance with Commonwealth and State legislation.

A majority of the subject site comprises of Cooks River /Castlereagh Ironbark Forest which is listed as an Endangered Ecological Community listed under the NSW *Threatened Species Conservation Act 1995*. The vegetation community is listed as a Critically Endangered under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999.* The site is included in the CPWL Priority Conservation lands and OEH Sensitive Biodiversity Values Map.

Additional targeted surveys were undertaken as requested by Council. These included surveys for:

- Threatened plant species
- Cumberland Plain Land Snail
- Microchiropteran bats

One threatened plant species - *Grevillea juniperina subsp. juniperina,* listed as vulnerable under the NSW *Threatened Species Conservation Act 1995* (TSC Act) was recorded at the rear of the site within the area to be protected as part of the Vegetation Management Plan. The plant is outside the area proposed for vegetation clearing bushfire Asset Protection Zone and is not proposed for removal. All recorded plants were mapped. No other threatened plants were recorded.

Targeted echolocation surveys for microchiropteran bats were undertaken using Anabat Express device Targeted searches for Cumberland Plain land Snail (*Meridolum corneovirens*) were undertaken for the entire property by 2 experienced ecologists. It is acknowledged that the entire property contains potential habitat for this species, however, despite targeted surveys only two (2) individuals of the species were recorded (at the rear of the property). This species will not be impacted by the property as sufficient areas of known habitat will retained.

A total of nine (9) species of bat were recorded. This included three (3) threatened species including Eastern Freetail Bat (*Mormopterus norfolcensis*), Little Bent-wing bat (*Miniopterus australis*) and Greater Broad-nosed Bat (*Scoteanax ruepelli*). Whilst it has been confirmed that the site contains foraging habitat for these species, critical breeding habitat resources are absent. Bat call analysis was undertaken using Analook Insight software and cross referenced with a reliable call reference for the Sydney basin (Pennay & Law 2004).

The ecological impacts of the proposed development have been substantially reduced as requested by Council to limit vegetation clearing/ disturbance to only the location of the proposed dwelling, shed, wastewater treatment and APZ area (7830 square metres). The remainder of the property (2.16ha) can be fenced off as requested by Council (as outlined in the amended VMP).

Updated Assessment of Significance ('Seven Part Tests') under the former TS Act were undertaken for listed entities (threatened species and Endangered Ecological Communities) factoring all of the above from the recent surveys and reduced development footprint. The major conclusion arising from this Flora and Fauna Impact Assessment is that the proposed works are unlikely to result in a significant impact on any listed species or communities. Therefore, in accordance with the EPA Act (1979), TSC Act (1995) and FM Act (1994), a Species Impact Statement is not required. The author of this report considers that the applicant demonstrated that the ecological impacts of the proposal has been sufficiently avoided and minimised.

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Unauthorised use of this report in any form is prohibited.

Licensing

When conducting flora and fauna surveys, consultants are required to possess licences to ensure that works are completed in an appropriate manner. Fraser Ecological Consulting is licensed under s.132c and s.91 of the NSW National Parks and Wildlife Act (1974) from the NSW NPWS. This allows Alex Fraser to undertake scientific investigations, collect specimens of protected flora and fauna across NSW in service and non-service areas and undertake bushland restoration works in EECs. This licence requires that all survey results are reported to the NSW NPWS for inclusion into the Atlas of NSW Wildlife.

Alex Fraser also holds an Animal Research Authority under the Animal Research Act (1995), as administered by NSW Agriculture. Surveys are approved and supervised by an Animal Care and Ethics Committee, applying the standards as detailed in the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes (NHMRC 1997).

Contents

1. Introduction

This flora and fauna assessment was commissioned by Mr. Mark Cohen to prepare an assessment of a dwelling, shed and property maintenance (side property fence installation) on the terrestrial ecology located at 880 Londonderry Road Londonderry in the Penrith City local government area.

The data contained within this report was collected on the 10th to the 13th August 2018. Targeted surveys were undertaken in January 2019.

The flora and fauna assessment:

- Identifies key flora and fauna habitats within the subject site;
- Reviews literature and databases relevant to the subject site;
- Describes the methodology and results of the survey;
- Addresses potential impacts on flora and fauna and their habitats resulting from the proposed development;
- Proposes appropriate mitigation measures; and
- Provides an assessment of the likelihood of significant impacts on threatened species and populations, and endangered ecological communities, according to Section 5A of the NSW EPA Act, TSC ACT, Commonwealth EPBC Act. This was done to determine the need for an SIS or an application under the EPBC Act.

Activities specifically related to the preparation of this report included:

- Identification of weed and indigenous native species recorded from the subject site
- Assessment of impacts of the proposed development
- Outlining the applicant's responsibilities including weed control and environmental safeguards before, during and post construction.

The information within this report relies upon the survey and design plans to determine the full impacts of the proposal.

1.1 Site characteristics

The study site is located approximately 50km north-west of the Sydney CBD within the Sydney Basin Bioregion (Figure 1 and 2).

The entire property (Lot 3 DP 539282) is an existing vacant rural residential occupying an area of approximately 3.16 hectares. The site for the proposed dwelling and shed (the 'subject site') occurs 390m from the road frontage where there is adequate and more suitable area to provide these structures that are permissible and consistent with the zoning of the property (Figure 3).

The driveway from Londonderry Road to the proposed shed and dwelling site is approximately 330 metres long.

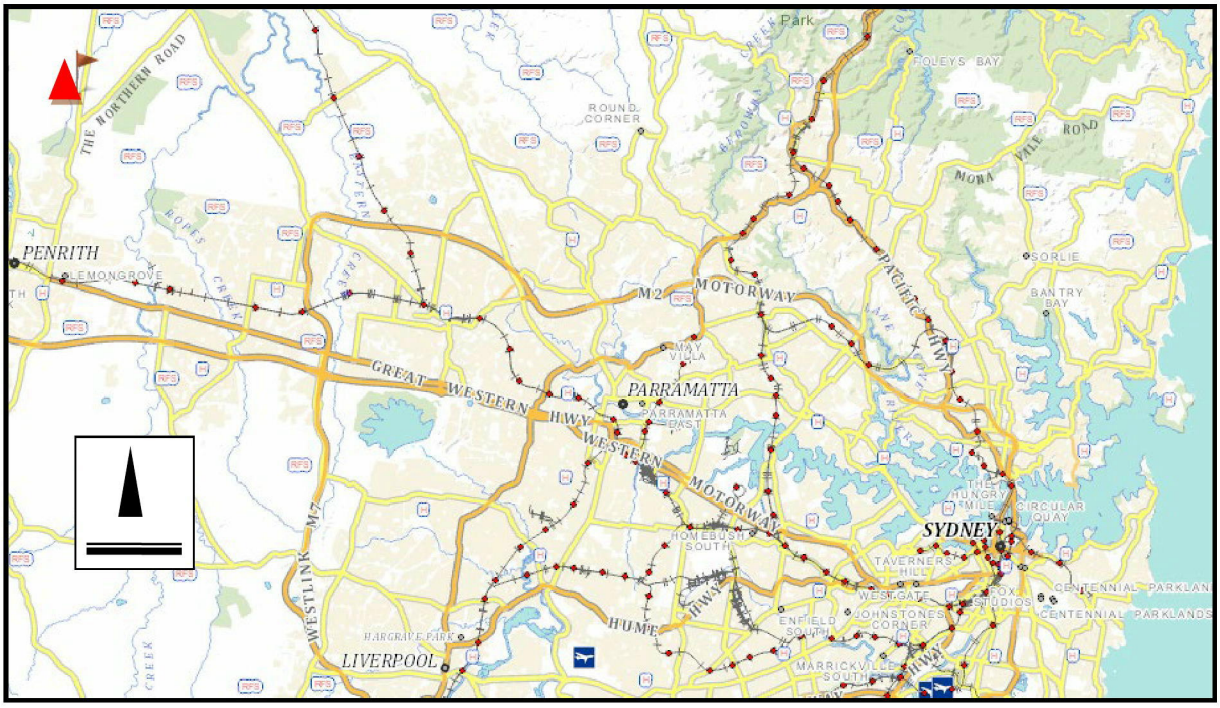


Figure 1: The site in context of the Sydney Basin bioregion

Figure 2: Aerial map of the entire property boundaries (Source: SIX Maps)

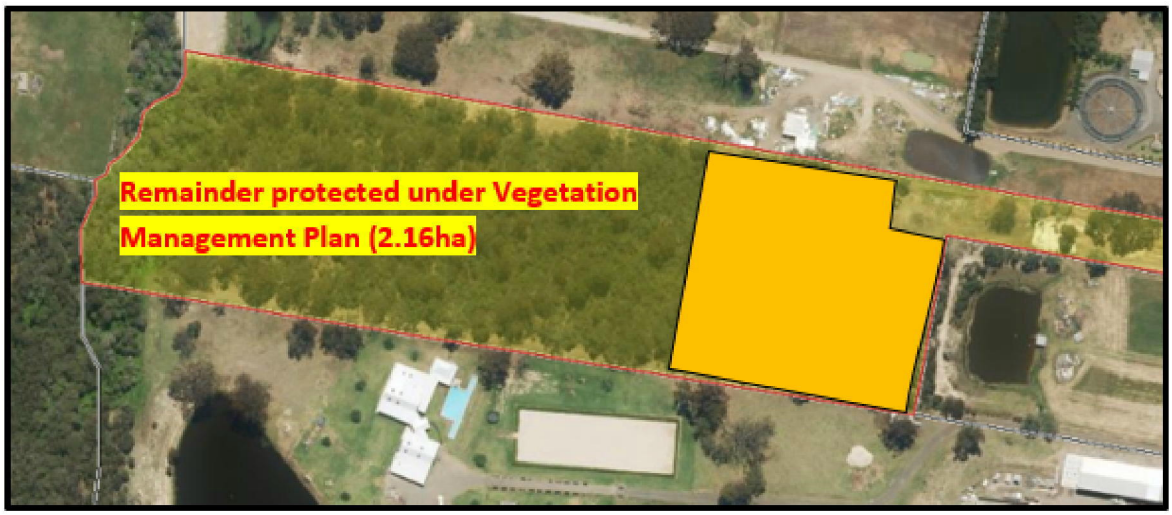


Figure 3: Aerial map of the subject site showing the approximate vegetation clearing in orange polygon equating to approximately 5553 sqm for a 7830 square metre footprint (Source: SIX Maps)

1.2 Climate

The climate of the area is temperate with mild to hot summers and cool to cold winters. The Bureau of Meterology summary statistics for rainfall for all years at the nearest weather station (Castlereagh Station No. 60072) is provided in Figure 4 (below). The local rainfall patterns influence the vegetation and habitat presents on site.

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	105.7	115.4	85.0	65.9	56.6	64.2	34.1	43.1	39.9	60.4	79.5	68.4
Median	79.0	86.8	75.6	34.1	30.5	32.2	16.8	22.0	30.0	40.8	72.5	50.4
Highest Daily	167.6	200.0	167.6	95.6	191.8	100.0	138.4	171.0	172.0	66.0	113.0	94.0

Figure 4: Bureau of Meterology summary statistics for rainfall for Castlereagh Weather Station No. 60072

1.3 Geology

The Penrith 1:100 000 Soil landscape of the Penrith 1:100 000 map sheet (Hazelton et al 1989) producedby the NSW Office of Environment and Heritage identifies the site as being part of the Berkshire Park soil landscape. The Berkshire Park soil landscape is found on the low rises of the Tertiary geology of the Hawkesbury/Nepean River system. Soils are weakly pedal of heavy orange clays and clayey sands. These soils are often mottled. Large silcrete boulders can occur as can unstructured plastic clays. Berkshire Park soils are prone to wind erosion when cleared of vegetation.

The limitation of this soil landscape is that it has very high wind erosion if cleared and gully, sheet and rill erosion on dissected area. It is also susceptible to water logging, impermeable subsoils and low fertility (Hazelton et al 1989).

Landscape—dissected, gently undulating low rises on the Tertiary terraces of the Hawkesbury/Nepean River system.

Soils—weakly pedal orange heavy clays and clayey sands, often mottled. Ironstone nodules common. Large (up to 20 cm) silcrete boulders occur in sand/clay matrix. Solods (Dy3.41), yellow podzolic soils (Dy4.11, Dy2.11, Dy2.21, Dy2.22), red podzolic soils (Dr4.11), chocolate soils (Dr4.11, Dr4.61), structured plastic clays (Uf6.11, Uf6.12), structured clays (Uf5.23, Gn4.11 and Gn3.11).

Limitations—very high wind erosion hazard if cleared. Gully, sheet and rill erosion on dissected areas. Localised seasonal waterlogging, localised flood hazard, impermeable subsoils, low fertility.

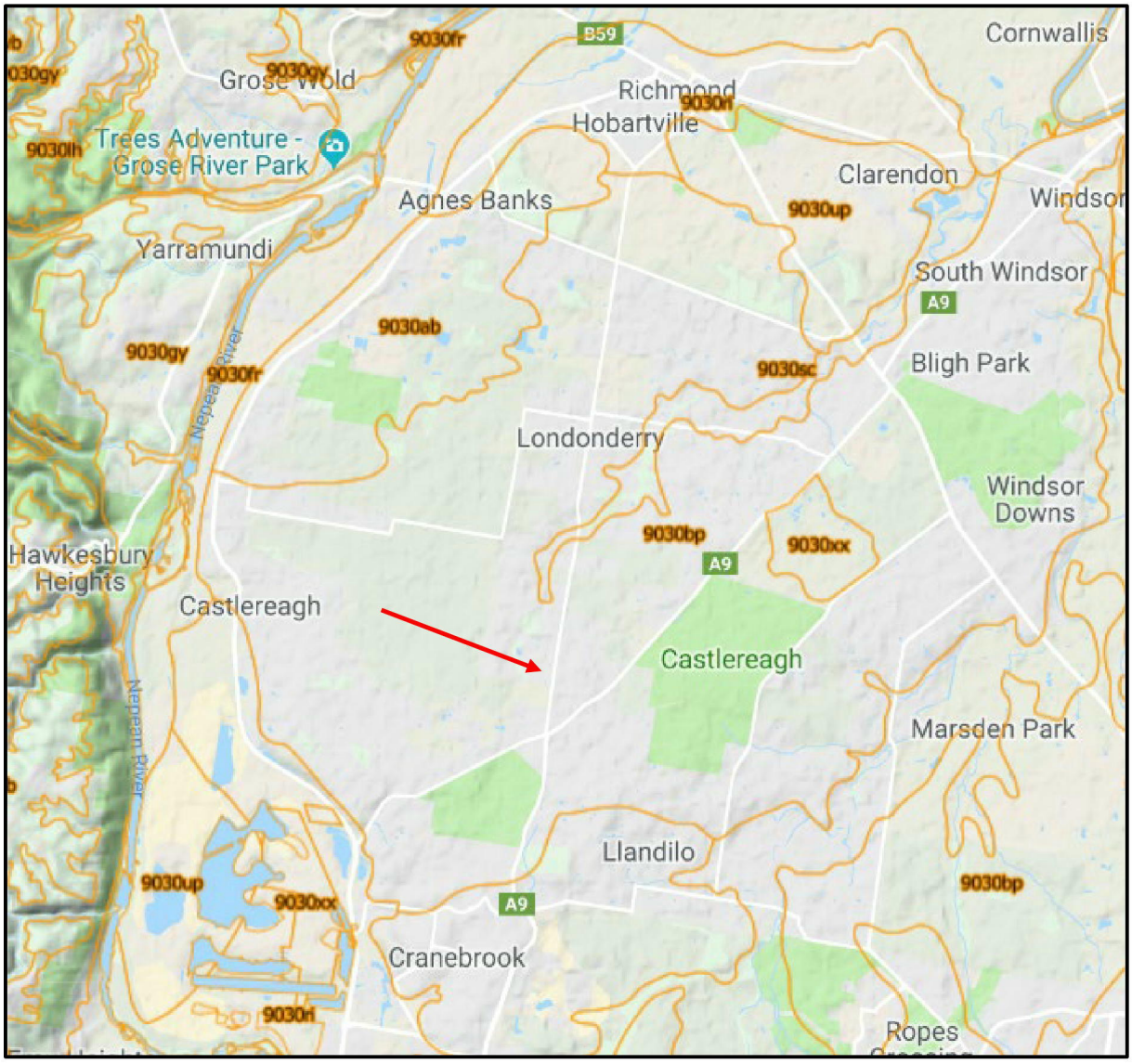


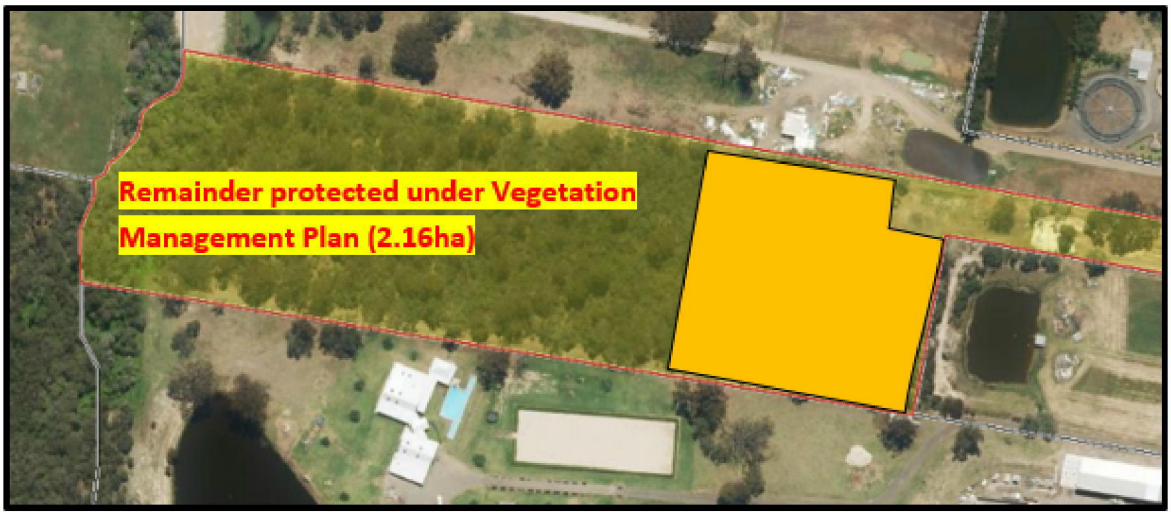
Figure 5: Berkshire Soil Landscapes mapped for the site

1.4 The proposed development

The subject development application that will be lodged with Penrith City Council takes into consideration the following impacts (Figure 3):

- Construction of new dwelling house (occupying approximately 1000 sqm)
- Construction of shed (re-positioned along the southern boundary)
- parking and turning area in front of shed
- Bushfire Asset Protection Zone (APZ) for a reduced extent of 24m (by increasing the BAL rating from the originally proposed BAL 12.5 to BAL 40)
- Wastewater disposal area within the APZ
- Retention of all native vegetation at the rear of the property including E2 zone (2.16ha) which is subject to a separate Vegetation Management Plan also submitted with this application
- This includes fencing to restrict access for vegetation disturbance as requested by Council
- Minimal vehicle access along fence lines to allow property maintenance

Please refer to the proposed development and survey plans (Figure 4) for further detailed specifications and information.



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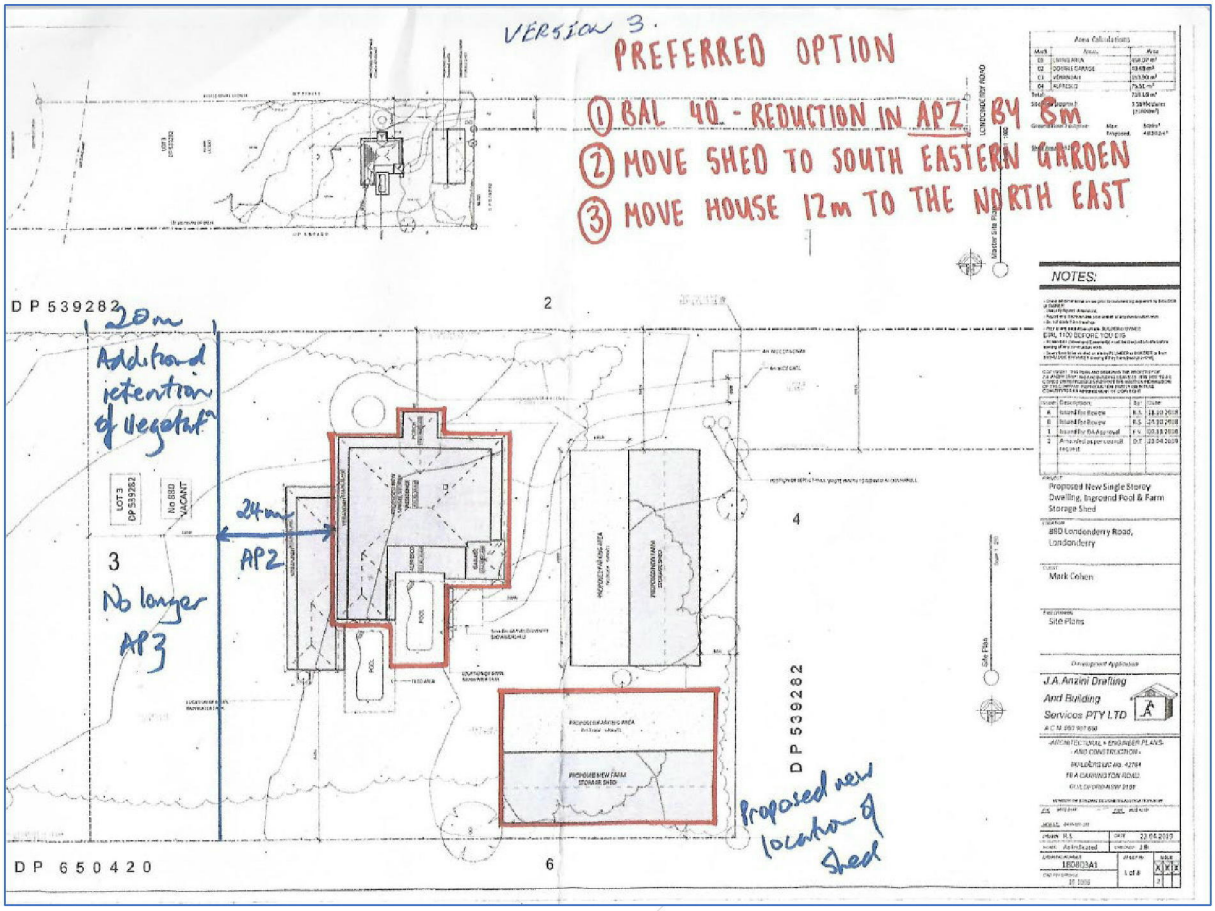


Figure 4: Amended development plans

2. Statutory Framework

The criteria used to assess likely impacts upon threatened species, populations or endangered ecological communities vary between Commonwealth and State jurisdictions. The following describes the legislative requirements for each level.

2.1. Commonwealth

The *Environment Protection and Biodiversity Conservation Act (1999)* (EPBC Act) is a nationally applicable Act that is administered by the Department of the Environment, Water, Heritage and the Arts. This Act requires approval for actions that are likely to have a significant impact on matters of National Environmental Significance (NES).

There are seven matters of NES that are triggers for Commonwealth assessment and approval. These are:

1. World Heritage properties;
2. National Heritage places;
3. Ramsar wetlands of international importance;
4. Nationally threatened species and communities;
5. Migratory species;
6. Nuclear actions; and
7. Commonwealth marine environment.

Threatened species and ecological communities are listed under Part 13, Division 1, Subdivision A of the EPBC Act 1999. Migratory species are listed under part 13, Division2, Subdivision A of the Act.

The Department of the Environment and Water Resources identifies the following:

"*Under the EPBC Act a person must not take an action that has, will have or is likely to have significant impact on any of these matter of NES without approval from the Commonwealth Environment Minister. There are penalties for taking such an action without approval.*

In general, an action that may need approval under the Act will involve some physical interaction with the environment, such as clearing native vegetation, building a new road, discharging pollutants into the environment, or offshore seismic survey.

If, following a referral, it is determined that that an action is likely to have a significant impact, and approval is therefore required, the action is called a 'controlled action'. The proposal will then undergo a formal assessment and approval process, and cannot proceed unless approval is granted.

If it is determined that an action is not likely to have a significant impact, then the action is not a controlled action. Approval under the EPBC Act is not required and the action may proceed, subject to obtaining any other necessary permits or approvals."

2.2 State

Threatened Species Conservation Act 1995

Section 5A of the (Environmental Planning and Assessment) EPA Act (1979) sets out seven factors that require consideration in terms of the likely significance of the impact of an action.

For the purposes of this Act and, in particular, in the administration of sections 78A, 79C (1) and 112, these seven factors must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats listed under the *Threatened Species Conservation (TSC) Act (1995)*.

If the proposed works are on land that is, or is a part of, critical habitat, or is likely to significantly affect threatened species, populations or ecological communities, or their habitats, a Species Impact Statement (SIS) must be prepared.

An SIS provides an more detailed assessment of threatened biota issues and proposes measures to manage and mitigate adverse impacts on threatened species, populations or ecological communities, or their habitats, resulting from the proposal.

This assessment considers these factors in accordance with the aforementioned legislative requirements. It also provides conclusions in regard to the necessity for a Species Impact Statement.

Water Management Act 2000

The WM Act provides a number of mechanisms for protection of water sources via the water management planning process. If a 'controlled activity' is proposed on 'waterfront land', an approval is required under Section 91 (2) of the WM Act. 'Controlled activities' include; the construction of buildings or carrying out of works; the removal of material or vegetation from land by excavation or any other means; the deposition of material on land by landfill or otherwise. 'Waterfront land' is defined as '*the bed of any river or lake, and any land lying between the river or lake and a line drawn parallel to and 40m inland from either the highest bank or shore*'.

State Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No 2 – 1997)

The State Regional Environmental Plan No 20 – Hawkesbury-Nepean River (No 2 – 1997) applies to certain lands in the Greater Metropolitan Region that are within a number of Local Government Areas, including the Hawkesbury LGA. The aim of this plan is to protect the environment of the Hawkesbury Nepean River system by ensuring that the impacts of future land uses are considered in a regional context.

Specific planning policies and recommended strategies for the plan have been set out under the broad areas of total catchment management, environmentally sensitive areas, water quality, water quantity, cultural heritage, flora and fauna, riverine scenic quality, agriculture/aquaculture and fishing, rural residential development, urban development, recreation and tourism, and metropolitan strategy.

Local Government Act 1993

The Act sets out the responsibilities of Councils including public land management, activity approvals, corporate and operation planning, orders and enforcement powers, setting rates and charges (LGSA 2009). Section 7(e) of the Act requires Councils, Councillors and Council employees to have regard to the principles of ecologically sustainable development in carrying out their responsibilities. The Charter (Section 8) also requires Councils to properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development. Under this Act, Councils are required to have Plans of Management for all Council owned land.

Hawkesbury Nepean Catchment Action Plan

The Hawkesbury Nepean Catchment Action Plan (Hawkesbury Nepean CAP) sets the direction for the activities and investment of the Hawkesbury Nepean Catchment Management Authority Hawkesbury Nepean CMA) over the next ten years. It was approved by the Minister for Environment and Climate Change in March 2008.

The Hawkesbury Nepean CAP is the first stage of managing the catchment in a way that will improve river health, protect biodiversity, and encourage best practice soil and land management. The goals of the CAP are underpinned by community and partnership programs which build community awareness and capacity, and support Indigenous community involvement.

The Hawkesbury Nepean CAP sets clear targets and a timetable for the Hawkesbury Nepean CMA's action and investment and is designed to be responsive to the changing needs of the catchment and the community. The Hawkesbury Nepean CAP operates across the same area as the Hawkesbury Nepean CMA's boundary.

Noxious Weeds Act 1993

Administered by Industry and Investment NSW (formerly the Department of Primary Industries), this Act allows for the listing of five categories of declared noxious weeds. It provides for the specification of control measures and public and private land responsibilities. Noxious weeds occurring in the Penrith City Council LGA have been considered in this assessment.

Penrith City Council Biodiversity Strategy 2004

The strategy provides policy objectives to conserve biodiversity in the LGA.

The document also provides some useful statistics on the extant of vegetation community types in the LGA as shown below.

Vegetation Communities		Modelled Pre-1750 Vegetation	Proportion Remaining	
	All Codes		All Codes	A+B+C+ SA
	Total (ha)	Total (ha)	(%)	(%)
Shale/Sandstone Transition Forest (Low Sandstone Influence)	161.6	438.9	36.8%	19.2%
Shale/Sandstone Transition Forest (High Sandstone Influence)	468.9	596.8	78.6%	31.4%
Sub total - 1&2 Shale/Sandstone Transition Forest	**630.4**	**1,035.7**	**60.9%**	**26.2%**
Cooks River Castlereagh Ironbark Forest (Low Sandstone Influence)	777.3	1,413.4	55.0%	34.4%
Castlereagh Swamp Woodland	479.4	557.6	86.0%	81.8%
Castlereagh Scribbly Gum Woodland*	3,680.1	4,873.8	75.5%	54.5%
Agnes Banks Woodland	175.6	470.5	37.3%	19.1%
Shale Hills Woodland	778.2	2,854.1	27.3%	13.4%
Shale Plains Woodland	3,683.6	17,949.1	20.5%	8.5%
Sub total - 9 & 10 Cumberland Plain Woodland	**4,461.7**	**20,803.2**	**21.4%**	**9.2%**
Alluvial Woodland	1,813.9	7,255.0	25.0%	15.1%
Riparian Forest	85.2	215.6	39.5%	22.8%
Sub total - 11 & 12 Sydney Coastal River-flat Forest	**1,899.1**	**7,470.8**	**25.4%**	**15.3%**
Western Sydney Dry Rainforest			na	na
Moist Shale Woodland	14.1	20.0	70.3%	61.2%
Turpentine-Ironbark Forest	15.9	58.2	27.4%	6.6%
Turpentine-Ironbark Margin Forest	29.8	74.3	40.1%	16.9%
Sub-total 15-43 Sydney Turpentine-Ironbark Margin Forest	**45.7**	**132.5**	**34.5%**	**12.4%**
Freshwater Wetlands*	15.7	15.7	100.0%	100.0%
Eldersilie Banksia Scrub Forest			na	na
Shale/Gravel Transition Forest	898.8	1,577.6	57.0%	19.2%
Blue Gum High Forest		1.9	0.0%	0.0%
TOTAL	**13,077.8**	**38,372.6**	**34.1%**	**19.2**

** Indicates not listed on Schedule 1 of The TSC Act.*

State Environmental Planning Policy No.44 – Koala Habitat Protection

Where Local Government Areas are listed on Schedule 1 of State Environmental Planning Policy 44 – Koala Habitat Protection (SEPP 44) and the site is greater that 1ha, then the likelihood of koala habitat needs to be assessed as part of the environmental assessment process. The Hawkesbury LGA is listed as a Council to which SEPP 44 applies.

Under SEPP 44, potential koala habitat means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. If potential koala habitat is identified then there is a requirement to assess the site for the occurrence of core koala habitat. Core koala habitat means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.

The site does not contain known Koala feed tree listed under Schedule 2. Therefore, SEPP 44 does not require further consideration in this Flora and Fauna Assessment.

Biosecurity Act 2015

From 1 July 2017, the Noxious Weeds Act 1993 will be repealed and replaced with the Biosecurity Act 2015. As such the declaration status and control measure of any weeds listed on this page will be no longer relevant. HRCC is developing a Local Weeds Plan which will guide the implementation of the new Act in relation to weeds.

The name "noxious weed" is a strictly legal term. It relates to plants which are "scheduled" by the Department of Primary Industries under the Noxious Weeds Act 1993. HRCC is the Local Control Authority for all land (terrestrial and aquatic) within the cities of Blacktown, Penrith, Hawkesbury and Hills Shire. The plants listed in the following link are the current noxious weeds for this area: http://hrcc.nsw.gov.au/weed-information/noxious-weed-list/

Biodiversity Conservation Act 2016

A development application or modification of a development consent under Part 4 of the Environmental Planning and Assessment Act 1979 (excluding major projects) may utilise the former TSC Act scheme for biodiversity offsets if the application is lodged within three months of 25 August 2017 (including The Hills Shire Council and Hornsby Shire Council), or 12 months in some local government areas local government areas of (Camden, City of Campbelltown, City of Fairfield, City of Hawkesbury, City of Liverpool, City of Penrith and Wollondilly).

Proponents should be aware that transitional arrangements under the new Scheme have not been fully developed and, in some cases, NSW Office of Environment and Heritage (**OEH**) should be approached directly for further information. The BC Act sets out the biodiversity assessment requirement for any development or activity that requires assessment or approval under the EP&A Act. The main elements of the Act:

- New Biodiversity Offsets Scheme (BOS)
- New assessment methodology - Biodiversity Assessment Method (BAM)
- Establishment of a Biodiversity Conservation Fund (collects and directs spending of offset monies throughout the state)
- Expansion of Biodiversity Certification for large rezoning proposal and masterplan 'green field' type developments (streamlined assessment at strategic planning stage)

It also consolidates:

- existing wildlife licensing requirements
- nominations of areas of outstanding biodiversity values
- updated criteria for listing threatened species and communities
- biodiversity offsets scheme
- Biocertification (large scale master planning development)
- Biodiversity stewardship agreements (where offset credits are created)

Note: The BOS area clearing threshold in this Act is also applied within the new SEPP and LLS Act. If the amount of native vegetation clearing application is below the threshold it is optional if the applicant wants to submit a Biodiversity Assessment Report (BAR). In relation to Council DAs assessments, Part 4 local development requires application of the BAM to determine whether an offset obligation if it either:

1) Exceeds the BOS threshold (also referred to as 'area trigger')
2) Located in an area of '*Sensitive Biodiversity Values*'

The Act sets outs the Biodiversity Assessment Methodology (BAM) which directs the methodology to be undertaken by accredited assessors (consultants) to produce a Biodiversity Assessment Report (BAR) submitted with a development application. The BAM sets out a detailed, complex and quantitative assessment methodology for producing the assessment report (BAR).

The methodology sets a framework for decision makers (Council assessment officers) to determine whether or not the proposal will have **'Serious and Irreversible Impact (SAII)**' for certain threatened species and communities (referred to as 'candidate entities').

For local developments, the new regulations make the new Offset Scheme **mandatory** for applications assessed under part of the Act that exceed the BOS thresholds. Under the Act, and offsets calculator will be used by accredited and appropriately trained assessors.

This application has been assessed under the former *TSC Act 1995* guidelines as transitional arrangements still apply for the Penrith City Council LGA.

3. Methodology

This chapter presents the methods used in conducting the ecological survey and assessment of the conservation importance of the study area.

3.1 Existing records

Records of threatened flora and fauna species and populations, listed in the schedule of the TSC and EPBC Acts, were obtained and reviewed to document known locations threatened and regionally significant fauna within the locality. The source of these records was the NSW Office of Environment and Heritage Bionet and the Department of Department of Environment & Energy online Protected Matters Search Tool database for an area covering approximately 10km radius of the subject site (Section 4.4).

A total of 9 threatened flora species and 28 threatened or migratory fauna (1 invertebrate, 2 frogs, 15 birds, and 11 mammals, 6 of which are bats), listed under the TSC or EPBC Acts, have been previously recorded within 10km the site (NSW Office of Environment & Heritage 2019; Department of Environment & Energy 2019).

Threatened species that have been considered in particular detail as part of this development application and those species that have been previously recorded near the site may be potentially affected by the proposal are described in Section 4.5, Appendix A and Appendix B.

The vegetation occurring on site is consistent with an Endangered Ecological Community (Cooks River Castlereagh Ironbark Forest).

3.2 Desktop survey

A desktop survey was performed to ensure all relevant documentation is considered when preparing the plan. Documents and other information resources utilised include:

- Aerial photographs (Google Maps, NearMaps & DPI Land Information)
- Vegetation maps (NSW OEH and Department of Lands, Tozer 2003 & NPWS 2003)
- Soil Landscapes of the Penrith 1:100,000 Sheet (Hazerton 1989)

3.3 Field Surveys

A visual inspection was undertaken on the 10th – 13th August 2018 and January 2019 to identify and evaluate the current vegetation community occurring on the subject site, identify any threatened flora and fauna species and assess the current nature and extent of fauna habitats.

Additional targeted flora and fauna surveys were undertaken as part of this assessment in January 2019.

Features of the vegetation including floristics, structure, extent, type and projective foliage cover, presence of weed species and other significant features were noted and recorded). All flora recorded were predominantly identified to family, genus and species level with confirmation according to *Field Guide to the Native Plants of Sydney* (Robinson, 2003), *Weeds of the south-east: an identification guide for Australia* (Richardson, 2006*), Tree & Shrubs in Rainforest of New South Wales and Southern QLD* (Williams et al 1984), *Native Plants of the Sydney District* (Fairly and Moore 2000) and the Botanic Gardens Trust (2009) *PlantNET* flora database.

It was not possible to determine with certainty all the fauna that utilise habitats in the subject site. This is because of the likely seasonal occurrences of some fauna species, the occasional occurrence of vagrant species, and because some species are difficult to detect because of their timid or cryptic behaviour. Therefore, fauna investigations comprised an assessment of fauna habitats present on site and an indication of their potential to support native wildlife populations and, in particular, threatened species.

The fauna habitat assessment criteria included:

Mammals: extent of ground cover, shrub layer and tree canopy, hollow-bearing trees, substrate type (for burrowing etc), evidence such as droppings, diggings, footprints, scratches on trees, nests, burrow paths and runways.

Birds: structural; features such as the extent and nature of the canopy, understorey and ground strata and flowering character

Reptiles and amphibians: cover shelter, suitable substrate, basking and breeding site availability, reptiles and frogs sough in likely sheltering places

Invertebrates: logs and other debris, leaf and bark accumulations around base of trees, grass clumps, loose soil for burrowing

Wildlife corridor values: Importance of the creek systems and riparian vegetation as movement corridors for fauna, especially birds, aquatic fauna, mammals (e.g. microchiropteran bats) & amphibians

Wildlife habitat, in its broadest definition, includes any vegetation or other physical structure that meets an animal's needs for food, shelter, and/or reproduction. Habitat provided by indigenous vegetation usually provide the best habitat, as they are richest in diversity and, resources for indigenous fauna species. However, disturbed and degraded areas can provide habitat for native flora and fauna species.

Wildlife habitat can be comprised of a number of elements. These include intact canopy, mid-storey and understorey layers in a vegetation community, particular plant species which may provide food or shelter resources for fauna species, hollows and cracks in living or dead trees, fallen logs and woody debris, deep leaf litter, exposed sandstone rocks supporting water seeps, and caves. Different resources for food, shelter, and reproduction occur in these habitat elements that may satisfy the varied needs of a particular species, or, more often, the needs of a number of different species.

Targeted flora fauna surveys were undertaken in October 2018 and January 2019.

The purposes of the surveys were to identify and evaluate the current vegetation community occurring on the subject site, identify any threatened flora and fauna species and assess the current nature and extent of fauna habitats. This included special emphasis on species previously recorded within the locality (database searches) and those species identified by Council as of potential concern.

3.4.1 Flora surveys

Flora surveys involved linear transects approximately 10 metres apart whereby 2 experienced botanists (Alex Fraser and Mark Sampson) slowly walked in parallel lines for the entire site proposed for vegetation clearing. All plant species were recorded with a focus on threatened plant species known to occur in the locality (Appendix A).

A total of 10 person hours were dedicated to targeted flora surveys. The location of recorded individuals were way-pointed via handheld GPS and mapped onto latest Nearmap aerial image of the site.

Features of the vegetation including floristics, structure, extent, type and projective foliage cover, presence of weed species and other significant features were noted and recorded). All flora recorded were predominantly identified to family, genus and species level with confirmation according to *Field Guide to the Native Plants of Sydney* (Robinson, 2003), *Weeds of the south-east: an identification guide for Australia* (Richardson, 2006*), Tree & Shrubs in Rainforest of New South Wales and Southern QLD* (Williams et al 1984), *Native Plants of the Sydney District* (Fairly and Moore 2000) and the Botanic Gardens Trust (2009) *PlantNET* flora database.

3.4.2 Fauna surveys

Habitat assessment

It was not possible to determine with certainty all the fauna that utilise habitats in the subject site. This is because of the likely seasonal occurrences of some fauna species, the occasional occurrence of vagrant species, and because some species are difficult to detect because of their timid or cryptic behaviour. Therefore, in addition to targeted fauna surveys, investigations comprised an assessment of fauna habitats present on site and an indication of their potential to support native wildlife populations and, in particular, threatened species.

The fauna habitat assessment criteria included:

Mammals: extent of ground cover, shrub layer and tree canopy, hollow-bearing trees, substrate type (for burrowing etc), evidence such as droppings, diggings, footprints, scratches on trees, nests, burrow paths and runways.

Birds: structural; features such as the extent and nature of the canopy, understorey and ground strata and flowering character

Reptiles and amphibians: cover shelter, suitable substrate, basking and breeding site availability, reptiles and frogs sough in likely sheltering places

Invertebrates: logs and other debris, leaf and bark accumulations around base of trees, grass clumps, loose soil for burrowing

Wildlife corridor values: Importance of the creek systems and riparian vegetation as movement corridors for fauna, especially birds, aquatic fauna, mammals (e.g. microchiropteran bats) & amphibians

Wildlife habitat, in its broadest definition, includes any vegetation or other physical structure that meets an animal's needs for food, shelter, and/or reproduction. Habitat provided by indigenous vegetation usually provide the best habitat, as they are richest in diversity and, resources for indigenous fauna species. However, disturbed and degraded areas can provide habitat for native flora and fauna species.

Wildlife habitat can be comprised of a number of elements. These include intact canopy, mid-storey and understorey layers in a vegetation community, particular plant species which may provide food or shelter resources for fauna species, hollows and cracks in living or dead trees, fallen logs and woody debris, deep leaf litter, exposed sandstone rocks supporting water seeps, and caves. Different resources for food, shelter, and reproduction occur in these habitat elements that may satisfy the varied needs of a particular species, or, more often, the needs of a number of different species.

Targeted survey methodology

NSW Office of Environment & Heritage Survey requirements (draft 2004) were employed to ascertain impacts of the proposed development on threatened fauna. These requirements can be viewed at:

http://www.environment.nsw.gov.au/resources/threatenedspecies/09213amphibians.pdf

http://www.environment.nsw.gov.au/resources/nature/TBSAGuidelinesDraft.pdf

Species identified as potential concern were surveyed in accordance with the survey methodologies and effort described in Table 2.

A full description of these survey methods are described below.

Microchiropteran bat surveys

The Anabat Express bat detector is a digital audio / ultrasonic recorder specifically designed for scheduled recording of microbat ultrasonic / echolocation signals. All amplitude and harmonic information is preserved onto a SD card. It is capable of 740 hours of highest sample rate audio recordings, or over 17000 hours at the lowest setting.

One anabat detector was deployed for 4 days and nights at a time for a total of 3 different locations across the site. The device recorded from duck to dawn to optimise detection of microbat species (January 24-27th).

Bat call analysis was undertaken using Analook Insight software and cross referenced with a reliable call reference for the Sydney basin (Pennay & Law 2004). The principal author and surveyor of this report (Alex Fraser) has over 10 years experience in anabat analysis.

SEPP 44 – Koala Habitat Assessment Koala habitat assessment

State Environmental Planning Policy No. 44—Koala Habitat Protection does not specify any methodologies for determining koala habitat other than the '*15 per cent Schedule 2 tree species*' method (refer to previous Section 2.2).

Alternative guidelines for koala habitat assessment are contained in Appendix 6 of the Port Stephens Council Comprehensive Koala Plan of Management (Port Stephens Council and AKF, 2001 considered a best practice document in the ecological consultant industry), as summarised below.

In order to identify Koala habitat and activity levels, the 'spot assessment technique' was used to determine the significance of Koala habitat. This involved sampling a minimum of 20 trees within a circle radiating from a central point. Searches for Koala scats or faecal pellets were conducted at the base of each tree for a maximum of two to three person minutes.

Minimum sampling density is one plot per 1,000 m^2 of potential development areas that contain native trees (Phillips and Callaghan, 1995). The validation of this technique is based on the occurrence of high quality habitat on medium o high-fertility soils, and is indicated as under evaluation on low fertility soils (Phillips and Callaghan, 1995).

Flora Survey Limitations

The data collected is relatively reliable for the majority of the species, especially those for which there was considered potential for significant impacts to occur. The flora survey for this assessment was conducted during as series of visits from October 2018 to January 2019. At the time of the survey the weather conditions had been favourable for plant growth and production of features required for the identification of most species. It is probable that the vast majority of species have been recorded and that issues including conservation significance of the flora, condition and viability of bushland and likely impact on native vegetation have been satisfactorily assessed.

Fraser Ecological is satisfied that conservation significance, condition and viability of communities, and impacts on native vegetation have been adequately assessed. Prior to the survey, weather conditions has been favourable for plant growth and production of features required for identification of most plants to species level, some were identified genus only. As the survey was carried out in Summer and Winter only, it was not possible to record all species that may be present on the subject land. However, sufficient plant material was present to identify key subject species. Generally due to the number of person hours spent on flora surveys that have been conducted and the methods used for detection of species, it is likely that an adequate intensity of survey has been carried out to verify the presence of threatened flora within the study area.

Fauna survey limitations

The surveys are limited to being snap shot investigations and so present a view of the fauna that were active during the time of the surveys. The data produced by the surveys is intended to be indicative of the types of species that could occur and not an absolute census of all vertebrate species of the site.

Several species are cryptic and difficult to detect or migratory and not all surveys in the ecological consulting industry are always conducted at the appropriate time of year.

3.4 Assessment of conservation value

Conservation value parameters

The conservation value of flora and fauna habitats on the subject site was determined by reference to the following criteria:

- Representativeness - whether the vegetation communities of the site are unique, typical or common in the bioregion. In addition the criteria takes into account whether or not such vegetation units are presently held in conservation reserves;
- the presence of threatened or regionally significant species on the site;
- the extent of human influence on the natural environment of the site and the condition of habitats (e.g. the presence of weeds, fire frequency, etc.);
- the uniqueness of the natural values of the site;
- the amount of native vegetation to be cleared or modified by the proposed development in relation to what remnant vegetation will remain in the locality; and
- the relative importance of the site as a corridor for the movement of wildlife.

4. Site ecological values

4.1 Vegetation associations/ communities

The site contains Cooks River/ Castlereagh Ironbark Forest which is listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and an Endangered Ecological Community under the *NSW Threatened Species Conservation Act 1995*.

The site is likely to be a transition zone between Castlereagh Scribbly Gum Woodland (Vulnerable Ecological Community of lower conservation significance) due to similar species present of both vegetation communities. Table 1 (below) shows the similarity in the composition of diagnostic species recorded on-site.

Castlereagh Scribbly Gum Woodland	Castlereagh Ironbark Forest
Angophora bakeri	*Angophora bakeri*
-	*Eucalyptus fibrosa*
Eucalyptus sclerophylla	-
Melaleuca nodosa	*Melaleuca nodosa*
Microlaena stipoides var. stipoides	*Microlaena stipoides var. stipoides*
Bursaria spinosa	*Bursaria spinosa*
Entolasia stricta	*Entolasia stricta*
Hakea sericea	*Hakea sericea*
Cyathochaeta diandra	-
-	*Lepidosperma laterale*
-	*Ozothamnus diosmifolius*

Table 1: Plant species recorded on-site that are positive diagnostic species for both for vegetation communities (Note: Castlereagh Ironbark Forest is the Endangered Ecological Community)

The native vegetation on-site is generally dominated by *Eucalyptus fibrosa* (Broad-leaved Ironbark), *Angophora bakeri* (Narrow-leaved Apple) and *Corymbia gummifera* (Red Bloodwood) trees that are approximately (15-20m tall). The mid-storey vegetation is largely dominated by smaller trees of *Melaleuca decora,* (10-15m tall). The groundcover is generally bare, however, there is the occasional occurrence of some natives including common grass species such as *Lepidosperma laterale* and *Entoalsia stricta*. Sparse shrubs of *Bursaria spinosa* and *Ozothamnus diosmifolius* were recorded. The vegetation community was considered to be in moderate to good condition.

The area where the proposed shed and fence line maintenance area was considered to be poor condition, as it was subject to edge effects and included some existing dead trees.

The area proposed for vegetation clearing (0.078ha) lacks the diversity of species and structural integrity that protected areas of forest (2.16ha) contains. Therefore, the development area is sited within the poorer quality areas of forest vegetation.

At least a third of the proposed development area (eastern portion) is so highly modified that it is unlikely to regenerate from the native soil seedbank. These areas are limited to canopy species with no shrubs or groundcovers species.

The more intact areas of the proposed development area are still limited in species diversity and comprise solely of sparse distribution of canopy species and a dense monoculture of Melaleuca nodosa in the mid-storey.

One threatened species - *Grevillea juniperina* subsp. *juniperina*, listed as vulnerable under the NSW Threatened Species Conservation Act 1995 (TSC Act) was recorded at the rear of the site within the area to be protected as part of the Vegetation Management Plan. Refer to Section 4.5.1 for further information.

4.2 Fauna species and habitat

The main development impact area provides fauna habitat in the following forms:

- Seasonal foraging resources when eucalypts and other plants flower provide nectar and insect resources for mobile fauna including Grey-headed Flying Fox, possums, gliders, microchiropteran bats and a variety of woodland bird species
- marginal foraging area for owl species that may periodically roost or glean prey items such as possums from the area

The site does not contain significant unique habitat features in habitat hollows (in trees), hollow logs and other dead wood on the forest floor, rocky outcrops, creek lines and dams.

It is likely that a variety of common woodland birds frequent the locality. Blossoms from flowering canopy of Myrtaceae would attract a variety of nectivores including possums, birds and threatened Grey-headed Flying Fox. Common Brushtail Possum scats were recorded on-site.

Nocturnal arboreal marsupials including Common Brushtail Possum are likely to occasionally use the site for foraging. Reptiles likely to occur include a variety of snakes (Red-bellied Black Snake and Brown Snake).

Large Forest Owls including threatened Barking Owl (*Ninox connivens*) may occasionally visit the site depending upon the availability of prey such as Common Ringtail Possum (*Pseudocheirus ringus*), however important breeding habitats in the form of tree hollows were absent.

Introduced species recorded on site included Rabbit (*Oryctolagus cuniculus*) and Goat (*Capra aegagrus hircus*).

Microchiropteran bat species

The vegetation on-site contains foraging habitat for microchiropetran species of bat.

Targeted echolocation surveys for microchiropteran bats were undertaken using Anabat Express device over 4 nights. Bat call analysis was undertaken using Analook Insight software and cross referenced with a reliable call reference for the Sydney basin (Pennay & Law 2004).

A total of nine (9) species of bat were recorded. This included three (3) threatened species including Eastern Freetail Bat (*Mormopterus norfolcensis*), Little Bent-wing bat (*Miniopterus australis*) and Greater Broad-nosed Bat (*Scoteanax ruepelli*). Whilst it has been confirmed that the site contains foraging habitat for these species, critical breeding habitat resources are absent.

Refer to Table 1 (below) for species recorded during surveys and other species previously recorded in the locality (Bionet database search results).

Table 2: Microchiropeteran bat species recorded on-site and in the locality

Species name	Common	BC Act status	Number of previous Bionet records in locality	Recorded on site?
Rhinolophus megaphyllus megaphyllus		P	2	
Austronomus australis	White-striped Freetail-bat	P	32	Yes
Mormopterus norfolkensis	Eastern Freetail-bat	V,P	22	Yes
Mormopterus planiceps	Little Mastiff-bat	P	2	
Mormopterus ridei	Eastern Free-tailed Bat	P	47	
Chalinolobus gouldii	Gould's Wattled Bat	P	83	Yes
Chalinolobus morio	Chocolate Wattled Bat	P	80	
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V,P	9	
Miniopterus australis	Little Bentwing-bat	V,P	1	Yes
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V,P	23	
Myotis macropus	Southern Myotis	V,P	16	
Nyctophilus geoffroyi	Lesser Long-eared Bat	P	129	Yes
Nyctophilus gouldi	Gould's Long-eared Bat	P	10	
Nyctophilus sp.	long-eared bat	P	13	
Scoteanax rueppellii	Greater Broad-nosed Bat	V,P	16	Yes
Scotorepens orion	Eastern Broad-	P	45	Yes

	nosed Bat			
Vespadelus darlingtoni	Large Forest Bat	P	8	
Vespadelus regulus	Southern Forest Bat	P	11	Yes
Vespadelus sp.	Unidentified Eptesicus	P	1	

Cumberland Plain Land Snail surveys

Targeted searches for Cumberland Plain Land (CPL) Snail (*Meridolum corneovirens*) was also undertaken across the entire property by 2 experienced ecologists. The surveys were undertaken at the ideal time following a brief period of rain. Targeted searches were undertaken through debris on the ground (i.e. fallen logs, bark at base of trees and dumped rubbish material). Species verification was undertaken by ID confirmation from Dr. Frank Koeheler, invertebrate expert at Australia Museum. The location of any recorded individuals was recorded by handheld GPS and mapped on aerial photograph (Figure 6).

Cumberland Plain Land Snail (*Meridolum corneovirens*) listed as Endangered under the NSW *Threatened Species Conservation Act 1995* was recorded dead at 2 locations at the western end of the study area as shown in Figure 6 and (Photographs 1 & 2). The species was recorded outside the proposed works area. The species was confirmed via photographic reference from Dr. Frank Koelher from the Australian Museum who is a well known NSW invertebrate expert.

The entire property contains potential habitat for this species, however, despite targeted surveys only two (2) individuals of the species were recorded (at the rear of the property). This species will not be impacted by the property as sufficient areas of known habitat will retained

Cumberland Plain Land Snail primarily inhabits Cumberland Plain Woodland (a critically endangered ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities.

Cumberland Plain Land Snail lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish and can dig several centimetres into soil to escape drought. Is a fungus specialist and is generally active at night. Little is known of its biology, including breeding biology. It is known to be hermaphroditic, laying clutches of 20-25 small, round, white eggs in moist, dark areas (such as under logs), with the eggs taking 2-3 weeks to hatch. There is a suggestion that the species breeds throughout the year when conditions are suitable.

Figure 6: Location of CPL Snails recorded during recent surveys

Photograph 1: Specimen 1 CPL Snail (dead) recorded during recent surveys on-site

Photograph 2: Specimen 2 CPL Snail (dead) recorded during recent surveys on-site

Photograph 1: Western view of the northern property boundary fence

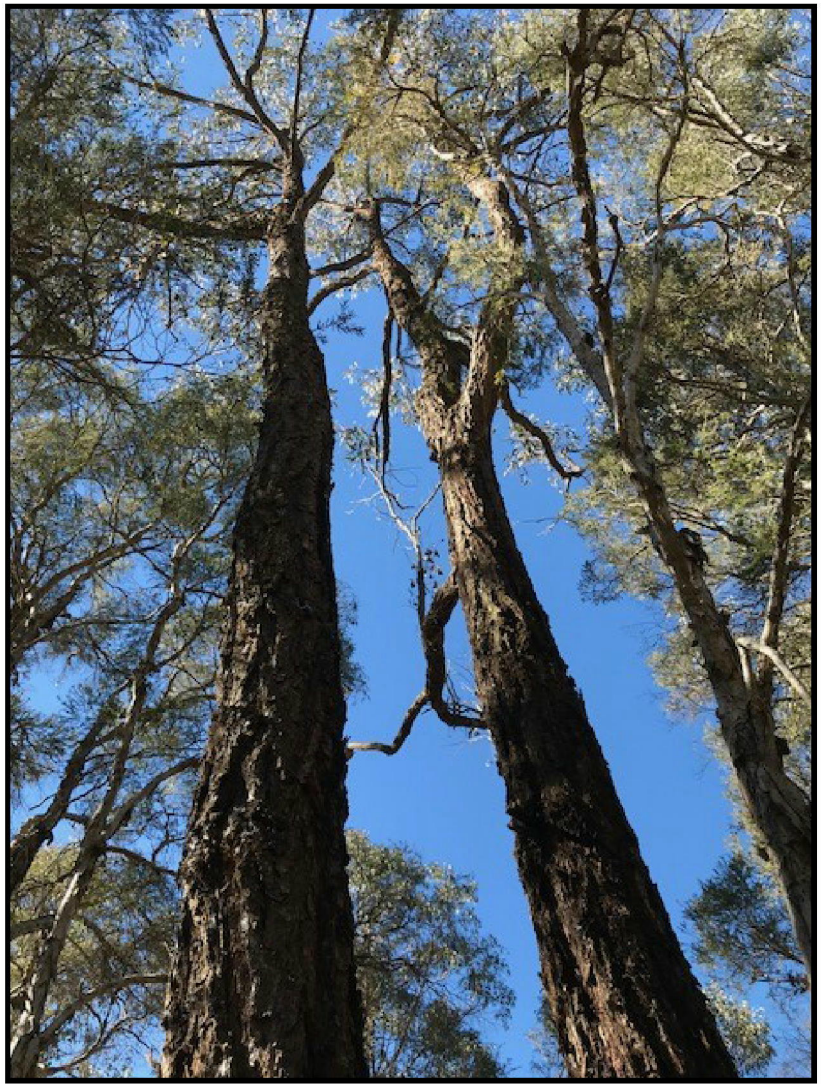
Photograph 2: Eastern view of the northern property boundary fence

Photograph 3: Location of the proposed shed

Photograph 4: The native vegetation (Castlereagh Scribbly Gum Woodland) proposed for removal for the dwelling

Photograph 5: *Grevillea juniperina* spp. *juniperina* that is outside the development impact area and proposed for protection as part of the Vegetation Management Plan

Photograph 6: Photograph 5: *Grevillea juniperina* spp. *juniperina* that is outside the development impact area and proposed for protection as part of the Vegetation Management Plan



Photograph 7: Larger *Eucalyptus fibrosa* trees occurring on site (dominant eucalypt species)

Photograph 8: The native vegetation (Castlereagh Scribbly Gum Woodland) proposed for removal for the dwelling

Photograph 9:The native vegetation (Castlereagh Scribbly Gum Woodland) proposed for removal for the dwelling

Photograph 10: Vegetation recently removed along the southern property boundary to allow access to maintain property and fencing - no threatened plants recorded in this area Note: width of clearing minised to allow only vehicle access same as neighbouring property (right side of photo)

Photograph 11: Vegetation recently removed along the southern property boundary to allow access to maintain property and fencing—including a dangerous *Eucalyptus fibrosa* that was leaning towards the neighbour's dwelling (shown in this photograph) No threatened plants recorded in this area

4.4 Corridors and connectivity

The biodiversity value of corridor networks is well known. Landscapes that retain more connections between patches of otherwise isolated areas of vegetation are more likely to maintain more numerous and more diverse populations of various plant and animal species (Lindenmayer and Fischer, 2006). Conversely, a lack of landscape connectivity can have a range of negative impacts on species populations (Lindenmayer and Fischer, 2006). It is thought that if existing remnants are left to persist without sufficient immigration to maintain genetic diversity, continued losses of biodiversity are certain (Parker *et al.* 2008).

The site forms part of a local habitat corridor being continuous with mosaic patches of surrounding bushland interspersed with agricultural and rural residential development. The moderate 'stepping stone' type connectivity of the site means that a variety of mobile threatened fauna are likely to be seasonally transient through the site. However, the site for the proposed development does not contain unique or critical habitat features that would have a likely significant impact upon the local population of a threatened species.

Furthermore, the proposed development will **not** fragment bushland or significantly impact upon the corridor function of bushland on site as trees will be retained around the development site.

4.5 Threatened species

4.5.1 Threatened flora

One threatened species - *Grevillea juniperina* subsp. *juniperina*, listed as vulnerable under the NSW Threatened Species Conservation Act 1995 (TSC Act) was recorded on site and specimens will be protected as part of the Vegetation Management Plan (Figure 7).

Targeted surveys for other species including *Allocasuarina glareicola, Micromyrtus minutiflora, Pultenaea parviflora, Dillwynia tenuifolia* and *Persoonia nutans* were undertaken but these species were not detected.

Other threatened flora previously recorded within 10km of the site that have been considered in this assessment are shown in Appendix A.

The proposal is unlikely to constitute a significant impact on threatened plant species given that:

- the proposed works would only remove poor quality habitat for these species
- other areas of better quality habitat will be retained immediately adjacent to within the subject site and surrounding landscape (2.16 ha will be fenced off)
- the proposal is not likely to fragment habitat to an extent that would prevent dispersal and/or pollination of the local viable population that exists within the sub-catchment
- no individuals of this species are proposed for removal

The proposal is unlikely to significantly impact on threatened flora listed under the NSW *Threatened Species Conservation Act 1995* and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

***Grevillea juniperina* spp. *juniperina* that is outside the development impact area and proposed for protection as part of the Vegetation Management Plan**

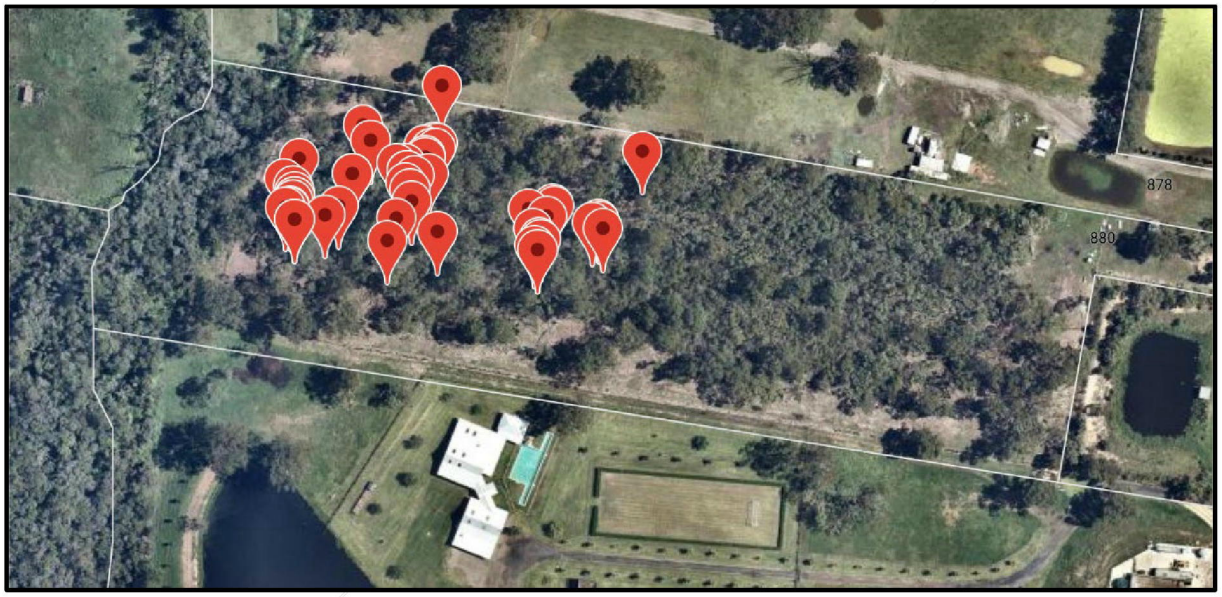


Figure 7: Location of *Grevillea juniperina* subsp. *juniperina* plants recorded on site (red markers)

4.5.2 Threatened Fauna

Following recent targeted fauna surveys, the following threatened fauna were recorded on-site:

- Three (3) threatened species including Eastern Freetail Bat (*Mormopterus norfolcensis*), Little Bent-wing bat (*Miniopterus australis*) and Greater Broad-nosed Bat (*Scoteanax ruepelli*) listed under the NSW *Threatened Species Conservation Act 1995*
- Cumberland Plain Land Snail (*Meridolum corneovirens*) listed as Endangered under the NSW *Threatened Species Conservation Act 1995*

Whilst it has been confirmed that the site contains foraging habitat for microchiropteran bat species, critical breeding habitat resources are absent.

Cumberland Plain Land Snail (*Meridolum corneovirens*) listed as Endangered under the NSW *Threatened Species Conservation Act 1995* was recorded dead at 2 locations at the western end of the study area as shown in Figure 6.

Threatened fauna recorded previously within 10km of the site that have been considered in this assessment are shown in Appendix B.

The proposal is unlikely to constitute a significant impact on threatened fauna species given that:

- the proposed works would only remove poor quality/marginal foraging habitat for these species
- other areas of better quality habitat will be retained immediately adjacent to within the subject site and surrounding landscape
- the proposal is not likely to fragment habitat to an extent that would prevent mobility of the local viable populations of any threatened fauna species that may potentially occur within the sub-catchment

The proposal is unlikely to significantly impact on threatened fauna listed under the NSW *Threatened Species Conservation Act 1995* and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

Assessment of significance were undertaken in Appendix C.

4.6 Castlereagh Ironbark Forest Endangered Ecological Community

The site contains Cooks River/ Castlereagh Ironbark Forest which is listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and an Endangered Ecological Community under the *NSW Threatened Species Conservation Act 1995*.

The amount of this community proposed for removal has been substantially reduced as requested by Council to limit vegetation clearing/ disturbance to only the location of the proposed dwelling, shed, wastewater treatment (OSSM) and APZ area (7830 square metres). The remainder of the property (2.16ha) will be fenced off as requested by Council (outlined in the amended VMP).

The amount of area cleared was reduced by re-positioning the shed to the southern boundary and the bushfire Asset Protection Zone (APZ) was reduced in extent to 24m by increasing the BAL rating from the originally proposed BAL 12.5 to BAL 40.

4.7 Consideration of threatening processes

The proposal does require the removal of native vegetation which is consistent with the listed Key Threatening Process "Clearing of Native Vegetation" which has been considered as part of this assessment. This listed Key Threatening Process was considered within Assessment of significance (seven part test) undertaken for the Castlereagh Scribbly Gum Woodland Vulnerable Ecological Community.

NSW OEH has identified the following actions to help in the recovery of endangered ecological communities in the CPWL region in NSW:

1. Develop and implement Cumberland Plain Reservation Strategy and create a protected bushland network through targeted land acquisition as land becomes available (high priority).
2. Encourage and promote best-practice management of EECs on private land (medium priority).
3. Encourage planning authorities to address EECs in development of environmental planning instruments and, where possible, seek biodiversity certification (medium priority).
4. Ensure the consideration of impacts on EECs when enforcing noxious weed or pest species control in EECs (medium priority).
5. Finalise the multi-EEC recovery plan as a State priority in accordance with contractual obligations with DEH, by July 2007 (medium priority).
6. Incorporate consideration of EEC protection in regional open space planning (high priority).
7. Investigate the development of a regular monitoring program to assess the change in extent of vegetation across the Cumberland Plain (medium priority).
8. Investigate the preparation of a recommendation for the declaration of critical habitat (low priority).
9. Liaise with institutions to facilitate research relevant to the recovery of Cumberland Plain EECs (low priority).
10. Local Govt prepare plans of management in accordance with the Local Government Act for reserves containing EECs, which have conservation as a primary objective, or where conservation is compatible (high priority).
11. Manage, to best practice standards, areas of EECs which have conservation as a primary objective, or where conservation is compatible. Priorities are to be based on DEC conservation significance assessment (high priority).
12. Management of EECs is to be included in school environmental management plans where the school land contains EECs (medium priority).
13. Management of EECs to be included in the conditions for Crown land trusts, lease and licence holders (medium priority).

14. Prepare and implement community awareness, education and involvement strategy (medium priority).
15. Promote best practice management guidelines (medium priority).
16. Public authorities will promote management agreements to landholders through their ongoing land use planning activities (medium priority).

5. Environmental Protection Measures

The current proposal is to be carried out in accordance with all policies, operational procedures and guidelines in place as part of consent conditions issued by Penrith City Council relating to environmental management or impact minimisation for construction projects.

These measures will be reinforced by the provision of a separate Vegetation Management Plan that will be submitted with the application.

The following environmental safeguard measures have been recommended for all phases of the proposed development.

1) Bushland protection during construction

The following activities shall not be conducted within the remnant bushland on site:

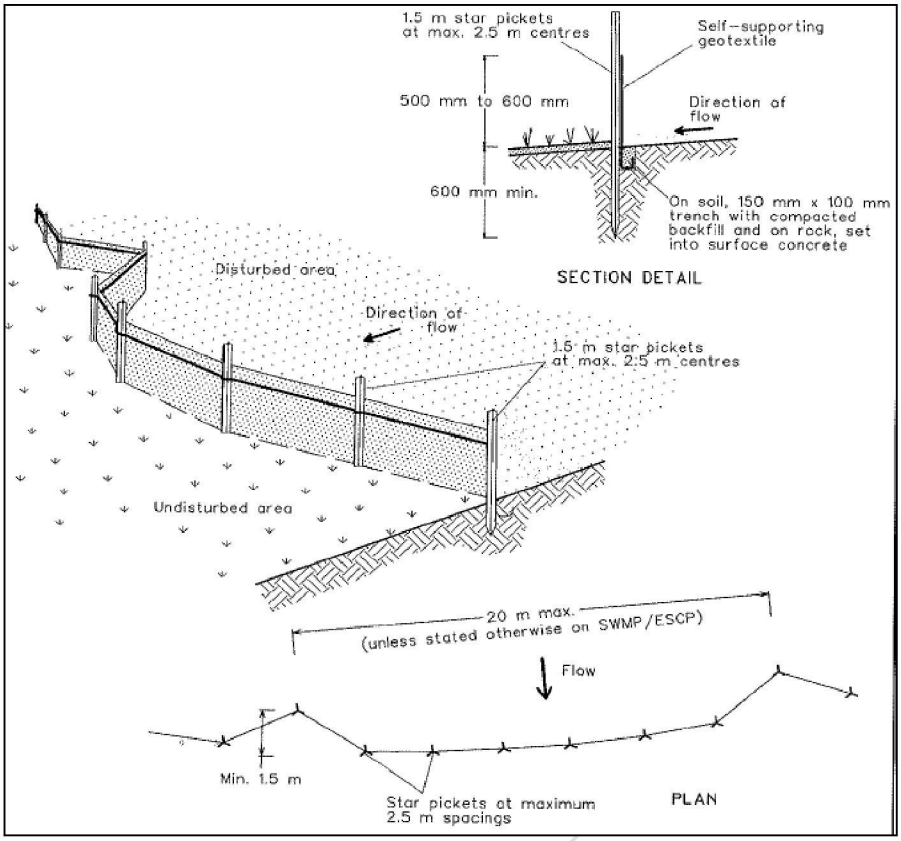
- Ripping, cultivation, trenching or mechanical removal of vegetation or earth
- The placement of fill
- Movement, stockpiling or storage of plant, materials, waste, equipment or vehicles
- Any activity likely to damage the trunk, crown or root system of the protected vegetation

The landowner has already fenced off the E2 zone at the rear of the property. Additional fencing shall be provided as described further in the Vegetation Management Plan (retaining 2.16 ha of native forest).

2) Erosion and Sediment Control

As a precautionary measure, a silt fence will be installed and maintained to EPA best practice standards during the entire construction of the proposal. The fence will remain in situ until the ground surface has stabilised.

All erosion and sediment controls (i.e. geotextile sediment fence and straw bales) shall be in place before any works begin so as to protect sedimentation of the riparian zone. Techniques used for erosion and sediment control on building sites are to be adequately maintained at all times and must be installed in accordance with EPA guidelines. All techniques shall remain in proper operation until all development activities have been completed and the site fully stabilised. This condition must be complied with during building work.



Best practice specifications of sediment and erosion control fencing (EPA 1994)

3) Weed management following construction works

Weeds are to be progressively removed in accordance with the following techniques recommended by the National Trust, NSW National Parks and Wildlife Service and Australian Association of Bush Regenerators.

Weed control from areas of high resilience to low resilience, upper slope to lower slope in accordance with the Bradley Method (Buchanan 1989) is to be undertaken in 3 stages described below:

1) Primary weed control: The first step. Targets primary weeds but does not remove all weeds as the soil will be eroded (DEC 2005). Areas identified with the greatest resilience (e.g. around the base of remnant trees) should be cleared first to encourage regeneration from the soil seed bank. Involves getting rid of larger debris and raking up areas of invasive creepers.

2) Secondary weed control: Intensive follow up weeding straight after primary weeding and treating weed seedlings as they germinate (Buchanan 1989). The weeds progress is monitored and some are allowed a month or two of annual weed growth before they are treated. Sites in good condition require little follow-up while others in worse condition require more effort.

3) Maintenance weeding: Maintain and controlling low weed levels ensuring new weeds that have moved into the area or have had the chance to germinate are eliminated.

5) Prevent Spread of Weed and Pathogens

To prevent the spread of weeds and fungal pathogens such as Cinnamon Fungus (*Phytophthora cinnamomi*) and Chytrid Fungus (*Batrachochytrium dendrobatidis*), all machinery shall be cleaned of soil and debris before entering the subject site.

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6) Tree removal practices

All tree removal and tree pruning shall be undertaken in accordance with *Australian Standard AS4373-2007 (Pruning of Amenity Trees)* and shall be carried out in a manner that does not adversely affect retained indigenous trees.

7) General Environmental Management

The site must be managed in accordance with the *Protection of the Environment Operations Act 1997* by way of implementing appropriate measures to prevent sediment run-off, excessive dust, noise or odour emanating from the site during the construction of the development.

6. Conclusion

The proposed works are unlikely to result in a significant impact upon species, populations and communities listed under the *Threatened Species Conservation Act 1995* and a Species Impact Statement is not required.

7. References

Auld, R.A & Medd, R.W 19897. Weeds – an illustrated guide the weeds of Australia. Inkata Press Melbourne

ARBOR 1996. Garden plants that go feral in the Sydney Bushland, Sydney.

Benson, D and Howell, J., Cunninghamia Volume 3 (4), National Herbarium of NSW, Royal Botanic Gardens Sydney 1994.

Benson, D. and Howell, J. (1994) The natural vegetation of the Sydney 1:100 000 map sheet Cunninghamia 3(4):677-995.

Buchanan, R. 1989. Bush Regeneration. TAFE Publications.

Bureau of Meterology 2014. Climate and Rainfall Averages. http://www.bom.gov.au

Department of the Environment, Water, Heritage and the Arts 2014. Weeds of National Significance. Canberra ACT.

Fairley, A. Moore, P; Native Plants of the Sydney District and identification guide: New Holland Sydney 2002

Matheney, N.P and Clark, J.R Trees and Development: A technical guide to preservation of trees during land development. International Society of Arboriculture 1998

McInnes S.K., 1997, *Soil Landscapes of the St Albans 1:100,000 Sheet* map and report, NSW Department of Land and Water Conservation, Sydney.

NPWS Native Vegetation of the Cumberland Plain Map 1 to 16; NPWS Sydney 2002

NSW Department Infrastructure Planning and Natural Resources 2007. *Guidelines for the preparation of Vegetation Management Plans*, Parramatta.

NSW Rural Fire Service (2006) Planning for Bushfire Protection A Guide for Councils, Planners, Fire Authorities, Developers and Homeowners NSW Rural Fire Service, Sydney.

Robinson, L. Field Guide to the Native Plants of Sydney; Kangaroo Press, Sydney 2004

Ryan, K., Fisher, M., and Shcaeper., L. 1996. Natural Vegetation of the St Albans Map Sheet. *Cunninghamia* Volume 4(3). Royal Botanic Gardens.

Tozer, M. (2003) The Native Vegetation of the Cumberland Plain, western Sydney: Systematic classification and field identification of communities *Cunninghamia* 8(1):1-75

Wrigley, J.W Fagg, M.A Australian Native Plants Cultivation, Use in Landscaping and Propagtaion; Kangaroo Press, Sydney 2003

Hazelton, P.A ., Bannerman, S.M and Tillie, P.J. 1989. *Soil landscapes of the Penrith 1:100 000 sheet*. Soil Conservation Service of NSW. NSW Department of Lands.

Fauna references:

Allison, F.R. and Hoye, G.A. (1995) Eastern Freetail-bat. In: Strahan, R (Ed.) (1995) The Mammals of Australia. Reed New Holland, Australia

Benson, D. and McDougall, L. (1995) Ecology of Sydney plant species. Part 3: Dicotyledon families Cabombaceae to Eupomatiaceae. Cunninghamia 4(2):143-431

Benson, D.H. and Howell, J. (1990) Taken for Granted: The Bushland of Sydney and Its Suburbs. Kangaroo Press, Sydney

Benson, D.H. and Howell, J. (2000) Sydney's Bushland — More than Meets the Eye. Royal Botanic Gardens, Sydney

Churchill, S. (1998) Australian Bats. Reed New Holland, Sydney Australia

Churchill, S. (2008) Australian Bats. Second Edition. Allen and Unwin, Sydney Australia

Department of Environment, Climate Change and Water (2009) Threatened Species Profiles (http://www.threatenedspecies.environment.nsw.gov.au)

Fairley, A. (2004) Seldom Seen: Rare Plants of Greater Sydney. Reed New Holland, Australia

Hoye, G.A. and Hall, L.S. (2008) Eastern Bent-winged Bat Miniopterus schreibersii oceanensis in Van Dyck, S. and Strahan, R. (eds) The Mammals of Australia Third edition. Reed New Holland, Sydney

Hoye, G.A. and Spence, J. (2004) The Large Bent-wing Bat Miniopterus schreibersii in Urban Environments: a survivor? in Lunney, D. and Burgin, S. (eds) Urban Wildlife: more than meets the eye. Royal Zoological Society of New South Wales, Mosman, NSW

Hoye, G.A., Law, B.S. and Allison, F.R. (2008) East-coast Free-tailed Bat Mormopterus norfolkensis in Van Dyck, S. and Strahan, R. (eds) The Mammals of Australia Third edition. Reed New Holland, Sydney

James, T. McDougall, L. and Benson, D.H. (1999) Rare Bushland Plants of Western Sydney, second edition, Royal Botanic Gardens, Sydney

Kingdom, R. (2009) Arboricultural Assessment of Trees and Impact Assessment for Development Application 96-98 Brush Road West Ryde. Unpublished report, Advanced Treescape Consulting

NSW Department of Environment and Conservation (2005) Threatened Species Information –Eastern Bent-wing Bat

NSW National Parks and Wildlife Service (1997) Urban Bushland Biodiversity Survey. Native Flora of Western Sydney. NSW NPWS, Hurstville

NSW National Parks and Wildlife Service (2002) Native Vegetation of the Cumberland Plain - Final Edition. NPWS, Sydney

NSW Scientific Committee (1998) Sydney turpentine-ironbark forest - Endangered ecological community listing. Final Determination

NSW Scientific Committee (2001) Yellow-bellied Sheathtail-bat – Vulnerable Species Listing. Final Determination

NSW Scientific Committee (No Date) Eastern Bent-wing-bat – Vulnerable Species Listing. Final Determination

NSW Scientific Committee (No Date) Eastern Freetail-bat – Vulnerable Species Listing. Final Determination

Richards, G.C. (2008) Yellow-bellied Sheath-tailed Bat Saccolaimus flaviventris. In: Van Dyck, S. and Strahan, R. (Eds.) (2008) The Mammals of Australia. Third Edition. Reed New Holland, Sydney

Strahan, R. (1995) A Photographic Guide to Mammals of Australia. New Holland, Sydney Australia

Strahan, R. (Ed.) (1995) The Mammals of Australia. Reed New Holland, Australia

APPENDIX A: Threatened flora previously recorded within 10km of the site (Source: NSW Bionet accessed 14th July 2019)

Scientific Name	Common Name	TSC Act	EPBC Act	ROTAP	Records	Habitat	Potential habitat
Allocasuarina glareicola		E	E		5	Grows in Castlereagh woodland on lateritic soil. Found in open woodland with Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla and Melaleuca decora. Common associated understorey species include Melaleuca nodosa, Hakea dactyloides, Hakea sericea, Dillwynia tenuifolia, Micromyrtus minutiflora, Acacia elongata, Acacia brownei, Themeda australis and Xanthorrhoea minor.Not killed outright by fire but resprouts from the rootstock. Spreads by vegetative means, such that clumps of up to 100s of stems may be a single individual. The time taken for the plants to flower and set seed is not known, but only those plants growing in areas unburnt for some time produced substantial numbers of fruit.	No
Pultenaea villifera	Pultenaea villifera Sieber ex DC. population in the Blue Mountains local government area	Endangered Population				Grows in dry sclerophyll forest and woodlands on sandy soil and appears to favour sheltered spots. Flowers all year, with peak flowering July to December. Fire sensitive (although can resprout following low intensity fire), with recruitment occurring from a persistent soil stored seed bank following fire.	No
Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	V				Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence), typically containing lateritic gravels. Recorded from Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest. Associated canopy species within Cumberland Plain Woodland and Shale/Gravel Transition Forest include Eucalyptus tereticornis, E. moluccana, E. crebra, E. fibrosa and E. eugenioides. Understorey species include Bursaria spinosa, Dillwynia sieberi, Ozothamnus diosmifolius, Daviesia ulicifolia, Acacia falcata, Acacia parramattensis, Themeda australis, Aristida ramosa, Cymbopogon refractus, Eragrostis brownii, Cheilanthes sieberi, Dianella revoluta and Goodenia hederacea. In Castlereagh Woodland on more sandy soils the dominant canopy species are Eucalyptus fibrosa, E. sclerophylla, Angophora bakeri and Melaleuca decora. Understorey species include Melaleuca nodosa, Hakea sericea, Cryptandra spinescens, Acacia elongata, Gonocarpus teucrioides, Lomandra longifolia and the threatened species Dillwynia tenuifolia, Pultenaea parviflora, Micromyrtus minutiflora and Allocasuarina glareicola. Dense growth of blackthorn (Bursaria) can limit the ability of the species to spread. Most prolific seeding occurs on plants more than 1m high.	Yes recorded on site

Scientific Name	Common Name	TSC Act	EPBC Act	ROTAP	Records	Habitat	Potential habitat
Dillwynia tenuifolia		V	V	2Vi	67	Occurs on the Cumberland Plain from the Blue Mountains to Howes Valley area where it grows in dry sclerophyll woodland on sandstone, shale or laterite {Harden, 2002 #5}. Specifically, occurs within Castlereagh woodlands, particularly in shale gravel transition forest. Associated species include Eucalyptus fibrosa, E. sclerophylla, Melaleuca decora, Daviesia ulicifolia, Dillwynia juniperina and Allocasuarina littoralis {James, 1997 #69}.	Yes within road reserve. Not recorded during surveys.
Pultenaea parviflora		E1	V	2E	17	Restricted to the Cumberland Plain where it grows in dry sclerophyll forest on Wianamatta shale, laterite or alluvium {Harden, 2002 #5}. Locally abundant within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. Also occurs in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland {NSW National Parks and Wildlife Service, 2002 #82; James, 1997 #69}.	No
Acacia bynoeana	Bynoe's Wattle	E1	V	3V	23	Occurs south of Dora Creek-Morisset area to Berrima and the Illawarra region and west to the Blue Mountains. It grows mainly in heath and dry sclerophyll forest on sandy soils {Harden, 2002 #5}. Seems to prefer open, sometimes disturbed sites such as trail margins and recently burnt areas. Typically occurs in association with Corymbia gummifera, Eucalyptus haemastoma, E. gummifera, E. parramattensis, E. sclerophylla, Banksia serrata and Angophora bakeri {NSW National Parks and Wildlife Service, 1999 #61}.	No
Persoonia hirsuta	Hairy Geebung	E	E		1	The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. It is usually present as isolated individuals or very small populations. It is probably killed by fire (as other Persoonia species are) but will regenerate from seed.	No
Persoonia nutans	*Nodding Geebung*	E	E		89	Northern populations are confined to aeolian and alluvial sediments and occur in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland and some in Cooks River / Castlereagh Ironbark Forests. Southern populations also occupy tertiary alluvium, but extend onto shale sandstone transition communities and into Cooks River / Castlereagh Ironbark Forest. Peak flowering is from November to March with sporadic flowering all year round. An obligate seed regenerator. Seed germination is promoted by fire and also by physical disturbance. Although listed as a short-lived species much of the ecology is poorly known. Maturity is expected in about 10 years. Plants appear to set abundant fruit. Seed is likely to be dispersed, after consumption of the fruit, by large birds	No

Scientific Name	Common Name	TSC Act	EPBC Act	ROTAP	Records	Habitat	Potential habitat
						such as currawongs and large mammals such as wallabies, kangaroos and possums. Abundance at a site appears to be related to disturbance history. Sites with higher abundance also appear to be more disturbed. No	
Micromyrtus minutiflora		E1	V	2V	27	Occurs in the western part of the Cumberland Plain between Richmond and Penrith where it grows on Tertiary sediments in dry sclerophyll forest {NSW Scientific Committee, 2002 #98; Harden, 2002 #5}.	No

TSC Act (*Threatened Species Conservation Act 1995*): E1 =Critically Endangered E= Endangered V= Vulnerable **EPBC Act (*Environment Protection Biodiversity Conservation Act 1999*):** E1 =Critically Endangered E= Endangered V= Vulnerable **ROTAP CODES *Source: Briggs, J.D. & Leigh J.H. (1988) Rare or threatened Australian plants.*** Plant Codes: **Distribution** 1: Known from type collection only. 2: Geographic range < 100km. 3: Geographic range > 100km. **Conservation** E: Endangered (at risk of disappearing in 1 or 2 decades) V: Vulnerable (at risk of disappearing in 20 - 50 years). R: Rare (rare in Australia but currently not endangered or vulnerable). K: Poorly known Reservation. C: Population reserved adequately reserved (>1000 plants). I: Inadequately reserved (<1000 plants) - Adequacy of reservation unknown.

APPENDIX B: Threatened fauna previously recorded within 10km of the site (Source: NSW Bionet accessed 14th July 2019)

Scientific Name	Common Name	TSC Act	EPBC Act	Records	Habitat	Potential habitat
Litoria aurea	Green and Golden Bell Frog	E	V	3	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (Typha spp.) or spikerushes (Eleocharis spp.).Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (Gambusia holbrooki), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas. The species is active by day and usually breeds in summer when conditions are warm and wet. Males call while floating in water and females produce a raft of eggs that initially float before settling to the bottom, often amongst vegetation. Tadpoles feed on algae and other plant-matter; adults eat mainly insects, but also other frogs. Preyed upon by various wading birds and snakes.	No
Pseudophryne australis	Red-crowned Toadlet	V		3	Occurs within 160 km of Sydney where it is restricted to Hawkesbury Sandstone. It breeds in deep grass and debris adjacent to ephemeral drainage lines. When not breeding individuals are found scattered on sandstone ridges under rocks and logs {Cogger, 2000 #20}.	No
Callocephalon fimbriatum	Gang-gang Cockatoo	V		9	Occurs in wetter forests and woodland from sea level to an altitude over 2000 metres, timbered foothills and valleys, coastal scrubs, farmlands and suburban gardens {Pizzey, 1997 #24}.	No
Calyptorhynchus lathami	Glossy Black-Cockatoo	V		1	Occurs in eucalypt woodland and forest with Casuarina/Allocasuarina spp. Characteristically inhabits forests on sites with low soil nutrient status, reflecting the distribution of key Allocasuarina species. The drier forest types with intact and less rugged landscapes are preferred by the species. Nests in tree hollows {Garnett, 2000 #21; NSW National Parks and Wildlife Service, 1999 #55}.	No
Glossopsitta pusilla	Little Lorikeet	V		4	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards Gregarious, travelling and feeding in small flocks (<10), though often with other lorikeets. Flocks numbering hundreds are still occasionally observed and may have been the norm in past centuries. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like Allocasuarina. Nesting season extends from May to September. In years when flowering is prolific, Little Lorikeet pairs can breed twice, producing 3-4 young per attempt. However, the survival rate of fledglings	Marginal foraging habitat; however, seven part test not required

Scientific Name	Common Name	TSC Act	EPBC Act	Records	Habitat	Potential habitat
					is unknown.	
Lophoictinia isura	Square-tailed Kite	V	M	2	This species hunts primarily over open forest, woodland and mallee communities as well as over adjacent heaths and other low scrubby habitats in wooded towns. It feeds on small birds, their eggs and nestlings as well as insects. Seems to prefer structurally diverse landscapes {Garnett, 2000 #21}.	Marginal foraging habitat; however, seven part test not required
Circus assimilis	Spotted Harrier	V		1	Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months. Preys on terrestrial mammals (eg bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion.	Marginal foraging habitat; however, seven part test not required
Falco subniger	Black Falcon	V		1	The Black Falcon inhabits woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses and agricultural land with scattered remnant trees. The Black Falcon is usually associated with streams or wetlands, visiting them in search of prey and often using standing dead trees as lookout posts. Habitat selection is generally influenced more by prey densities than by specific aspects of habitat floristics or condition, although in agricultural landscapes the Black Falcon tends to nest in healthy, riparian woodland remnants with a diverse avifauna (Debus et al. 2005). Much of the best habitat of the Black Falcon in New South Wales is likely to occur on private land (i.e. agricultural or pastoral land), rather than in reserves (e.g. Debus et al. 2005; Debus & Olsen 2011; Debus & Tsang 2011).	Marginal foraging habitat; however, seven part test not required
Ninox connivens	Barking Owl	V		1	Occurs in dry sclerophyll woodland. In the south west it is often associated with riparian vegetation while in the south east it generally occurs on forest edges. It nests in large hollows in live eucalypts, often near open country. It feeds on insects in the non-breeding season and on birds and mammals in the breeding season {Garnett, 2000 #21}.	Marginal foraging habitat; however, seven part test not required. No habitat hollows recorded on site.
Tyto novaehollandiae	Masked Owl	V		1	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	Marginal foraging habitat; however, seven part test not required. No habitat hollows recorded on site.

Scientific Name	Common Name	TSC Act	EPBC Act	Records	Habitat	Potential habitat
Chthonicola sagittata	Speckled Warbler			3	The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding. The rounded, domed, roughly built nest of dry grass and strips of bark is located in a slight hollow in the ground or the base of a low dense plant, often among fallen branches and other litter. A side entrance allows the bird to walk directly inside. A clutch of 3-4 eggs is laid, between August and January, and both parents feed the nestlings. The eggs are a glossy red-brown, giving rise to the unusual folk names 'Blood Tit' and 'Chocolatebird'. Some cooperative breeding occurs. The species may act as host to the Black-eared Cuckoo. Speckled Warblers often join mixed species feeding flocks in winter, with other species such as Yellow-rumped, Buff-rumped, Brown and Striated Thornbills.	Marginal foraging habitat; however, seven part test not required.
Petroica boodang	Scarlet Robin	V		5	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. The Scarlet Robin is a quiet and unobtrusive species which is often quite tame and easily approached. Birds forage from low perches, fence-posts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground, or off tree trunks and logs; they sometimes forage in the shrub or canopy layer. Scarlet Robin pairs defend a breeding territory and mainly breed between the months of July and January; they may raise two or three broods in each season. This species' nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than 2 metres above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub. Eggs are pale greenish-, bluish- or brownish-white, spotted with brown; clutch size ranges from one to four. Birds usually occur singly or in pairs, occasionally in small family parties; pairs stay together year-round. In autumn and winter, the Scarlet Robin joins mixed flocks of other small insectivorous birds which forage through dry forests and woodlands.	Marginal foraging habitat; however, seven part test not required
Petroica rodinogaster	Pink Robin	V		1	Inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies. Catches prey by the perch-and-pounce method, foraging more on the ground than the more flycatcher-like Rose Robin. Insects and spiders are the main dietary items. Breeds between October and January and can produce two clutches in a season. The nest is a deep, spherical cup made of green moss bound with cobweb and adorned with camouflaging lichen, and is lined with fur and plant down. It is situated in an upright or oblique fork, from 30cm to 6m above the ground, in deep undergrowth. Females do most or all of the nest building and incubate unaided, but both adults feed the nestlings. The most common call most closely resembles a snapping twig	No

Scientific Name	Common Name	TSC Act	EPBC Act	Records	Habitat	Potential habitat
Dasyurus maculatus	Spotted-tailed Quoll	V	E	2	Occurs from the Bundaberg area in south-east Queensland, south through NSW to western Victoria and Tasmania. In NSW, it occurs on both sides of the Great Dividing Range and north-east NSW represents a national stronghold {NSW National Parks and Wildlife Service, 1999 #502}. Occurs in wide range of forest types, although appears to prefer moist sclerophyll and rainforest forest types, and riparian habitat. Most common in large unfragmented patches of forest. It has also been recorded from dry sclerophyll forest, open woodland and coastal heathland, and despite its occurrence in riparian areas, it also ranges over dry ridges. Nests in rock caves and hollow logs or trees. Feeds on a variety of prey including birds, terrestrial and arboreal mammals, small macropods, reptiles and arthropods {NSW National Parks and Wildlife Service, 1999 #27; NSW National Parks and Wildlife Service, 1999 #502}.	No
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V		3	Usually roosts in tree hollows in higher rainfall forests. Sometimes found in caves (Jenolan area) and abandoned buildings. Forages within the canopy of dry sclerophyll forest. It prefers wet habitats where trees are more than 20 metres high {Churchill, 1998 #26}.	No
Miniopterus schreibersii	Eastern Bent-wing Bat	V	C	15	Usually found in well timbered valleys where it forages on small insects above the canopy. Roosts in caves, old mines, stormwater channels and sometimes buildings and often return to a particular nursery cave each year {Churchill, 1998 #26}.	No
Mormopterus norfolkensis	Eastern Freetail-bat	V		6	Thought to live in sclerophyll forest and woodland. Small colonies have been found in tree hollows or under loose bark. It feeds on insects above the forest canopy or in clearings at the forest edge {Churchill, 1998 #26}.	No
Myotis adversus	Large-footed Myotis	V		9	Colonies occur in caves, mines, tunnels, under bridges and buildings. Colonies always occur close to bodies of water where this species feeds on aquatic insects {Churchill, 1998 #26}.	Recorded on-site. Seven Part Test required.
Petaurus australis	Yellow-bellied Glider	V		1	Restricted to tall, mature eucalypt forest in high rainfall areas of temperate to sub-tropical eastern Australia. Feeds on nectar, pollen, the sap of eucalypts and sometimes insects. Preferred habitats are productive, tall open sclerophyll forests where mature trees provide helter and nesting hollows and year round food resources are available from a mixture of eucalypt species {NSW National Parks and Wildlife Service, 1999 #44; NSW National Parks and Wildlife Service, 2003 #45}.	No. No habitat hollows recorded on site.
Petaurus norfolcensis	Squirrel Glider	V		2	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	Marginal foraging habitat; however, seven part test not required. No habitat hollows recorded on site.

Scientific Name	Common Name	TSC Act	EPBC Act	Records	Habitat	Potential habitat
Phascolarctos cinereus	Koala	V		4	Found in sclerophyll forest. Throughout New South Wales, Koalas have been observed to feed on the leaves of approximately 70 species of eucalypt and 30 non-eucalypt species. However, in any one area, Koalas will feed almost exclusively on a small number of preferred species. The preferred tree species vary widely on a regional and local basis. Some preferred species in NSW include Forest Red Gum Eucalyptus tereticornis, Grey Gum E. punctata, Monkey Gum E. cypellocarpa and Ribbon Gum E. viminalis. In coastal areas, Tallowwood E. microcorys and Swamp Mahogany E. robusta are important food species, while in inland areas White Box E. albens, Bimble Box E. populnea and River Red Gum E. camaldulensis are favoured {NSW National Parks and Wildlife Service, 1999 #43; NSW National Parks and Wildlife Service, 2003 #31}.	No
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	24	Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps. Urban gardens and cultivated fruit crops also provide habitat for this species. Feeds on the flowers and nectar of eucalypts and native fruits including lilly pillies. It roosts in the branches of large trees in forests or mangroves {NSW National Parks and Wildlife Service, 2001 #56; Churchill, 1998 #26}.	Marginal foraging habitat; however, seven part test not required
Scoteanax rueppellii	Greater Broad-nosed Bat	V		7	The preferred hunting areas of this species include tree-lined creeks and the ecotone of woodlands and cleared paddocks but it may also forage in rainforest. Typically it forages at a height of 3-6 metres but may fly as low as one metre above the surface of a creek. It feeds on beetles, other large, slow-flying insects and small vertebrates. It generally roosts in tree hollows but has also been found in the roof spaces of old buildings {Churchill, 1998 #26}.	Recorded on-site. Seven Part Test required.
Daphoenositta chrysoptera	Varied Sitella	V		21	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. Generation length is estimated to be 5 years.	Marginal foraging habitat; however, seven part test not required
Xanthomyza phrygia	Regent Honeyeater	E1		14	The Regent Honeyeater builds a cup-shaped nest of fibres located in forks in live eucalypt (including Angophora) or she-oak canopy. The Regent Honeyeater mostly feeds on nectar from flowering eucalypts, especially boxes and ironbarks, and from Amyema cambagei. They also feed on the sugary exudates of insects (e.g. lerps) which become an important part of their diet when breeding. Within NSW, breeding sub-populations are fragmented and now occur mainly around the Capertee Valley in central-eastern NSW and the Bundarra-Barraba region in northern inland NSW. Minor and sporadic breeding occurs in other areas such as Warrumbungle National Park, Pilliga forests, Mudgee-Wollar region, and the Hunter and Clarence Valleys.	Marginal foraging habitat; however, seven part test not required
Neophema pulchella	Turquoise Parrot	V		3	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Usually seen in pairs or small, possibly family, groups and have also been reported in flocks of up to thirty individuals. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Forages quietly and may be quite tolerant of disturbance. However, if flushed it will fly to a nearby tree and then return to the ground to browse as soon as the danger has passed. Nests in tree hollows, logs or posts, from August to	No

Scientific Name	Common Name	TSC Act	EPBC Act	Records	Habitat	Potential habitat
					December. It lays four or five white, rounded eggs on a nest of decayed wood dust.	
Lathamus discolor	Swift Parrot	E	E	5	Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Inland Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis. Return to some foraging sites on a cyclic basis depending on food availability. Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum Eucalyptus globulus.	No
Meridolum corneovirens	Cumberland Plain Snail	E		13	Primarily inhabits Cumberland Plain Woodland (a critically endangered ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities. Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish. Can dig several centimetres into soil to escape drought. Is a fungus specialist. Unlike the Garden Snail, does not eat green plants. It is generally active at night. Little is known of its biology, including breeding biology. It is known to be hermaphroditic, laying clutches of 20-25 small, round, white eggs in moist, dark areas (such as under logs), with the eggs taking 2-3 weeks to hatch. There is a suggestion that the species breeds throughout the year when conditions are suitable.	Recorded on-site. Seven Part Test required.

TSC Act (*Threatened Species Conservation Act 1995*): E1 =Critically Endangered E= Endangered V= Vulnerable

EPBC Act (*Environment Protection Biodiversity Conservation Act 1999*): E1 =Critically Endangered E= Endangered V= Vulnerable

APPENDIX C: Seven Part Tests

Commonwealth Assessment of Significance

The *Environment Protection and Biodiversity Conservation Act, (1999)* requires that Commonwealth approval be obtained for certain actions. The Act provides an assessment and approvals systems for actions that have a significant impact on matters of National Environment Significance (NES). These may include:-

- Wetlands protected by international treaty (the Ramsar Convention);
- Nationally listed threatened species and ecological communities;
- Nationally listed migratory species.

Actions are projects, developments, undertakings, activities, series of activities or alteration of any of these. An action that needs Commonwealth approval is known as a controlled action. A controlled action needs approval where the Commonwealth decides the action would have a significant effect on a NES matter.

Where a proposed activity is located in an area identified to be of NES, or such that it is likely to significantly affect threatened species, ecological communities, migratory species or their habitats, the matter needs to be referred to the federal Department of the Environment and Energy (DoEE).

The following assessment in accordance with the EP&BC Act Policy Statement 1.1 *Significant Impact Guideline (DoEE 2019)* is provided:

i. Are there any Matters of National Environmental Significance located in the area of the proposed action?

A search of the Protected Matters Search Tool (DoEE 2019) was conducted for EPBC Listed threatened and migratory species recorded within 10 km of the subject site (Appendix A).

Suitable habitat is present for the following nationally listed threatened species recorded from the Protected Matters Search (DoEE 2019) which occur or which may occur within 10 km of the subject site:

Threatened Fauna Species

- Large-eared Pied Bat
- Regent Honeyeater

Suitable habitat is present for the following nationally listed migratory species recorded from the Protected Matters Search (DoEE 2019) which occur or which may occur within 10 km of the subject site:

Migratory Species

- White-throated Needletail (*Hirundapus caudacutus*)
- Fork-tailed Swift (*Apus pacificus*)
- Rufous Fantail (*Rhipidura rufifrons*)
- Satin Flycatcher *(Myiagra cyanoleuca*)

- Black-faced Monarch (*Monarcha melanopsis*)

Threatened ecological communities

The site contains Cooks River/ Castlereagh Ironbark Forest which is listed as Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and an Endangered Ecological Community under the *NSW Threatened Species Conservation Act 1995*.

The amount of this community proposed for removal has been substantially reduced as requested by Council to limit vegetation clearing/ disturbance to only the location of the proposed dwelling, shed, wastewater treatment (OSSM) and APZ area (7830 square metres). The remainder of the property (2.16ha) will be fenced off as requested by Council (outlined in the amended VMP).

The amount of area cleared was reduced by re-positioning the shed to the southern boundary and the bushfire Asset Protection Zone (APZ) was reduced in extent to 24m by increasing the BAL construction rating from the originally proposed BAL 12.5 to BAL 40.

ii. Considering the proposed action at its broadest scope, is there potential for impacts on Matters of National Environmental Significance?

n/a

iii. Are there any proposed measures to avoid or reduce impacts on Matters of National Environmental Significance?

No, as no matters of national environmental significance were observed during surveys.

iv. Are any impacts of the proposed action on Matters of National Environmental Significance likely to be significant impacts?

With regard to nationally listed threatened species it is considered that the proposal is not likely to:

• 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 threatened species becoming established in the threatened species' habitat;

• introduce disease that may cause a species to decline; or

• interfere with the recovery of the species.

The following reasons are provided:

• There are larger areas of higher quality habitat for locally occurring nationally listed threatened and migratory species present within the locality, including lands reserved for conservation; and

• No nationally listed threatened species were observed within the subject site during surveys.

With regard to nationally listed migratory species it is considered that the proposal is not likely to:

• 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.

The following reasons are provided:

• The subject site has not been identified as containing important habitat for a nationally listed migratory species; and

• No nationally listed migratory species have been recorded within the subject site during surveys.

CONCLUSION

It is considered that the proposed action is not likely to have a significant impact on nationally listed threatened or migratory species.

NSW Assessment of Significance ('seven part test')

Section 78A of the *Environmental Planning and Assessment Act*, 1979 (EP&A Act) enables a person to apply to a consent authority to carry out development that is permissible under an environmental planning instrument. In assessing a development application a consent authority must, pursuant to 79C of the EP&A Act take into consideration, where relevant, the likely impacts of the development on the natural and built environments.

Section 5A subsection 1 of the *Environmental Planning and Assessment Act 1979* states that **each** of the factors in subsection 2 must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats, and any **assessment guidelines**.

Species Impact Statement (SIS) is required if an activity is on land that is, or is part of critical habitat; or there is likely to be a significant effect as determined under s.5A of the EP&A Act, the seven part assessment of significance.

Definitions:

- *Critical habitat: the whole or any part or parts of the area or areas of land comprising the habitat of an endangered species, population or ecological community that is critical to the survival of the species, population or ecological community.*
- *Significant impact: if the Assessment of Significance determines that a there will be a significant effect on threatened species, populations or ecological communities, or their habitats a SIS will be required.*
- *Assessment guidelines means assessment guidelines issued and in force under section 94A of the Threatened Species Conservation Act 1995 or, subject to section 5C, section 220ZZA of the Fisheries Management Act 1994.*

- *Key threatening process means a threatening process specified in Schedule 3 of the Threatened Species Conservation Act 1995 or, subject to section 5C, Part 7A of the Fisheries Management Act 1994*

4.7 Cooks River/ Castlereagh Ironbark Forest Endangered Ecological Community

Assessment of Significance ('Seven Part Test')

Section 78A of the *Environmental Planning and Assessment Act*, 1979 (EP&A Act) enables a person to apply to a consent authority to carry out development that is permissible under an environmental planning instrument. In assessing a development application a consent authority must, pursuant to 79C of the EP&A Act take into consideration, where relevant, the likely impacts of the development on the natural and built environments.

Section 5A subsection 1 of the *Environmental Planning and Assessment Act 1979* states that **each** of the factors in subsection 2 must be taken into account in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats, and any **assessment guidelines**.

Species Impact Statement (SIS) is required if an activity is on land that is, or is part of critical habitat; or there is likely to be a significant effect as determined under s.5A of the EP&A Act, the seven part assessment of significance.

Cooks River/ Castlereagh Ironbark Forest is listed as an Endangered Ecological Community.

Definitions:

- *Critical habitat: the whole or any part or parts of the area or areas of land comprising the habitat of an endangered species, population or ecological community that is critical to the survival of the species, population or ecological community.*
- *Significant impact: if the Assessment of Significance determines that a there will be a significant effect on threatened species, populations or ecological communities, or their habitats a SIS will be required.*
- *Assessment guidelines means assessment guidelines issued and in force under section 94A of the Threatened Species Conservation Act 1995 or, subject to section 5C, section 220ZZA of the Fisheries Management Act 1994.*

- *Key threatening process means a threatening process specified in Schedule 3 of the Threatened Species Conservation Act 1995 or, subject to section 5C, Part 7A of the Fisheries Management Act 1994*

Cooks River/ Castlereagh Ironbark Forest is listed as Endangered Ecological Community listed under the NSW *Threatened Species Conservation Act 1995*.

QUESTION A

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

Response:

The question is not relevant to an endangered ecological community

QUESTION B

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

Response:

The question is not relevant to an endangered ecological community

QUESTION C

In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

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

Response:

The proposal will not increase extinction of local occurrence of this 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?

The vegetation community proposed for removal is in poor condition.

The extent of modification proposed would not place the local occurrence of the EEC (including areas forming the local population of this community that extends outside the property) at risk of extinction.

QUESTION D

In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

Response:

The proposal includes:

- Construction of new dwelling house (occupying approximately 1000 sqm)
- Construction of shed (re-positioned along the southern boundary)
- parking and turning area in front of shed
- Bushfire Asset Protection Zone (APZ) for a reduced extent of 24m (by increasing the BAL rating from the originally proposed BAL 12.5 to BAL 40)
- Wastewater disposal area within the APZ
- Retention of all native vegetation at the rear of the property including E2 zone (2.16ha) which is subject to a separate Vegetation Management Plan also submitted with this application
- This includes fencing to restrict access for vegetation disturbance as requested by Council
- Minimal vehicle access along fence lines to allow property maintenance

A total of 7830 square metres of native vegetation will be removed or modified.

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

Response:

The proposed development will not fragment bushland or significantly impact upon the corridor function of bushland on site as trees will be retained around the development site. Fragmentation of habitat is unlikely to be further exacerbated as 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, population or ecological community in the locality?

Response:

The habitat proposed for removal to facilitate the proposed development is not considered to have a detrimental effect to the availability of food, roosting and other habitat resources for native fauna in the study area and locality. It does not provide habitat resources that are critical to the survival of threatened species or other local areas of this same EEC.

Local vegetation mapping studies and aerial photographs have been checked, and the action will not break the connectivity between, or otherwise fragment or isolate, the remaining trees may be part of the stepping stones of canopy within urban areas. Protection of areas outside existing cleared areas would actually improve the condition of native vegetation.

The vegetation proposed for removal does not provide a vital ecological function or genetic bank to such an extent that its potential removal would place the local population at risk of extinction.

Therefore, the habitat potentially removed as result of the development would not further exacerbate the decline in ecological function of the community in the locality.

QUESTION E

Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)?

Response:

No critical habitat has been declared for this endangered ecological community.

QUESTION F

Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan?

Response:

The action is not inconsistent with a recovery or threat abatement plan or the actions in the Priorities Action Statement (PAS).

The mitigation measures are consistent with the PAS for Threatened Spp/Pop/Communities in the Penrith LGA.

QUESTION G

Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process?

Response:

The proposal does require the removal of native vegetation which is consistent with the listed Key Threatening Process "Clearing of Native Vegetation" which has been considered as part of this assessment. This listed Key Threatening Process was considered within this Assessment of significance (seven part test) undertaken for the Castlereagh Ironbark Forest Endangered Ecological Community.

However, the development footprint is consistent with the permissible land use zoning of the site and surrounding existing rural residential properties.

The size of the development is not considered excessive from an ecological perspective.

CONCLUSION

The proposed development will not have a significant impact upon the local population of this Endangered Ecological Community.

Cumberland Plain Land Snail

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

Known habitat equating to 2.16ha that contains a viable population for this species will be retained.

The extent of potential habitat proposed for removal (7830 sqm) would not place the local population of species at risk of extinction.

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

This is not an Endangered Population.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

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

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?

This is not an Endangered Ecological Community.

d) in relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed?

The proposed development proposes the removal of native vegetation that comprises of potential foraging habitat.

ii) whether an area of habitat is likely to be come fragmented or isolated from other areas of habitat as a result of the proposed action?

The proposal will not further fragment or isolate the habitat for this species.

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

Individuals were not recorded despite targeted surveys within the development impact area.

However, the area proposed for removal provides potential habitat for this species.

The importance of the habitat proposed for removal is not considered significant. Areas where this species was recorded will be retained and protected under the Vegetation Management Plan.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)?

No critical habitats have been declared for this species.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan?

There is no recovery plan or threat abatement plan for this species.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process?

"Clearing of Native Vegetation" is a Key Threatening Process listed in Schedule 3 of the *Threatened Species Conservation Act, 1995*.

Conclusion

The proposal is unlikely to constitute a significant impact on the CPL Snail given that:

- the proposed works would only remove potential habitat resources for this species
- other areas of potential foraging habitat are present within the subject site and surrounding landscape
- the proposal would not isolate or fragment any currently connecting areas of habitat in terms of use by this highly mobile/migratory species

Grevillea juniperina ssp. juniperina

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

Known habitat equating to 2.16ha that contains a viable population for this species will be retained.

No recorded locations of the plants will be impacted by the proposal.

The extent of potential habitat proposed for removal (7830 sqm) would not place the local population of species at risk of extinction.

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

This is not an Endangered Population.

i) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

- ***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***
- ***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?***

This is not an Endangered Ecological Community.

j) in relation to the habitat of a threatened species, population or ecological community:

- ***i) the extent to which habitat is likely to be removed or modified as a result of the action proposed?***

Known habitat equating to 2.16 ha that contains a viable population for this species will be retained.

No recorded locations of the plants will be impacted by the proposal.

The extent of potential habitat proposed for removal (9900sqm) would not place the local population of species at risk of extinction.

- ***ii) whether an area of habitat is likely to be come fragmented or isolated from other areas of habitat as a result of the proposed action?***

The proposal will not further fragment or isolate the habitat for this species.

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

The area proposed for removal provides potential habitat for this species.

The importance of the habitat proposed for removal is not considered significant as this no individuals were recorded in this location despite targeted surveys. Areas where this species was recorded will be retained and protected under the Vegetation Management Plan.

k) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)?

No critical habitats have been declared for this species.

l) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan?

There is no recovery plan or threat abatement plan for this species.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process?

"Clearing of Native Vegetation" is a Key Threatening Process listed in Schedule 3 of the *Threatened Species Conservation Act, 1995*.

Conclusion

The proposal is unlikely to constitute a significant impact on this species given that:

- the proposed works would only remove potential habitat resources for this species
- other areas of potential foraging habitat are present within the subject site and surrounding landscape
- the proposal would not isolate or fragment any currently connecting areas of habitat in terms of use by this highly mobile/migratory species

Large Forest Owls (Powerful Owl, Sooty Owl, Masked Owl and Barking Owl)

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

No trees contain hollow that form potential breeding habitat for these species will be removed. Significant areas of foraging habitat will remain available within the property.

Given that these species are highly mobile/migratory and the insignificant amount of -potential foraging habitat proposed for removal (in relation to what will remain on the property), it is considered unlikely that the proposal would impact on this species such that it would place a local population at risk of extinction.

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

This is not an Endangered Population.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

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

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?

This is not an Endangered Ecological Community.

d) in relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed?

These species will continue to be able to utilise vast areas of foraging and potential breeding available within the subject property.

ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action?

The proposed development will not fragment or isolate habitat for this species.

The subject species potentially utilising the subject site for foraging, is highly mobile. Thus, the loss of what is considered a relatively small amount of native vegetation in relation to their territorial range is unlikely to increase the fragmentation or isolation of habitat for these species.

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

The importance of the habitat proposed for removal is not considered significant.

The areas of potential habitat for large forest owl species to be removed under the current proposal is not considered critical to the survival of the local population of these species, particularly in proportion to the area of similar and better quality habitats that will be retained on the property and locality and throughout the region.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)?

No critical habitats have been declared for this species.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan?

A recovery plan has been prepared for the Large Forest Owls including Powerful Owl was produced by the former Department of Environment and Conservation (2006) with the following objectives or actions:

- Update and refine existing owl habitat models using the best available information. Map the amount of modelled habitat across forested land in NSW.
- Design a sampling strategy to test the modelled habitat for the presence of owls and locate identified sites.
- Field validation of modelled habitat for the presence of owls.
- Estimate the areal amount of mapped modelled habitat for each owl species that is occupied (based on the proportion of sample sites with owls in them) and use this estimate to further estimate the number of owl territories present within different land tenures (based on home range data).

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process?

"Clearing of Native Vegetation" is a Key Threatening Process listed in Schedule 3 of the *Threatened Species Conservation Act, 1995*.

Conclusion

The proposal is unlikely to constitute a significant impact on the subject owl species given that:

- the proposed works would only remove marginal foraging resources for these species
- other areas of potential foraging habitat are present within the property and surrounding landscape
- the proposal would not isolate or fragment any currently connecting areas of habitat in terms of use by these highly mobile species

Grey-headed Flying Fox (*Pteropus poliocephalus*)

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

Numerous canopy trees occur throughout the locality; these trees are likely to be utilised by the Grey-headed Flying fox as food when these Myrtaceae species.

The Proposal would thus not significantly reduce the extent of any Grey-headed Flying-fox foraging or sheltering opportunities, nor would it result in the erection of any barriers to the dispersal, foraging or interbreeding needs of this species. As such, the viability of the local Grey-headed Flying-fox population would not be adversely affected thereby resulting in the local extinction of this species.

(b) "…in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction…",

An 'endangered population' is defined as a "population specified in Part 2 of Schedule 1" of the TSC Act. Therefore the Grey-headed Flying-fox is not an endangered population.

(c) "…in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

> **(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**
>
> **(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..."**

An Endangered Ecological Community means an ecological community specified in Part 3 of Schedule 1 of the TSC Act. The Grey-headed Flying-fox is not listed as an Endangered Ecological Community.

(d) "…in relation to the habitat of a threatened species, population or ecological community:

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

The vegetation likely to be removed or impacted may offer some foraging opportunities for the Grey-headed Flying-fox when the Myrtaceae species flower. Whilst this is the case other areas of foraging habitat may also be found in local parks and reserves, in private gardens and streetscapes, and ofcourse vast areas of bushland within the property that will remain unaffected by the proposed development.

The removal of foraging habitat is not considered to be significant in the context of the Locality and Region.

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

The Grey-headed Flying-fox is known to easily negotiate urban infrastructure, roads, open fields, water bodies and paddocks. When eucalyptus trees are flowering, the Flying-fox is known to traverse long distances in search of food.

The proposed development will not fragment or isolate habitat for this species.

The subject species potentially utilising the subject site for foraging, is highly mobile. Thus, the loss of what is considered a relatively small amount of native vegetation in relation to their territorial range is unlikely to increase the fragmentation or isolation of habitat for these species.

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

The importance of the habitat proposed for removal is not considered significant.

The areas of potential habitat for this species to be removed under the current proposal is not considered critical to the survival of the local population of these species, particularly in proportion to the area of similar and better quality habitats that will be retained on the property and locality and throughout the region.

(e) "…whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)…"

No critical habitat would be adversely affected by the Proposal. The Study Area and Locality are

not listed as critical habitat under Part 3, Division 1 of the TSC Act. Critical habitat for the Grey-headed Flying-fox is yet to be defined.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

A Draft National Recovery Plan has been prepared for the Grey-headed Flying-fox (DECCW 2009).

The following objective is relevant to this Proposal: to identify and protect foraging habitat

critical to the survival of Grey-headed Flying-foxes throughout their range. However, given the

very small amount of habitat likely to be disturbed by the proposal it is highly unlikely that this stand of vegetation would be identified as a priority foraging area.

(g) ..whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Currently 27 Key Threatening Processes for mainland NSW are listed under Schedule 3 of the

TSC Act. Of these, "clearing of native vegetation" would be applicable to the Proposal. Whilst it is acknowledged that the proposal would impact native bushland, it is not considered that this impact, would result in a significant loss of habitat for this species from the Locality or Region.

The effects of other key threatening processes such as the introduction and spread of weeds such as Lantana, exotic vines, perennial grasses, vines and scramblers should be kept to a minimum.

It is recommended that the largest possible area of bushland within the Study Area remains undisturbed to minimise the impact of key threatening processes.

Conclusion

The proposal is unlikely to constitute a significant impact on Grey-headed Flying Fox given that:

- the proposed works would only remove marginal foraging resources for these species
- other areas of potential foraging habitat are present within the subject site and surrounding landscape
- the proposal would not isolate or fragment any currently connecting areas of habitat in terms of use by these highly mobile species

Microchiropteran Bats

The Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), Eastern False Pipistrelle (*Falsistrellus tasmaniensis*), Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*), and Eastern Freetail-bat (*Mormopterus norfolkensis*), Greater-broad-nosed Bat (*Scoteanx ruepelli*) and Large-eared Pied Bat (*Chalinolobus dwyeri*) have been grouped on the basis of their similar habitat requirements.

Three (3) threatened species including Eastern Freetail Bat (*Mormopterus norfolcensis*), Little Bent-wing bat (*Miniopterus australis*) and Greater Broad-nosed Bat (*Scoteanax ruepelli*) listed under the NSW *Threatened Species Conservation Act 1995* were recorded on-site.

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

No trees contain hollow that form potential breeding habitat for these species will be removed. Significant areas of foraging habitat will remain available within the property.

Given that this species is highly mobile/migratory and the insignificant amount of -potential foraging habitat proposed for removal (in relation to what will remain on the property), it is considered unlikely that the proposal would impact on this species such that it would place a local population at risk of extinction.

Microbats use 'flyways' created by openings or interface edges surrounding bushland. It is expected that post-construction, these species would to continue forage in and around the property, utilising much the same habitat types as previously. Given the area of vegetation to be impacted in proportion to the species' high mobility and foraging range, it is unlikely that the proposal would have a significant impact on a viable local population of these microchiropteran bats.

(b) "…in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a
viable local population of the species is likely to be placed at risk of extinction…",

An endangered population is defined under the *TSC Act* as 'a population specified in Part 2 of Schedule 1'. At the present time, there are no endangered populations of microchiropteran bat species listed under the Act.

(c) "…in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(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
(ii)... is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction..."

Not applicable to a threatened species.

(d) "…in relation to the habitat of a threatened species, population or ecological community:
(i) ...the extent to which habitat is likely to be removed or modified as a result of the action proposed…", and

The vegetation likely to be removed or impacted may offer some foraging for insects. Whilst this is the case other areas of foraging habitat may also be found in local parks and reserves, in private gardens and streetscapes, and ofcourse vast areas of bushland within the property that will remain unaffected by the proposed development.

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

Microchiropteran bats can easily negotiate open areas and given the limited size of the habitat to be cleared, this loss is not expected to result in the disturbance to the bats' foraging patterns. The possible roosting (i.e. hollows for the Eastern Freetail-bat) and foraging sites within the Study Area will still be connected to other foraging and roosting in the Locality and Region.

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

The habitat proposed for removal is not considered important breeding habitat for the local population of these species. Although potential foraging habitat would be removed similar foraging habitat will be available in the locality. Given the extent of the resources to be retained in the Study Area and beyond, it is not considered that the Proposal would affect these species such that there would be an impact on their long term survival.

(e) "…whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)…"

No critical habitat would be adversely affected by the draft Proposal. The Study Area is not

listed as critical habitat under Part 3 Division 1 of the *TSC Act*.

(f) "…whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan…"

No Recovery Plans or Threat Abatement Plans (either finalised or draft) have been prepared for these species.

The recommendation of this report to retain native vegetation and hollows on site is consistent with the objectives of the priority actions.

(g) "…whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process…"

Currently 27 Key threatening processes are defined under Schedule 3 of the *TSC Act*. The Proposal would include the clearing of an area of native vegetation; this being listed as a Key Threatening Process.

The effects of other key threatening processes such as the introduction and spread of weeds such as Lantana, exotic vines, perennial grasses, vines and scramblers should be kept to a minimum.

Conclusion

The proposal is unlikely to constitute a significant impact on threatened microchiropetran bats given that:

- the proposed works would only remove marginal foraging resources for these species
- other areas of potential foraging habitat are present within the subject site and surrounding landscape
- the proposal would not isolate or fragment any currently connecting areas of habitat in terms of use by these highly mobile species

Regent Honeyeater

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

Numerous canopy trees occur throughout the locality; these trees are likely to be utilised by the Regent Honeyeater as food when these Myrtaceae species flower.

Given that this species is highly mobile/migratory, it is considered unlikely that the proposal would impact on this species such that it would place a local population at risk of extinction.

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

This is not an Endangered Population.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

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

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?

This is not an Endangered Ecological Community.

d) in relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed?

The vegetation likely to be removed or impacted may offer some foraging opportunities for the Regent Honeyeater when the Myrtaceae species flower. Whilst this is the case other areas of foraging habitat may also be found in local parks and reserves, in private gardens and streetscapes, and ofcourse vast areas of bushland within the property that will remain unaffected by the proposed development.

The proposed development proposes the removal of native vegetation that comprises of potential foraging habitat.

ii) whether an area of habitat is likely to be come fragmented or isolated from other areas of habitat as a result of the proposed action?

The proposal will not further fragment or isolate the habitat for this mobile species present within the locality given the removal of trees within a previously cleared area that is surrounded by extensive tracts of undisturbed bushland.

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

The importance of the habitat proposed for removal is not considered significant.

The areas of potential habitat for this species to be removed under the current proposal is not considered critical to the survival of the local population of these species, particularly in proportion to the area of similar and better quality habitats that will be retained on the property and locality and throughout the region.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)?

No critical habitats have been declared for this species.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan?

A recovery plan has been prepared for Regent Honeyeater – *The Regent Honeyeater* (*Anthochaera Phrygia*) Recovery Plan 1999-2003' and a revised recovery plan is currently in preparation.

The proposed works do not conflict with any of these objectives.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process?

"Clearing of Native Vegetation" is a Key Threatening Process listed in Schedule 3 of the *Threatened Species Conservation Act, 1995*.

Conclusion

The proposal is unlikely to constitute a significant impact on the Regent Honeyeater given that:

- the proposed works would only remove marginal foraging resources for this species
- other areas of potential foraging habitat are present within the subject site and surrounding landscape
- the proposal would not isolate or fragment any currently connecting areas of habitat in terms of use by this highly mobile/migratory species

Scarlet Robin and Flame Robin

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

A significant proportion of the similar habitat will be retained within the property in perpetuity. These retained areas contain better quality habitat for these species than those proposed for removal. I.e. areas of abundant logs and fallen timber for the Scarlet Robin will be retained.

Given that this species is highly mobile/migratory, and similar habitat will be retained on-site, it is considered unlikely that the proposal would impact on this species such that it would place a local population at risk of extinction.

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

This is not an Endangered Population.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

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

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?

This is not an Endangered Ecological Community.

d) in relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed?

The proposed development proposes the removal of native vegetation that comprises of potential foraging habitat and breeding habitat.

ii) whether an area of habitat is likely to be come fragmented or isolated from other areas of habitat as a result of the proposed action?

The proposal will not further fragment or isolate the habitat for this mobile species present within the locality given the removal of trees within a previously cleared area that is surrounded by extensive tracts of undisturbed bushland.

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

The Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. Birds forage from low perches, fence-posts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground, or off tree trunks and logs; they sometimes forage in the shrub or canopy layer. This species' nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than 2 metres above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub.

Flame Robin migrate to the lowland in winter. It nests is Spring are often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks. It actually prefers clearings or areas with open understoreys (OEH 2015).

A significant proportion of the similar habitat will be retained within the property in perpetuity. These retained areas contain better quality habitat for these species than those proposed for removal. I.e. areas of abundant logs and fallen timber for the Scarlet Robin will be retained.

Given that this species is highly mobile/migratory, and similar habitat will be retained on-site, it is considered unlikely that the proposal would impact on this species such that it would place a local population at risk of extinction.

The importance of the habitat proposed for removal is not considered significant.

The areas of potential habitat for this species to be removed under the current proposal is not considered critical to the survival of the local population of these species, particularly in proportion to the area of similar and better quality habitats that will be retained on the property and locality and throughout the region.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)?

No critical habitats have been declared for this species.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan?

There is no recovery plan or threat abatement plan for this species.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process?

"Clearing of Native Vegetation" is a Key Threatening Process listed in Schedule 3 of the *Threatened Species Conservation Act, 1995*.

Conclusion

The proposal is unlikely to constitute a significant impact on the Scarlet Robin and Flame Robin given that:

- the proposed works would only remove marginal foraging resources for this species
- other areas of potential foraging habitat are present within the subject site and surrounding landscape
- the proposal would not isolate or fragment any currently connecting areas of habitat in terms of use by this highly mobile/migratory species

Varied Sitella

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

A significant proportion of the similar habitat will be retained within the property in perpetuity. These retained areas contain better quality habitat for these species than those proposed for removal.

Given that this species is highly mobile/migratory, and similar habitat will be retained on-site, it is considered unlikely that the proposal would impact on this species such that it would place a local

population at risk of extinction.

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

This is not an Endangered Population.

o) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

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

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?

This is not an Endangered Ecological Community.

p) in relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed?

The proposed development proposes the removal of native vegetation that comprises of potential foraging habitat.

ii) whether an area of habitat is likely to be come fragmented or isolated from other areas of habitat as a result of the proposed action?

The proposal will not further fragment or isolate the habitat for this mobile species present within the locality given the removal of trees within a previously cleared area that is surrounded by extensive tracts of undisturbed bushland.

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

Varied Sitella Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years (OEH 2015).

The area proposed for removal vegetation provides potential foraging habitat for this species.

The importance of the habitat proposed for removal is not considered significant.

The areas of potential habitat for this species to be removed under the current proposal is not considered critical to the survival of the local population of these species, particularly in proportion to

the area of similar and better quality habitats that will be retained on the property and locality and throughout the region.

q) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)?

No critical habitats have been declared for this species.

r) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan?

There is no recovery plan or threat abatement plan for this species.

g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process?

"Clearing of Native Vegetation" is a Key Threatening Process listed in Schedule 3 of the *Threatened Species Conservation Act, 1995*.

Conclusion

The proposal is unlikely to constitute a significant impact on the Varied Sitella given that:

- the proposed works would only remove marginal foraging resources for this species
- other areas of potential foraging habitat are present within the subject site and surrounding landscape
- the proposal would not isolate or fragment any currently connecting areas of habitat in terms of use by this highly mobile/migratory species

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APPENDIX D: Results from EPBC Protected Matters Search Tool database

Australian Government

Department of the Environment and Energy

EPBC Act Protected Matters Report

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

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

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

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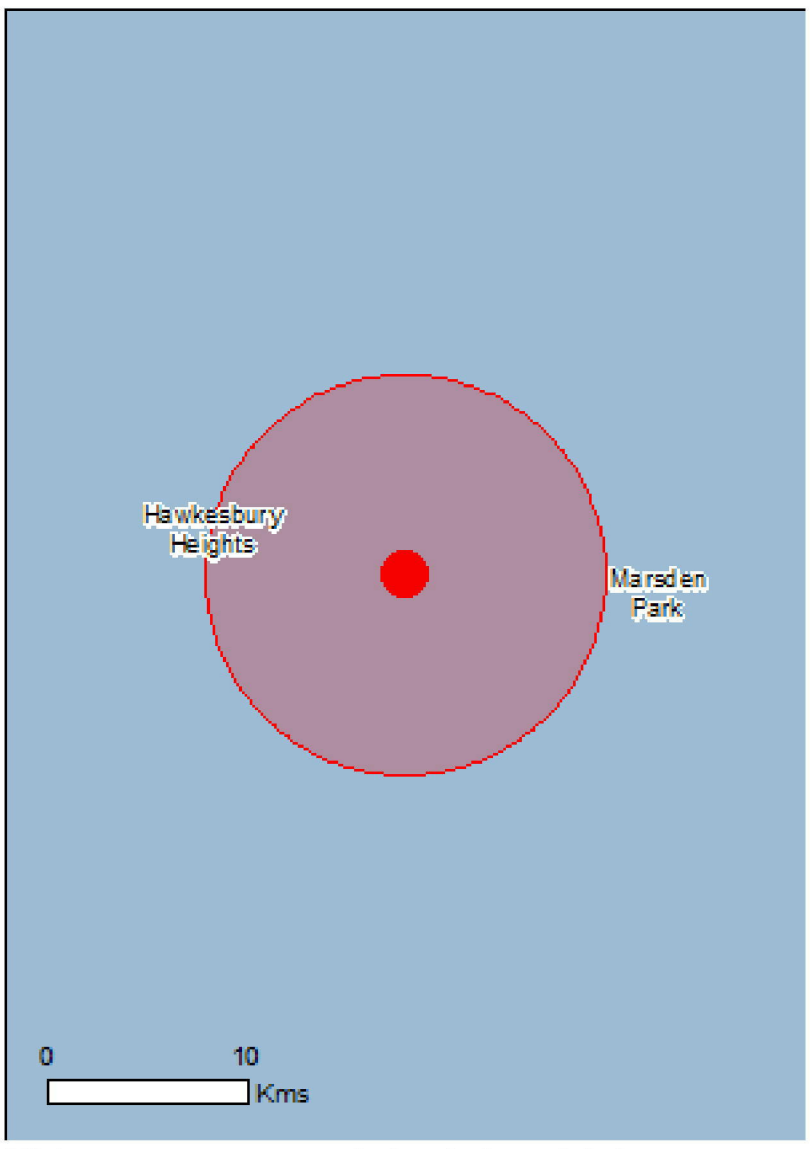

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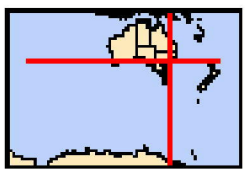

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	51
Listed Migratory Species:	17

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	17
Commonwealth Heritage Places:	2
Listed Marine Species:	24
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	7
Regional Forest Agreements:	None
Invasive Species:	50
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Status
The Greater Blue Mountains Area	NSW	Declared property

National Heritage Properties		[Resource Information]
Name	State	Status
Natural		
The Greater Blue Mountains Area	NSW	Listed place

Listed Threatened Ecological Communities		[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community likely to occur within area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Community likely to occur within area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur

APPENDIX E: QUALIFICATIONS

& EXPERIENCE OF THE AUTHOR

Alex Fraser (Fraser Ecological Consulting) has over 10 years experience in ecological assessment and on-ground bushland restoration management. Previous work roles include ecological consulting with Parsons Brinckerhoff (large infrastructure), NPWS (regional biodiversity surveys), NSW Department of Environment and Climate Change (SIS DGRs/ breach investigations) and Hornsby Shire Council (residential, rural and industrial DA assessment and bushland project management) have focussed primarily on ecological survey, project work and policy development for consent authorities. Alex also possesses practical experience in bushland restoration and landscape construction.

A full list of flora and fauna assessments previously undertaken can be provided upon request.

Professional Affiliations include the Australian Association of Bush Regenerators, Ecological Society of Australia, Royal Zoological Society of NSW, Birds Australia, Australasian Bat Society, Urban Feral Animal Action Control Group (Sydney North Councils), Surfrider Foundation & Fred Hollows Foundation.

Relevant qualifications and training:

- Bachelor of Applied Science – Coastal Resource Management (Honours)
- Certificate 3 - Bushland Restoration (Ryde Horticultural College)
- Land for Wildlife Assessor (NPWS and Central Coast Environment Network)
- Chemcert (Department of Natural Resources – Cert 3)
- Chainsaw Cross Cutting Techniques (Ryde Horticultural College)
- Certificate 3 Vertebrate Animal Pest Control (NSW DPI, Orange)
- OH&S General Induction for Construction Work (Work Cover NSW)
- Senior First Aid (St. Johns Ambulance Australia)
- Project Management 'the hard and soft skills' (NPWS- 2004)
- Frog, Bat and Reptile: species identification and survey skills (Forests NSW)
- Planning for Bushfire Protection (2006) UTS Sydney
- State Rail Contractor Safety Awareness (State Rail Authority)
- NPWS Scientific Licence - S10445 (Department of Environment Climate Change and Water)
- Animal Ethics Research Authority (NSW DPI&I)
- Graduate diploma in bushfire management at UWS (currently in progress)