

Leppington Station

Flora and Fauna Assessment

Transport for New South Wales

28 April 2020

Final



Report No. 19233RP1

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

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Glossary

| Glossary | |
|----------------------|---|
| BC Act | <i>Biodiversity Conservation Act 2016</i> |
| BOS | Biodiversity Offset Scheme |
| CEEC | Critically Endangered Ecological Community |
| CPW | Cumberland Plain Woodland |
| DBH | Diameter at Breast Height |
| EP&A Act | <i>Environmental Planning and Assessment Act 1979</i> |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999</i> |
| GPS | Global Positioning System |
| ISCA | Infrastructure Sustainability Council |
| Locality | Area with a 5km radius from the Proposal Area |
| OWRC | Other Weed of Regional Concern |
| PCT | Plant Community Type |
| Proposal Area | Area subject to the Proposal for the extension of the existing Leppington Station commuter car park (Figure 1) |
| REF | Review of Environmental Factors |
| RMS | Random Meander Survey |
| SEPP | State Environment Planning Policy |
| SP | State Priority Weed |
| Subject site | Non-biocertified area of the Proposal Area (Figure 1) |
| TEC | Threatened Ecological Community |
| TfNSW | Transport for New South Wales |
| The Proposal | Construction of multi-storey commuter car park |
| WoNS | Weeds of National Significance |

1. Introduction

1.1. Purpose

Cumberland Ecology was commissioned by Pitt & Sherry on behalf of Transport for New South Wales (TfNSW) to prepare a specialist assessment of ecological values to assess the impacts of the proposed Leppington Station Car Park (the 'Proposal'). This specialist assessment supports the Review of Environmental Factors (REF) which is being prepared to assess the impacts of the Proposal in accordance with Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Following a desktop review, it has been determined that much of the area covered by the Proposal (the Proposal Area) is located within Biodiversity Certified Land which was conferred on the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* by the Minister for the Environment under Section 126G of the then NSW *Threatened Species Conservation Act 1995*. A small area affected by the Proposal to the west of the existing Leppington Station car park is not within Biodiversity Certified Land and requires further ecological assessment. As such, the impact assessment in this report focusses on the non-certified areas to be impacted by the Proposal to the west of the existing Leppington Station car park (the 'subject site').

In addition to the impact assessment, an assessment of the Biodiversity Certified vegetation within the existing car park is also included in this report. Although this area is Biodiversity Certified and does not require further impact assessment under Division 5.1 of the EP&A Act, TfNSW have elected to offset the removal of these trees and they have been considered in this report to provide an indication of the number of trees required to be offset. The extent of the Proposal Area and subject site are shown in **Figure 1**.

1.1.1. Aims

The Proposal is subject to a REF and is seeking approval under Division 5.1 of the EP&A Act. Entry into the Biodiversity Offset Scheme (BOS) is not mandatory for Division 5.1 activities unless the proponent chooses to opt-in to the scheme, or if the project is classified as State Significant Development or a State Significant Infrastructure project. Due to the limited scope of impacts to biodiversity resulting from the Proposal, TfNSW have chosen to utilise their Vegetation Offset Guidelines (TfNSW 2019) to offset the impact of any trees requiring removal, including the removal of any that occur on biodiversity certified land.

The aims of this assessment are to:

- Provide a description and assessment of the ecological values of the Proposal Area (i.e. the area of land subject to the Proposal) including an assessment of habitat connectivity;
- Identify threatened species, populations or ecological communities in the Proposal Area listed under the *Biodiversity Conservation Act 2016* (BC Act) (*Threatened Species Conservation Act 1995* – repealed) and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Assess the potential impacts of the Proposal on any threatened species, populations and communities identified as having the potential to occur within the Proposal Area;
- Identify the location and identity of species listed as 'Priority Weeds' under the NSW *Biosecurity Act 2015* (Biosecurity Act) at the Proposal Area;

- Provide recommendations on how to minimise impacts of the Proposal on the ecological values of the Proposal Area.
- Provide recommendations as to how the ecological values of the Proposal Area can be maintained during the construction and operational phases of the Proposal; and
- Provide recommendations on whether further ecological assessment is required under the BC Act and/or EPBC Act.

1.2. Background

Transport for New South Wales is the lead agency for integrated delivery of public transport services across all modes of transport in NSW. TfNSW is proposing to provide further car parking infrastructure as part of the NSW Government's Commuter Car Park Program which aims to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

As mentioned previously, a preliminary desktop assessment has shown the Proposal Area to be located partly within Biodiversity Certified Land (**Figure 1**). Item 5 of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006 states that:

"Pursuant to section 126H of the Act, the biodiversity certification of the SEPP is limited to the certified areas.

Note: Pursuant to section 126I of the Act, developments or activities proposed to be undertaken within the certified areas do not need to undertake assessment of impacts on threatened species, populations and ecological communities, or their habitats, that would normally be required by Part 4 or 5 of the Environmental Planning and Assessment Act 1979."

As part of the biocertification process, the impacts of vegetation removal and associated offsets have already been considered for the majority of the Proposal Area (all areas within the Proposal Area and outside the subject site). Consequently, no further ecological assessments of the areas of the Proposal Area that have been Biodiversity Certified are required as part of the REF. As such this Ecological Assessment focusses on the non-certified areas to be impacted by the Proposal to the west of the Leppington Station car park (the subject site). However, TfNSW have chosen to offset the removal of vegetation within Biodiversity Certified Land within the existing car park and therefore an assessment of this vegetation is also included in this report in order to determine the offset requirement under the TfNSW Vegetation Offset Guidelines.

1.3. The Proposal Area

Leppington Station is approximately 40 kilometres from Central Station, Sydney on the T2 Inner West, T5 Cumberland Line and Leppington Line of the Sydney Trains Network. The station is located on the eastern edge of the settlement of Leppington, with the Bringelly Road running east-west about 400 m to the north. It is a multi-platform station providing services to Central Station, Sydney.

The current main existing commuter car park that services the station is located on the northern side of the station and contains parking facilities for the passengers using the station every day (TfNSW 2018). The car park is accessed via Rickard Road that runs north-south on the eastern side of the station. The Proposal Area

runs approximately 150 m west of the western edge of the current car park into an adjacent lot (Lot 2 DP 1200957).

Figure 1 and **Figure 2** provide the local and regional site context for the Proposal, respectively.

1.4. Scope of Works

The Proposal involves the provision of additional commuter car parking for Leppington Station as part of the Commuter Car Park Program. The Proposal involves the construction and operation of a multi-storey car park adjacent to and partially overlapping the existing at-grade commuter car park which is accessed from Rickard Road.

The Proposal would include the following key elements:

- provision of a ground level plus four levels (including rooftop) commuter car park including:
 - approximately 1,000 commuter car parking spaces;
 - approximately 20 additional accessible car parking spaces in the station precinct;
 - internal circulation ramps connecting the levels;
 - two lifts and six sets of stairs;
 - provision for electric vehicle charging stations;
 - Opal Park and Ride infrastructure; and
 - separate vehicle exit and entry points on the eastern face of the car park.
- roadworks to facilitate access and egress for pedestrians and vehicles via the existing at-grade commuter car park;
- installation of renewable energy options such as solar panels and battery storage;
- installation of fencing around the multi-storey car park where necessary;
- wayfinding signage for traffic and pedestrians; and
- ancillary works including services diversion and/or relocation, drainage works, landscaping, installation of lighting, installation of handrails and balustrades and new infrastructure including CCTV cameras.

The footprint and the key element for the location and key elements of the conceptual design for the Proposal are shown in **Figure 3**.



- Legend**
- Subject Site
 - Proposal Area
 - Cadastre
- South West Growth Centre**
- Biodiversity Certified
 - Non-certified

Image Source:
Image © NearMap 2020
Dated: 23/1/2020

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Camden LGA

OEH, 2015. Subject Lands
for the Biocertification of Sydney
Region Growth Centres SEPP
and related EPIs.



Coordinate System: MGA Zone 56 (GDA 94)

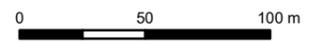


Figure 1. The Proposal area and subject site



Legend

- Subject Site
- Proposal Area

South West Growth Centre

- Biodiversity Certified
- Non-certified

Image Source:
Image © NearMap 2020
Dated: 23/1/2020

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Camden LGA



Coordinate System: MGA Zone 56 (GDA 94)



Figure 2. Regional context of the proposal area and subject site

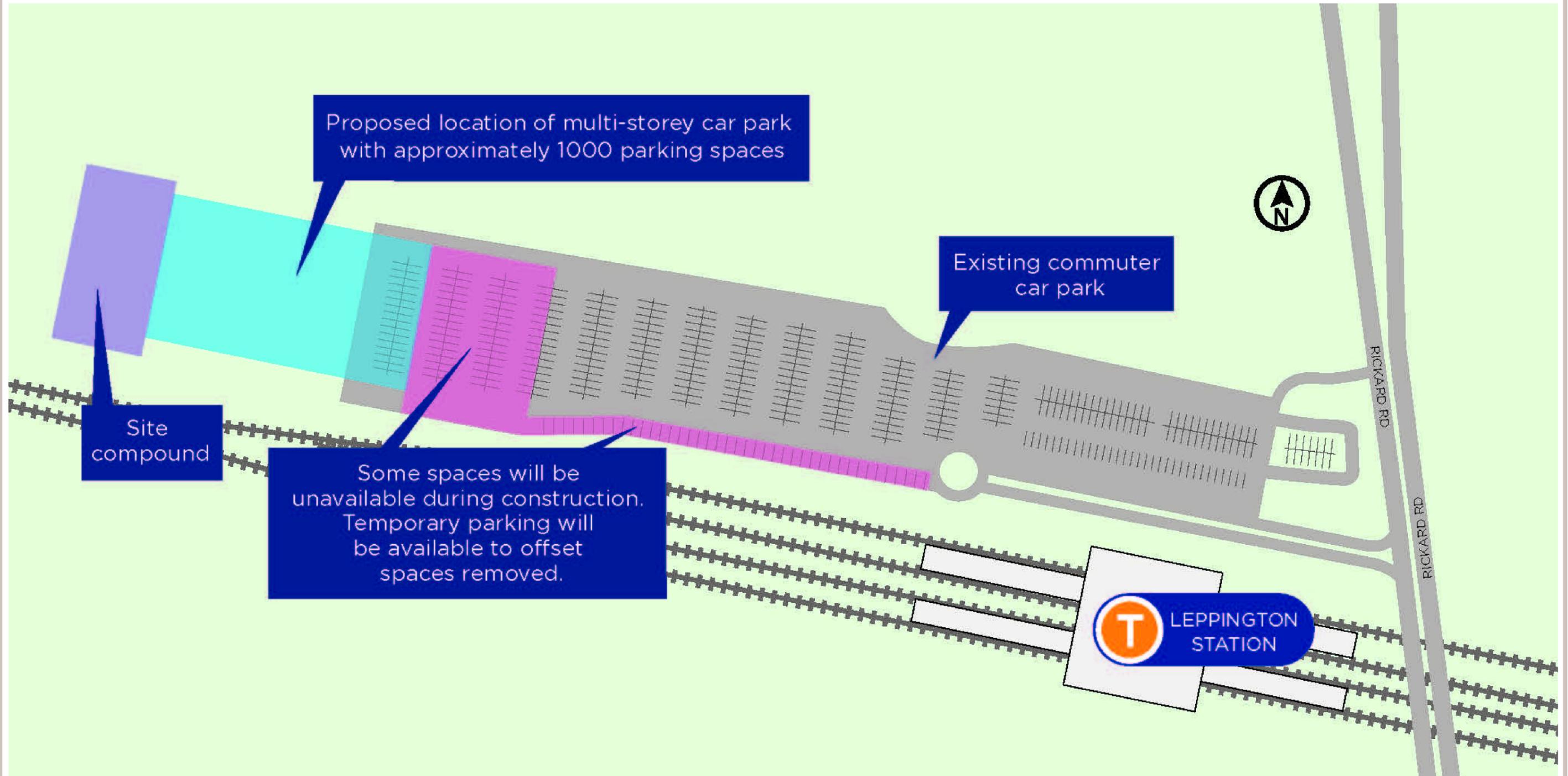


Figure 3. The Proposal

2. Methodology

2.1. Desktop Assessment

2.1.1. Database Search

A review of government databases was conducted on 16th August 2019 utilising the NSW Wildlife Atlas (OEH 2019) and the EPBC Protected Matters Database (DotEE 2019), to identify threatened species, populations and ecological communities that occur or are likely to occur within a five (5) kilometre radius (the locality) of the Proposal Area.

2.1.2. Likelihood of Occurrence Assessment

All threatened species, populations and ecological communities identified in the database search were assessed for their likelihood to occur within the Proposal Area. Factors considered in the likelihood of occurrence assessment for each threatened species, population and ecological community included:

- Habitat requirements;
- Number, age and location of previous records from the locality; and
- The availability of suitable habitat within the Proposal Area.

The likelihood of occurrence assessments of threatened species, populations and communities are provided in **Appendix A**. It has been determined that targeted threatened fauna species surveys are not required.

2.2. Site Assessment

Field surveys were undertaken on 21 January 2020 by Cumberland Ecology staff. Inspections focussed on the subject site and involved traversing the area on foot and visually inspecting the areas where ecological disturbance is proposed. Photographs were taken at various locations of proposed disturbance to document the condition of vegetation, habitat value and habitat connectivity within the subject site. The locations of surveys conducted during the site assessment are shown in **Figure 4** and a detailed description of the methodology implemented is provided below.

2.2.1. Flora Surveys and Vegetation Mapping

Flora surveys were conducted to verify and update any existing mapping, with particular reference to Threatened Ecological Communities (TECs), as listed under the BC Act and/or EPBC Act.

The vegetation within the Proposal Area was ground-truthed via a random meander survey (RMS) and the condition and composition of vegetation was assessed as per the TfNSW Vegetation Offset Guidelines (TfNSW, 2013).

The vegetation survey consisted of the following methods:

- The establishment of two 20 m x 20 m plots to sample the vegetation within the Proposal Area. The following details were recorded:
 - Cover and abundance of native and exotic species;

- Presence of mature trees (Diameter at Breast Height (DBH) $\geq 30\text{cm}$);
 - Structural information of each stratum;
 - Identification of hollow-bearing trees, logs/timber, rock cover and leaf litter; and
 - Condition and connectivity of vegetation.
- Targeted survey for threatened flora species known to occur within the locality.

Under the NSW *Biosecurity Act 2015* (Biosecurity Act) state and regional listed Priority Weeds have specific legal requirements for management and have higher management priorities. A survey for Priority Weeds and Weeds of National Significance (WoNS) within the Proposal Area was also carried out.

2.2.2. Fauna Habitat Assessment

A fauna habitat assessment was completed within the subject site with consideration of significant indicators of habitat availability, condition and complexity. A search for the following indicators of fauna habitat was conducted:

- Ground, shrub/understorey and canopy cover;
- Tree hollows with particular reference to the number and size of hollows if present;
- Habitat features such as bush rock, fallen logs and decorticating bark; and
- Indirect indicators such as scats, scratches, nests, burrows, paths and runways.

Additionally, an assessment of the structural complexity and connectivity of vegetation, age of structure and nature and extent of human disturbance was also undertaken to infer the degree of connectivity in accordance with the Infrastructure Sustainability Council (ISCA) v1.2 Guidelines. **Table 1** below was utilised to determine the degree of habitat connectivity within the Proposal Area.

Any fauna species seen or determined to be present during surveys on the basis of calls or other signs were also recorded.

Table 1. Guidelines utilised to measure habitat connectivity within the Proposal Area (ISCA)

| Degree of connectivity | Definition |
|------------------------|--|
| High | Native vegetation in good condition >100m wide that forms a sole link between other native vegetation in good condition. |
| Moderate | Low condition native vegetation >100m wide or native vegetation in good condition 50- 100m wide that forms part of a sole link between other vegetation in good condition. |
| Low | Low condition native vegetation >100m wide or native vegetation in good condition >50m wide that is part of one of several links to other native vegetation in good condition. |
| Nil | None of the above. |

2.2.3. Existing Car Park

Due to its location within Biodiversity Certified Land, a detailed ecological assessment of the existing car park is not required. However, since the vegetation present within this area comprises previously established offsets which will now be replaced, this area was surveyed on 12 March 2020 in order to provide accurate offsetting requirements. Trees and shrubs within the existing car park to be impacted by the Proposal were identified to species level and the DBH recorded. The location of each tree, or group of trees, was recorded using a handheld Global Positioning System (GPS). Hollows and leaf litter cover were also recorded. The data collected during the assessment of the existing car park is included in **Appendix C**.

2.3. Limitations

Flora of the locality is well known based upon a sizeable database of past records and various published reports. The field survey undertaken by Cumberland Ecology added to this existing database and has helped to provide an indication of the likelihood that various species occur or are likely to occur within the subject site. The data obtained from database assessment and surveys of the subject site furnished an appropriate level of information to support this assessment.

It is considered that the flora species of conservation value have been adequately targeted within the subject site to enable this assessment to be prepared. A range of threatened flora is known to occur in the locality, however based on site conditions, a number of these are unlikely to occur in the subject site.

The area values presented within this report are approximate and are derived from a combination of aerial photo-interpretation, field-based mapping and data extrapolation. This approach provides adequate and reliable information for this ecological assessment.



- Legend**
- Subject Site
 - Proposal Area
 - Flora Plot Locations
 - Random Meander

Image Source:
Image © NearMap 2020
Dated: 24/10/2019

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Camden LGA



Coordinate System: MGA Zone 56 (GDA 94)



Figure 4. Survey locations within the proposal area

3. Results

3.1. Database Search

The results of the database search and likelihood of occurrence assessment are shown in **Appendix A**. No threatened flora species were identified as having the potential to occur on the subject site due to the degraded condition of the majority of the vegetation, limited subject site and a lack of records within the locality. Urban adapted, and highly mobile of threatened fauna species may have the potential to utilise the exotic grassland for foraging including predominantly microchiropteran bats.

These species and/or species groups may occasionally and opportunistically utilise the foraging resources within the subject site as part of a much larger foraging range, however they would not be expected to solely rely on the available habitat within the subject site. These species are considered in greater detail in subsequent subsections, **Appendix A** and **Appendix D**.

3.2. Vegetation Communities

Vegetation within the Proposal Area is comprised of three vegetation communities. The vegetation within the Proposal Area has been subject to disturbance and clearing for linear infrastructure works. Previous land use of the Proposal Area and immediate surrounds has removed and/or modified much of the fauna habitat complexity.

Following field surveys, Cumberland Ecology identified one (1) native plant community as occurring within the Proposal Area; and within the subject site, this community is represented by one *Eucalyptus moluccana* (Grey Box) individual. Cumberland Shale Plains Woodland is associated with the shale plains of western Sydney and can be associated with an open grassy woodland dominated by Grey Box (*Eucalyptus moluccana*), Forest Red Gum (*Eucalyptus tereticornis*) and ironbarks (*Eucalyptus crebra/Eucalyptus fibrosa*). Cumberland Plains Woodland (CPW) is listed as a Critically Endangered Ecological Community (CEEC) under both the schedules of the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In the case of the subject site, the CPW in question conforms to the BC Act listing but does not conform to the Commonwealth listing of CPW. The remainder of the Proposal Area comprises Exotic Grassland, and Planted Gardens and Cleared Lands.

Plant Community Types (PCTs) were selected for naturally occurring vegetation communities with the utilisation of the Bionet Vegetation Classification System (OEH 2019). A PCT was then chosen based upon number of floristic matches and physical environmental attributes such as landform and underlying geology and soils. A description of each vegetation community is provided below and the total area of extent within the Proposal Area is identified in **Table 2**. The extent of each community is detailed in **Figure 5**.

Table 2. Vegetation communities within the Proposal Area

| Vegetation Community | Plant Community Type | BC Act Listing | EPBC Act Listing | Area (ha) |
|----------------------------------|----------------------|----------------|------------------|-----------|
| Cumberland Plain Woodland | 849 | CEEC | CEEC | 0.52 |
| Exotic Grassland | N/A | Not listed | Not listed | 0.48 |
| Planted Gardens and Cleared Land | N/A | Not listed | Not listed | 1.11 |

3.2.1. Cumberland Shale Plains Woodland – Moderate Condition

BC Act Status: Critically Endangered Ecological Community

EPBC Act Status: Not listed

PCT: 849 - Grey Box-Forest Red Gum Grassy Woodland on Flats of the Cumberland Plain, Sydney Basin.

The moderate condition CPW occupied 0.52 ha of the total area and was found along the majority of the eastern half of the Proposal Area. The dominant canopy species observed were *Eucalyptus moluccana* (Grey Box), *Eucalyptus tereticornis* (Forest Red Gum) and *Angophora floribunda* (Rough-barked Apple). The small tree stratum is primarily comprised of canopy species. Common species occurring within the shrub stratum include regenerating canopy species as well as *Acacia falcata* (Hickory Wattle). The ground stratum included the forbs *Brunonia australis* (Blue Pincushion), *Commelina cyanea* (Native Wandering Jew), *Dichondra repens* (Kidney Weed) and *Einadia nutans* subsp. *linifolia* (Climbing Saltbush). The ground stratum included the grasses *Chloris ventricosa* (Tall Chloris), *Microlaena stipoides* (Weeping Grass) and *Lomandra multiflora* (Many-flowered Mat-rush). The climbers *Glycine tabacina* (Variable Glycine) occurred in the understorey.

The moderate condition CPW is also present within the subject site (0.005 ha) represented by one *Eucalyptus moluccana* (Grey Box) individual. The tree exists inside the subject site on the fence-line and is on the southern edge of a larger patch of CPW that stretches northward to Bringelly Road. This representation of CPW is bereft of a mid-storey and the understorey is atypical for the community comprising predominantly exotic grasses, and no leaf litter.

The main structural features of this community within the Proposal Area and subject site are shown in **Photograph 1** and **Photograph 2**, respectively.

Photograph 1. Cumberland Plain Woodland within the Proposal Area



Photograph 2. Cumberland Plain Woodland within the subject site



3.2.2. Exotic Grassland

BC Act Status: Not Listed

EPBC Act Status: Not Listed

PCT: Not applicable

The Proposal Area includes 0.48 ha of Exotic Grassland dominating the understorey throughout the Proposal Area. The main grass species is the non-endemic native grass *Cynodon dactylon* (Common Couch) and to a lesser extent *Cenchrus clandestinus* (Kikuyu Grass). Exotic forbs such as *Lactuca saligna* (Willow-leaved Lettuce), *Conyza sumatrensis* (Tall fleabane), *Foeniculum vulgare* (Fennel) and *Verbena bonariensis* (Purple top) are scattered throughout. Native groundcover species present include *Alternanthera denticulata* (Lesser Joyweed) and *Cymbopogon refractus* (Barbwire Grass). This community contained sparsely scattered regenerating individuals of *Eucalyptus moluccana* (Grey Box).

This community is also present within the subject site with a consistent species assemblage with that of the remaining area of the Proposal Area. Within the subject site, Exotic Grassland covers 0.17 ha.

The main structural features of this community within the Proposal Area and subject site are shown in **Photograph 3** and **Photograph 4**, respectively.

Photograph 3. Exotic Grassland within the Proposal Area



Photograph 4. Exotic Grassland within the subject site



3.2.3. Planted Gardens and Cleared Lands

BC Act Status: Not listed

EPBC Act Status: Not listed

PCT: Not applicable

The vegetation within the western boundary of the existing car park consists entirely of young native trees and shrubs of planted origin which do not conform to any PCT listings. This area of the Proposal Area is vegetated with a mixture of endemic, such as White Bottlebrush (*Callistemon salignus*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*), and non-endemic native trees and shrubs, including Queensland Brush Box (*Lophostemon confertus*) and Black She-oak (*Allocasuarina littoralis*). Similarly, the ground cover of the existing car park was also composed of endemic and non-endemic native species such as Longhair Plume Grass (*Dichelachne crinita*), *Themeda triandra* and *Lomandra longifolia* 'Tanika'. A list of all trees and shrubs identified during the assessment of the existing car park is included in **Appendix C**.

This community occupies 0.08 ha of the Proposal Area and is located entirely within Biodiversity Certified Land. It is restricted to the existing car park and is not found within the subject site.

3.3. Flora

3.3.1. General Species

A total of 36 flora species were identified within the Proposal Area. Species present are comprised of a mix of remnant trees, planted native and non-endemic native species (59%) and exotic species (41%). A flora species list for the Proposal Area is provided in **Appendix B** documenting all species recorded during the flora surveys.

3.3.2. Threatened Species

No threatened flora species were recorded within the subject site. An analysis of the likelihood of occurrence of the Proposal Area for each threatened flora species recorded within the locality is provided in **Appendix A**.

It is considered unlikely that any threatened flora species would naturally occur within the subject site as the majority of the habitat is highly disturbed or comprises previously cleared and replanted vegetation. Additionally, no threatened flora species were found during surveys and there are limited records of occurrence as shown in **Appendix A**.

3.3.3. Priority Weeds

A total of 2 Priority weeds and Weeds of National Significance (WoNS) were identified within the subject site. A list of Priority weeds and their Sydney Region Weed Management Plan (*Biosecurity Act 2015*) and WoNS status is provided in **Table 3** below (LLS: Greater Sydney 2019).

Table 3. Priority weeds and WoNS within the Proposal Area

| Scientific Name | Common Name | WoNS |
|---------------------------------|----------------|------|
| <i>Onopordum acanthium</i> | Scotch Thistle | OWRC |
| <i>Senecio madagascariensis</i> | Fireweed | SP |

Note: OWRC = Other Weeds of Regional Concern, SP = State level determined priority weeds

3.4. Fauna

3.4.1. Fauna Habitat

The subject site provides limited habitat for fauna species due to the degraded nature of the vegetation. Although there are some areas of potential habitat for urban adapted species and small reptiles, the potential habitat is not considered to be a reliable resource and it is most likely to be used for foraging by urban adapted bird species such as the Noisy Miner (*Manorina melanocephala*) and Rainbow Lorikeet (*Trichoglossus haematodus*). On a precautionary basis, the subject site is considered to constitute marginal foraging habitat for a range of highly mobile threatened fauna species that may utilise the subject site as part of a much larger foraging range as detailed in **Section 3.4.4**. No habitat features were found to occur within the subject site during the survey period.

3.4.2. Fauna Habitat Connectivity

The vegetation within the subject site comprises Cumberland Plain Woodland represented by one *Eucalyptus moluccana* (Grey Box) individual and has been assessed to not contain significant habitat connectivity as per

the ISCA definitions. This tree occurs on the southern edge of a larger patch of CPW the stretches northward to Bringelly Road. The patch contains areas that are >100 m in width as well as areas that are less than 50 m and represents a corridor associated with the creek line to the west of the subject site.

3.4.3. General Fauna Species

A total of four native fauna species were identified within the subject site and immediate surrounds and are included in **Table 4** below.

Table 4. Fauna species recorded during the survey period within the subject site

| Common Name | Scientific Name | Method |
|---------------------------|-------------------------------|---------------|
| Australian Magpie | <i>Cracticus tibicen</i> | Observed |
| Australian Pied Cormorant | <i>Phalacrocorax varius</i> | Heard calling |
| Noisy Miner | <i>Manorina melanocephala</i> | Heard calling |
| Pied Currawong | <i>Strepera graculina</i> | Heard calling |

3.4.4. Threatened Species

A number of threatened species have been recorded within the locality that have the potential to occur within the subject site. An analysis of the likelihood of occurrence of threatened fauna to occupy the subject site has been conducted and is included in **Appendix A**.

The likelihood of occurrence assessments indicate that a small number of threatened species listed under the BC Act and/or EPBC Act have potential to occur based on the foraging habitat available, including highly mobile and aerial groups of fauna species. No migratory species would be anticipated to utilise the subject site due to a lack of suitable habitat and a lack of prior records of occurrence within the locality as discussed in **Appendix A** (OEH 2019). The subject site may have the potential to be utilised by the following threatened species on occasion as part of a much broader foraging range:

- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*);
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*);
- Greater Broad-nosed Bat (*Scoteanax rueppellii*);
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*); and
- Southern Myotis (*Myotis macropus*).



Legend

- Subject Site
- Proposal Area

Vegetation Community

- Cumberland Plain Woodland
- Planted Gardens and Cleared Lands
- Exotic Grassland

Image Source:
Image © NearMap 2020
Dated: 24/10/2019

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Camden LGA



Coordinate System: MGA Zone 56 (GDA 94)



Figure 5. Vegetation communities within the proposal area

4. Impact Assessment

4.1. Removal of Vegetation

4.1.1. Impacts to Vegetation Communities

As mentioned previously, much of the Proposal Area is biocertified as part of the South West Growth Centre. This impact assessment refers to the subject site as this area was determined prior to assessment to be non-certified. The vegetation to be impacted within the subject site includes the removal of one *Eucalyptus moluccana* (Grey Box) individual. **Table 4** and **Figure 6** show areas of vegetation to be disturbed within the subject site.

One native vegetation community occurs within the subject site and a very small area (0.005 ha) will be directly impacted by the Proposal; one *Eucalyptus moluccana* (Grey Box). Other vegetation to be impacted includes up to ~0.17 ha of Exotic Grassland that included sparsely scattered regenerating individuals of *Eucalyptus moluccana* (Grey Box). Further trees are to be removed as part of the Proposal however, these trees are within the Biocertified lands.

Table 5. Vegetation communities within the subject site

| Vegetation Community | BC Act Listing | EPBC Act Listing | Proposal Area (ha) | Subject site (ha) |
|---------------------------|----------------|----------------------------------|--------------------|-------------------|
| Cumberland Plain Woodland | CEEC | Does not conform to EPBC listing | 0.52 | 0.005 |
| Exotic Grassland | Not listed | Not listed | 0.48 | 0.17 |
| Total | | | 1.00 | 0.175 |

4.1.2. Impacts to Habitat Connectivity

The tree that is non-certified and is proposed for removal forms part of a much larger patch of CPW expanding outside the subject site. As only one tree on the southern edge of this patch is proposed for removal, the impacts of the Proposal will have a minimal impact on the habitat connectivity values of the vegetation in question. The subject site only encroaches ~10 m into the edge of treed habitat, maintaining the ~120 m corridor associated with the creek line to the west of the subject site. This is not considered to be a significant impact to the habitat connectivity values of the vegetation.

4.1.3. Impacts to Threatened Flora

No threatened flora species were recorded within the subject site (or Proposal Area). The subject site and surrounding areas have been significantly modified and therefore it is considered that habitat within the Proposal Area is not suitable for the occurrence of threatened flora species endemic to the area.

4.1.4. Priority Weeds and WoNS

The Proposal will require the removal of the Priority Weeds and WoNS within the subject site (see **Table 3**). Precautionary actions and recommendations are provided in **Chapter 5** to aid efficient removal and minimise the spread of these species into adjacent land.

4.1.5. Impacts to Threatened Fauna

The subject site is located within a previously cleared, ecologically degraded urban environment containing moderate condition native vegetation, surrounded by farmland and infrastructure. The northern extent of the subject site encroaches into a large patch of CPW through the removal of on canopy tree and relative to the size of the patch, offers little habitat to threatened fauna. The patch of CPW stretching outside the subject site is in a moderate condition state and offers relatively greater habitat values for threatened fauna.

The main group of fauna that would be anticipated to utilise the subject site includes Microchiropteran Bats. All of these highly mobile species of bat would be expected to occasionally and opportunistically utilise the foraging habitat within the subject site as part of a larger foraging range and would not be solely reliant on the habitat to be impacted. The subject site does not contain breeding habitat for any of the species considered likely to occur, as no breeding habitat features were present such as caves, tree hollows, or known breeding camps. Tests of Significance under Section 7.3 of the BC Act have been prepared for the threatened fauna species that have potential to utilise the subject site as detailed in **Appendix C**. The removal or modification of a ~0.18 ha area of marginal foraging habitat is considered highly unlikely to result in significant impacts on potentially occurring threatened Microchiropteran bats.

4.2. Indirect Impacts

In general, construction activities and vegetation removal have the potential to indirectly impact the remaining vegetation and habitats adjacent to the subject site. Such impacts may include:

- **Habitat fragmentation:** affects biodiversity and natural systems through reduction of available habitat and connectivity between habitat patches and corridors. Although one tree is proposed for removal from the subject site, this tree is located on the southern edge of a larger patch of CPW and is unlikely to fragment any existing patch of vegetation;
- **Edge effects:** affects biodiversity through changes in light, temperature, humidity and wind that can favour an array of different species and thus drive significant change in ecological processes (Lindenmayer and Fischer 2006). As the subject site is located adjacent to an existing railway station and railway corridor, the habitat in question is already subject to significant edge effects. Subsequently, edge effects are not anticipated to be increased further than current conditions;
- **Increased sedimentation and erosion:** affects biodiversity through the smothering of vegetation, increasing turbidity of waterways and transportation of weed matter and nutrients. Provided that appropriate sedimentation and erosion mitigation measures are followed, significant sedimentation and erosion impacts are considered unlikely to occur;
- **Introduction and spread of invasive species:** affects biodiversity through increased competition for resources. Provided that appropriate weed management mitigation measures are followed as described in **Section 5.1.5**, significant impacts from the spread of invasive species are unlikely to occur; and
- **Habitat disturbance:** changes in noise and light levels during the construction phase. Whilst the Proposal is likely to involve temporary increases in noise and light levels during the construction phase, the resident fauna is already habituated to living adjacent to an operational railway station and associated noise and

light. Subsequently, the Proposal is unlikely to result in habitat disturbance further than current conditions in the longer term.

Further indirect impacts are not anticipated during the operational phase due to the current proximity of the subject site to Leppington Station, railway corridor and existing car park.



Legend

- Subject Site
- Proposal Area
- *Eucalyptus moluccana*

Impact Area

- Non-certified land
- Biocertified Land

Vegetation Community

- Cumberland Plain Woodland
- Planted Gardens and Cleared Lands
- Exotic Grassland

Image Source:
Image © NearMap 2020
Dated: 24/10/2019

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Camden LGA



Coordinate System: MGA Zone 56 (GDA 94)



Figure 6. Vegetation to be impacted within the subject site

5. Mitigation Measures

While the majority of the Proposal Area is biocertified under the South West Growth Centre SEPP and/or comprises planted gardens and cleared lands, the following recommendations have been provided to minimise impacts of the proposed works on the biodiversity values of the subject site.

5.1. Vegetation Clearing

5.1.1. Vegetation Management and Removal

Vegetation management and removal must be undertaken in accordance with the TfNSW *Vegetation Management (Protection and Removal) Guidelines SD-111* and TfNSW *Fauna Management Guidelines SD-113* (TfNSW 2019, TfNSW 2019). As outlined in the guidelines, pre, during and post-construction management strategies should be utilised for sufficient protection and clearing of vegetation and fauna management.

5.1.1.1. Delineation of Clearing Areas

Areas that require clearance will be flagged and clearly delineated by highly visible temporary fencing and appropriate signage to ensure that no areas intended for retention will be inadvertently cleared during the construction process (TfNSW 2019). No machinery will be parked on areas beyond the temporary fencing and no access will be allowed during construction. Ancillary facilities such as stockpile sites, site compounds and construction zones will not be located beyond the limits of clearing. Defined access tracks and entry/exit points must be utilised for all vehicle movements. Site inductions are to be provided by the construction contractor to ensure all site workers and visitors are aware of any no-access areas.

5.1.1.2. Tree Protection Measures

Prior to clearance, trees and vegetation to be retained are to be identified and marked to be protected, whilst trees to be cleared must be marked for removal. Where construction activities are in close proximity to trees, trunk and branch protection must be installed in accordance with Figure 2 of the TfNSW *Vegetation Management (Protection and Removal) Guidelines SD-111* (TfNSW 2019). All temporary exclusion fencing must be located outside of the tree protection zones of trees to be retained.

5.1.2. Pre-clearance Surveys

In order to avoid impacts to fauna species during construction, pre-clearance surveys will be conducted in all areas of vegetation that are required to be cleared or altered. Pre-clearance surveys will be undertaken approximately one week ahead of clearing, to limit fauna injury and mortality, to identify newly formed or existing habitat features to be relocated and to identify priority weeds. Pre-clearance surveys will be conducted by suitably qualified and experienced ecologists, and all fauna found during these surveys will be encouraged to move on or will be relocated by the ecologists in areas of similar habitat nearby that will not be impacted.

Pre-clearance surveys will be undertaken by a suitably qualified ecologist and will include:

- Demarcation of key habitat features, such as log piles or hollow-bearing trees within or directly adjacent to the Proposal Area;
- Checking trees for the presence of bird nests and arboreal mammals, such as possums, and bats, prior to felling; and

- Safe removal of animals found to be occupying trees and habitat before the clearing of trees and relocation into nearby wooded habitat.

To minimise impacts to native fauna species, clearing will be undertaken in the following two-stage process under the supervision of a suitably qualified ecologist:

- The initial phase of clearing will involve clearing around identified habitat features and leaving the features overnight to provide the opportunity for fauna to self-relocate; and
- The second stage will involve clearing of the habitat features left overnight. Inspections of the habitat features will be conducted prior and immediately following clearing.

5.1.3. Clearance Supervision

An ecologist will supervise the removal of any habitat items (e.g. nests, tree hollows) identified in the pre-clearance surveys. Clearance supervision will include the inspection of previously identified habitat items prior to and post felling in order to minimise impacts on native fauna.

Provisions will be made to protect any native fauna during clearing activities by the following means:

- All staff working on the vegetation clearing will be briefed about the possible fauna present and should avoid injuring any present;
- Animals disturbed or dislodged during the clearance but not injured will be assisted to move to adjacent bushland or other specified locations; and
- If animals are injured during the vegetation clearance, appropriate steps will be taken to humanely treat the animal (either taken to the nearest veterinary clinic for treatment, or if the animal is unlikely to survive, it will be humanely euthanised).

Provision of a report following the completion of clearing works will be provided detailing the total number and species of individuals recorded and details of their release/health.

5.1.4. Translocation of Course Woody Debris

Where possible, any course woody debris such as log piles identified within the Proposal Area will be translocated to beyond the Proposal Area boundary within a suitable location in adjacent bushland.

5.1.5. Weed Removal

Due to the presence of weeds listed as Priority weeds under the Biosecurity Act and WoNS within the Proposal Area, all vegetation removed from site must not be reused as mulch within the Proposal Area or off-site. During pre-clearance surveys, Priority weeds should be demarcated in order for these to be disposed of separately from native material. All groundcover should be disposed of in a manner that will prevent spread as the majority comprises of exotic species. Additionally, check all items are free of soil and vegetative material before moving through a weed free area and before leaving the site, including machinery, vehicles, tools and footwear.

To supplement this, weed removal, management and disposal must be undertaken in accordance with the TfNSW Weed Management and Disposal Guide (TfNSW 2019). This guideline outlines the necessity to prevent, control and dispose of weeds in order to preserve biodiversity values present within the Proposal Area.

5.1.6. Sedimentation, Erosion and Pollution Control

To reduce possible sedimentation on the Proposal Area, erosion control measures must be implemented. This includes minimising the amount of exposed soils on the site at any given time. All soil stockpiles should be adequately covered when not in use to prevent air quality impacts in windy conditions and erosion during heavy rainfall. To reduce the potential impacts of sediment/erosion runoff, it is recommended that no works be carried out during periods of heavy rainfall. Sediment fences should be set up in all areas down slope of proposed works.

5.2. Offsetting Requirements

TfNSW has prepared a Vegetation Offset Guide to assist in meeting biodiversity sustainability targets and providing a framework for a consistent approach for offsetting impacts to vegetation on TfNSW projects (TfNSW 2019). In the case of the Proposal, the subject site is the only area of the Proposal Area that is non-certified under the South West Growth Centre and which requires offsetting under the EP&A Act. However, TfNSW has also elected to voluntarily offset the trees being removed as part of the Proposal that are located in the existing car park.

As an offset site has not been identified for the Proposal, actions are to be undertaken in accordance with Figure 3 of the TfNSW Vegetation Offset Guide (TfNSW 2019). The parameters detailed in **Table 6** below have been gathered during the site assessment and will provide relevant information for the provision of an appropriate offset. All proposed offset plantings must be designed and located with the guidance of a suitably experienced and qualified ecologist following provision of detailed designs. Offset plantings must be designed to ensure that habitat connectivity within offset area is maximised with a suitable species composition utilising species characteristic of CPW.

Table 6. Ecological Parameters of the subject site

| Parameter | Result |
|--|---------------------|
| Proportion of native species on the Proposal Area | 65% |
| Mature Trees Present (DBH* > 30cm) | Yes (1) |
| Proportion of native species in over-storey | 100% |
| Proportion of native species in mid-storey | N/A (no mid storey) |
| Proportion of native species in ground layer (grasses) | 55% |
| Proportion of native species in ground layer (shrubs) | 100% |
| Proportion of native species in ground layer (other) | 7% |
| Habitat Connectivity | Medium |
| Endangered Ecological Community present? | Yes |
| Regeneration | 100% |

| Parameter | Result |
|--|--------|
| Timber length (m) /1000m ² | 0 |
| Hollow Bearing Trees /1000m ² | 0 |
| Leaf Litter | 47% |
| Detritus cover | 0% |

*DBH = Diameter at Breast Height (~140 cm)

The TfNSW Vegetation Offset Guide specifies the ratios required for replacement planting for the removal of single or a group of trees (TfNSW 2019). The following tree replacement ratios are listed in the offset guide and include:

- Eight planted trees for every large tree removed with a DBH >60cm;
- Four planted trees for every medium tree removed with a DBH of 15cm-60cm; and
- Two planted trees for every small tree removed with a DBH <15cm.

Table 7 below details the recommended offsetting ratios required for tree removal within the subject site associated with the Proposal.

Table 7. Tree replacement planting ratio of subject site

| DBH (cm) | No. Trees Removed | Planting Ratio | Replacement Plantings |
|--------------------|-------------------|----------------|-----------------------|
| Large trees >60 | 1 | 8:1 | 8 |
| Medium trees 15-60 | 0 | 4:1 | 0 |
| Small trees <15 | 3 | 2:1 | 6 |
| Total | 4 | - | 14 |

Table 8 below details recommended offsetting ratios required for tree removal within the existing car park associated with the Proposal.

Table 8. Tree replacement planting ratio of existing car park

| DBH (cm) | No. Trees Removed | Planting Ratio | Replacement Plantings |
|--------------------|-------------------|----------------|-----------------------|
| Large trees >60 | 0 | 8:1 | 0 |
| Medium trees 15-60 | 6 | 4:1 | 24 |
| Small trees <15 | 199 | 2:1 | 398 |
| Total | 206 | - | 422 |

Table 9 below details the total offset requirements for all the trees removed within the entire Proposal Area.

Table 9. Total tree replacement ratio of Proposal Area

| DBH (cm) | No. Trees Removed | Replacement Plantings |
|--------------------------------|--------------------------|------------------------------|
| Subject site | 4 | 14 |
| Existing Car Park | 206 | 422 |
| Total for Proposal Area | 210 | 436 |

It should be noted that the total number of trees proposed for removal are indicative only and subject to change relative to detailed design and the extent of construction works. The offsetting requirements and ratios calculated have been done so to account for clearance of trees identified during the site assessments on 21 January 2020 and 12 March 2020.

There may be opportunity to do secondary offsetting, in accordance with the TfNSW Vegetation Offset Guidelines.. Potential offset plantings provide an opportunity for the enhancement of habitat connectivity on the northern side of the station throughout the surrounding area of CPW with the reinstatement of native trees. Other areas identified as suitable for offset tree planting include garden beds. The locations of all offset plantings will be determined during the detailed design phase of the Proposal.

6. Conclusion

The majority of the Proposal Area is Biocertified under the South West Growth Centre and does not require further ecological assessment or offsetting. The subject site; a small area on the western side of the Proposal Area, was identified as not comprising Biodiversity Certified Land. A detailed impact assessment was conducted for this area of land within the subject site. The Proposal involves minimal disturbance to CPW in the form of one *Eucalyptus moluccana* (Grey Box) individual, and Exotic Grassland to enable construction works within the subject site associated with the proposed Leppington commuter car park. Further trees are also to be removed in the existing car park as part of the Proposal. These trees are entirely of planted origin and are located within Biodiversity Certified Land. However, as TfNSW has elected to offset the trees within the existing car park being impacted by the Proposal, offsetting requirements for these trees have also been included in this report.

Only 0.005 ha of CPW is proposed to be impacted by the Proposal. The location and details of this vegetation is provided in **Figure 6** and **Table 4**. CPW is listed as a CEEC under both the BC Act and EPBC Act, although the vegetation within the Proposal Area does not conform to the Commonwealth listing of CPW. Since the extent of impacts within the subject site include one tree, these impacts are considered not be significant. Areas of grassland are also expected to be removed within the subject site, the majority of which are exotic species. General disturbance to groundcover and shrubs is anticipated throughout the entirety of the Proposal Area resulting from construction activities.

No threatened flora species were identified within the subject site, and none are likely to occur due to the degraded and fragmented condition of the available habitat. Although some threatened fauna species may utilise the subject site occasionally and opportunistically for foraging, none are likely to solely rely on the subject site. Highly mobile and aerial threatened fauna species would be expected to forage throughout a larger foraging range extending far beyond the subject site.

TfNSW has prepared a Vegetation Offset Guide to assist in meeting biodiversity sustainability targets and providing a framework for a consistent approach for offsetting impacts to vegetation on TfNSW projects. It has been determined that a total of 436 trees are to be replanted within or surrounding the Proposal Area following provision of detailed design and consultation with Sydney Trains in accordance with the secondary offsetting provisions of the TfNSW Vegetation Offset Guidelines (See **Tables 7-9**). If deemed appropriate, these secondary offsetting provisions have potential to enhance biodiversity values through planting species indicative of CPW as well as providing connectivity to the native vegetation adjacent to the Proposal Area. With the implementation of the proposed mitigation measures and the establishment of offset plantings described previously, it is considered that the impacts to biodiversity will be minimal and can be appropriately managed.

7. References

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APPENDIX A :

Likelihood of Occurrence Table

Table 10. Threatened flora likelihood of occurrence table

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|---------------------------------|--------------------------|---------------|-----------------|-------------------|--|---|
| <i>Acacia bynoeana</i> | Bynoe's Wattle | | V | 1 | Found in heath and woodland on sandy soils. Prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include <i>Corymbia maculata</i> (Red Bloodwood), <i>Eucalyptus haemastoma</i> (Scribbly Gum), <i>Eucalyptus parramattensis</i> (Parramatta Red Gum), <i>Banksia serrata</i> (Saw Banksia) and <i>Angophora bakeri</i> (Narrow-leaved Apple). | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Acacia pubescens</i> | Downy Wattle | | V | 1 | Occurs on alluviums, shales and at the intergrade between shales and sandstones. Occur in open woodland and forest, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Allocasuarina glareicola</i> | | | E | 1 | Grows in Castlereagh woodland on lateritic soil with <i>Eucalyptus parramattensis</i> , <i>Eucalyptus fibrosa</i> , <i>Angophora bakeri</i> , <i>Eucalyptus sclerophylla</i> and <i>Melaleuca decora</i> . Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Cynanchum elegans</i> | White-flowered Wax Plant | | E | 1 | Usually associated with dry rainforest vegetation and in coastal communities. Can occur in clay influenced woodland associated with <i>Eucalyptus tereticornis</i> and <i>Corymbia maculata</i> . | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|--|---|---------------|-----------------|-------------------|--|---|
| <i>Genoplesium baueri</i> | Yellow Gnat-orchid | | E | 1 | Grows in dry sclerophyll forest and moss gardens over sandstone. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Grevillea parviflora</i> subsp. <i>parviflora</i> | Small-flower Grevillea | | V | 1 | Grows in light sandy or clay soils over thin shales, often with lateritic ironstone gravels and nodules. Is known to occur in Shale/Sandstone Transition Forest. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Haloragis exalata</i> subsp. <i>exalata</i> | Wingless Raspwort | | V | 1 | Species requires protected and shaded damp situations in riparian habitats. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> | <i>Marsdenia viridiflora</i> R. Br. subsp. <i>viridiflora</i> population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local | E | | 1 | Found in open shale woodland in vine thickets. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence | |
|---------------------------|------------------|---------------|-----------------|-------------------|--|---|---|
| | government areas | | | | | | |
| <i>Persicaria elatior</i> | Knotweed | | V | 1 | Species in known to occur in Raymond Terrace and Grafton areas. Grows in damp places, preferring areas near streams and lakes and occasionally found in swamp forest. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. | |
| <i>Persoonia hirsuta</i> | Hairy Geebung | | E | 1 | Occurs in dry sclerophyll forest and woodland with a shrubby understorey. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. | |
| <i>Persoonia nutans</i> | Nodding Geebung | | E | 1 | 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. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. | |
| <i>Pimelea spicata</i> | Spiked flower | Rice- | E | E | 800 | On the Cumberland Plain sites, it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark. In the coastal Illawarra it occurs commonly in Coast Banksia open woodland | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|-----------------------------|-------------------------|---------------|-----------------|-------------------|--|---|
| | | | | | with a better developed shrub and grass understorey. Coastal headlands and hilltops are the favoured sites. | |
| <i>Pomaderris brunnea</i> | Rufous Pomaderris | | V | 1 | In the region, the species is only found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Pterostylis gibbosa</i> | Illawarra Greenhood | | E | 1 | All known populations grow in open forest or woodland, on flat or gently sloping land with poor drainage. In the Illawarra region, the species grows in woodland dominated by <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>E. longifolia</i> (Woollybutt), and <i>Melaleuca decora</i> (White Feather Honey-myrtle). Near Nowra, the species grows in open forest of <i>Corymbia maculata</i> (Spotted Gum), <i>E. tereticornis</i> , and <i>E. paniculata</i> (Grey Ironbark). It is only visible above the ground between late summer and spring, and only when soil moisture levels can sustain its growth. The species is currently only known to occur at five sites three in the Illawarra, one near Nowra, and one at Milbrodale in the Hunter Valley. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Pterostylis saxicola</i> | Sydney Plains Greenhood | | E | 1 | The species occurs in small pockets of shallow soil in flat areas on top of sandstone rock shelves above cliff lines, or on mossy rocks in gullies. Sclerophyll forest/woodland often occurs growing above where the species occurs, on shale or shale/sandstone transition | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|------------------------------|---------------------|---------------|-----------------|-------------------|--|---|
| | | | | | soils. Flowering time is from October to December. It is currently only known to occur at five locations within western Sydney: Georges River National Park, close to Yeramba Lagoon, Peter Meadows Creek, and St Marys Towers. | |
| <i>Pultenaea parviflora</i> | | | V | 1 | Endemic to the Cumberland Plain. Core distribution is from Windsor to Penrith and east to Dean Park. Found in scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays and in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Pultenaea pedunculata</i> | Matted pea | Bush- | E | 1 | Within the Cumberland Plain, the species favours clay or sandy-clay soils on Wianamatta Shale-derived soils, usually close to Tertiary alluvium or Shale-Sandstone interface. All sites have a lateritic influence with ironstone gravel present. Associated tree species include: <i>Eucalyptus moluccana</i> , <i>E. fibrosa</i> , <i>E. crebra</i> , <i>E. longifolia</i> and <i>Melaleuca decora</i> . | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Syzygium paniculatum</i> | Magenta Lilly Pilly | | V | 1 | On south coast of NSW occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities. | Unlikely to Occur. The vegetation within the subject site is sufficiently degraded that habitat is not suitable for this species. |
| <i>Thesium australe</i> | Austral Toadflax | | V | 1 | Found in very small populations scattered across eastern NSW. Occurs in grassland on coastal headlands or grassland and grassy | Unlikely to Occur. The vegetation within the subject site is sufficiently |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|-----------------|-------------|---------------|-----------------|-------------------|--|---|
| | | | | | woodland away from the coast. Often found in association with Kangaroo Grass (<i>Themeda australis</i>). | degraded that habitat is not suitable for this species. |

Key: V = Vulnerable, E = Endangered, CE = Critically Endangered

Table 11. Threatened fauna likelihood of occurrence table

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|---------------------------------|----------------------------|---------------|-----------------|-------------------|---|---|
| Amphibia | | | | | | |
| <i>Heleioporus australiacus</i> | Giant Burrowing Frog | | V | 1 | Occurs in heath, woodland and open dry sclerophyll forest on a variety of soil types. Breeding habitat for this species usually contains soaks or pools within first of second order streams. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Litoria aurea</i> | Green and Golden Bell Frog | E | V | 1 | The species is found in a wide range of water bodies except fast moving streams. It commonly inhabits disturbed sites such as abandoned quarries and mines, though generally breeds in habitats that include still, shallow, unpolluted water bodies, that are unshaded, contain aquatic plants are free of Mosquito fish and other predators, with a range of diurnal shelter sites (emergent aquatic vegetation). | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Litoria raniformis</i> | Growling Grass Frog | | V | 1 | Occurs in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| Aves | | | | | | |
| <i>Botaurus poiciloptilus</i> | Australasian Bittern | | E | 1 | Occurs in freshwater wetlands, and more rarely, estuarine wetlands. It favours wetlands | Unlikely to occur. No suitable habitat present |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|-----------------------------|--------------------------|---------------|-----------------|-------------------|---|---|
| | | | | | with tall, dense vegetation, and forages in shallow water up to a depth of 0.3m. It nests in deep vegetative cover over shallow pools. | within the subject site to lack of waterbodies. |
| <i>Rostratula australis</i> | Australian Painted Snipe | | E | 1 | Inhabits fringes of shallow inland wetlands, swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Monarcha melanopsis</i> | Black-faced Monarch | | M | 1 | Found along the coast of eastern Australia, becoming less common further south. The Black-faced Monarch is found in rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Ardea ibis</i> | Cattle Egret | | M | 20 | Found in grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor. Will also forage at garbage dumps and is often seen with cattle and other stock. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Calidris ferruginea</i> | Curlew Sandpiper | | CE | 1 | The Curlew Sandpiper is found in coastal areas with intertidal mudflats, including estuaries, inlets and lagoons, and ponds in saltworks. The species have also occasionally been recorded inland around lakes, dams and waterholes with mud or sand present. Main requirements for feeding habitats are the presence of mudflats or shallow water up to 60mm. The Curlew Sandpiper may also forage | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|--|-------------------|---------------|-----------------|-------------------|--|---|
| | | | | | in saltmarsh environments and flooded paddocks. | |
| <i>Artamus cyanopterus cyanopterus</i> | Dusky Woodswallow | V | | 19 | In New South Wales the species is widespread from coast to inland, including the western slopes of the Great Dividing Range and farther west. The Dusky Woodswallow is found in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. The species primarily eats invertebrates, mainly insects, which are captured whilst hovering and sallying above the canopy or over water. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Numenius madagascariensis</i> | Eastern Curlew | | CE | 1 | Prefers sheltered coasts, especially estuaries, bays, harbours, inlets and lagoons. Also known to occur in sewage farms, wetlands and mangroves. Species roosts on sandy spits and in low Saltmarsh or mangroves. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Gallinago hardwickii</i> | Latham's Snipe | | M | 1 | Seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Hieraaetus morphnoides</i> | Little Eagle | V | | 6 | The Little Eagle occupies habitats rich in prey within open eucalypt forest, woodland, or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. For nest sites it requires a tall living tree within a remnant patch. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|-----------------------------|--------------------|---------------|-----------------|-------------------|---|---|
| <i>Glossopsitta pusilla</i> | Little Lorikeet | V | | 2 | Forages primarily in the canopy of open <i>Eucalyptus</i> forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Also utilises isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees. 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. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Cuculus optatus</i> | Oriental Cuckoo | | M | 1 | Non-breeding visitor to Australia who is a brood parasite. Usually inhabits forested areas and can be found at all levels of the canopy and at a range of elevations. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Grantiella picta</i> | Painted Honeyeater | | CE | 1 | Occurs in Boree, Brigalow and Box-Gum Woodlands and Box-Ironbarks. Feeds primarily on mistletoe fruit and insects. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Ninox strenua</i> | Powerful Owl | V | | 1 | In NSW the Powerful Owl lives in forests and woodlands occurring in the coastal, escarpment, tablelands and western slopes environments. Specific habitat requirements include eucalypt forests and woodlands on productive sites on gentle terrain; a mosaic of | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|-----------------------------|--------------------|---------------|-----------------|-------------------|--|--|
| | | | | | moist and dry types, with mesic gullies and permanent streams; presence of leafy sub canopy trees or tall shrubs for roosting; presence of large old trees to provide nest hollows. Optimal habitat includes a tall shrub layer and abundant hollows supporting high densities of arboreal marsupials. | |
| <i>Anthochaera phrygia</i> | Regent Honeyeater | CE | CE | 1 | Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. | Unlikely to occur. Subject site is not located in mapped as Regent Honeyeater breeding habitat. Also, very limited number of sightings recorded within the locality and limited suitable foraging habitat due to lack of mistletoes. |
| <i>Rhipidura rufifrons</i> | Rufous Fantail | | M | 1 | Found in rainforest, dense wet forests, swamp woodlands and mangroves, preferring deep shade, and is often seen close to the ground. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Myiagra cyanoleuca</i> | Satin Flycatcher | | M | 1 | Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Monarcha trivirgatus</i> | Spectacled Monarch | | M | 1 | The Spectacled Monarch prefers thick understorey in rainforests, wet gullies and | Unlikely to occur. The vegetation within the |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|----------------------------------|------------------|---------------|-----------------|-------------------|---|---|
| | | | | | waterside vegetation, as well as mangroves. The Spectacled Monarch is found in coastal north-eastern and eastern Australia, including coastal islands, from Cape York, Queensland to Port Stephens, New South Wales. It is much less common in the south. It is also found in Papua New Guinea, the Moluccas and Timor. | subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Circus assimilis</i> | Spotted Harrier | V | | 1 | Occurs throughout mainland Australia except in densely forested or wooded habitats of the coast, escarpment, and ranges. It inhabits open grassy woodland, shrubland, and grassland. It nests in trees and preys on terrestrial mammals, birds, and reptiles, and will occasionally consume carrion. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Lathamus discolor</i> | Swift Parrot | E | CE | 211 | In NSW mostly occurs on the coast and south west slopes. 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 <i>Eucalyptus robusta</i> , <i>Corymbia maculata</i> , <i>C. gummifera</i> , <i>E. sideroxylon</i> , and <i>E. albens</i> . Breeds in Tasmania in spring and summer. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Neophema pulchella</i> | Turquoise Parrot | V | | 1 | Found at the edges of eucalypt woodland adjacent to clearings, timbered ridges and creeks in farmland. Associated with coastal scrubland, open forest and timbered grassland. Nests in hollow-bearing trees, logs or posts. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Daphoenositta chrysoptera</i> | Varied Sittella | V | | 19 | Inhabits eucalypt forests and woodlands, especially those containing rough-barked | Unlikely to occur. The vegetation within the |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|-------------------------------|-----------------------------|---------------|-----------------|-------------------|---|---|
| | | | | | species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Inhabits most of mainland Australia except the treeless deserts and open grasslands. | subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Hirundapus caudacutus</i> | White-throated Needletail | | V | 1 | Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Occur over most types of habitat, particularly above wooded areas including open forest and rainforest, between trees or in clearings and below the canopy. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Motacilla flava</i> | Yellow Wagtail | | M | 1 | Species is believed to be a regular summer visitor to NSW, preferring open grassy flats near water. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| Gastropoda | | | | | | |
| <i>Meridolum corneovirens</i> | Cumberland Plain Land Snail | E | | 117 | Primarily inhabits Cumberland Plain Woodland. Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Lives in a very small area on the Cumberland Plain west of Sydney, from Richmond and Windsor south to Picton and from Liverpool west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. | Unlikely to occur. The subject site comprises mostly exotic grassland not suitable for foraging. |
| Mammalia | | | | | | |
| <i>Petrogale penicillata</i> | Brush-tailed Rock-wallaby | | V | 1 | Prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky | Unlikely to occur. The vegetation within the |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|-----------------------------------|---------------------------------|---------------|-----------------|-------------------|---|---|
| | | | | | slopes, cliffs, gorges, and isolated rock stacks. Vegetation types associated with the species include dense forest, wet sclerophyll forest, vine thicket, dry sclerophyll forest, and open forest. | subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Micronomus norfolkensis</i> | Eastern Coastal Free-tailed Bat | V | | 34 | Found in dry sclerophyll forest, woodland, swamp forest and mangrove forests east of the Great Dividing Range. Primarily roosts in tree hollows but will also utilise man-made structures. | Potential to occur. Marginal foraging habitat present within the subject site in the form of sparse woodland and grassland for foraging. No breeding habitat present. |
| <i>Falsistrellus tasmaniensis</i> | Eastern False Pipistrelle | V | | 18 | Favours hollow trunks of Eucalypt trees over 20m high in wet sclerophyll forest and coastal mallee. Occasionally found in old wooden buildings. | Potential to occur. Marginal foraging habitat present within the subject site in the form of sparse woodland and grassland for foraging. No breeding habitat present. |
| <i>Scoteanax rueppellii</i> | Greater Broad-nosed Bat | V | | 15 | Found mainly in the gullies and river systems that drain the Great Dividing Range. Usually roosts in tree hollows and buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects. | Potential to occur. Marginal foraging habitat present within the subject site in the form of sparse woodland and grassland for foraging. No breeding habitat present. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|---------------------------------------|------------------------|---------------|-----------------|-------------------|---|---|
| <i>Petauroides volans</i> | Greater Glider | | V | 1 | Occurs in eucalypt forests and woodlands from north-eastern Queensland to the Central Highlands of Victoria. The species has a relatively small home range which consists of numerous tree hollows. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Pteropus poliocephalus</i> | Grey-headed Flying-fox | V | V | 84 | Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. | Unlikely to occur. The subject site comprises mostly exotic grassland not suitable for foraging. |
| <i>Phascolarctos cinereus</i> | Koala | V | V | 1 | Inhabit eucalypt woodlands and forests. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Miniopterus orianae oceanensis</i> | Large Bent-winged Bat | V | | 20 | Forages above the canopy and eats mostly moths. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. | Potential to occur. Marginal foraging habitat present within the subject site in the form of sparse woodland and grassland for foraging. No breeding habitat present. |
| <i>Chalinolobus dwyeri</i> | Large-eared Pied Bat | | V | 1 | The species is associated with areas dominated by sandstone escarpments; sandstone cliffs and fertile woodland valley | Unlikely to occur. The vegetation within the subject site is sufficiently |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|----------------------------------|------------------------|---------------|-----------------|-------------------|--|---|
| | | | | | habitat occurring in close proximity to each other is important for the species. It roosts in cliff/escarpment areas and forages in fertile forest. Roosting is predominately in arch caves with dome roofs, but has been observed in disused mines shafts, overhangs, and disused Fairy Martin nests. | degraded that no suitable habitat is present. |
| <i>Miniopterus australis</i> | Little Bent-winged Bat | V | | 2 | Moist eucalypt forest, rainforest or dense coastal banksia scrub. Little Bentwing-bats roost in caves, tunnels and sometimes tree hollows during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. | Potential to occur. Marginal foraging habitat present within the subject site in the form of sparse woodland and grassland for foraging. No breeding habitat present. |
| <i>Pseudomys novaehollandiae</i> | New Holland Mouse | | V | 1 | Occurs in open habitats (heathland, woodland and forest) with a heath understorey and vegetated sand dunes. The species prefers deep soft top soils in order to burrow. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Myotis macropus</i> | Southern Myotis | V | | 18 | Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. | Potential to occur. Marginal foraging habitat present within the subject site in the form of sparse woodland and grassland for foraging. No breeding habitat present. |

| Scientific Name | Common Name | BC Act Status | EPBC Act Status | Number of Records | Habitat Requirements | Likelihood of Occurrence |
|-------------------------------------|--------------------------------|---------------|-----------------|-------------------|--|---|
| <i>Dasyurus maculatus maculatus</i> | Spot-tailed Quoll | | E | 1 | Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. | Unlikely to occur. The vegetation within the subject site is sufficiently degraded that no suitable habitat is present. |
| <i>Saccolaimus flaviventris</i> | Yellow-bellied Sheath-tail-bat | V | | 3 | Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. | Potential to occur. Marginal foraging habitat present within the subject site in the form of sparse woodland and grassland for foraging. No breeding habitat present. |

Key: V = Vulnerable, E = Endangered, CE = Critically Endangered, M = Migratory

APPENDIX B :

Flora Species List

| Scientific Name | Exotic | Common Name | Family | BC Act Status | EPBC Act Status | High Threat Weed | Plot 1 | | Plot 2 | | RMS 1 |
|----------------------------------|--------|----------------------|------------------------|---------------|-----------------|------------------|--------|------|--------|-----|-------|
| | | | | | | | C | A | C | A | |
| <i>Acacia falciformis</i> | | Broad-leaved Hickory | Fabaceae (Mimosoideae) | Not Listed | Not Listed | | | | 0.1 | 1 | |
| <i>Alternanthera denticulata</i> | | Lesser Joyweed | Amaranthaceae | Not Listed | Not Listed | | 0.1 | 3 | 0.1 | 10 | X |
| <i>Avena barbata</i> | * | Bearded Oats | Poaceae | Not Listed | Not Listed | | 0.5 | 25 | 0.2 | 20 | X |
| <i>Briza subaristata</i> | * | | Poaceae | Not Listed | Not Listed | YES | 0.5 | 30 | 5 | 500 | |
| <i>Brunonia australis</i> | | Blue Pincushion | Goodeniaceae | Not Listed | Not Listed | | | | 0.2 | 35 | |
| <i>Cenchrus clandestinus</i> | * | Kikuyu Grass | Poaceae | Not Listed | Not Listed | YES | | | | | X |
| <i>Chloris ventricosa</i> | | Tall Chloris | Poaceae | Not Listed | Not Listed | | | | 0.2 | 20 | |
| <i>Cirsium vulgare</i> | * | Spear Thistle | Asteraceae | Not Listed | Not Listed | | 0.1 | 1 | | | |
| <i>Commelina cyanea</i> | | Native Wandering Jew | Commelinaceae | Not Listed | Not Listed | | | | 0.1 | 10 | |
| <i>Conyza sumatrensis</i> | * | Tall fleabane | Asteraceae | Not Listed | Not Listed | | | | | | X |
| <i>Cymbopogon refractus</i> | | Barbed Wire Grass | Poaceae | Not Listed | Not Listed | | 0.2 | 25 | | | |
| <i>Cynodon dactylon</i> | | Common Couch | Poaceae | Not Listed | Not Listed | | 90 | 9000 | 5 | 500 | X |
| <i>Cyperus eragrostis</i> | * | Umbrella Sedge | Cyperaceae | Not Listed | Not Listed | YES | | | | | X |

| | | | | | | | | | | | |
|--|---|------------------------|-------------------------|------------|------------|-----|-----|-----|-----|----|---|
| <i>Dichondra repens</i> | | Kidney Weed | Convolvulaceae | Not Listed | Not Listed | | | 0.2 | 30 | | |
| <i>Ehrharta erecta</i> | * | Panic Veldtgrass | Poaceae | Not Listed | Not Listed | YES | | 0.2 | 20 | | |
| <i>Einadia nutans</i> subsp. <i>linifolia</i> | | Climbing Saltbush | Chenopodiaceae | Not Listed | Not Listed | | | 0.1 | 1 | | |
| <i>Eucalyptus moluccana</i> | | Grey Box | Myrtaceae | Not Listed | Not Listed | | 0.2 | 1 | 5 | 4 | |
| <i>Eucalyptus tereticornis</i> | | Forest Red Gum | Myrtaceae | Not Listed | Not Listed | | | 14 | 7 | | |
| <i>Foeniculum vulgare</i> | * | Fennel | Apiaceae | Not Listed | Not Listed | | | | | X | |
| <i>Glycine tabacina</i> | | Variable Glycine | Fabaceae (Faboideae) | Not Listed | Not Listed | | | 0.1 | 10 | | |
| <i>Lactuca saligna</i> | * | Willow-leaved Lettuce | Asteraceae | Not Listed | Not Listed | | 0.1 | 3 | | X | |
| <i>Lomandra multiflora</i> | | Many-flowered Mat-rush | Lomandraceae | Not Listed | Not Listed | | | 0.1 | 5 | | |
| <i>Melaleuca decora</i> | | | Myrtaceae | Not Listed | Not Listed | | | 10 | 5 | | |
| <i>Microlaena stipoides</i> | | Weeping Grass | Poaceae | Not Listed | Not Listed | | | 1 | 0 | | |
| <i>Nothoscordum gracile</i> | * | Onion Weed | Alliaceae | Not Listed | Not Listed | | | | | X | |
| <i>Onopordum acanthium</i> | * | Scotch Thistle | Asteraceae | Not Listed | Not Listed | | 0.1 | 5 | | X | |
| <i>Paspalum dilatatum</i> | * | Paspalum | Poaceae | Not Listed | Not Listed | YES | 5 | 250 | 1 | 50 | X |
| <i>Plantago lanceolata</i> | * | Lamb's Tongues | Plantaginaceae | Not Listed | Not Listed | | 0.1 | 10 | 0.2 | 25 | X |

| | | | | | | | | | | | |
|---------------------------------|---|------------------------|--------------|------------|------------|-----|-----|----|-----|----|---|
| <i>Rumex crispus</i> | * | Curled Dock | Polygonaceae | Not Listed | Not Listed | | 0.1 | 5 | | | X |
| <i>Senecio madagascariensis</i> | * | Fireweed | Asteraceae | Not Listed | Not Listed | YES | 0.1 | 5 | 0.1 | 5 | |
| <i>Sida rhombifolia</i> | * | Paddy's Lucerne | Malvaceae | Not Listed | Not Listed | | | | 0.1 | 10 | |
| <i>Solanum nigrum</i> | * | Black-berry Nightshade | Solanaceae | Not Listed | Not Listed | | 0.1 | 10 | | | X |
| <i>Sonchus oleraceus</i> | * | Common Sowthistle | Asteraceae | Not Listed | Not Listed | | | | | | X |
| <i>Taraxacum officinale</i> | * | Dandelion | Asteraceae | Not Listed | Not Listed | | | | | | X |
| <i>Tragopogon porrifolius</i> | * | Salsify | Asteraceae | Not Listed | Not Listed | | 0.1 | 5 | | | X |
| <i>Verbena bonariensis</i> | * | Purpletop | Verbenaceae | Not Listed | Not Listed | | 0.5 | 25 | | | X |

APPENDIX C :

Existing Car Park Survey Data

Table 12 Survey data of existing car park

| Number of trees | Species | Stratum | DBH (cm) | No. of Hollows | Leaf litter (%) |
|-----------------|---------------------------------|------------|----------|----------------|-----------------|
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 8 | 0 | 50 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 40 |
| 1 | <i>Callistemon salignus</i> | Shrub | 12 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 8 | 0 | 80 |
| 1 | <i>Callistemon viminalis</i> | Sub Canopy | 25 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 10 | 0 | 0 |
| 1 | <i>Casuarina glauca</i> | Sub Canopy | 15 | 0 | 0 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 12 | 0 | 50 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 7 | 0 | 70 |
| 1 | <i>Casuarina glauca</i> | Sub Canopy | 10 | 0 | 50 |
| 1 | <i>Casuarina glauca</i> | Sub Canopy | 8 | 0 | 50 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 5 | 0 | 50 |
| 4 | <i>Callistemon salignus</i> | Shrub | 3 | 0 | 60 |
| 2 | <i>Acacia implexa</i> | Sub Canopy | 5 | 0 | 5 |
| 9 | <i>Callistemon salignus</i> | Shrub | 3 | 0 | 50 |
| 1 | <i>Casuarina glauca</i> | Sub Canopy | 8 | 0 | 50 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 5 | 0 | 50 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 3 | 0 | 0 |
| 1 | <i>Acacia decurrens</i> | Sub Canopy | 7 | 0 | 60 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 2 | 0 | 50 |
| 1 | <i>Eucalyptus melliodora</i> | Sub Canopy | 12 | 0 | 10 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 7 | 0 | 20 |

| Number of trees | Species | Stratum | DBH (cm) | No. of Hollows | Leaf litter (%) |
|-----------------|---------------------------------|------------|----------|----------------|-----------------|
| 22 | <i>Callistemon salignus</i> | Shrub | 10 | 0 | 80 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 4 | 0 | 10 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 2 | 0 | 10 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 4 | 0 | 10 |
| 1 | <i>Melaleuca styphelioides</i> | Sub Canopy | 4 | 0 | 10 |
| 1 | <i>Acacia decurrens</i> | Sub Canopy | 6 | 0 | 20 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 3 | 0 | 20 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 3 | 0 | 20 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 10 | 0 | 0 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 14 | 0 | 10 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 10 | 0 | 10 |
| 1 | <i>Melaleuca styphelioides</i> | Sub Canopy | 10 | 0 | 40 |
| 7 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 11 | 0 | 60 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 10 | 0 | 40 |
| 3 | <i>Allocasuarina littoralis</i> | Sub Canopy | 6 | 0 | 20 |
| 2 | <i>Allocasuarina littoralis</i> | Sub Canopy | 7 | 0 | 20 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 7 | 0 | 5 |
| 2 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 10 | 0 | 20 |
| 1 | <i>Melaleuca styphelioides</i> | Sub Canopy | 5 | 0 | 20 |
| 6 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 12 | 0 | 40 |
| 2 | <i>Lophostemon confertus</i> | Sub Canopy | 5 | 0 | 20 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 12 | 0 | 60 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 7 | 0 | 5 |
| 2 | <i>Allocasuarina littoralis</i> | Sub Canopy | 10 | 0 | 10 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 5 | 0 | 10 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 20 | 0 | 10 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 12 | 0 | 10 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 8 | 0 | 10 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 15 | 0 | 20 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 7 | 0 | 20 |
| 1 | <i>Melaleuca styphelioides</i> | Sub Canopy | 9 | 0 | 30 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 18 | 0 | 20 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 7 | 0 | 40 |

| Number of trees | Species | Stratum | DBH (cm) | No. of Hollows | Leaf litter (%) |
|-----------------|---------------------------------|------------|----------|----------------|-----------------|
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 12 | 0 | 40 |
| 1 | <i>Eleocharis reticulatus</i> | Sub Canopy | 3 | 0 | 70 |
| 1 | <i>Allocasuarina littoralis</i> | Sub Canopy | 10 | 0 | 50 |
| 1 | <i>Eleocharis reticulatus</i> | Sub Canopy | 3 | 0 | 50 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 14 | 0 | 40 |
| 1 | <i>Eleocharis reticulatus</i> | Sub Canopy | 1 | 0 | 0 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 3 | 0 | 10 |
| 3 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 6 | 0 | 20 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 6 | 0 | 30 |
| 4 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 6 | 0 | 60 |
| 1 | <i>Melaleuca styphelioides</i> | Sub Canopy | 3 | 0 | 20 |
| 2 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 6 | 0 | 10 |
| 1 | <i>Eleocharis reticulatus</i> | Sub Canopy | 2 | 0 | 20 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 14 | 0 | 10 |
| 1 | <i>Acacia decurrens</i> | Sub Canopy | 7 | 0 | 10 |
| 1 | <i>Eleocharis reticulatus</i> | Sub Canopy | 1 | 0 | 10 |
| 1 | <i>Acacia decurrens</i> | Sub Canopy | 5 | 0 | 10 |
| 7 | <i>Acacia decurrens</i> | Sub Canopy | 7 | 0 | 10 |
| 1 | <i>Eleocharis reticulatus</i> | Shrub | 2 | 0 | 20 |
| 1 | <i>Acacia implexa</i> | Sub Canopy | 6 | 0 | 40 |
| 2 | <i>Eleocharis reticulatus</i> | Sub Canopy | 2 | 0 | 40 |
| 1 | <i>Acacia decurrens</i> | Sub Canopy | 10 | 0 | 20 |
| 3 | <i>Eleocharis reticulatus</i> | shrub | 2 | 0 | 20 |
| 6 | <i>Acacia decurrens</i> | Sub Canopy | 10 | 0 | 20 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 10 | 0 | 20 |
| 1 | <i>Eleocharis reticulatus</i> | Sub Canopy | 4 | 0 | 20 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 12 | 0 | 20 |
| 1 | <i>Eleocharis reticulatus</i> | Sub Canopy | 3 | 0 | 40 |
| 2 | <i>Lophostemon confertus</i> | Sub Canopy | 6 | 0 | 20 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 15 | 0 | 10 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 6 | 0 | 20 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 7 | 0 | 20 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 4 | 0 | 10 |

| Number of trees | Species | Stratum | DBH (cm) | No. of Hollows | Leaf litter (%) |
|-----------------|--------------------------------|------------|----------|----------------|-----------------|
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 12 | 0 | 20 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 8 | 0 | 5 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 5 | 0 | 40 |
| 2 | <i>Dodonaea triquetra</i> | Sub Canopy | 6 | 0 | 20 |
| 10 | <i>Lophostemon confertus</i> | Sub Canopy | 8 | 0 | 20 |
| 9 | <i>Corymbia maculata</i> | Canopy | 12 | 0 | 20 |
| 7 | <i>Corymbia maculata</i> | Canopy | 10 | 0 | 30 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 7 | 0 | 10 |
| 2 | <i>Eleocharis reticulatus</i> | Sub Canopy | 4 | 0 | 40 |
| 1 | <i>Lophostemon confertus</i> | Sub Canopy | 5 | 0 | 20 |
| 1 | <i>Melaleuca quinquenervia</i> | Sub Canopy | 7 | 0 | 20 |

APPENDIX D :

Tests of Significance

D.1. Introduction

This appendix contains the formal Test of Significance required under Section 7.3 of the BC Act that have been prepared in accordance with the DRAFT Threatened Species Test of Significance Guidelines (OEH 2018). The Test of Significance is used for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats.

A Test of Significance has been prepared to collectively assess potential impacts on threatened fauna species listed under the BC Act that are considered to have the potential to occur within the subject site as described in **Appendix A**. Each Test of Significance is a series of factors (shown as italicised text below) for which a response has been supplied beneath in plain text.

D.2. Tests of Significance

D.2.1. Cumberland Plain Woodland

Cumberland Plain Woodland typically comprises an open tree canopy layer, sometimes with a shrub layer and groundcover dominated by grasses and herbs. Dominant canopy species are *Eucalyptus moluccana* (Coastal Grey Box) and *E. tereticornis* (Forest Red Gum), often with *E. crebra* (Narrow-leaved Ironbark), *E. eugenioides* (Narrow-leaved Stringybark), *Corymbia maculata* (Spotted Gum) or other less frequently occurring eucalypts, including *Angophora floribunda*, *A. subvelutina* (Broad-leaved Apple), *E. amplifolia* (Cabbage Gum) and *E. fibrosa* (Broad-leaved Ironbark) (NSW Scientific Committee 2011). Soils within this community are derived from Wianamatta Group geology. Cumberland Plain Woodland is listed as a Critically Endangered Ecological Community under the TSC and EPBC Act.

Within the subject site, a total of 0.005 ha of Cumberland Plain Woodland is present, comprising one *Eucalyptus moluccana* (Grey Box) individual. This tree is on the southern edge of a larger patch of CPW that stretches northward outside the subject site towards Bringelly Road. It is evident that the vegetation on the subject site has been cleared extensively from historic and on-going land uses from agricultural development and infrastructure, and therefore contains a relatively degraded understorey predominantly comprising exotic species.

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

Not applicable

- b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
 - i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
 - 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 total area of Cumberland Plain Woodland present within the subject site is 0.005 ha, all of which is proposed to be removed to facilitate the Proposal. The CPW to be removed is represented by one *Eucalyptus moluccana* (Grey Box) individual.

Within the subject site, while all the CPW is being removed, the tree is on the edge of a much larger patch. It is unlikely that the Proposal will have any adverse effect on the extent or composition of the local occurrence of CPW such that it places the community at risk of extinction.

- c. *In relation to the habitat of a threatened species or ecological community:*
- i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
 - ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
 - iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

Approximately 0.005 ha of Cumberland Plain Woodland will be removed as a result of the Proposal, which comprises <0.01% of the community's local occurrence and of the community in the locality.

Cumberland Plain Woodland occurring within the subject site has previously been fragmented by previous land use. The Proposal will clear all remaining fragments of this community present, represented by one tree. The habitat within the subject site does not join onto any national parks or reserves.

The community within the subject site has already been impacted by previous and current land uses. This has resulted in impacts such as spread of exotic species. Due to the community's generally degraded nature, the Cumberland Plain Woodland to be removed is not considered important for the long-term survival of the community in the locality.

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

No area of outstanding biodiversity value for the assessed threatened community has currently been identified under the BC Act. No area of outstanding biodiversity value is located in the locality of the subject site.

- e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The following key threatening processes are relevant to Cumberland Plain Woodland occurring within the subject site:

- Clearing of native vegetation

Approximately 0.005 ha of Cumberland Plain Woodland will be removed for the Proposal. This is represented by one tree that occurs on the edge of a much larger patch of CPW. The removal of this tree will unlikely have any adverse effects on this patch of vegetation or to CPW within the locality.

- Invasion of native plant communities by exotic perennial grasses

The Proposal has the potential to result in the spread of exotic grasses. In order to mitigate this key threatening process, mitigation measures will be implemented during clearing works to further minimise the risk of weeds spreading during the Proposal. Mitigation measures to be implemented include: no mulching of weeds, disposal of all weeds off-site and weeds must be covered when transporting off-site.

- Invasion and establishment of exotic vines and scramblers;

The Proposal has the potential to result in the spread of exotic weeds. In order to mitigate this key threatening process, mitigation measures will be implemented during clearing works to further minimise the risk of weeds spreading during the Proposal. Mitigation measures to be implemented include: no mulching of weeds, disposal of all weeds off-site and weeds must be covered when transporting off-site.

- High frequency fire resulting in disruption of life cycle processes in plants and animals and loss of vegetation structure and composition.

The Proposal is unlikely to contribute to high frequency fire further than current conditions.

Conclusion

The Proposal will result in the removal of all Cumberland Plain Woodland (0.005 ha) from the subject site. This represents less than 0.01% of the community within the locality. The community within the subject site exists as one *Eucalyptus moluccana* (Grey Box) individual that has been degraded due to surrounding land uses. Although all of the community will be removed from the subject site, the tree is on the southern edge of a larger patch of CPW that stretches northward towards Bringelly Road. In this regard, when considered in the context of the community's occurrence in the locality and its condition within the subject site, the overall impact on the community in the wider context is not considered to be significant.

D.2.2. Threatened Fauna Species

The vegetation to be impacted comprising potential habitat for threatened fauna species includes Cumberland Plain Woodland in the form of one *Eucalyptus moluccana* (Grey Box) individuals and Exotic Grassland. The habitat within the subject site is only considered to constitute marginal foraging habitat for the assessed species due to its degraded condition and a lack of habitat features typically utilised for breeding. Subsequently, impacts of the Proposal upon threatened fauna likely to occur within the subject site have been assessed together in a single Test of Significance. This Test of Significance covers the following Microchiropteran bat species:

- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*);
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*);

- Greater Broad-nosed Bat (*Scoteanax rueppellii*);
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*); and
- Southern Myotis (*Myotis macropus*).

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

None of the species being assessed have been recorded within the subject site; however, they have been recorded within a 5 km radius of the subject site (i.e. the locality) and subsequently, the local populations of these potentially occurring species is considered to extend beyond the subject site. The assessed species would be expected to utilise the foraging resources within the subject site occasionally or opportunistically as part of a much broader habitat range.

Due to the highly modified, artificial and degraded nature of the majority of the various habitats within the subject site, it is not likely to constitute breeding habitat for any of the species being assessed. The subject site does not contain suitable breeding habitat in the form of caves for the Large Bent-winged Bat, nor does it contain hollow-bearing trees suitable for utilisation for breeding by hollow dwelling species. Accordingly, the Proposal is not considered to have an adverse effect on the life cycle of these species such that a viable local population is likely to be placed at risk of extinction.

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

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

c. *In relation to the habitat of a threatened species or ecological community:*

- i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
- ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
- iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

These highly mobile fauna species will primarily be impacted by the Proposal through the removal and modification of a ~0.175 ha area of marginal foraging habitat, comprising CPW (~0.005 ha), and Exotic

Grassland (~0.17 ha). The primary foraging habitat feature within this area of vegetation is the existing canopy of CPW and Exotic Grassland, comprising foliage, blooms and associated invertebrates. The potential impacts to woody vegetation comprising habitat for the assessed species are expected to be localised and are not considered to cause a substantial change in the extent of the broader habitat within the locality.

The Proposal will not significantly increase fragmentation of habitat within the subject site further than current conditions. The encroachment into CPW occurs at the edge of treed habitat within a larger patch extending outside the of subject site. Past land use associated with the existing railway station and rail corridor has resulted in the modification of the habitat of the subject site. A significant increase in edge effects to adjacent vegetation is not anticipated further than current conditions as the vegetation to the north of the subject site is adjacent to an existing rail corridor. Given the condition of the habitat, the small area of habitat directly and indirectly impacted by the Proposal is not important for the long-term survival of the assessed species in the locality.

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

No area of outstanding biodiversity value for the assessed threatened fauna species has currently been identified under the BC Act. No area of outstanding biodiversity value is located in the locality of the subject site.

- e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The Proposal may exacerbate the following key threatening processes, relevant to the species being assessed:

- 'Clearing of native vegetation' as this reduces the area of foraging habitat available for all assessed threatened fauna species. The Proposal will only remove a very small area (~0.005 ha) of CPW; and

Conclusion

Previous clearing and historic land use of the subject site as adjacent to a railway station, railway corridor and farmland has resulted in the degradation of the available habitat, such that it is considered to be marginal foraging habitat only used occasionally and opportunistically by highly mobile and aerial threatened fauna species. The removal of a ~0.005 ha area of marginal foraging habitat comprising CPW and Exotic Grassland is highly unlikely to result in significant impacts on the potentially occurring threatened Microchiropteran bats species.