

Waratah Station Upgrade

Flora and Fauna Assessment Report



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| Name | Signature | Date |
|---------------|-----------|----------|
| Gareth Thomas | | 04/11/18 |

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| | | | |
|---------------------|---|----------------------|--|
| Prepared by: | RPS AUSTRALIA EAST PTY LTD Unit 2A, 45 Fitzroy Street Carrington, NSW 2294 Australia PO Box 120, Carrington NSW 2294 | Prepared for: | TRANSPORT FOR NSW 18 Lee Street Chippendale NSW 2008 Australia |
| T: | +61 2 4940 4200 | T: | 02 8202 2200 |
| E: | Newcastle@rpsgroup.com.au | E: | |
| | | W: | |
| Author: | Mark Aitkens | | |
| Reviewed: | Amanda White | | |
| Approved: | Mark Aitkens | | |
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Summary

Context

RPS Australia East Pty Ltd (RPS) was engaged by Transport for NSW (TfNSW) to prepare a flora and fauna assessment report for the Waratah Station Upgrade, hereafter referred to as the Proposal. The Proposal is part of a NSW Government commitment to facilitating and encouraging the use of public transport. In this circumstance the Proposal is focused on meeting key requirements for the Disability Standards for Accessible Public Transport (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA). This report assesses the impact of the Proposal on listed flora and fauna values identified within the Proposal area.

Methods

Threatened biodiversity listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) relevant to the Proposal were identified to produce a preliminary 'likelihood of occurrence' analysis. Desktop and field investigations were performed in October 2018 including a revised likelihood of occurrence analysis following field validation. Plant Community Types (PCTs) present on site and relevant threatened biodiversity were identified. Impact assessments were performed in accordance with relevant legislation.

Key results – flora species

One observation of a threatened flora species listed under the BC Act and EPBC Act was observed. The Magenta Lilly Pilly (*Syzygium paniculatum*), which is listed as endangered under the BC Act and vulnerable under the EPBC Act, occurs within the footprint of the proposed northern lift. The presence of this species at this location is likely related to its inclusion in historical landscape plantings (circa 1986) and is not representative of a natural occurrence.

Key results – fauna species

There were no observations of any threatened fauna species listed under either the BC Act or the EPBC Act. Foraging habitat for the Grey-headed Flying Fox (*Pteropus poliocephalus*) is associated with Forest Redgum (*Eucalyptus tereticornis*) and Magenta Lilly Pilly. The Grey-headed Flying Fox is listed as vulnerable under the BC Act and EPBC Act.

Key results – plant communities

The Proposal does not coincide with any naturally occurring PCT. Rather, the Proposal area comprises plantings of native and exotic tree and shrub species.

Impacts

It is estimated that the Proposal would result in the loss of one planted specimen of Magenta Lilly Pilly, which is listed as endangered under the BC Act and vulnerable under the EPBC Act. The Grey-headed Flying Fox may opportunistically forage on the fruits of the Magenta Lilly Pilly in the summer period, thus representing an impact on the foraging habitat of this species.

Conclusion

The Proposal would result in the loss of a native tall shrub (Magenta Lilly Pilly), which is listed as threatened on relevant State and Commonwealth legislation. The impacts would be limited to the selective removal of one specimen, believed to be planted as part of prior works at Waratah Station. Impact mitigation is recommended and includes, among other matters, the selective use of Magenta Lilly Pilly in landscaping.

1 Introduction

1.1 Overview

The NSW Government has devised a Transport Access Program initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure where it is needed most. The program aims to provide:

- stations that are accessible to people with a disability, limited mobility and parents with prams
- modern buildings and facilities for all modes that meet the needs of a growing population
- modern interchanges that support an integrated network and allow seamless transfers between all modes for all customers.

Waratah Station and interchange located in the Newcastle LGA (see **Figure 1**) does not currently meet the key requirements of the Disability Standards for Accessible Public Transport (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA) (i.e. non-compliant ramp and stairs requiring upgrading).

1.2 The Proposal

The key features of the Waratah Station Upgrade (the 'Proposal') include the following:

- installation of a new access ramp and stairs from Platt Street to Platform 2
- installation of three new lifts connecting to the existing footbridge, with canopies for weather protection at the waiting areas
- installation of a new elevated walkway connecting the lift on Platform 1 to the existing footbridge, and localised widening of Platform 1 at the lift location
- refurbishment works to the existing footbridge including: replacement of stair treads and handrails, for Tactile Ground Surface Indicators (TGSIs) and localised strengthening, repairs and repainting
- works to the existing station building including: provision of a new Family Accessible Toilet (FAT) and a new unisex ambulant toilet (to replace existing male and female toilets), works to make the waiting room accessible and work to provide a new Station Services Equipment Room (SSER) including extension of the building,
- platform works including localised regrading for accessible paths of travel, platform resurfacing and repairs where impacted by construction activities, adjustment to seating and other facilities on the platforms, and TGSIs adjustments including for the stairways
- ancillary works including:
 - protection or relocation of services and utilities to accommodate the new works
 - upgrade to the station power supply to cater for the new lifts
 - lighting upgrades required for the new work
 - improvement to station security and communication systems (including CCTV upgrade, public address system and new hearing induction loops within the station platforms)
- modifications to wayfinding and other signage
- transport interchange works including a new accessible parking space on Platt Street; upgrade work to provide kiss and ride facilities for all users on Platt Street and Railway Terrace; new bus stop seating in Platt Street and Hanbury Street and relocation of the bicycle racks at the Platt Street station entrance.

1.3 Purpose of report

The purpose of this report is to assess the impacts of the Proposal on threatened biodiversity listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in addition to the general biodiversity values of the existing environment. These assessments have been prepared for threatened species and ecological communities impacted by the Proposal in accordance with:

- Section 7.8 of the BC Act involving the preparation of a Test of Significance under Section 7.3
- *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (DoE 2013, specifically for listings under Section 18 and 18A of the EPBC Act)

Assessments were used to determine if the Proposal is likely to have a significant impact on listed biodiversity values.

1.4 Proposal Area Particulars

| | |
|-------------------------|--|
| Proposal area: | Between Platt Street and Railway Terrace/Hanbury Street, Waratah. |
| LGA: | Newcastle City Council |
| Current land use | The Proposal area is comprised of a station platform, footbridge, footpath and carpark |
| Hydrology | There are no natural water bodies or creek lines within the Proposal area |
| Vegetation | The Proposal area is characterised by hardstand and landscaped vegetation |

1.5 Legislation and Policy

1.5.1 NSW Environmental Planning and Assessment Act 1979

Section 1.7 of the EP&A Act requires the application of Part 7 of the BC Act (i.e. Biodiversity assessment and approvals under the Planning Act). Here, Part 7, Division 2 of the BC Act describes the biodiversity assessment requirements for Part 5, Division 5.1 Activities (Section 7.8).

Transport for NSW (TfNSW) is both the proponent and determining authority and, under Section 110B(1)(a) of the EP&A Act, acts under Part 5 of the EP&A Act. Proponents acting under Part 5, Division 5.1 of the EP&A Act need to consider Sections 7.2 (1)(a) and (c) of the BC Act, as indicated by Section 7.8 of the BC Act.

1.5.2 NSW Biodiversity Conservation Act 2016

The BC Act and supporting regulations establish a modern and integrated legislative framework for land management and conservation in NSW. The purpose of the BC Act, with reference to the assessment of development (Part 4 of the EP&A Act) or activities (Part 5 of the EP&A Act), is:

(k) to establish a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity

(l) to establish a scientific method for assessing the likely impacts on biodiversity values of proposed development and land use change, for calculating measures to offset those impacts and for assessing improvements in biodiversity values

(m) to establish market-based conservation mechanisms through which the biodiversity impacts of development and land use change can be offset at landscape and site scales

The assessment requirement for proponents acting under Part 5 of the EP&A is described in Section 7.3 of the BC Act (i.e. Assessment of Significance or Five-Part Test). This assessment is performed to determine if the Proposal is likely to significantly affect threatened species or ecological communities, or their habitats. If it is determined that a Proposal is likely to significantly affect threatened species or ecological communities, or their habitats, then one of the following two assessments are required:

- Species Impact Statement (SIS) under Part 7 Division 5 of the BC Act or
- Biodiversity Assessment Development Report (BDAR) under Section 7.13 of the BC Act (optional)

Participation in the latter assessment pathway is optional, at the discretion of the determining authority and is subject to the *Biodiversity Assessment Method Order 2017*; hereafter referred to as the Biodiversity Assessment Method (BAM). When opting into the Biodiversity Offset Scheme (BOS) under Part 6 of the BC Act, a Proponent acting under Part 5, Division 5.1 of the EP&A Act may consider Section 7.15 of the BC Act when determining the offsetting arrangements for residual impacts on threatened species, ecological communities or their habitats.

For this Proposal, TfNSW has elected to opt out of the BOS. As outlined above, should the Proposal have a significant impact on threatened species, ecological communities and their habitats then TfNSW would be required to prepare a SIS under Part 7 Division 5 of the BC Act.

1.5.3 NSW Biosecurity Act 2015

The NSW *Biosecurity Act 2015* divides NSW into regions based on combined LGAs and priority weeds for a region. Some weeds are managed at a state level as they form part of a broader containment strategy. The legislation compliments listed Weeds of National Significance (WoNS).

The Act provides for the identification and classification of listed weeds to identify the duty required for management. The duty assigned to the weed informs land managers and owners of their role and responsibility in managing the weed within the Proposal area. Weeds identified as occurring within the Proposal area listed as a priority weed within the region, need to be managed according to the duty assigned to the species in NSW Weed wise.

1.5.4 State Environmental Planning Policy 44 – Koala Habitat Protection

State Environmental Planning Policy No.44 - Koala Habitat Protection (SEPP 44) aims to protect the Koala and its habitat by incorporating prescriptions for consent authorities to consider during the assessment of development applications. SEPP 44 contains prescriptions for the consideration of “potential koala habitat” and “core koala habitat” for developments within local government areas (LGAs) listed in Schedule 1 of the Policy. The Proposal area is located within the Newcastle LGA, which is listed under Schedule 1 as an LGA to which SEPP 44 applies; however, the Proposal is being assessed under Part 5, Division 5.1 of the EP&A Act and as such is not part of a development application to be assessed by Newcastle City Council. Therefore SEPP 44 does not apply; however, this assessment has had regard for the provisions of SEPP 44.

1.5.5 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo a process of assessment. Under the EPBC Act, an action includes a Proposal, undertaking, development or activity that may impact MNES. An action that ‘has, will have or is likely to have a significant impact on a MNES’ is deemed to be a ‘controlled action’ and may not be undertaken without prior approval from the Commonwealth Minister for the Department of the Environment and Energy (DoEE). MNES categories listed under the EPBC Act are:

- world heritage properties
- national heritage places

- wetlands of international importance (Ramsar wetlands)
- threatened species and ecological communities (Section 18 and 18A)
- migratory species
- commonwealth marine areas
- nuclear actions (including uranium mining)
- a water resource, in relation to coal seam gas development and large coal mining development.

The first step in considering MNES protected under the EPBC Act (e.g. Section 18 and 18A) is a self-assessment performed in accordance with the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (DoE 2013). This is performed to determine if there is likelihood for an action to have a significant impact on MNES. Regulatory approval from the Commonwealth Minister for the Environment is required for actions that have, or are likely to have, a significant impact on MNES. The decision to refer an action must have due regard for directions specified under Section 68 of the Act.

1.6 Qualifications and licensing

1.6.1 Qualifications

This report was written by Mark Aitkens (BSc) and reviewed by Amanda White (BEnv.Sc Hons) of RPS.

1.6.2 Licensing

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence S100536 (Valid 31 December 2018)
- Animal Research Authority (Trim File No: 16/361) issued by NSW Department of Primary Industries (Valid 21 March 2019)
- Animal Care and Ethics Committee Certificate of Approval (Trim File No: 16/361) issued by NSW Department of Primary Industries (Valid 21 March 2019)
- Certificate of Accreditation of a Corporation as an Animal Research Establishment (Trim File No: V14/532 & Ref No: AW2001/014) issued by NSW Department of Primary Industries (DPI) (Valid to 22 May 2020).

2 Methodology

This assessment has been prepared in accordance with Assessments of Significance (Section 7.3 of the BC Act) as outlined in **Section 1.5.2**. The methods and tasks performed in preparing this assessment are outlined in the following sections.

2.1 Desktop assessment

2.1.1 Database

A review of relevant information was performed to gain an understanding of the biodiversity values that may occur. Information sources reviewed for a 10 kilometre radius of the Proposal, hereafter referred to as the 'locality', included:

- reviewing of threatened species profiles and notional output from the BAM Credit Calculator
- fauna and flora records contained in the Office of Environment and Heritage (OEH) Atlas of NSW Wildlife (OEH 2018a) (accessed October 2018)
- fauna and flora records contained in the Department of the Environment and Energy (DoEE) Protected Matters Search tool (DoEE 2018) (accessed October 2018).

2.1.2 Spatial datasets

The following spatial datasets were interrogated to describe key landscape parameters for the Proposal area:

- local vegetation mapping
- Mitchell Landscapes (NPWS 2003)
- IBRA Region and subregion mapping (IBRA7).

The latest aerial photography was inspected to review the currency / accuracy of these spatial datasets and to estimate adjacent patch size and condition.

2.1.3 Likelihood of occurrence

The list of threatened species, populations and ecological communities (threatened biodiversity) identified by database searches (i.e. **Section 2.1.1**) were subject to a likelihood of occurrence analysis using the key landscape parameters determined by **Section 2.1.2**. Five 'likelihood of occurrence' categories were attributed to threatened biodiversity. Habitat descriptions were generally taken from the online Threatened Species Profile Database (TSPD) (OEH 2018b).

A preliminary 'likelihood of occurrence' analysis was produced using the categories outlined in **Table 1**. Field validation of this preliminary analysis was performed during the site inspection and subsequently updated to identify species and ecological communities in need of further consideration (i.e. moderate or greater likelihood of occurrence). Also reported in the likelihood of occurrence analysis are:

- the number of BioNet records for each species
- a comment on the recency of these BioNet records (i.e. records of less than five years old are regarded as recent in this assessment).

Table 1 Likelihood of occurrence criteria

| Likelihood Rating | Description |
|-------------------|---|
| None | Suitable 'vegetation formation level' habitat surrogates are absent from the Proposal area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| Low | Typical habitat types are absent from the Proposal area; however, formation level vegetation habitat surrogates are present. Irrespective of proximity to the species known 'extent of occurrence' and 'area of occurrence' (i.e. standard grid size of 2x2km (IUCN 2001), the presence of this species would likely be incidental or random and generally inconsistent with natural occurrences. The species is unlikely to depend on available habitat for important life cycle processes such as reproduction. |
| Moderate | Typical habitat types, important habitat features and/ or known habitat surrogates (e.g. PCTs) are present within the Proposal area. Habitat is located within known 'extent of occurrence'; however, is outside its known area of occurrence (i.e. standard grid size of 2x2km (IUCN 2001). Incidence may be supplementary to proximal incidence in higher value habitat or associated with modified or degraded habitat. |
| High | Habitat values generally consistent with description provided in the OEH TSPD. Habitat is located within known 'extent of occurrence' and 'area of occurrence' (i.e. standard grid size of 2x2km (IUCN 2001). If present, the species is likely to depend on the habitat it occurs within for important life cycle processes. |
| Known | Habitat values generally consistent with description provided in the OEH TSPD. Habitat is located within known 'extent of occurrence' and 'area of occurrence' (i.e. standard grid size of 2x2km (IUCN 2001). The species is likely to depend on the habitat it occurs within for important life cycle processes; however, the importance of this habitat would depend on additional factors (e.g. size and extent of local population). |

2.2 Field investigations

An inspection of the Proposal was conducted on 3 October 2018, where an ecologist performed the following investigations:

- a flora inventory of the Proposal area, including the identification of threatened species and/or ecological communities
- incidental observations of fauna species and indirect evidence of fauna (such as scats, nests, burrows, location of hollow-bearing trees, tracks, scratches and diggings)
- identification of native and exotic plant species, including noxious weeds listed under the NSW *Biosecurity Act 2015* for the Newcastle LGA
- taking photographs of any significant ecological values occurring within the Proposal area.

The methods involved in obtaining these results are provided in the following sections.

2.2.1 Flora

A flora inventory of the site was undertaken by undertaking Rapid Data Points (RDPs) in order to map the type and range of vegetation communities present. General searches were undertaken for all threatened flora species known to occur within the locality and in the habitat types present within the Proposal area. These searches were performed in accordance with the 'parallel transect' method described in the NSW Guide to Surveying Threatened Plants (OEH 2016).

2.2.2 Fauna

Opportunistic sightings and secondary indications (scratches, scats, diggings, tracks etc.) of resident fauna were noted. Such indicators may include:

- distinctive scats left by mammals
- scratch marks made by various types of arboreal animals
- nests made by various guilds of birds
- feeding scars on Eucalyptus trees made by gliders
- whitewash, regurgitation pellets and prey remains from owls
- aural recognition of bird and frog calls
- skeletal material of vertebrate fauna
- searches for indirect evidence of fauna (such as scats, nests, burrows, hollows, tracks, and diggings).

2.2.3 Survey effort

Fauna observations were taken over one day in unison with flora surveys.

2.3 Nomenclature

2.3.1 Plant taxonomy

Plant taxonomy used was consistent with the nomenclature of the Flora of NSW (Harden 1990-1993; 2002), except where more recent revisions have been published in recognised scientific journals and accepted by the National Herbarium of New South Wales (as per PlantNet website <http://plantnet.rbgsyd.nsw.gov.au/>).

2.3.2 Fauna taxonomy

Taxonomy and common names of fauna in this report were from the following sources.

- Mammals: Menkhorst and Knight (2010) and Churchill (2009)
- Birds: Simpson and Day (2010)
- Reptiles: Wilson and Swan (2010)
- Frogs: Tyler and Knight (2011).

2.4 Limitations

Limitations inherent in the investigation, as presented in this report, have been taken into account specifically in relation to threatened species surveys, assessments, results and conclusions. A precautionary approach has been adopted where scientific uncertainty exists; resulting in 'assumed presence' of known and expected threatened species, populations and ecological communities thus ensuring a holistic assessment.

2.4.1 Seasonality

Threatened flora species should be surveyed within their respective flowering periods to ensure accurate identification. Surveys have been undertaken outside the flowering period of some cryptic species and in these cases the precautionary principle has been applied and the potential presence of these species has been analysed based on the presence of suitable habitat.

The flowering and fruiting plant species that attract some nomadic or migratory threatened species, often fruit or flower in cycles spanning a number of years. Furthermore, these resources might only be accessed in some areas during years when resources more accessible to threatened species fail. As a consequence, threatened species may be absent from some areas where potential habitat exists for extended periods and this might be the case for nomadic and opportunistic species.

Where required, recommendations are provided in respect to these assumptions should information from an appropriately timed targeted survey provide important details and/ or clarity on the likely impact intensity of the Proposal.

2.4.2 Data availability and accuracy

The collated threatened flora and fauna species records provided by the Atlas of NSW Wildlife are known to vary in accuracy and reliability. Traditionally, this is due to the reliability of information provided to the NPWS for collation and/or the need to protect specific threatened species locations. For the purposes of this assessment, this information has been considered to have a maximum accuracy of \pm one kilometre. Threatened flora and fauna records within the region were predominantly sourced from the online OEH BioNet and DoEE Protected Matters Search Tool. Limitations exist with regards to this data and its accuracy.

2.4.3 Fauna

The presence of fauna within a particular area is not static over time, may be seasonal or in response to the availability of a particular resource and interspecific interactions. Some fauna species that have been recorded in the local area occur on a seasonal or migratory basis and may be absent from the locality for much of the year. Fauna behaviours may have also affected the chance of detection; species that are easily disturbed or cryptic may not have been detected during surveys.

As such, habitat assessment and prediction of the occurrence of threatened fauna species has been applied where survey effort targeting particular threatened fauna species could not be undertaken. The precautionary principle was applied where marginal habitat was identified or predicted to occur or where species are migratory or nomadic and were therefore likely to utilise habitat components at some stage during their life cycle.

2.4.4 Flora

The cryptic nature of many flora species makes them very difficult to detect even when they are known to be present. There is a range of cryptic plant species that have a brief flowering period and hence a small window for detection. Due to seasonality and other factors some threatened species that are not detected cannot be regarded as absent from the Proposal area.

3 Results

3.1 Desktop assessment

3.1.1 Database searches

The results of database searches using OEH Atlas of NSW Wildlife (accessed October 2018) and EPBC Protected Matters Search (accessed October 2018) identified 21 threatened flora species, 35 threatened fauna species and 25 threatened ecological communities (TECs) as either previously recorded or potentially occurring within the locality. The EPBC Act Protected Matters Search identified a further four TECs (DoEE 2018; OEH 2018a). This information was used to prepare a preliminary likelihood of occurrence analysis prior to the field investigation, which was subsequently updated following analysis of field data. The updated likelihood of occurrence analysis is provided in **Appendix A**. Results relevant to the Proposal are discussed in the following sections.

3.2 Flora

3.2.1 Species

The native species observed in the Proposal area are listed below:

- Swamp Oak (*Casuarina glauca*)
- Forest Redgum (*Eucalyptus tereticornis*)
- Magenta Lilly Pilly (*Syzygium paniculatum*)
- *Callistemon salignus*
- *Dianella caerulea*
- *Lomandra longifolia*

Plate 1 provides a visual appreciation for the condition of the Magenta Lilly Pilly observed within the Proposal area. The location of the Magenta Lilly Pilly is shown in **Figure 2**.



Plate 1 Magenta Lilly Pilly (to be removed to accommodate the proposed lift access path)

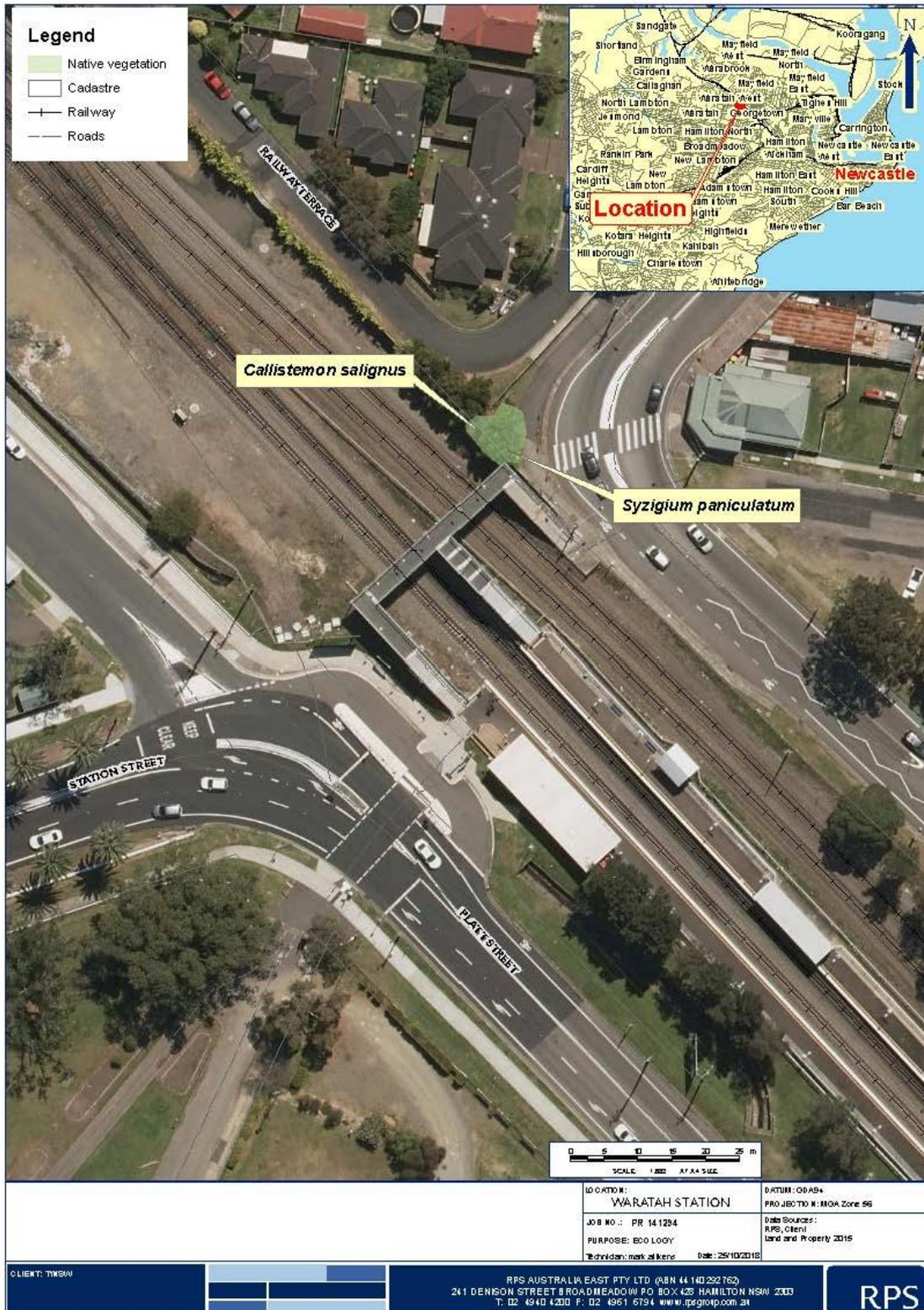


Figure 2 Vegetation mapping

Exotic species were also noted and include Western Australian Golden Wattle (*Acacia saligna*) and *Pavonia hastata*. Both species are commonly occurring in rail corridors in the Hunter Valley. One Weed of National Significance, as listed on the NSW Department of Primary Industries (DPI) website, was identified on site – Fireweed (*Senecio madagascariensis*).

3.2.2 Vegetation cover

Analysis of floristic data indicates the Proposal comprises no area of native vegetation cover that forms part of a formally described NSW PCT. Conversely, observed vegetation cover is representative of prior landscaping activity, which is possibly associated with a station upgrade performed in 1986.

3.2.3 Threatened Ecological Communities

Database searches identified 29 TECs of which seven may be of relevant to the Proposal area. Relevant TECs are listed in **Table 2**.

Table 2 Threatened Ecological Communities

| TEC Name | BC Act | EPBC Act |
|---|--------|----------|
| Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions | E | |
| Hunter Valley Foothills Slaty Gum Woodland in the Sydney Basin Bioregion | V | |
| Central Hunter Valley eucalypt forest and woodland | | CE |
| Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin Bioregion | E | |
| River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions | E | |
| Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions | E | E |
| Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions | E | |

E = Endangered CE = Critically Endangered V= Vulnerable

Analysis of floristic data indicates the Proposal area contains no areas of native vegetation cover that form part of a formally described NSW PCTs. Further, the Proposal area does not comprise an area that forms part of a listed TEC.

3.3 Fauna Survey

3.3.1 Species Observations

A total of five fauna species were identified during opportunistic surveys on-site. These include:

- Australian Magpie (*Cracticus tibicen*)
- Noisy Miner (*Manorina melanocephala*)
- Rainbow Lorikeet (*Trichoglossus moluccanus*)
- Sulphur Crested Cockatoo (*Cacatua galerita*)
- Eastern Water Skink (*Eulamprus quoyii*)

None of these are a listed threatened species.

3.3.2 Fauna habitat

No important fauna habitat features such as hollow-bearing trees, fallen logs or termite mounds were observed in the Proposal area. However, seasonal nectar resources produced by mature Forest Redgum and Magenta Lilly Pilly could be used for foraging purposes by the Grey-headed Flying Fox (*Pteropus poliocephalus*).

3.3.3 Koala habitat

One koala feed tree, as listed on Schedule 2 of SEPP44, was identified within the Proposal area (Forest Redgum). However, there is no current record of koala activity within the Proposal area. Therefore, the site does not constitute potential koala habitat. No further consideration of this matter is required.

4 Impact analysis

4.1 Avoidance

It is not possible to demonstrate an impact avoidance outcome for the Magenta Lilly Pilly due to spatial constraints associated with the Proposal area.

4.2 Direct impacts

Direct impacts on native vegetation and associated flora and fauna habitat are detailed in the following sections.

4.2.1 Vegetation loss

Two tall native shrub species (i.e. Magenta Lilly Pilly and *Callistemon salignus*) will be removed through constructing the Proposal. A summary of the native tree/ shrub removal is provided in the **Table 3**.

Table 3 Proposed Tree Removal (Allied Tree Consultancy 2018)

| Tree Number | Species | Height (metres) | Crown spread (square metres) | Reason for removal |
|-------------|-----------------------------|-----------------|------------------------------|-------------------------------------|
| 11* | <i>Syzygium paniculatum</i> | 6 | 42 | Major encroachment on Proposal area |
| 12* | <i>Callistemon salignus</i> | 6 | 10 | Major encroachment on Proposal area |

*tree numbering derived from Waratah Station Upgrade Arboricultural Impact Assessment Report (Allied Tree Consultancy 2018)

4.2.2 Threatened flora

The presence of one threatened species, *Syzygium paniculatum* (Magenta Lilly Pilly), was observed and is coincident with the footprint of the proposed northern lift. This species is listed as endangered under the BC Act and vulnerable under the EPBC Act. The presence of this species at this location is likely related to its inclusion in historical landscape plantings (circa 1986) and is not representative of a natural occurrence. There was no evidence of any recruitment beneath the canopy of this species; further corroborating the suspected 'planted' status of the tree. While the removal of this tree signifies the loss of a listed threatened species, it is considered that its occurrence is not natural nor representative of a viable population and, as such, its removal cannot be considered a significant impact. Assessment has been provided to verify this conclusion in **Appendix B** and **Appendix C**.

4.2.3 Threatened Fauna

Foraging habitat for the Grey-headed Flying Fox (i.e. mature Forest Redgum, Magenta Lilly Pilly and *Callistemon salignus*) occurs within the Proposal area. Only two Grey-headed Flying Fox foraging trees would be removed by the Proposal (i.e. Magenta Lilly Pilly and *Callistemon salignus*) representing an impact on this species. The impact area associated with this loss is estimated to be 52 square metres. Impacts on the habitat of this species is further discussed in **Section 5**, **Appendix B** and **Appendix C**.

4.2.4 Threatened Ecological Communities

The Proposal would not impact on any relevant TEC listed in **Table 2**.

4.3 Habitat loss

The area impacted by the Proposal has limited habitat of value to native flora and fauna. Important habitat features such as hollow-bearing trees, fallen logs or termite mounds were not located in the impact area and would not be adversely impacted by the Proposal.

4.4 Indirect Impacts

4.4.1 Overview

The 'edge effect' describes a collection of factors and processes that influence the presence and abundance of species at a boundary such as natural boundaries (e.g. ecotones) or a disturbance of some kind (e.g. cleared lands). Edges can occur naturally within ecosystems and include situations such as the common boundary between two ecological communities or the boundary between burnt and unburnt vegetation. Biodiversity often adapt to the effects of an edge, with some species being partially or wholly reliant on edge effects. Bali (2005) identifies the following main factors and processes that operate at a disturbed edge of an ecological community:

- microclimate (e.g. localised changes in temperature, wind, light, humidity)
- hydrology (i.e. localised changes in surface and subsurface water flows)
- altered fire frequency and intensity
- invasion by exotic plant and animal species
- alteration of soil conditions (e.g. increased sedimentation and nutrient availability)
- alteration of vegetation structure (e.g. tree death and increased shrub densities).

On average, edge effects have been estimated to occur up to 50 metres from the road edge (Bali 2005), although much greater distances have been recorded in some road studies (Forman et al. 2003). Edge effects are particularly pronounced in patches where a large edge to area ratio exists (i.e. small vegetation patches with a proportionally large perimeter). Such conditions often result in the simplification of biodiversity values in favour of generalists or edge specialist species. These impacts already exist in the smaller more isolated vegetation patches of the Proposal area. The Proposal is unlikely to have any substantial incremental edge effects on these smaller isolated patches over and above existing conditions. Potential edge effects promoted by the proposal may include:

- establishment of weeds along boundaries between native vegetation and cleared lands and potential for weed incursions into adjacent native vegetation
- modification of habitat attributes, through increased light and noise levels, and changes to vegetation structure, soil nutrient levels and plant species diversity
- changes to fauna assemblages, including alteration of woodland and forest bird assemblages by edge specialists
- increased predation of vertebrate fauna by predator species that use forest edges for foraging
- increased nest predation of small insectivorous birds at forest edges.

In regards to the above potential edge effects it is considered that establishment of weeds is the most likely tangible impact that may arise from the Proposal.

4.4.2 Exotic flora

Due to equipment use and soil disturbance, there is the potential for the introduction of weeds. Further, without the use of appropriate weed management protocols, the Proposal has the potential to facilitate the spread of weeds into adjoining native vegetation. Mitigation measures to be implemented during the

construction and operational phases of the Proposal are recommended to manage and control the incidence and effect of noxious and environmental weeds on the receiving environment. There is potential for high threat weeds observed within and adjacent to the Proposal to benefit from construction works and, as such, the management of these species would be beneficial in lowering any indirect impacts on the adjoining environment.

4.5 Key Threatening Processes

Key Threatening Processes (KTPs) are listed under Schedule 4 of the BC Act and EPBC Act. There are no relevant KTPs that have the potential to affect biodiversity values related to the Proposal as a consequence of Proposal activities. The proposed native vegetation removal is not of a scale to warrant significant impacts.

5 Impact assessment

5.1 Assumptions

This impact assessment has been prepared with reference to the Proposal description and impact analysis discussed in **Section 4**. As previously stated in **Section 4.1**, there is no scope to incorporate impact avoidance outcomes for native vegetation cover removed by the Proposal. Vegetation and habitat loss are limited to the removal of two trees as shown in **Figure 2**. Assessments are provided without the consideration of any benefit from mitigation.

5.2 BC Act 'Test of Significance' (Section 7.3 of the BC Act)

One threatened flora species will be removed by the Proposal (Magenta Lilly Pilly) and removal of 52 square metres of potential foraging habitat for the Grey-headed Flying Fox. A Test of Significance is required for these matters.

The BC Act test of significance was undertaken (Appendix B) to determine if the Proposal is likely to have any significant impact on the Magenta Lilly Pilly and Grey-headed Flying Fox. That assessment concluded that the Proposal is not likely to substantially reduce the extent or lifecycle of the Magenta Lilly Pilly or Grey-headed Flying Fox. No important habitat features for a threatened species or ecological community would be adversely affected by the Proposal. The Proposal would not result in an impact on any declared area of outstanding biodiversity value. On this basis, it is considered that the Proposal is not likely to have a significant impact on threatened species and their habitat.

5.3 EPBC Act Significant Impact Guidelines

MNES likely to be impacted by the Proposal have been assessed in accordance with the *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (Department of the Environment 2013). The MNES relevant considerations are addressed below.

5.3.1 World heritage properties

The Proposal area is not within proximity to a World Heritage Area.

5.3.2 National heritage places

The Proposal area is not within proximity to a National Heritage Place.

5.3.3 Wetlands of international importance (declared Ramsar wetlands)

The Proposal area is not in a Ramsar listed wetland and there are no water bodies within the Proposal area, therefore the Proposal would not impact upon any Ramsar wetlands.

5.3.4 The Great Barrier Reef Marine Park

The Great Barrier Reef Marine Park does not occur within or adjacent to the Proposal area, therefore, the Proposal will not impact upon any areas of the Great Barrier Reef Marine Park.

5.3.5 Commonwealth marine area

The Proposal area is not a Commonwealth Marine Area and is not in close proximity to any such area. Therefore, the Proposal would not impact upon any Commonwealth Marine Area.

5.3.6 Listed threatened ecological communities

There are no TECs within or adjacent to the Proposal area.

5.3.7 Nationally listed threatened and migratory species

Impacts on the Magenta Lilly Pilly and foraging habitat for the Grey-headed Flying Fox were assessed in Appendix C. The Proposal is not likely to have a significant impact on these matters.

5.4 Mitigation

Table 4 lists mitigation measures recommended for minimising direct and indirect impacts on flora and fauna as a consequence of the Proposal.

Table 4 Recommended Mitigation Measures

| Impact | Mitigation Measure | Timing |
|------------------------------|--|---------------------------|
| Landscaping | Planting eight Magenta Lilly Pilly (or similar species to provide foraging habitat for the Grey-headed Flying Fox) in the landscaping of the Proposal area. | Pre and post construction |
| Erosion and sediment impacts | A site-specific Erosion and Sediment Control Plan will be prepared and implemented for the Proposal. The Plan will identify detailed measures and controls to be applied to minimise erosion and sediment control risks including, but not necessarily limited to: runoff, diversion and drainage points; sediment basins and sumps; scour protection; stabilising disturbed areas as soon as possible, check dams, fencing and swales; and staged implementation arrangements. The Plan will also include arrangements for managing wet weather events, including monitoring of potential high-risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather. | During construction |
| Minimise risk from spills | All fuels, chemicals and other hazardous materials will be stored in a roofed, fire-protected and impervious bunded area at least 50 metres from waterways, drainage lines, basins, flood-affected areas or slopes above 10%. Bunding design will comply with relevant Australian Standards, and should generally be in accordance with guidelines provided in the EPA Authorised Officers Manual. | During construction |

5.5 Residual Impacts and the Need for Offsetting

The Proposal will remove two native trees comprising 52 square metres of native vegetation (see **Figure 2**). According to Section 1.4 of the TfNSW Vegetation Offset Guide 9TP-SD-087/1.0, offsetting is to be used in circumstances where 'Residual Impacts' are identified and the Proposal is not likely to have a significant impact on threatened species, ecological communities or their habitats. 'Residual Impacts' are defined by native vegetation loss that cannot be avoided or mitigated. The process for determining the type and magnitude of an offset for 'Residual Impacts' is defined in the TfNSW Vegetation Offset Guide 9TP-SD-087/1.0.

Mitigation specified in **Section 5.4** includes a recommendation for the inclusion of eight Magenta Lilly Pilly, or similar nectar producing species, in the landscaping of the Proposal area. The magnitude of this mitigation measure is comparable to an offset calculated in accordance with the TfNSW Vegetation Offset Guide 9TP-SD-087/1.0. Therefore, it is considered the Proposal, inclusive of the recommendation mitigation specified in **Section 5.4**, can demonstrate no 'Residual Impact', thus no requirement for an offset.

6 Conclusions

6.1 Key Biodiversity Values

The Proposal would result in the removal of two trees comprising one threatened flora species (Magenta Lilly Pilly) and 52 square metres of potential foraging habitat that may be used by the State and Commonwealth listed Grey Headed Flying Fox. Impact assessment has been undertaken for potential impacts on these TECs, as included in the **Appendix B** and **C**.

6.2 Impact Assessment

The following Impact assessments were performed for the State and Commonwealth listed threatened ecological community impacted by the Proposal as listed in **Appendix B** and **C**:

- Test of Significance under the BC Act (**Appendix B**)
- Assessment of Significant under the EPBC Act (**Appendix C**).

These assessments concluded that the Proposal is not likely to substantially reduce the extent or composition of a threatened species and its habitat. No important habitat features would be adversely affected by the Proposal. The Proposal would not result in an impact on any declared area of outstanding biodiversity value. On this basis, it is considered that the Proposal is not likely to have a significant impact on the Magenta Lilly Pilly and foraging habitat for the Grey-headed Flying Fox.

6.3 Key Mitigation

Mitigation for direct and indirect impacts have been addressed in **Table 4**. Key impact mitigation outcomes are listed below:

- Inclusion of eight Magenta Lilly Pilly or other appropriate native tree species in the landscaping of the Proposal area
- implementation of tree protection measures prior to the construction to protect retained trees
- a site-specific Erosion and Sediment Control Plan will be prepared and implemented for the Proposal
- all fuels, chemicals and other hazardous materials will be stored in a roofed, fire-protected and impervious bunded area at least 50 metres from waterways, drainage lines, basins, flood-affected areas or slopes above 10 per cent.

6.4 Residual Impacts and Offsetting

It is considered that the recommended mitigation measures outlined in **Section 5.4** eliminates the incidence of 'Residual Impacts' to an extent that negates a requirement for offsets. Offsets have not been calculated on this basis.

7 References

- Allied Tree Consultancy (2018). Aborigicultural Impact Assessment Report for the Waratah Station Upgrade. Report prepared for RPS Australia East Pty Ltd, Sydney.
- Briggs, J. D. & Leigh, J.H. (1995). Rare or Threatened Australian Plants. CSIRO, Australia.
- DEC (2004). Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft. Department of Environment and Conservation NSW, Sydney.
- DECC (2007). Threatened Species Assessment Guidelines: The Assessment of Significance. [Online] <http://www.environment.nsw.gov.au/resources/threatenedspecies/tsaguide07393.pdf>
- DoE (2013). Matters of National Environmental Significance: Significant Impact Guidelines 1.2 Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies. Department of the Environment, Canberra.
- DoE (2016). National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*), Commonwealth of Australia.
- DoEE (2017). EPBC Protected Matters Search Tool, accessed August 2017, <http://www.environment.gov.au/epbc/pmst/index.html>
- Harden, G.J. (1993). Flora of New South Wales Volume 4 revised edition. NSW University Press, Sydney NSW.
- Harden, G.J. (2000). Flora of New South Wales Volume 1 revised edition. NSW University Press, Sydney NSW.
- Harden, G.J. (2002). Flora of New South Wales Volume 2 revised edition. NSW University Press, Sydney NSW.
- Office of Environment and Heritage [OEH] (2016). NSW Guide to Surveying Threatened Plants
- OEH (2018a). BioNet Atlas of NSW Wildlife. Accessed July 2017. http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx
- OEH (2018b). Threatened species profile search. Accessed July 2017. Available from: <http://www.environment.nsw.gov.au/threatenedSpeciesApp/>
- Saunders, D.L. and Tzaros, C.L. (2011). National Recovery Plan for the Swift Parrot *Lathamus discolor*, Birds Australia, Melbourne.
- Simpson, K. and Day, N. (2010). Field Guide to the Birds of Australia. Penguin Group, Australia.
- Tyler and Knight (2011). Field Guide to the Frogs of Australia. CSIRO Publishing, Victoria.
- Wilson and Swan (2010). A complete Guide to Reptiles of Australia. New Holland Publishers, Australia.

Appendix A

Likelihood of Occurrence

| Scientific Name (Common Name) | BC Act | EPBC Act | Habitat | Records (OEH 2018) | Likelihood of Occurrence |
|---|--------|----------|---|-----------------------|---|
| <i>Litoria aurea</i> (Green and Golden Bell Frog) | E | V | Inhabits a very wide range of water bodies including marshes, dams and streams, particularly those containing emergent vegetation such as bullrushes or spikerushes. It also inhabits numerous types of man-made water bodies including quarries and sand extraction sites. Optimum habitat includes water-bodies that are un-shaded, free of predatory fish such as Plague Minnow, have a grassy area nearby and diurnal sheltering sites available. | 3389 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Litoria brevipalmata</i> (Green-thighed Frog) | V | - | This species is distributed from south-east Queensland to the NSW Central Coast. It occurs in a range of habitat types including rainforest, moist eucalypt forest, dry eucalypt forest and heath, but is most closely associated with wetter forest types in the southern part of its range. Calling and breeding is highly correlated with heavy rainfalls that lead to the formation of large ephemeral pools in a range of sites, but always in association with some native vegetation. Calling occurring only for one or two nights at a time anywhere between September and May. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Litoria littlejohni</i> (Littlejohn's Tree Frog) | V | V | Occurs in wet and dry sclerophyll forests and heathland associated with sandstone outcrops between 280 and 1000 m on the eastern slopes of the Great Dividing Range from the Central Coast down into Victoria. Individuals have been collected from a wide range of water bodies that includes semi-permanent dams, permanent ponds, temporary pools and permanent streams, with calling occurring from fringing vegetation or on the banks. Individuals have been observed sheltering under rocks on high exposed ridges during summer and within deep leaf litter adjacent to the breeding site. Calling occurs in all months of the year, often in association with heavy rains. The tadpoles are distinctive, being large and very dark in colouration. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Heleioporus australiacus</i> (Giant Burrowing Frog) | V | V | The Giant Burrowing Frog has been recorded breeding in a range of water bodies associated with more sandy environments of the coast and adjacent ranges from the Sydney Basin south the eastern Victoria. It breeds in hanging swamps, perennial non-flooding creeks and occasionally permanent pools, but permanent water must be present to allow its large tadpoles time to reach metamorphosis. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Caretta caretta</i> (Loggerhead Turtle) | E | - | Loggerhead turtles have a worldwide tropical and subtropical distribution. In Australia, they occur in coral reefs, bays and estuaries in tropical and warm temperate waters off the coast of Queensland, Northern Territory, Western Australia and New South Wales. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Chelonia mydas</i> (Green Turtle) | V | V | Green turtles occur in seaweed-rich coral reefs and inshore seagrass pastures in tropical and subtropical areas of the Indo-Pacific region. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Eretmochelys imbricata</i> (Hawksbill Turtle) | V | V | Found mainly throughout the world's tropical oceans, predominantly in coral reefs | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Natator depressus</i> (Flatback Turtle) | V | V | Found only in the waters around Australia, Papua New Guinea and Timor, hence it is also known as the Australian flatback | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Dermochelys coriacea</i> (Leathery Turtle) | V | E | Occurs in inshore and offshore marine waters. Rarely breeds in Australia, with the nearest regular nesting sites being the Solomon Islands and Malayan Archipelago. Occasional breeding records from NSW coast, including between Ballina and Lennox Head in northern NSW. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

| Scientific Name (Common Name) | BC Act | EPBC Act | Habitat | Records (OEH 2018) | Likelihood of Occurrence |
|---|--------|----------|---|-----------------------|---|
| <i>Circus assimilis</i> (Spotted Harrier) | V | - | The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Erythrotriorchis radiatus</i> (Red Goshawk) | CE | - | The Red Goshawk occurs in coastal and sub-coastal areas in wooded and forested lands of tropical and warm-temperate Australia. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle) | V | M | Inhabits coastal and near coastal areas, building large stick nests, and feeding mostly on marine and estuarine fish and aquatic fauna. | 7 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Hieraaetus morphnoides</i> (Little Eagle) | V | - | Most abundant in lightly timbered areas with open areas nearby. Often recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. May nest in farmland, woodland and forest in tall trees. | 1 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Lophoictinia isura</i> (Square-tailed Kite) | V | - | Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by <i>Eucalyptus longifolia</i> , <i>Corymbia maculata</i> , <i>E. elata</i> or <i>E. smithii</i> . Individuals appear to occupy large hunting ranges of more than 100km ² . They require large living trees for breeding, particularly near water with surrounding woodland -forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs. | 2 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pandion cristatus</i> (Osprey) | V | - | Ospreys are found right around the Australian coast line, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. | 1 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Stictonetta naevosa</i> (Freckled Duck) | V | - | The freckled duck breeds in permanent fresh swamps that are heavily vegetated. Found in fresh or salty permanent open lakes, especially during drought. Often seen in groups on fallen trees and sand spits. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Anseranas semipalmata</i> (Magpie Goose) | V | - | Mainly found in shallow wetlands less than 1 m deep, with a dense growth of rushes or sedges. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Apus pacificus</i> (Fork-tailed Swift) | - | M | The Fork-tailed Swift is almost exclusively aerial, flying from less than one metre to at least 300 metres above ground and probably much higher. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Hirundapus caudacutus</i> (White-throated Needletail) | - | M | An aerial species found in feeding concentrations over cities, hilltops and timbered ranges. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Botaurus poiciloptilus</i> (Australasian Bittern) | E | E | The Australasian Bittern is widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes and spikerushes. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

| Scientific Name (Common Name) | BC Act | EPBC Act | Habitat | Records (OEH 2018) | Likelihood of Occurrence |
|---|--------|-----------|---|-----------------------|---|
| <i>Ixobrychus flavicollis</i> (Black Bittern) | V | - | Usually found on coastal plains below 200 m. Often found along timbered watercourses, in wetlands with fringing trees and shrub vegetation. The sites where they occur are characterized by dense waterside vegetation. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Burhinus grallarius</i> (Bush Stone-curlew) | E | - | The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Charadrius bicinctus</i> (Double-banded Plover) | - | M, MAR | Littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It occurs on muddy, sandy, shingled or sometimes rocky beaches, bays and inlets, harbours and margins of fresh or saline terrestrial wetlands such as lakes, lagoons and swamps, shallow estuaries and rivers. The species is sometimes associated with coastal lagoons, inland saltlakes and saltworks. It is also found on seagrass beds, especially <i>Zostera</i> , which, when exposed at low tide, remain heavily saturated or have numerous water-filled depressions. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Charadrius leschenaultii</i> (Greater Sand-plover) | V | - | Occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons. Non-breeding in Australia. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Charadrius mongolus</i> (Lesser Sand-plover) | V | - | Inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. Non-breeding in Australia. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pluvialis fulva</i> (Pacific Golden Plover) | - | M | Mainly coastal habitats; usually in small parties or quite large flocks on estuaries, intertidal mudflats, beaches, reefs, saltmarshes and offshore islands; only rarely far inland. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pluvialis squatarola</i> (Grey Plover) | - | M, MAR | In Australia, Grey Plovers occur almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons. They also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. The species is also very occasionally recorded further inland, where they occur around wetlands or salt-lakes. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Ephippiorhynchus asiaticus</i> (Black-necked Stork) | E | - | Mainly found on shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters, as well as extending into adjacent grasslands, paddocks and open savannah woodlands. They also forage within or around estuaries and along intertidal shorelines, such as saltmarshes, mudflats and sandflats, and mangrove vegetation. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Climacteris picumnus victoriae</i> (Brown Treecreeper (eastern subspecies)) | V | - | Found in eucalypt woodlands (including box-gum woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and river red gum forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Ptilinopus magnificus</i> (Wompoo Fruit-dove) | V | - | Distributed north of the Hunter River in NSW on the coast and coastal ranges. Inhabits rainforest, monsoon forest, adjacent eucalypt forest and brush box forest. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

| Scientific Name (Common Name) | BC Act | EPBC Act | Habitat | Records (OEH 2018) | Likelihood of Occurrence |
|---|--------|-----------|---|-----------------------|---|
| <i>Ptilinopus superbus</i> (Superb Fruit-dove) | V | - | The Superb Fruit-dove occurs principally from north-eastern Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as far south as eastern Victoria and Tasmania. Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Cuculus optatus</i> (Oriental Cuckoo, Horsefield's Cuckoo) | - | M, MAR | Occurs in a variety of environments throughout tropical and subtropical Australia extending from the Pilbara in WA to southern NSW east of the Great Dividing Range. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Monarcha melanopsis</i> (Black-faced Monarch) | - | M | Found along the coast of eastern Australia, becoming less common further south. Inhabits rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Monarcha trivirgatus</i> (Spectacled Monarch) | - | M | Coastal north-eastern and eastern Australia, including coastal islands, from Cape York, Queensland to Port Stephens, New South Wales. Prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Myiagra cyanoleuca</i> (Satin Flycatcher) | - | M | The Satin Flycatcher is found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. Found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Diomedea antipodensis</i> (Antipodean Albatross) | V | V | The species ranges across the southern Pacific Ocean, east to the coast of Chile and west to eastern Australia. The Antipodean Albatross breeds biennially in colonies on ridges, slopes and plateaus of isolated subantarctic islands, usually in vegetation such as grass tussocks. This species regularly occurs in small numbers off the NSW south coast from Green Cape to Newcastle during winter where they feed on cuttlefish. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Diomedea antipodensis gibsoni</i> (Gibson's Albatross) | V | - | The species is regularly encountered on trans-Tasman shipping routes and at seas off Sydney, and regularly occurs off the NSW coast usually between Green Cape and Newcastle. This species is known only to breed on the Adams, Disappointment and Auckland Islands in the subantarctic Auckland Island group. Potential forage in NSW waters during the winter is considered significant for the species. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Diomedea epomophora</i> (Southern Royal Albatross) | V | V | Breeding occurs on Adams, Enderby and Auckland Islands (Auckland Islands group), Campbell Island, and on Tairaroa Head (Otago Peninsula, South Island), New Zealand. This otherwise pelagic species is most commonly recorded in New Zealand and South American waters in the non-breeding season, but may circumnavigate all the way around the Southern Ocean | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Diomedea exulans</i> (Wandering Albatross) | E | - | The Wandering Albatross is marine, pelagic and aerial. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Diomedea sanfordi</i> (Northern Royal Albatross) | E | E | Marine, subtropical to sub-Antarctic oceans; occasionally further south into the Antarctic. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

| Scientific Name (Common Name) | BC Act | EPBC Act | Habitat | Records (OEH 2018) | Likelihood of Occurrence |
|---|--------|----------|--|-----------------------|---|
| <i>Phoebastria fusca</i> (Sooty Albatross) | V | - | In Australian waters, this species is generally recorded in winter off the south coast from Tasmania to Western Australia, while there are occasional sightings off the NSW coast, north of Grafton. This pelagic or ocean-going species inhabits subantarctic and subtropical marine waters, spending the majority of its time at sea, and rarely occurs in continental shelf waters. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche bulleri</i> (Pacific Albatross) | V | V | Inhabits tropical to sub-Antarctic waters, shelf edge and pelagic, preferring warmer waters, of south seas where currents from the north make it warmer. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche bulleri platei</i> (Northern Buller's Albatross) | - | V | Marine, pelagic species that occurs in subtropical and subantarctic waters of the South Pacific Ocean. In Australia, the species occurs over inshore, offshore and pelagic waters (Blaber 1986; Carter 1977; Rogers 1969) and off the coast of south-east Tasmania. Prefers waters of the East Australia Current where sea surface-temperatures are greater than 16.5 °C. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche cauta</i> (Shy Albatross) | V | V | Marine species occurring in subantarctic and subtropical waters, reaching the tropics in the cool Humboldt Current off South America. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche cauta cauta</i> (Shy Albatross) | V | V | The Shy Albatross is a marine species occurring in subantarctic and subtropical waters, reaching the tropics in the cool Humboldt Current off South America. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche cauta steadi</i> (Black-browed Albatross) | V | V | The Black-browed Albatross has a circumpolar range over the southern oceans, and are seen off the southern Australian coast mainly during winter. Inhabits antarctic, subantarctic, subtropical marine and coastal waters over upwellings and boundaries of currents. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche eremita</i> (Chatham Albatross) | E | E | Breeds solely on a small, precipitous rock in the Chatham Islands called 'The Pyramid', to the east of New Zealand. When not breeding, the Chatham albatross migrates across the South Pacific and can be found off the coast of Peru and Chile | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche impavida</i> (Campbell Albatross) | - | V | While most of its time is spent at sea, the Campbell albatross returns to land to breed, nesting on ledges and steep slopes which are covered with short grasses, tussocks and mud. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche melanophris</i> (Black-browed Albatross) | - | V | Uses wide range of marine habitats from inshore shallows, bays and channels to the edge of the continental shelf and beyond to pelagic ocean environs. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Thalassarche salvini</i> (Salvin's Albatross) | - | V | Breeds on just a few small barren and rocky islands, and otherwise occupies the open oceans | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Falco subniger</i> (Black Falcon) | V | - | The Black Falcon is found along tree-lined watercourses and in isolated woodlands, mainly in arid and semi-arid areas. It roosts in trees at night and often on power poles by day. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Haematopus fuliginosus</i> (Sooty Oystercatcher) | V | - | In NSW the Sooty Oystercatcher occupies rocky headlands, reefs and offshore islands along the entire coast, apparently as a single continuous population. | 2 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

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|---|--------|-------------|---|-----------------------|---|
| <i>Haematopus longirostris</i> (Pied Oystercatcher) | E | - | The Pied Oystercatcher inhabits marine littoral habitats, including islands. It occupies muddy, sandy, stony or rocky estuaries, inlets and beaches, particularly intertidal mudflats and sandbanks in large marine bays. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Fregetta grallaria grallaria</i> (White-bellied Storm-Petrel) | - | V | The White-bellied Storm-Petrel occurs across sub-tropical and tropical waters in the Tasman Sea, Coral Sea and, possibly, the central Pacific Ocean. In the non-breeding season, it reaches and forages over near-shore waters along the continental shelf of mainland Australia. It breeds, in Australian territory, on offshore islets and rocks in the Lord Howe Island group. It nests in crevices between large volcanic rocks, and in burrows excavated in banks. Breeding colonies are often situated along dykes . | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Irediparra gallinacea</i> (Comb-crested Jacana) | V | - | Inhabits permanent wetlands with a good surface cover of floating vegetation, especially water-lilies. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Anous stolidus</i> (Common Noddy) | - | MAR, MIG | During the non-breeding period, the species occurs in groups throughout the pelagic zone. During the breeding season, usually occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or on shoals or cays of coral or sand. When not at the nest, individuals will remain close to the nest, foraging in the surrounding waters. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Sternula albifrons</i> (Little Tern) | E | - | Almost exclusively coastal, preferring sheltered environments; however may occur several hundred kilometres from the sea in harbours, inlets and rivers. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Anthochaera phrygia</i> (Regent Honeyeater) | CE | E,M | The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. The distribution of the species has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Epthianura albifrons</i> (White-fronted Chat) | V | - | Low vegetation in salty coastal and inland areas and crops. Runs along ground and is found in local flocks in Winter. | 10 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Grantiella picta</i> (Painted Honeyeater) | V | - | The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits boree, brigalow and box-gum woodlands and box-ironbark forests. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Daphoenositta chrysoptera</i> (Varied Sittella) | V | - | Inhabits wide variety of dry eucalypt forests and woodlands, usually with either shrubby under storey or grassy ground cover or both, in all climatic zones of Australia. Usually in areas with rough-barked trees, such as stringybarks or ironbarks, but also in paperbarks or mature Eucalypts with hollows. | 1 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Chthonicola sagittata</i> (Speckled Warbler) | V | - | The Speckled Warbler lives in a wide range of eucalypt dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Dasyornis brachypterus</i> (Eastern Bristlebird) | E | E | Found in coastal woodlands, dense scrub and heathlands, particularly where it borders taller woodlands. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

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|--|--------|-----------|--|-----------------------|---|
| <i>Stagonopleura guttata</i> (Diamond Firetail) | V | - | Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Found in grassy eucalypt woodlands, including box-gum woodlands and snow gum woodlands. Also occurs in open forest, mallee, natural temperate grassland, and in secondary grassland derived from other communities. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pomatostomus temporalis</i> (Grey-crowned Babbler (eastern subspecies)) | V | - | In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open box-gum woodlands on the slopes, and box-cypress-pine and open box woodlands on alluvial plains. | 1 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Ardenna carneipes</i> (Flesh-footed Shearwater) | V | - | The Flesh-footed Shearwater mainly occurs in the subtropics over continental shelves and slopes and occasionally inshore waters | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Calonectris leucomelas</i> (Streaked Shearwater) | - | M, MAR | Recorded in tropical waters from Broome across Cape York; and SE QLD to southern NSW. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Macronectes giganteus</i> (Southern Giant Petrel) | E | E | The Southern Giant Petrel has a circumpolar pelagic range from Antarctica to approximately 20 S and is a common visitor off the coast of NSW. Over summer, the species nests in small colonies amongst open vegetation on antarctic and subantarctic islands, including Macquarie and Heard Islands and in Australian Antarctic territory. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Macronectes halli</i> (Northern Giant-petrel) | V | V | Breeding in Australian territory is limited to Macquarie Island and occurs during spring and summer. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pachyptila turtur subantarctica</i> (Fairy Prion) | V | V | The fairy prion is the smallest prion and it measures between 23 and 28 cm (9.1–11.0 in) long.[2] Its plumage is blue-grey on its upperparts, and white underneath. They have a dark "M" on their upperparts extending to their wingtips, and their tail is wedge-shaped with a dark tip. They have a blue bill and feet. The diet consists mainly of planktonic crustaceans and other tiny sea animals, which they feed at night from the water's surface. They breed colonially and prefer small islands. The nest is situated in soil, hidden by vegetation and is dug with the bill or feet, or it is in a hollow in a crevice. When coming back to their nest at night, they will coo softly and listen for their mate. The fairy prion is found throughout oceans and coastal areas in the Southern Hemisphere. Their colonies can be found on Chatham, Snares and Antipodes Islands of New Zealand, Bass Strait Islands of Australia, Falkland Islands, Marion Island, the Crozet Islands and Macquarie Island. Outside of the breeding season, the fairy prion is most often found feeding over deep waters, far from shore. During stormy weather it may come towards coastal habitats. It breeds on oceanic islands, where it nests in crevices on cliffs and rock falls or in burrows in soil, although it may also nest in scrub, herblands, tussock or pasture. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pterodroma leucoptera leucoptera</i> (Gould's Petrel) | V | E | Pelagic marine species, spending much of its time foraging at sea and coming ashore only to breed. The Australian subspecies breeds and roosts on two islands off NSW, Cabbage Tree and Boondelbah Islands, and the at-sea distribution is poorly known. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pterodroma neglecta neglecta</i> (Kermadec Petrel) | V | V | Pelagic seabird that occurs in tropical, subtropical and temperate waters of the Pacific Ocean. It breeds on islands, atolls and islets in the southern Pacific Ocean. Breeding habitat in Australia includes Balls Pyramid and Phillip Island. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pterodroma solandri</i> (Providence Petrel) | V | - | Marine Nest on the tops of Mount Gower and Mount Lidgbird and to a less extent, on the lower slopes of the mountains. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

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|---|--------|-----------|---|-----------------------|---|
| <i>Glossopsitta pusilla</i> (Little Lorikeet) | V | - | Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes. | 1 | Moderate. Typical habitat types, important habitat features and/ or known habitat surrogates (e.g. PCTs) are present within the study area. Habitat is located within known 'extent of occurrence'; however, is outside its known area of occurrence (i.e. standard grid size of 2x2km (IUCN 2001). Incidence may be supplementary to proximal incidence in higher value habitat or associated with modified or degraded habitat. Not recently observed in the locality (NSW BioNet records). |
| <i>Lathamus discolor</i> (Swift Parrot) | E | CE | The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Neophema pulchella</i> (Turquoise Parrot) | V | - | The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Nests in tree hollows, logs or posts, from August to December. It lays four or five white, rounded eggs on a nest of decayed wood dust. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Rostratula australis</i> (Australian Painted Snipe) | E | E, M | In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Actitis hypoleucos</i> (Common Sandpiper) | - | M, MAR | Utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Arenaria interpres</i> (Ruddy Turnstone) | - | M | Rocky shores | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Calidris acuminata</i> (Sharp-tailed Sandpiper) | - | M | Freshwater or saltwater wetlands- the muddy edges of lagoons, swamps, lakes, dams, soaks, sewage dams or temporary floodwaters. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Calidris canutus</i> (Red Knot) | - | E | The Red Knot is common in all the main suitable habitats around the coast of Australia. Very large numbers are regularly recorded in north-west Australia, with 80 Mile Beach and Roebuck Bay being particular strongholds. The only places it is not found in significant numbers are the northern part of the Great Australian Bight in South Australia and Western Australia, and along much of the NSW coast, where wader habitat is rather scarce (excluding the Hunter Estuary). It is widespread along the coast south of Townsville and along the coasts of NSW and Victoria. In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Calidris ferruginea</i> (Curlew Sandpiper) | E | - | The Curlew Sandpiper is distributed around most of the coastline of Australia. It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes the inland | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

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|---|--------|-----------|--|-----------------------|---|
| <i>Calidris tenuirostris</i> (Great Knot) | V | - | In NSW, the species has been recorded at scattered sites along the coast to about Narooma. It has also been observed inland at Tullakool, Armidale, Gilgandra and Griffith. Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons. Often recorded on sandy beaches with mudflats nearby, sandy spits and islets and sometimes on exposed reefs or rock platforms. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Gallinago hardwickii</i> (Latham's Snipe) | - | M | Latham's Snipe is a non-breeding migrant to the south east of Australia including Tasmania, passing through the north and New Guinea on passage. Latham's Snipe breed in Japan and on the east Asian mainland. 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. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Gallinago megala</i> (Swinhoe's Snipe) | - | M, MAR | Habitat specific to Australia includes the dense clumps of grass and rushes round the edges of fresh and brackish wetlands. This includes swamps, billabongs, river pools, small streams and sewage ponds. They are also found in drying claypans and inundated plains pitted with crab holes | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Gallinago stenura</i> (Pin-tailed Snipe) | - | M, MAR | Most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation. The species is also found in drier, more open wetlands such as claypans in more arid parts of species' range. It is also commonly seen at sewage ponds; not normally in saline or inter-tidal wetlands | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Limicola falcinellus</i> (Broad-billed Sandpiper) | V | - | Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. Occasionally, individuals may be recorded in sewage farms or within shallow freshwater lagoons. Broad-billed Sandpipers roost on banks on sheltered sand, shell or shingle beaches. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Limosa lapponica</i> (Bar-tailed Godwit) | - | M | Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Limosa limosa</i> (Black-tailed Godwit) | V | - | Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and-or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Numenius madagascariensis</i> (Eastern Curlew) | - | CE | The Eastern curlew spends its breeding season in northeastern Asia, including Siberia to Kamchatka, and Mongolia. Its breeding habitat is composed of marshy and swampy wetlands and lakeshores. Most individuals winter in coastal Australia, with a few heading to South Korea, Thailand, Philippines and New Zealand, where they stay at estuaries, beaches, and salt marshes. It uses its long, decurved bill to probe for invertebrates in the mud. It may feed in solitary but it generally congregates in large flocks to migrate or roost. Its call is a sharp, clear whistle, cuuue-reee, often repeated. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Numenius minutus</i> (Little Curlew) | - | M, MAR | Most often found feeding in short, dry grassland and sedgeland, including dry floodplains and blacksoil plains, which have scattered, shallow freshwater pools or areas seasonally inundated. Open woodlands with a grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts, mown lawns, gardens, recreational areas, ovals, racecourses and verges of roads and airstrips are also used. When resting congregates around pools, river beds and water-filled tidal channels, and shallow water at edges of billabongs. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

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|--|--------|-------------|--|-----------------------|---|
| <i>Philomachus pugnax</i> (Ruff) | - | MAR, MIG | Found on generally fresh, brackish or saline wetlands with exposed mudflats at the edges. It is found in terrestrial wetlands including lakes, swamps, pools, lagoons, tidal rivers, swampy fields and floodlands. They are occasionally seen on sheltered coasts, in harbours, estuaries, seashores and are known to visit sewage farms and saltworks. They are sometimes found on wetlands surrounded by dense vegetation including grass, sedges, saltmarsh and reeds. They have been observed on sand spits and other sandy habitats including shingles. The Ruff forages on exposed mudflats, in shallow water and occasionally on dry mud. They have been observed foraging in dry waterside plants and in swampy areas next to aeration tanks in sewage farms. They prefer to roost amongst shorter vegetation. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Tringa nebularia</i> (Common Greenshank) | - | M | Habitat is diverse, both inland and coastal. Found inland on both permanent and temporary wetland- billabongs, swamps, lakes, floodplains, sewage, farms and saltwater ponds. On the coast, it uses sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons and occasionally rocky tidal edges. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Tringa stagnatilis</i> (Marsh Sandpiper) | - | M, MAR | Permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Xenus cinereus</i> (Terek Sandpiper) | V | - | The Terek Sandpiper mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Ninox strenua</i> (Powerful Owl) | V | - | Occupies wet and dry eucalypt forests and rainforests. Can occupy both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. It is most commonly recorded within red turpentine in tall open forests and black she-oak within open forests. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm. | 22 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Sula dactylatra</i> (Masked Booby) | V | - | Marine. Remain at Lord Howe Island year around but range widely for food and some juveniles wander before returning to breed. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Tyto longimembris</i> (Grass Owl) | V | - | Found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Eubalaena australis</i> (Southern Right Whale) | E | E | Migrate between summer feeding grounds in Antarctica and winter breeding grounds around the coasts of southern Australia, New Zealand, South Africa and South America. They feed in the open ocean in summer. They move inshore in winter for calving and mating. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Balaenoptera musculus</i> (Blue Whale) | E | E | Breeds in warm water at low latitudes, preferring open seas rather than coastal waters. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Megaptera novaeangliae</i> (Humpback Whale) | V | V | The population of Australia's east coast migrates from summer cold-water feeding grounds in subantarctic waters to warm-water winter breeding grounds in the central Great Barrier Reef. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

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|---|--------|----------|--|-----------------------|---|
| <i>Dasyurus maculatus maculatus</i> (Spotted-tailed Quoll) | V | E | Spotted-tailed Quoll are found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common. 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. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Dugong dugon</i> (Dugong) | E | - | Extends south from warmer coastal and island waters of the Indo-West Pacific to northern NSW, where its known from incidental records only. Major concentrations of Dugongs occur in wide shallow protected bays, wide shallow mangrove channels and in the lee of large inshore islands. Will also occupy deeper waters if their sea grass food is available. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Saccolaimus flaviventris</i> (Yellow-bellied Sheath-tail-bat) | V | - | 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. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Petrogale penicillata</i> (Brush-tailed Rock-wallaby) | E | V | Found in rocky areas in a wide variety of habitats including rainforest gullies, wet and dry sclerophyll forest, open woodland and rocky outcrops in semi-arid country. Commonly sites have a northerly aspect with numerous ledges, caves and crevices. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Mormopterus norfolkensis</i> (Eastern Freetail-bat) | V | - | Most records are from dry eucalypt forests and woodlands to the east of the Great Dividing Range. Appears to roost in trees, but little is known of this species' habits. | 5 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pseudomys novaehollandiae</i> (New Holland Mouse) | - | V | The New Holland Mouse currently has a disjunct, fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Across the species' range the New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Arctocephalus forsteri</i> (New Zealand Fur-seal) | V | - | Prefers rocky parts of islands with jumbled terrain and boulders. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Petaurus norfolcensis</i> (Squirrel Glider) | V | - | Generally occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range. Requires abundant hollow bearing trees and a mix of eucalypts, banksias and acacias . There is only limited information available on den tree use by Squirrel gliders, but it has been observed using both living and dead trees as well as hollow stumps. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked. Endangered population in the Wagga Wagga LGA. | 9 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Phascolarctos cinereus</i> (Koala) | V | V | Inhabits eucalypt forests and woodlands. The suitability of these forests for habitation depends on the size and species of trees present, soil nutrients, climate and rainfall . | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Potorous tridactylus tridactylus</i> (Long-nosed Potoroo) | V | V | Inhabits coastal heath and wet and dry sclerophyll forests. Generally found in areas with rainfall greater than 760 mm. Requires relatively thick ground cover where the soil is light and sandy. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Petauroides volans</i> (Greater Glider) | - | V | The Greater Glider occurs in eucalypt forests and woodlands. Utilise tree hollows | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

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|--|--------|----------|---|-----------------------|---|
| <i>Pteropus poliocephalus</i> (Grey-headed Flying-fox) | V | V | This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Bats commute daily to foraging areas, usually within 15 km of the day roost although some individuals may travel up to 70 km. | 10 | Moderate. Typical habitat types, important habitat features and/ or known habitat surrogates (e.g. PCTs) are present within the study area. Habitat is located within known 'extent of occurrence'; however, is outside its known area of occurrence (i.e. standard grid size of 2x2km (IUCN 2001). Incidence may be supplementary to proximal incidence in higher value habitat or associated with modified or degraded habitat. Not recently observed in the locality (NSW BioNet records). |
| <i>Chalinolobus dwyeri</i> (Large-eared Pied Bat) | V | V | Located in a variety of drier habitats, including the dry sclerophyll forests and woodlands to the east and west of the Great Dividing Range. Can also be found on the edges of rainforests and in wet sclerophyll forests. This species roosts in caves and mines in groups of between 3 and 37 individuals. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle) | V | - | Inhabit sclerophyll forests, preferring wet habitats where trees are more than 20 m high. Two observations have been made of roosts in stem holes of living eucalypts. There is debate about whether or not this species moves to lower altitudes during winter, or whether they remain sedentary but enter torpor. This species also appears to be highly mobile and records showing movements of up to 12 km between roosting and foraging sites. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Miniopterus australis</i> (Little Bentwing-bat) | V | - | Coastal north-eastern NSW and eastern Queensland. Little Bent-wing Bat is an insectivorous bat that roost in caves, in old mines, in tunnels, under bridges, or in similar structures. They breed in large aggregations in a small number of known caves and may travel 100s km from feeding home ranges to breeding sites. Little Bent-wing Bat has a preference for moist eucalypt forest, rainforest or dense coastal banksia scrub where it forages below the canopy for insects. | 5 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Miniopterus schreibersii oceanensis</i> (Eastern Bentwing-bat) | V | - | Eastern Bent-wing Bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Myotis macropus</i> (Southern Myotis) | V | - | The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. 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. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Scoteanax rueppellii</i> (Greater Broad-nosed Bat) | V | - | Prefer moist gullies in mature coastal forests and rainforests, between the Great Dividing Range and the coast. They are only found at low altitudes below 500 m. In dense environments they utilise natural and human-made opening in the forest for flight paths. Creeks and small rivers are favoured foraging habitat. This species roosts in hollow tree trunks and branches. | 2 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Carcharias taurus</i> (Grey Nurse Shark) | - | CE | The grey nurse shark occupies the continental shelf and has been reported from the surf zone down to 190 m below sea level. At sites where they aggregate, they are often observed near the bottom at depths of 10 – 40 m in or near steep-sided gutters with sandy substrate or rocky caves. Grey nurse sharks have also been observed congregating in mid-water adjacent to, or above pinnacles or wrecks at depths of 5 – 30 m. The east coast grey nurse shark population extends from mid-Queensland to Narooma in southern NSW. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Carcharodon carcharias</i> (Great White Shark) | - | V | Found in coastal waters around Australia, South Africa, California and northeastern USA. The great white can swim at the surface, as well as more than 250m deep. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

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|--|--------|----------|--|-----------------------|--|
| <i>Epinephelus daemeli</i> (Black Cod) | - | V | In Australia, the distribution of black cod ranges from southern Queensland through NSW to northern Victoria. However, records from Queensland and Victoria are rare, and the single specimen recorded from South Australian waters is considered a vagrant. The NSW coastline forms the species' main range, both in Australia and internationally. Black cod are known to occur to some degree in all six NSW Marine Parks – Lord Howe, Cape Byron, Solitary Island, Port Stephens, Jervis Bay and Batemans Bay | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Cynanchum elegans</i> (White-flowered Wax Plant) | E | E | Recorded from rainforest gullies scrub and scree slopes from the Gloucester district to the Wollongong area and inland to Mt Dangar. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Rutidosis heterogama</i> | V | V | Grows in heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pultenaea maritima</i> | V | - | The species occurs in grasslands, shrublands and heath on exposed coastal headlands. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Angophora inopina</i> | V | V | Endemic to the Central Coast region of NSW. The known northern limit is near Karuah where a disjunct population occurs; to the south populations extend from Toronto to Charmhaven with the main population occurring between Charmhaven and Morisset. Occurs most frequently in red bloodwood – scribbly gum woodland, wet heath, red mahogany – paperbark sedge woodland and stringybark – red bloodwood forest. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Eucalyptus camfieldii</i> | V | V | Restricted distribution in a narrow band with the most northerly records in the Raymond Terrace Area south to Waterfall. Localised and scattered distribution includes sites at Norah Head (Tuggerah Lakes), Peats Ridge, Mt Colah, Elvina Bay Trail (West Head), Terrey Hills, Killara, North Head, Menai, Wattamolla and a few other sites in Royal National Park. Poor coastal country in shallow sandy soils overlying Hawkesbury sandstone. Coastal heath mostly on exposed sandy ridges. Occurs mostly in small scattered stands near the boundary of tall coastal heaths and low open woodland of the slightly more fertile inland areas. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Eucalyptus parramattensis</i> subsp. <i>decadens</i> | V | V | Generally occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Melaleuca biconvexa</i> (Biconvex Paperbark) | V | V | Grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects. Scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. | 5 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Syzygium paniculatum</i> (Magenta Lilly Pilly) | E | V | Found only in NSW, in a narrow, linear coastal strip from Bulahdelah to Conjola State forest. On the south coast the species occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral rainforest. On the central coast it occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities | 1 | Known. Habitat values generally consistent with description provided in the OEH TSPD. Habitat is located within known 'extent of occurrence' and 'area of occurrence' (i.e. standard grid size of 2x2km (IUCN 2001)). The species is likely to depend on the habitat it occurs within for important life cycle processes; however, the importance of this habitat would depend on additional factors (e.g. size and extent of local population). Species not recently observed in the locality (NSW BioNet records). |
| <i>Caladenia tessellata</i> (Thick-lip Spider Orchid) | E | V | The Tessellated Spider Orchid is found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

| Scientific Name (Common Name) | BC Act | EPBC Act | Habitat | Records (OEH 2018) | Likelihood of Occurrence |
|--|--------|----------|---|-----------------------|---|
| <i>Cryptostylis hunteriana</i> (Leafless Tongue-orchid) | V | V | Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (<i>Eucalyptus sclerophylla</i>), Silvertop Ash (<i>E. sieberi</i>), Red Bloodwood (<i>Corymbia gummifera</i>) and Black Sheoak (<i>Allocasuarina littoralis</i>); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (<i>C. subulata</i>) and the Tartan Tongue Orchid (<i>C. erecta</i>). | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Diuris praecox</i> (Rough Doubletail) | V | V | Occurs between Ourimbah and Nelson Bay. Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey. Exists as subterranean tubers most of the year. It produces leaves and flowering stems in winter. | 555 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Phaius australis</i> (Southern Swamp Orchid) | E | E | Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Prasophyllum</i> sp. <i>Wybong</i> (A leek orchid) | - | CE | Endemic to NSW. It is known from seven populations in eastern NSW near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell and Tenterfield. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Pterostylis gibbosa</i> (Illawarra Greenhood) | E | E | Grows in open forest or woodland, on flat or gently sloping land with poor drainage. Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra). | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Grevillea parviflora</i> subsp. <i>parviflora</i> (Small-flowered Grevillea) | V | V | Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest. Found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests. Often occurs in open, slightly disturbed sites such as along tracks. | 3 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Euphrasia arguta</i> | CE | CE | Occur in eucalypt forest with a mixed grass and shrub understorey within Nundle State forest. Sites have either been logged in the last few decades, or appear to have regrown from past clearing. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Commersonia prostrata</i> | E | E | Occurs on sandy, sometimes peaty soils in a wide variety of habitats: snow gum woodland at Rose Lagoon; blue leaved stringybark open forest at Tallong; and in brittle gum low open woodland at Penrose; scribbly gum - swamp mahogany ecotonal forest at Tomago. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Tetradlea glandulosa</i> | V | V | Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, Gynea, Lambert and Faulconbridge. Topographically, the plant occupies ridgetops, upper-slopes and to a lesser extent mid-slope sandstone benches. Soils are generally shallow, consisting of a yellow, clayey-sandy loam. Stony lateritic fragments are also common in the soil profile on many of these ridgetops. Vegetation structure varies from heaths and scrub to woodlands-open woodlands, and open forest. | 1 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Tetradlea juncea</i> (Black-eyed Susan) | V | V | Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. It is usually found in low open forest-woodland with a mixed shrub understorey and grassy groundcover. The majority of populations occur on low nutrient soils associated with the Awaba Soil Landscape. Cryptic species that requires survey in September-October. | 1995 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |
| <i>Zannichellia palustris</i> | E | - | Grows in fresh or slightly saline stationary or slowly flowing water. NSW populations behave as annuals, dying back completely every summer. | 0 | None. Suitable 'vegetation formation level' habitat surrogates are absent from the study area. Species incidence is not expected and, if present, would represent atypical habitat usage. |

Appendix B

Test of Significance

Grey-headed Flying Fox

- (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.**

Habitat critical to the survival of the Grey-headed Flying fox includes camp sites for communal diurnal roosts and proximal foraging habitat during lactating periods. An estimated 52 square metres of foraging habitat would be removed by the Proposal (i.e. two trees). While potentially utilised by the Grey-headed Flying Fox, it is considered that this loss of foraging habitat is minor and not likely to have an adverse effect on the life cycle of the species such that a viable local population of this species is likely to be placed at risk of extinction.

- (b) **In the case of an endangered ecological community or critically endangered community, whether the proposed development or activity:**

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

Not an EEC or CEEC

- 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 an EEC or CEEC

- (c) **In relation to the habitat of a threatened species or ecological community**

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

The Proposal would result in the clearance and/or disturbance of approximately 52 square metres of potential foraging habitat for the Grey-headed Flying Fox (i.e. two trees). Due to the size and nature of the impact, it is not likely to have an adverse effect on the extent of the habitat for this species such that its local occurrence is likely to be placed at risk of extinction.

- ii) Whether an area of habitat is likely to be fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

The Grey-headed Flying Fox is a highly mobile species capable of utilising resources across large areas without barriers. The clearing of habitat within the Proposal area will not generate or contribute to a barrier that would otherwise increase fragmentation or isolate habitat.

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

The habitat to be removed is considered to be of moderate value to the Grey-headed Flying Fox. However, the contribution of this habitat area is not considered important to the long term survival of the 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 areas of outstanding biodiversity value would be impacted by the Proposal.

- (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 will result in clearing to approximately 52 square metres of foraging habitat and as such will contribute to the key threatening process: 'Clearing of Native Vegetation'.

CONCLUSION

The Proposal is not likely to substantially reduce the extent of foraging habitat for the Grey-headed Flying Fox; nor will it increase the fragmentation/ isolation of habitat or adversely impact lifecycle processes for this species. The Proposal would not result in an impact on any declared area of outstanding biodiversity value. It is considered that the Proposal is not likely to have a significant impact on the Grey-headed Flying Fox.

Magenta Lilly Pilly

- (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.**

Habitat critical to the survival of the Magenta Lilly Pilly is described as Littoral Rainforest or River Riparian Forest. The presence of Magenta Lilly Pilly within the Proposal area is a function of prior landscaping activity, not a manifestation of habitat suitable for this species. The Proposal will not be removing the natural habitat of this species. On this basis, it is considered that this loss of Magenta Lilly Pilly outside its natural habitat is minor and not likely to have an adverse effect on the life cycle of the species such that a viable local population of this species is likely to be placed at risk of extinction.

- (b) **In the case of an endangered ecological community or critically endangered community, whether the proposed development or activity:**

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

Not an EEC or CEEC

- 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 an EEC or CEEC

- (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

One tree outside its natural habitat context.

- ii) Whether an area of habitat is likely to be fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

The occurrence of Magenta Lilly Pilly within the Proposal area is not of natural origin and not part of a corridor or larger patch of vegetation.

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

The habitat to be removed is considered to be of low value to threatened species.

- (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 areas of outstanding biodiversity value would be impacted by the Proposal.

- (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 will result in clearing to approximately 52 square metres of native vegetation and as such will contribute to the key threatening process: 'Clearing of Native Vegetation'.

CONCLUSION

The Proposal is not likely to adversely impact the lifecycle of the Magenta Lilly Pilly. No important habitat features would be adversely affected by the Proposal. The Proposal would not result in an impact on any declared area of outstanding biodiversity value. On this basis, it is considered that the Proposal is not likely to have a significant impact on Magenta Lilly Pilly.

Appendix C

EPBC Act Assessment of Significance

Pteropus poliocephalus (Grey-headed Flying Fox)

Lead to a long-term decrease in the size of an important population of a species

The Proposal will result in a reduction in an estimated 52 square metres of foraging habitat of moderate importance for the Grey-headed Flying Fox. The Proposal will not adversely impact habitat that is likely to be relied on by the Grey-headed Flying Fox to an extent that would influence the size of an important population. It is considered that the Proposal is not likely to lead to a long-term decrease in the size of an important population of a species.

Reduce the area of occupancy of the species

The Proposal will result in a negligible reduction of potential foraging habitat for the species.

Fragment an existing population into two or more populations

The Proposal will not result in the fragmentation of any populations due to the small scale of the impact and the high mobility of the species.

Adversely affect habitat critical to the survival of an important population

The Proposal will have no impact on habitat important to the species (i.e. camps). If the species is present the area to be impacted would likely only be used for opportunistic foraging and mobility purposes. The Proposal is unlikely to affect habitat critical to the survival of the species.

Disrupt the breeding cycle of a population

The clearing of an estimated 52 square metres of foraging habitat will not impact upon the breeding cycle of the Grey-headed Flying Fox.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The clearing of estimated 52 square metres of foraging habitat will remove and ultimately modify a small portion of the available habitat for the species. Given the small area to be impacted and the nature of the impact the Proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat

Mobilisation of fertilisers, herbicides or other chemicals or pollutants into the potential foraging habitat is not expected as a result of the Proposal. Mitigation measures are to be enacted to prevent the spread of WoNS as a result of the Proposal. The Proposal is not expected to result in additional invasive species that are harmful to the Grey-headed Flying Fox.

Introduce disease that may cause the species to decline

Clearing estimated 52 square metres of foraging habitat for this species is considered a small portion of moderate importance and is unlikely to introduce disease that may cause the species to decline.

Interfere with the recovery of the species

Clearing estimated 52 square metres of foraging habitat for this species is considered a small portion of low importance habitat and is unlikely to interfere with the recovery of the species.

CONCLUSION

The Proposal is not likely to substantially reduce the extent or fragment any populations of the Grey-headed Flying Fox. Habitat critical to the survival of the species would not be adversely affected by Proposal. The Proposal will not interfere with the recovery of the species in the area. On this basis, it is considered that the Proposal is not likely to have a significant impact on the Grey-headed Flying Fox.

***Syzigium paniculatum* (Magenta Lilly Pilly)**

Lead to a long-term decrease in the size of an important population of a species

The Proposal will result in the removal of one Magenta Lilly Pilly outside its natural habitat context (i.e. planted specimen) . The Proposal is not linked with suitable occupied habitat and will not adversely impact habitat relied on by the Magenta Lilly Pilly to an extent that would influence the size of an important population. It is considered that the Proposal is not likely to lead to a long-term decrease in the size of an important population of a species.

Reduce the area of occupancy of the species

The Proposal will result in a negligible reduction of in the area of occupancy for the Magenta Lilly Pilly.

Fragment an existing population into two or more populations

The Proposal will not result in the fragmentation of any populations.

Adversely affect habitat critical to the survival of an important population

The Proposal will have no impact on habitat important to the species (i.e. occupied natural habitat). The Proposal is unlikely to affect habitat critical to the survival of the species.

Disrupt the breeding cycle of a population

The clearing of one tree of the Magenta Lilly Pilly will not adversely disrupt reproduction of this species within its natural habitat.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Given the small area to be impacted and the nature of the impact the Proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat

Mitigation measures are to be enacted to reintroduce Magenta Lilly Pilly into the landscaped area. The Proposal is not expected to result in additional invasive species that are harmful to the Magenta Lilly Pilly.

Introduce disease that may cause the species to decline

Clearing one tree of this species is considered a small portion of low importance and is unlikely to introduce disease that may cause the species to decline.

Interfere with the recovery of the species

Clearing one tree of this species is considered a small portion of low importance and is unlikely to interfere with the recovery of the species.

CONCLUSION

The Proposal is not likely to substantially reduce the extent or fragment any populations of the Magenta Lilly Pilly. Habitat critical to the survival of the species would not be adversely affected by Proposal. The Proposal will not interfere with the recovery of the species in the area. On this basis, it is considered that the Proposal is not likely to have a significant impact on the Magenta Lilly Pilly.