



Transport Access Program

Wahroonga Station Upgrade

Supporting Studies



Artist's Impression of the proposed Wahroonga Station Upgrade, subject to change during detailed design.

FLORA AND FAUNA ASSESSMENT REPORT

Wahroonga Station Upgrade



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Flora and Fauna
Assessment: Wahroonga
Station Upgrade
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REPORT

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18 November 2019

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- Appendix A Likelihood of Occurrence
- Appendix B BC Act Test of Significance
- Appendix C EPBC Act Significance Assessment

ABBREVIATIONS

Term	Meaning
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
CBD	Central Business District
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DDA	<i>Disability Discrimination Act 1992 (Commonwealth)</i>
DSAPT	<i>Disability Standards for Accessible Public Transport 2002</i>
EEC	Endangered Ecological Community
EPA	Environment Protection Authority, DPIE
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
ESD	Ecologically Sustainable Development (refer to Definitions)
Infrastructure SEPP	<i>State Environmental Planning Policy (Infrastructure) 2007 (NSW)</i>
KTP	Key Threatening Process
LEP	Local Environmental Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance (EPBC Act)
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NSW	New South Wales
PCT	Plant Community Type
REF	Review of Environmental Factors (this document)
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community
TfNSW	Transport for NSW
TPZ	Tree Protection Zone

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 Wahroonga 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 2002 (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 August 2019 including a revised likelihood of occurrence analysis following field validation. Plant Community Types (PCTs) present and relevant threatened biodiversity were identified. Impact assessments were performed in accordance with relevant legislation.

Key results – flora species

There were no observations of any threatened flora species listed under either the BC Act or the EPBC Act.

Key results – fauna species

There were no observations of any threatened fauna species listed under either the BC Act or the EPBC Act.

Key results – plant communities

There were no observations of any threatened ecological community listed under either the BC Act or the EPBC Act. There was no evidence of the State and Commonwealth listed Blue Gum High Forest critically endangered ecological community (CEEC) being present with the Proposal area.

Impacts

It is estimated that the Proposal would result in the loss of two native species comprising at 4 metre high Hoop Pine (*Araucaria cunninghamii*) and mature Prickly-leaved Paperbark (*Melaleuca styphelioides*). Four exotic trees are also to be removed these being Mexican Fan Palm (*Washingtonia robusta*), Magnolia (*Magnolia sp.*), Poinsettia (*Euphorbia pulcherrima*) and Ornamental Cherry (*Prunus sp.*). Direct impacts would be limited to the removal of these trees and understorey vegetation with proposed mitigation including offset plantings and management of exotic plant species with biosecurity duty. An offset planting of 28 trees is recommended to address the removal of the four exotic and two native trees, with offset plantings recommended to consider suitable locally occurring natives such as Blueberry Ash (*Elaeocarpus reticulatus*).

Conclusion

The Proposal would result in the loss of four exotic and two native trees that do not provide habitat for a threatened species, ecological community or their habitats. Impacts on other vegetation would be limited to the trimming of branches, clearing of groundcover vegetation and selective tree removal. Impact minimisation and mitigation is recommended and includes, among other matters, the management of high threat weeds with biosecurity duties. The total offset required for tree removal, as calculated by the *TfNSW Vegetation Offset Guide 9TP-SD-087*, is 28 trees with the locally occurring native Blueberry Ash (*Elaeocarpus reticulatus*) recommended as a suitable species to include in the offset plantings.

1 INTRODUCTION

1.1 Overview

1.1.1 Need for the Proposal

The Wahroonga Station Upgrade (the 'Proposal'), the subject of this assessment, forms part of the Transport Access Program. This Program is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. The Proposal would improve accessibility of the station in line with the requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

1.1.2 Key features

The key features of the Proposal are shown in Figure 1 and summarised as follows:

- refurbishment of the Redleaf Avenue bridge and replacement of the pedestrian walkway structure with a new footbridge
- a new passenger lift and station entrance to provide access from the Redleaf Avenue bridge to the island platform
- a new walkway at platform level linking the lift to the platform
- a new accessible ramp and pathway to provide access from the station to Wahroonga shopping village
- a proposed interchange zone in Railway Avenue, to provide an accessible parking space, and a zone for taxis and kiss and ride
- a new family accessible toilet and unisex ambulant toilet within the station building
- an additional platform canopy for weather protection on the platform at the boarding assistance zone (north of the station building)
- improvements to station lighting and CCTV to increase safety and security
- improvements to customer information and communication systems, including wayfinding modifications, public address (PA) system upgrade, and new hearing induction loops
- station building refresh work (such as painting).

Subject to planning approval, construction is expected to commence in 2020 and take around 24 months to complete. A detailed description of the Proposal is provided in Chapter 3 of the Review of Environmental Factors.

1.1.3 Location of the Proposal

The Proposal would involve upgrade works to Wahroonga Station, which is located in the suburb of Wahroonga in the Ku-ring-gai Local Government Area (LGA) about 20 kilometres northwest of the Sydney Central Business District (CBD) (Figure 2).

Wahroonga Station consists of a single island platform and is serviced by the T1 North Shore Line. It is bound by Millewa Avenue to the north and Railway Avenue to the south, with Illoura Avenue / Redleaf Avenue bridge crossing over the rail corridor and providing pedestrian access to the station to the east. The Proposal includes upgrades to Wahroonga Station on land owned by RailCorp and managed by Sydney Trains within the station precinct, with some works also proposed along the station entrances which are managed by Ku-ring-gai Council.

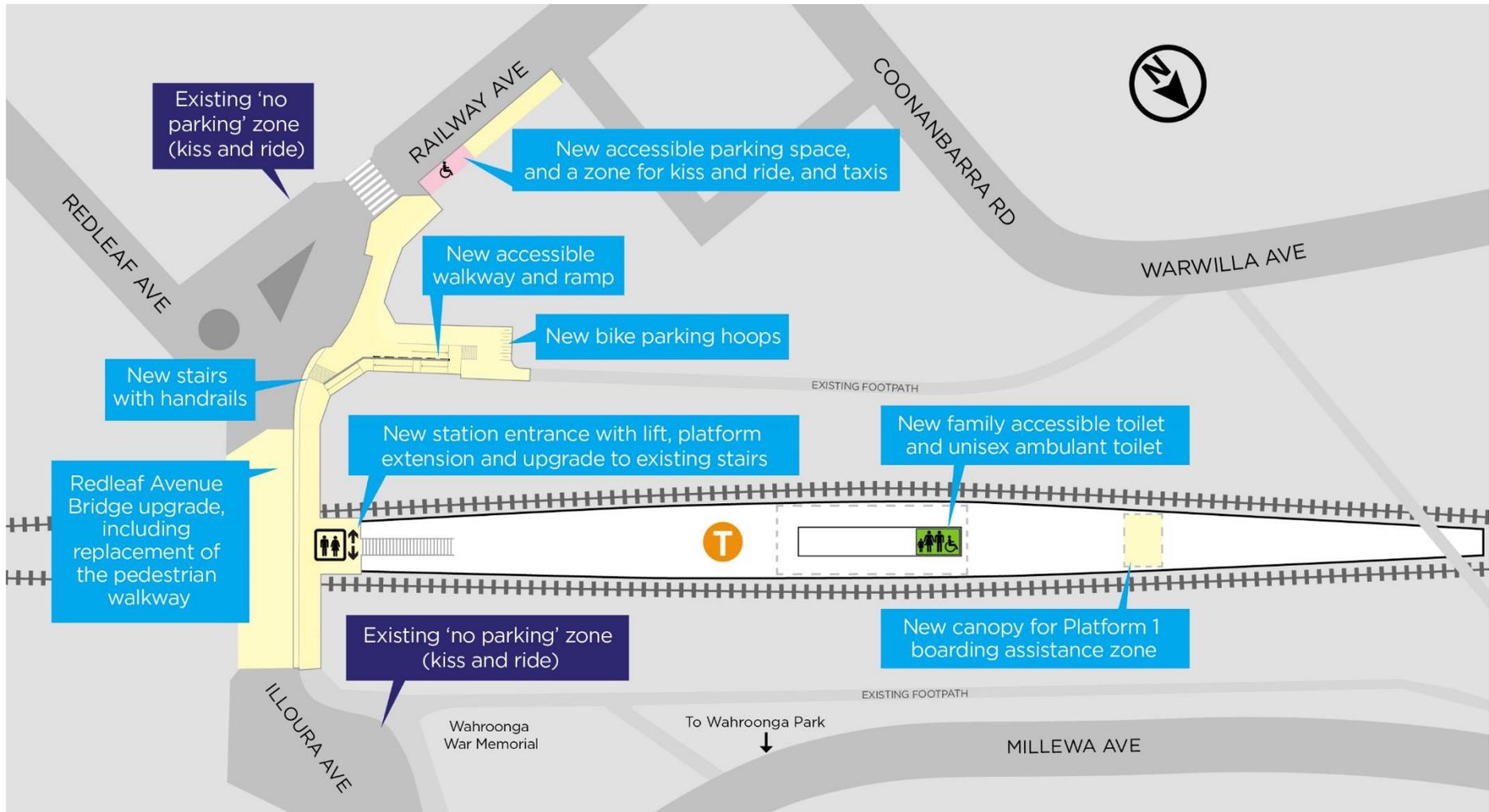


Figure 1 Key features of the Proposal (indicative only, subject to detailed design)

1.2 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. The Proposal area considered in this assessment is shown in Figure 2. The area assessed includes the Proposal design as shown in Figure 1 and additional lands that may be used for site offices and laydown areas.

1.3 Legislation and policy

1.3.1 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 Activities (Section 7.8).

Transport for NSW (TfNSW) is both the proponent and determining authority and, under Section 5.3 of the EP&A Act, acts under Part 5, Division 5.1 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.

1.3.2 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

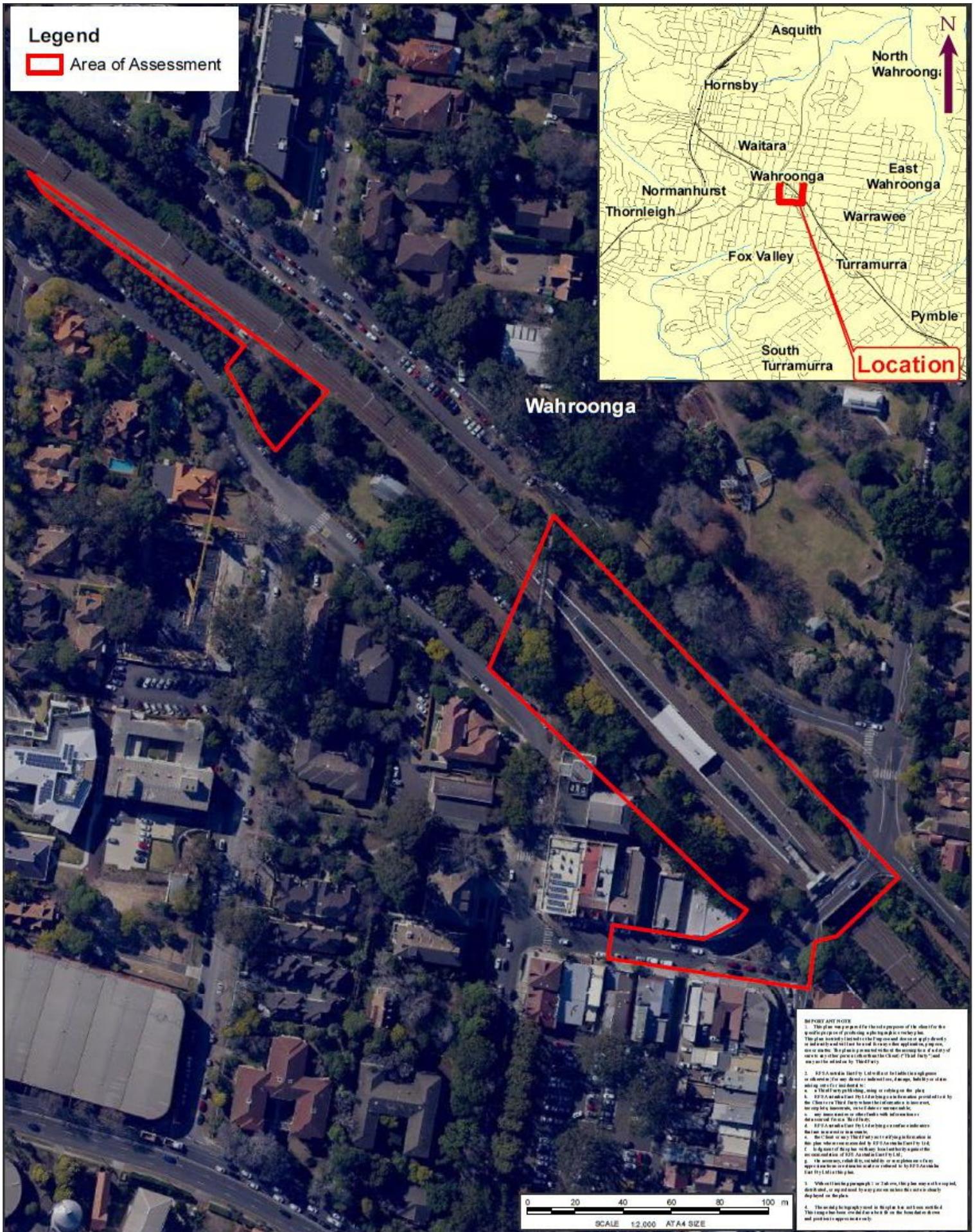
(m) to establish market-based conservation mechanisms through which the biodiversity impacts of development and land use change can be offset at landscape and site scales

The assessment requirement for proponents acting under Part 5, Division 5.1 of the EP&A Act 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 assessment pathways is to be followed:

- 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.

Legend

 Area of Assessment



DISCLAIMER

1. This plan was prepared for the sole purpose of the client for the specific purpose of providing a preliminary indication of the location of the proposed station. It is not intended to be used for any other purpose, and the client is advised to seek professional advice before relying on this plan. The client is responsible for ensuring that the information provided in this plan is accurate and up-to-date. It is not intended to be used for any other purpose, and the client is advised to seek professional advice before relying on this plan.

2. RPS Australia East Pty Ltd is not liable for any errors or omissions in this plan, whether caused by negligence or otherwise. The client is responsible for ensuring that the information provided in this plan is accurate and up-to-date. It is not intended to be used for any other purpose, and the client is advised to seek professional advice before relying on this plan.

3. With respect to the proposed station, the client is advised to seek professional advice before relying on this plan. The client is responsible for ensuring that the information provided in this plan is accurate and up-to-date. It is not intended to be used for any other purpose, and the client is advised to seek professional advice before relying on this plan.

Figure 2: The Area of Assessment

LOCATION: WAHROONGA STATION	Coordinate System: GDA 1994 MGA Zone 56 Datum: GDA 1994
JOB NO.: PR141294	Data Sources: RPS, Client Land and Property 2017
PURPOSE: PLACE AND ENVIRONMENT	
Technician: mark.aiseba	Date: 18/11/2019

CLIENT: NOT SPECIFIED

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Participation in the latter assessment pathway is 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 in to the Biodiversity Offset Scheme (BOS) under Part 6 of the BC Act, a Proponent acting under Part 5 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. The TfNSW pathway is explained further below.

1.3.3 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 biosecurity 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 WeedWise.

1.3.4 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 Ku-ring-gai LGA, which is listed under Schedule 1 as an LGA to which SEPP 44 applies; however, the Proposal is being assessed under Part 5 of the EP&A Act and as such is not part of a development application to be assessed by Ku-ring-gai Council. Therefore SEPP 44 does not apply, however this assessment has had regard for the provisions of SEPP 44.

1.3.5 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.

1.4 Qualifications and Licensing

1.4.1 Qualifications

This report was written by Mark Aitkens (BSc) and reviewed by Natalie Green (BSc/BA) of RPS.

1.4.2 Licencing

Research was conducted under the following licences:

- NSW National Parks and Wildlife Scientific Investigation Licence S100536 (Valid 31 December 2019; currently being renewed)
- Animal Research Authority (Trim File No: 01/1142) issued by NSW Agriculture (Valid 26 March 2020)
- Animal Care and Ethics Committee Certificate of Approval (Trim File No: 01/1142) issued by NSW Agriculture (Valid 21 March 2020)
- Certificate of Accreditation of a Corporation as an Animal Research Establishment (Trim File No:01/1522 & Ref No: AW2001/014) issued by NSW Agriculture (Valid 22 May 2020).

2 METHODOLOGY

This assessment has been prepared to meet the requirements of Section 7.3 of the BC Act (Test of Significance) as outlined in Section 1.3.2. The methods and tasks performed in preparing this assessment are outlined in the following sections.

2.1 Desktop Research

2.1.1 Spatial datasets

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

- local vegetation mapping to identify plant community types (PCT) that may occur
- 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.

2.1.2 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:

- notional output from the BAM Credit Calculator using PCTs identified in Section 2.1.1
- fauna and flora records contained in the Biodiversity Conservation Division (BCD) BioNet wildlife atlas (BCD 2019a) (accessed October 2019)
- fauna and flora records contained in the Department of the Environment and Energy (DoEE) Protected Matters Search tool (DoEE 2019) (accessed October 2019)
- habitat descriptions as provided by the online Threatened Species Profile Database (TSPD) (BCD 2019b) (accessed October 2019).

2.2 Likelihood of occurrence

The list of threatened species and ecological communities (threatened biodiversity) identified by database searches (i.e. Section 2.1.2) were subject to a likelihood of occurrence analysis using the key landscape parameters determined by Section 2.1.1. Five 'likelihood of occurrence' categories have been attributed to identified threatened biodiversity; a process that had regard for:

- habitat descriptions as provided in the TSPD (BCD 2019b)
- the recency of threatened species observations (i.e. recent being less than five years) and proximity to the Proposal area (i.e. application of landscape factors such as patch size and connectivity)
- habitat value and condition as determined through the site inspection
- the results of targeted surveys (where performed)
- the effect of existing key threatening process (KTPs).

The analysis starts with a preliminary desktop evaluation produced prior to the site inspection for the purposes of guiding the evaluation of habitat values within the Proposal area during that inspection. The preliminary analysis was revised and updated following the evaluation of findings from the site inspection, thereby focusing the assessment on species and ecological communities relevant to the Proposal.

The five likelihood of occurrence ratings are described in Table 1.

Table 1 Likelihood of occurrence criteria

Likelihood Rating	Description
None	Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
Low	Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs.
Moderate	Species specific (i.e. important habitat features) and vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) occur within the investigation area. The investigation area may or may not be located within the species known 'area of occurrence' but is within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality may be influencing the capacity for habitat occupancy. Pre-existing and active KTPs may potentially have a negative influence on species incidence and/ or habitat occupancy.
High	Habitat values within the investigation area are generally consistent with descriptions provided in the BCD TSPD. Habitat is likely to be located within the known 'extent of occurrence' and 'area of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are unlikely to adversely influence the capacity of the species to occupy the habitat. Pre-existing and active KTPs are unlikely to be substantially influencing species incidence and/ or habitat occupancy.
Known	Species observed and habitat values within the investigation area are generally consistent with descriptions provided in the BCD TSPD. Habitat is located within known 'extent of occurrence' and 'area of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Habitat occupancy is likely to be associated with important life cycle processes; however, the reliance on this habitat would depend on additional factors (e.g. size and extent of local population, effect of KTPs).

2.3 Field investigations

An inspection of the Proposal was conducted on 3 August 2019, 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 Ku-ring-gai 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.

2.3.1 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).

2.3.2 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).

2.3.3 Survey effort

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

2.3.4 Data recording

A hand-held Trimble differential global positioning system (DGPS), accurate to less than one metre, was used to record the location of survey methodologies along with notable results including the location of threatened flora and/or fauna species.

2.4 Nomenclature

2.4.1 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/>).

2.4.2 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).

2.5 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.

2.5.1 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.

2.5.2 Data availability and accuracy

The collated threatened flora and fauna species records obtained from BioNet (BCD 2019a) 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 BioNet and DoEE Protected Matters Search Tool. Limitations exist with regards to this data and its accuracy.

2.5.3 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.

2.5.4 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 Spatial datasets

3.1.1.1 Regions

The Proposal area is located on the Cumberland IBRA7 subregion of the Sydney Basin Bioregion.

3.1.1.2 Mitchell landscapes

The Proposal area is located on the Pennant Hills Ridges Mitchell Landscape (NPWS 2002), which is broadly described as:

“Rolling to moderately steep hills on horizontal Triassic shales and siltstones. General elevation 10 to 90 metres, local relief 60 metres. Deep red texture-contrast soils on narrow hillcrests, red and brown to yellow texture-contrast soils on slopes becoming slightly harsher in drainage lines. Tall open forest of Sydney blue gum (*Eucalyptus saligna*), turpentine (*Syncarpia glomulifera*), blackbutt (*Eucalyptus pilularis*), white stringybark (*Eucalyptus globoidea*), grey ironbark (*Eucalyptus paniculata*), forest oak (*Allocasuarina torulosa*) and rough-barked apple (*Angophora floribunda*). Rainforest elements in protected moist gully heads with sweet pittosporum (*Pittosporum undulatum*), cheese tree (*Glochidion ferdinandi*), sandpaper fig (*Ficus coronata*) and black wattle (*Callicoma serratifolia*)”.

3.1.1.3 Soil landscapes

The Proposal area is located on the Glenorie Soil Landscape (Chapman and Murphy 1989), which has vegetation generally described as:

“Dominant tree species include Sydney Blue Gum (*Eucalyptus saligna*) and Blackbutt (*E. pilularis*). Other species include Turpentine (*Syncarpia glomulifera*), Grey Ironbark (*E. paniculata*), White Stringybark (*E. globoidea*) and Rough-barked Apple (*Angophora floribunda*). Pittosporum (*Pittosporum undulatum*) and Coffee Bush (*Breynea oblongifolia*) are common understorey species. Most original vegetation has been extensively cleared, except for larger trees in many residential areas. Examples of original vegetation can be seen in parts of Dalrymple Hay Reserve at St Ives and Blackwood Memorial Sanctuary at Beecroft”.

3.1.1.4 Native vegetation

Vegetation mapping within the general vicinity of the Proposal area (OEH 2016b) identifies small isolated patches of native vegetation described as *Sydney Blue Gum - Blackbutt - Smooth-barked Apple moist shrubby open forest on shale ridges of the Hornsby Plateau, Sydney Basin Bioregion* (PCT 1237) amid a greater number of patches described as *Urban Exotic/Native*.

This mapping identifies no occurrence of native vegetation within the Proposal area. However, following the consideration of predictive tools such as soil landscape mapping (i.e. Glenorie Soil Landscape; Chapman and Murphy 1989), it is considered that the most likely pre-European vegetation cover of the Proposal area was once PCT 1237. This PCT has been used in database interrogations to identify threatened species and ecological communities that may occur within the Proposal area.

3.1.2 Database searches

3.1.2.1 Threatened species

The results of database searches and regional vegetation mapping identified 35 threatened flora species, 78 threatened fauna species and 24 threatened ecological communities (TECs) as either previously recorded or potentially occurring within the locality (DoEE 2019; BCD 2019a). 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 and is provided in Appendix A.

3.1.2.2 Threatened Ecological Communities

TECs of the region as identified from the database searches are listed in Table 2.

Table 2 Threatened Ecological Communities of the Region

TEC Name	BC Act	EPBC Act
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Region Woodlands of the Sydney Basin Bioregion	E	E
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	CE	CE
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	CE	CE
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion		E
Blue Gum High Forest in the Sydney Basin Bioregion	CE	CE
Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	E	CE
Blue Mountains Swamps in the Sydney Basin Bioregion	V	E
Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	V	E
Castlereagh Swamp Woodland Community	E	
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	E	CE
Cumberland Plain Woodland in the Sydney Basin Bioregion	E	CE
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	
Hunter Valley Foothills Slaty Gum Woodland in the Sydney Basin Bioregion	V	CE
Moist Shale Woodland in the Sydney Basin Bioregion	E	CE
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	E	E
Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion	E	E
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	
Shale Gravel Transition Forest in the Sydney Basin Bioregion	E	CE
Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	E	
Sun Valley Cabbage Gum Forest in the Sydney Basin Bioregion	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	
Western Sydney Dry Rainforest in the Sydney Basin Bioregion	E	CE
White Box Yellow Box Blakely's Red Gum Woodland	E	CE

V = Vulnerable E = Endangered CE = Critically Endangered

TECs with potential to occur within the Proposal area, as guided by information provided in the published scientific committee final determinations, are listed below:

- Blue Gum High Forest in the Sydney Basin Bioregion
- Turpentine-Ironbark Forest of the Sydney Basin Bioregion.

PCT 1237 forms part of the State and Commonwealth listed Blue Gum High Forest in the Sydney Basin Bioregion CEEC and, as indicated in Section 3.1.1.4, is not mapped as occurring within the Proposal area.

3.2 Flora

No area of continuous native vegetation consistent with a recognised plant community type was observed within the Proposal area. A written description of the flora within the Proposal area is provided without the aid of a vegetation map.

3.2.1 Native species

Few native species were observed in the Proposal area; an observation consistent with the long history of site management (e.g. extensive landscaping with exotic species) and rail land use. Native species occurrences are mostly planted and generally not locally endemic such as Hoop Pine (*Araucaria cunninghamii*), Queensland Silver Wattle (*Acacia podalyriifolia*), Prickly-leaved Paperbark (*Melaleuca styphelioides*), Tallowwood (*Eucalyptus microcorys*), Weeping Bottlebrush (*Melaleuca viminalis*) and Black tea-tree (*Melaleuca bracteata*). Native species that occur naturally in the locality and have persisted in low abundances in the modified environment include *Cyperus gracilis*, Bracken (*Pteridium esculentum*), *Acacia parramattensis* and Couch (*Cynodon dactylon*).

Locally endemic species appearing in the landscaped environment, which have been deliberately planted, include Blueberry Ash (*Elaeocarpus reticulatus*). Plate 1 provides a visual appreciation for the condition of the groundcover and midstorey layers.



Plate 1 Example of groundcover vegetation within the Proposal area

3.2.2 Exotic species

The Proposal area is dominated by exotic species, whether introduced as part of historical landscaping or through unassisted processes. An example of the exotic vegetation within the landscaped area is shown in Plate 2.

Planted species include but are not restricted to species such as Rhododendron (*Rhododendron* spp.*), Fan Palm (*Washingtonia* sp.*), Climbing Fig (*Ficus pumila**), Natal Lily (*Clivia* sp.*), Agapanthus (*Agapanthus* sp.*), Jacaranda (*Jacaranda mimosifolia**) and Tibouchina (*Tibouchina* sp.*). Notable species with relatively high abundance and biosecurity duties observed within the Proposal area include Mickey Mouse Plant (*Ochna serrulata**), Small-leaved Privet (*Ligustrum sinense**), Large-leaved Privet (*Ligustrum lucidum**), Japanese Honeysuckle (*Lonicera japonica**), Camphor Laurel (*Cinnamomum camphora**), Morning Glory (*Ipomoea indica**) and African Olive (*Olea europaea* subsp. *cuspidata**). Exotic species identified within the Proposal area that are dual listed as having biosecurity duties and are Weeds of National Significance include Lantana (*Lantana camara**), Asparagus Fern (*Asparagus aethiopicus**) and Blackberry (*Rubus fruticosus** aggregate).



Plate 2 Example of exotic vegetation within the Proposal area

3.2.3 Vegetation classification

The analysis of flora information obtained from the Proposal area confirms the absence of native vegetation cover that would otherwise form part of a recognised plant community type (PCT) listed in the NSW BioNet Vegetation Information System (BCD 2019c). Vegetation observed is consistent with regional vegetation mapping (i.e. *Urban Exotic/Native*). There is no native vegetation

3.3 Fauna survey

A total of five native fauna species were identified during opportunistic surveys of the Proposal area. These include:

- Yellow-faced Honeyeater (*Lichenostomus chrysops*)
- Australian Magpie (*Cracticus tibicen*)

- Noisy Miner (*Manorina melanocephala*)
- Rainbow Lorikeet (*Trichoglossus moluccanus*)
- Sulphur Crested Cockatoo (*Cacatua galerita*).

These species are commonly found in the urban environment and none are listed as either threatened or migratory species.

The exotic European rabbit (*Oryctolagus cuniculus**) has been reported as occurring within the Wahroonga Station gardens although no evidence of this species was observed during the site inspection for the Proposal area. Other exotic species expected include Black Rat (*Rattus rattus**), House Mouse (*Mus musculus**), Spotted-turtle Dove (*Spilopelia chinensis**) and Indian Myna (*Acridotheres tristis**).

3.3.1 Fauna habitat

No important fauna habitat features such as hollow-bearing trees, fallen logs or termite mounds were observed in the Proposal area. Inspection of the underside of the bridge structure identified a relatively smooth surface with occasional 2-3 centimetre wide drainage holes. Due to the location and character of these holes (i.e. above the powerlines and smooth surface), it is considered that these features are not likely to provide habitat of value for species that may use caves or similar structures for roosting (e.g. microchiropteran bats).

3.3.2 Koala habitat

No koala feed trees as listed on Schedule 2 of SEPP44 were identified within the area to be impacted by the Proposal. Therefore, the site does not constitute potential koala habitat. No further consideration of this matter is required.

4 IMPACT ASSESSMENT

4.1 Avoidance

Where possible, the Proposal has been designed in a manner to avoid the clearing of mature trees with a diameter greater than 0.15 metres. Due to design parameters, it is not possible to avoid the clearing of groundcover vegetation. However, this clearing would be limited to vegetation of exotic and/ or planted origin.

4.2 Residual direct impacts

Residual direct impacts on native vegetation and associated flora and fauna habitat represent unavoidable loss due to conflicts with the Proposal design. These are detailed in the following sections.

4.2.1 Vegetation loss

The Proposal would not result in the loss of a naturally occurring PCT. However, individual trees are to be removed or pruned where encroachment with the design has been identified. A summary of the tree removal (Table 3) or trees which may require pruning (Table 4) as assessed by Allied Tree Consultancy (2019).

Table 3 Trees to be removed

Tree Number	Species	Height (metres)	Diameter at Breast Height (cm)	Comment
1	<i>Araucaria cunninghamii</i>	4	0.26	Planted. Native but not endemic to the predicted pre-European PCT.
2	<i>Melaleuca styphelioides</i>	10	0.70	Planted. Native but not endemic to the predicted pre-European PCT.
3	<i>Washingtonia robusta</i>	20	0.35	Planted. Exotic and not endemic to the predicted pre-European PCT.
4	<i>Magnolia sp.</i>	4	0.35	Planted. Exotic and not endemic to the predicted pre-European PCT.
16	<i>Euphorbia pulcherrima</i>	6	0.15	Planted. Exotic and not endemic to the predicted pre-European PCT.
17	<i>Prunus sp.</i>	4	0.15	Planted. Exotic and not endemic to the predicted pre-European PCT.

Table 4 Trees to be pruned

Tree Number	Species	Height (metres)	Diameter at Breast Height (cm)	Comment
12	<i>Araucaria cunninghamii</i>	28	138	Planted. Native but not endemic to the predicted pre-European PCT.
13	<i>Araucaria cunninghamii</i>	26	112	Planted. Native but not endemic to the predicted pre-European PCT.
18	<i>Triadica sebifera</i>	7	50	Planted. Exotic and not endemic to the predicted pre-European PCT.
20	<i>Lophostemon confertus</i>	17	136	Planted. Native but not endemic to the predicted pre-European PCT.
27	<i>Elaeocarpus reticulatus</i>	6	2	Planted. Endemic to the predicted pre-European PCT.

None of the trees to be removed or pruned have any particular value as habitat for native fauna. While the species identified in

Table 4 may require some treatment (e.g. pruning), they are not expected to be removed as part of the Proposal.

4.2.2 Threatened flora and fauna

No threatened flora or fauna species or their habitats were detected within the Proposal area.

4.2.3 Threatened Ecological Communities

The Proposal would impact on vegetation described as Urban Exotic/Native (OEH 2016b), which is not recognised as forming part of a listed TECs. No impacts on listed TECs are expected as part of the Proposal.

4.2.4 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 Proposal area and would not be adversely impacted by the Proposal.

4.3 Residual indirect impacts

4.3.1 Overview

Residual indirect impacts on native vegetation and associated flora and fauna habitat represent unavoidable impacts arising from the construction and operation of the Proposal and is a type of impact often broadly referred to as 'edge effects'.

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 and modification of habitat attributes (i.e. water runoff) are the most likely tangible impacts that may arise from the Proposal.

4.3.2 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 desirable in lowering any indirect impacts on the adjoining environment.

4.3.3 Runoff

The removal of vegetation, including both trees and grasses would increase the risk of sediment laden storm-water run-off. Operational activities also increase the risk of spills into the environment, specifically petroleum based materials (e.g. fuel and hydraulic oils).

Matters at greatest risk to terrestrial biodiversity that may be impacted by this factor are species and ecological communities that depends on water. No such matters are identified within the Proposal area and as such the Proposal is unlikely to cause any negative effects. Post construction impacts are likely to have a similar profile to existing conditions, which does not appear to be having a negative impact on these matters.

4.4 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 within the Proposal area as a consequence of the Proposal. The proposed removal of native species (i.e. Clearing of Native Vegetation KTP) is not of a kind or scale to warrant further consideration.

4.5 Assessment

As previously stated in Section 4.1, there are no impacts on native vegetation cover that forms part of a recognised PCT. Edge effects are likely and cannot be avoided. The following assessments are provided without the consideration of any benefit from mitigation.

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

The Proposal area does not contain or comprise an area containing a State listed threatened or migratory species or its habitat with a moderate or greater likelihood of occurrence (see Appendix A). A BC Act test of significance was performed on this basis (Appendix B) to determine if the Proposal is likely to have any significant impact on threatened species, ecological communities or their habitats. That assessment concluded that the Proposal is not likely to result in a significant impact on threatened species, ecological communities or their habitats. Therefore, it is concluded that further impact assessment in accordance with either a Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR) is not required.

4.5.2 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.

4.5.2.1 World heritage properties

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

4.5.2.2 National heritage places

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

4.5.2.3 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.

4.5.2.4 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 would not impact upon any areas of the Great Barrier Reef Marine Park.

4.5.2.5 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.

4.5.2.6 Listed threatened ecological communities

The Proposal area does not contain or comprise an area of habitat that forms part of a Commonwealth listed TEC. Therefore, the Proposal is not likely to impact upon any Commonwealth listed TECs.

4.5.2.7 Nationally listed threatened and migratory species

The Proposal area does not contain or comprise an area containing a Commonwealth listed threatened or migratory species or its habitat with a moderate or greater likelihood of occurrence (see Appendix A). Therefore, the Proposal is not likely to impact upon any Commonwealth listed threatened or migratory species.

4.6 Mitigation

Table 5 lists mitigation measures recommended for minimising direct and indirect impacts on flora and fauna as a consequence of the Proposal.

Table 5 Recommended mitigation measures

Mitigation Measure	Timing
Remove all propagules of exotic flora with biosecurity duties. Maintain weed control practices as part of landscaping maintenance.	Pre and post construction
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
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
The five medium trees and one large tree nominated for removal have an offset calculation of 28 trees as per the requirements of TfNSW Vegetation Offset Guide 9TP-SD-087. It is recommended that these are planted within the Proposal area.	During construction
Any additional tree removal required must be assessed and offset in accordance with TfNSW policies and procedures.	Pre and post construction

4.7 Residual impacts and the need for offsetting

According to Section 1.4 of the *TfNSW Vegetation Offset Guide 9TP-SD-087*, 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*.

Mitigation specified in Section 0 includes a recommendation for the removal and ongoing management of exotic plant species with biosecurity duties. The mitigation proposed is considered sufficient to compensate for any residual impacts associated with the removal of scattered groundcover native plant species as these impacts will not result in the removal of a patch of native vegetation comprising a PCT or vegetation that forms habitat for a threatened species. Therefore, it is considered for this impact that there is no requirement for an offset .

However, an offset liability is incurred for tree removal. According to the *TfNSW Vegetation Offset Calculator 9TP-SD-087*, the removal of five medium trees and one large tree results in an offset requirement of 28 trees. Offset plantings should consider the use of locally endemic native species such as Blueberry Ash (*Elaeocarpus reticulatus*), which is a naturally occurring species in local native vegetation and is also common landscaping species.

5 CONCLUSIONS

5.1 Key biodiversity values

The Proposal would not result in the removal of a naturally occurring PCT. No native trees are to be cleared as part of the Proposal.

5.2 Impact considerations

The impacts of the Proposal would be limited to the clearing of ground cover vegetation that is mostly exotic and not forming part of a PCT, trimming of branches and selective removal of trees. Whilst these constitute direct impacts, indirect impact have also been considered.

5.3 Impact assessment

The following impact assessments were performed for the State and Commonwealth listed threatened species, ecological community and their habitats likely to be impacted by the Proposal as listed in Appendix B and C:

- BC Act Test of Significance (Appendix B)
- EPBC Act Assessment of Significance (Appendix C).

These assessments concluded that the Proposal is not likely to have a significant impact on the State and Commonwealth listed threatened species, ecological communities or their habitats. The Proposal would not result in an impact on:

- any declared area of outstanding biodiversity value
- the species composition or the quality and integrity of an ecological community
- the recovery of a threatened species, ecological community and its habitat.

On this basis, it is considered that there is no requirement to further assess the impacts of the Proposal in accordance with a SIS or BDAR.

5.4 Key mitigation

Mitigation for direct and indirect impacts have been addressed in Table 5. Key impact mitigation outcomes include the implementation of:

- vegetation management procedures to address exotic flora with biosecurity duties
- tree protection measures prior to the construction to protect retained trees as specified by Allied Tree Consultancy (2019)
- a site-specific Erosion and Sediment Control Plan to protect landform stability
- general environmental safeguards to prevent damage to waterways, drainage lines, basins, flood-affected areas or slopes above 10 per cent.

It is considered that the implementation of sensitive landscaping and use of weed management during construction would have a beneficial impact on residual vegetation cover.

5.5 Residual impacts and offsetting

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*. In relation to the removal of five medium trees and one large sized tree, the *TfNSW Vegetation Offset Calculator 9TP-SD-087* has determined a offset of 28 trees. It is recommended that any offset plantings consider the use of locally endemic native species such as Blueberry Ash (*Elaeocarpus reticulatus*).

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Appendix A Likelihood of Occurrence

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	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.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Mixophyes balbus</i> (Stuttering Frog)	E	V	Associated with streams in dry sclerophyll and wet sclerophyll forests and rainforests of more upland areas of the Great Dividing Range of NSW and down into Victoria. Breeding occurs along forest streams with permanent water where eggs are deposited within nests excavated in riffle zones by the females and the tadpoles swim free into the stream when large enough to do so. Outside of breeding, individuals range widely across the forest floor and can be found hundreds of metres from water	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Mixophyes iteratus</i> (Giant Barred Frog)	E	E	This species is found along larger streams of the coast and adjacent ranges of NSW and SE QLD. It inhabits rainforest and wet sclerophyll forest, but is also found within cleared farmland where fringing vegetation is retained, including lantana beds. Many sites where the Giant Barred Frog is known to occur are the lower reaches of streams which have been affected by major disturbances such as clearing, timber harvesting and urban development in their headwaters.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Pseudophryne australis</i> (Red-crowned Toadlet)	V	-	Occurs on wetter ridge tops and upper slopes of sandstone formations on which the predominant vegetation is dry open forests and heaths. This species typically breeds within small ephemeral creeks that feed into larger semi-perennial streams. After rain these creeks are characterised by a series of shallow pools lined by dense grasses, ferns and low shrubs and usually contain leaf litter for shelter. Eggs are terrestrial and laid under litter, vegetation or rocks where the tadpoles inside will reach a relatively late stage of development before waiting for flooding waters before hatching will occur.	6	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Hoplocephalus bungaroides</i> (Broad-headed Snake)	E	V	Occurs almost exclusively in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they spend most of the year sheltering in and under rock crevices and exfoliating rock. However, some individuals will migrate to tree hollows to find shelter during hotter parts of summer.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Varanus rosenbergi</i> (Rosenberg's Goanna)	V	-	This species is a Hawkesbury-Narrabeen sandstone outcrop specialist. Occurs in coastal heaths, humid woodlands and both wet and dry sclerophyll forests.	4	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	9	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<i>Hirundapus caudacutus</i> (White-throated Needletail)	-	M	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges.	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	E	E	The Australasian Bitterns 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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Artamus cyanopterus cyanopterus</i> (Dusky Woodswallow)	V	-	The Dusky Woodswallow is widespread in eastern, southern and southwestern Australia. In New South Wales it is widespread from coast to inland, including the western slopes of the Great Dividing Range and farther west. It is sparsely scattered in, or largely absent from, much of the Upper Western region. The Dusky Woodswallow is often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests. At sites where Dusky Woodswallows are recorded the understorey is typically open with sparse eucalypt saplings, acacias and other shrubs, including heath. The ground cover may consist of grasses, sedges or open ground, often with coarse woody debris (Higgins and Peter 2002). Birds are also often observed in farm land, usually at the edges of forest or woodland or in roadside remnants or wind breaks with dead timber.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Callocephalon fimbriatum</i> (Gang-gang Cockatoo)	V	-	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine snow gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Calyptorhynchus lathamii</i> (Glossy Black-Cockatoo)	V	-	Inhabits forest with low nutrients, characteristically with key Allocasuarina spp. Tends to prefer drier forest types with a middle stratum of Allocasuarina below Eucalyptus or Angophora. Often confined to remnant patches in hills and gullies. Breed in hollows stumps or limbs, either living or dead. Endangered population in the Riverina.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Thinornis rubricollis rubricollis</i> (Hooded Plover)	CE	V	The Hooded Plover occurs on sandy beaches and inland saltlakes of south-eastern and south-western Australia. Within NSW, the Hooded Plover occurs along the southern coast, north to Jervis Bay. In souther-eastern Australian, the Hooded Plover is found mostly on long stretches of sandy shore, backed by tussock and creeper covered dunes with nearby inland lakes.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Ptilinopus regina</i> (Rose-crowned Fruit-dove)	V	-	Coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Vagrants are occasionally found further south to Victoria. Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Ptilinopus superbus</i> (Superb Fruit-dove)	V	-	The Superb Fruit-dove occurs principally from north-eastern in 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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative

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<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	effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records). Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Not recently observed in the locality (NSW BioNet records).
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Rhipidura rufifrons</i> (Rufous Fantail)	-	M	Found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. Inhabits tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Dasyornis brachypterus</i> (Eastern Bristlebird)	E	E	Found in coastal woodlands, dense scrub and heathlands, particularly where it borders taller woodlands.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Petroica boodang</i> (Scarlet Robin)	V	-	The Scarlet Robin is found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia. In NSW, it occurs from the coast to the inland slopes. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Polytelis swainsonii</i> (Superb Parrot)	V	V	The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. Inhabits box-gum, box-cypress-pine and boree woodlands and river red gum forest.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Calidris melanotos</i> (Pectoral Sandpiper)	-	M	Tends to live and feed over shallow coastal waters- the estuaries, lagoons and channels around river and harbour entrances and along the shallows close in shore.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Ninox connivens</i> (Barking Owl)	V	-	Generally found in open forests, woodlands, swamp woodlands and dense scrub. Can also be found in the foothills and timber along watercourses in otherwise open country.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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.	119	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Tyto novaehollandiae</i> (Masked Owl)	V	-	Inhabits a diverse range of wooded habitat that provide tall or dense mature trees with hollows suitable for nesting and roosting. Mostly recorded in open forest and woodlands adjacent to cleared lands. Nest in hollows, in trunks and in near vertical spouts or large trees, usually living but sometimes dead. Nest hollows are usually located within dense forests or woodlands. Masked owls prey upon hollow-dependent arboreal marsupials, but terrestrial mammals make up the largest proportion of the diet.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<i>Tyto tenebricosa</i> (Sooty Owl)	V	-	Often found in tall old-growth forests, including temperate and subtropical rainforests. In NSW mostly found on escarpments with a mean altitude less than 500 metres. Nests and roosts in hollows of tall emergent trees, mainly eucalypts often located in gullies. Nests have been located in trees 125 to 161 centimetres in diameter.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Cercartetus nanus</i> (Eastern Pygmy-possum)	V	-	Inhabits rainforest through to sclerophyll forest and tree heath. Banksias and myrtaceous shrubs and trees are a favoured food source. Will often nest in tree hollows, but can also construct its own nest. Because of its small size it is able to utilise a range of hollow sizes including very small hollows. Individuals will use a number of different hollows and an individual has been recorded using up to 9 nest sites within a 0.5ha area over a 5 month period.	59	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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.	7	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Pseudomys gracilicaudatus</i> (Eastern Chestnut Mouse)	V	-	In NSW the Eastern Chestnut Mouse mainly occurs north from the Hawkesbury River area as scattered records along to coast and eastern fall of the Great Dividing Range extending north into Queensland. There are however isolated records in the Jervis bay area. In NSW the Eastern Chestnut Mouse is mostly found, in low numbers, in heathland and is most common in dense, wet heath and swamps. In the tropics it is more an animal of grassy woodlands. Optimal habitat appears to be in vigorously regenerating heathland burnt from 18 months to four years previously. By the time the heath is mature, the larger Swamp Rat becomes dominant, and Eastern Chestnut Mouse numbers drop again.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Isoodon obesulus obesulus</i> (Southern Brown Bandicoot (eastern))	E	-	Prefers sandy soils with scrubby vegetation and-or areas with low ground cover that are burn from time to time. A mosaic of post fire vegetation is important for this species.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Petaurus australis</i> (Yellow-bellied Glider)	V	-	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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 .	8	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Petauroides volans</i> (Greater Glider)	-	V	The Greater Glider occurs in eucalypt forests and woodlands. Utilise tree hollows.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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.	85	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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.	8	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<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.	48	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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.	6	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Phoniscus papuensis</i> (Golden-tipped Bat)	V	-	Distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to Bega in southern NSW. Found in rainforest and adjacent sclerophyll forest. Roost in abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests located in rainforest gullies on small first- and second-order streams.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	4	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Macquaria australasica</i> (Macquarie Perch)	E (FM Act)	E	Macquarie perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Prototroctes maraena</i> (Australian Grayling)	-	V	Historically, this species occurred in coastal streams from the Grose River Valley, southwards through NSW, Vic. and Tas. It also occasionally occurred high upstream in the Snowy R. A single juvenile specimen was collected from Lake Macquarie in 1974. This species spends only part of its lifecycle in freshwater. The Tambo River population inhabits a clear, gravel-bottomed stream with alternating pools and riffles, and granite outcrops. It has also been associated with clear, gravel-bottomed habitats in the Mitchell & Wonnangatta Rivers but was present in a muddy-bottomed, heavily silted habitat in the Tarwin R.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Pommerhelix duralensis</i> (Dural Land Snail)	-	E	Endemic to NSW and confined to northwest fringes of the Cumberland Plain. Distribution extends as far north as St. Albans; southwest to Mulgoa, and southeast to Parramatta. Occurs in low densities in Hawkesbury Sandstone Vegetation and Shale/Sandstone Transition Forest. Found under rocks, logs, bark and in leaf litter. Has a strong preference for shale-influenced transitional landscapes and has not been confirmed outside such habitats.	2	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Synemon plana</i> (Golden Sun Moth)	E	CE	The Golden Sun Moth's NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut. Occurs in natural temperate grasslands and grassy box-gum woodlands in which groundlayer is dominated by wallaby grasses <i>Austrodanthonia</i> spp.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Allocasuarina glareicola</i>	E	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool. Grows in Castlereagh woodland on lateritic soil. Found in open woodland with <i>Eucalyptus parramattensis</i> , <i>Eucalyptus fibrosa</i> , <i>Angophora bakeri</i> , <i>Eucalyptus sclerophylla</i> and <i>Melaleuca decora</i> . Common associated understorey species include <i>Melaleuca nodosa</i> , <i>Hakea dactyloides</i> , <i>Hakea sericea</i> , <i>Dillwynia tenuifolia</i> , <i>Micromyrtus minutiflora</i> , <i>Acacia elongata</i> , <i>Acacia brownei</i> , <i>Themeda australis</i> and <i>Xanthorrhoea minor</i> .	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Hibbertia spanantha</i>	CE	CE	Grows in forest with canopy species including <i>Eucalyptus pilularis</i> , <i>E. resinifera</i> , <i>Corymbia gummifera</i> and <i>Angophora costata</i> on light clay soils occurring on a shale sandstone soil transition on Sydney's north shore. The understorey is open with species of Poaceae, Orchidaceae, Fabaceae and Liliaceae. Flowers October and November.	1	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species recently observed in the locality (NSW BioNet records).
<i>Epacris purpurascens</i> var. <i>purpurascens</i>	V	-	Recorded from Gosford in the north, to Narrabeen in the east, Silverdale in the west and Avon Dam vicinity in the South. Found in a range of habitat types, most of which have a strong shale soil influence.	9	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Acacia bynoeana</i> (Bynoe's Wattle)	E	V	Grows mainly in heath and dry sclerophyll forest in sandy soils. Mainly south of Dora Creek-Morisset area to Berrima and the Illawarra region, west to the Blue Mountains, also recorded from near Kurri Kurri in the Hunter Valley and from Morton National Park.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Acacia pubescens</i>	V	V	Concentrated around the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravelly soils, often with ironstone. Grows in open woodland and forest, in a variety of plant communities, including Cooks River-Castlereagh Ironbark forest, Shale-Gravel Transition forest and Cumberland Plain woodland.	31	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Grammitis stenophylla</i> (Narrow-leaf Finger Fern)	E	-	Moist places, usually near streams, on rocks or in trees, in rainforest and moist eucalypt forest.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Haloragodendron lucasii</i>	E	E	Occurs on Hawkesbury Sandstone in moist sandy loam soil. The species prefers sheltered aspects and inhabits gentle slopes below cliff lines near creeks in low open woodland or open forest. Its distribution is correlated with high soil moisture and phosphorus levels.	55	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Callistemon linearifolius</i>	V	-	Recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. Recorded in 2000 at Coalcliff in the northern Illawarra. For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River. Grows in dry sclerophyll forest on the coast and adjacent ranges.	2	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Darwinia biflora</i>	V	V	Recorded in Ku-ring-gai, Hornsby, Baulkham Hills and Ryde local government areas. The northern, southern, eastern and western limits of the range are at Maroota, North Ryde, Cowan and Kellyville, respectively. Occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone. The vegetation structure is usually woodland, open forest or scrub-heath.	159	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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<i>Darwinia peduncularis</i>	V	-	Occurs as local disjunct populations in coastal NSW with a couple of isolated populations in the Blue Mountains. It has been recorded from Brooklyn, Berowra, Galston Gorge, Hornsby, Bargo River, Glen Davis, Mount Boonbourwa and Kings Tableland. Usually grows on or near rocky outcrops on sandy, well drained, low nutrient soil over sandstone.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Eucalyptus nicholii</i> (Narrow-leaved Black Peppermint)	V	V	Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock. Seedling recruitment is common, even in disturbed soils, if protected from grazing and fire.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

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Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Leptospermum deanei</i>	V	V	woodland on lower hill slopes or near creeks. Sandy alluvial soil or sand over sandstone. Occurs in riparian scrub, woodland and open forest.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Melaleuca deanei</i> (Deane's Paperbark)	V	V	Grows in wet heath on sandstone in coastal districts from Berowra to Nowra.	5	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Rhodamnia rubescens</i> (Scrub Turpentine)	CE	-	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. This species is characterised as highly to extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.	1	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Rhodomyrtus psidioides</i> (Native Guava)	CE	-	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines. This species is characterised being extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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	11	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<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. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Genoplesium baueri</i> (Bauer's Midge Orchid)	E	E	Grows in dry sclerophyll forest and moss gardens over sandstone. Flowers February to March. Has been recorded between Ulladulla and Port Stephens. Currently the species is known from just over 200 plants across 13 sites. The species has been recorded in Berowra Valley Regional Park, Royal National Park and Lane Cove National Park and may also occur in the Woronora, O'Hares, Metropolitan and Warragamba Catchments.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Genoplesium plumosum</i> (Tallong Midge Orchid)	CE	E	Occurs exclusively in heathland, generally dominated by violet kunzea, common fringe-myrtle and parrot-peas. Grows on very shallow soils or within mosses on sandstone conglomerate shelves. Plants exist only as a dormant tuber for much of the year, with leaves or fruiting stems dying back in winter. Reproduces by seed and has no mechanism for vegetative reproduction.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Deyeuxia appressa</i>	E	E	A highly restricted NSW endemic known only from two pre-1942 records in the Sydney area (Herne Bay, Saltpan Creek, off the Georges River, south of Bankstown and Killara, near Hornsby). Almost nothing is known about the species' habitat and ecology. Flowers spring to summer and is mesophytic (grows in moist conditions).	0	Low. Vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are present; however, species specific habitat types (i.e. important habitat features) are either absent, in low abundance and/ or in a disturbed state. The investigation area is likely to be located outside the species known 'area of occurrence' but may be within the known 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Factors such as connectivity, patch size, habitat quantum and/ or quality are likely to be negatively influencing the likelihood of habitat occupancy. If detected, species activity is most likely low and associated with landscape scale habitat use such as movement between areas of higher value habitat, the use of supplementary habitat or reflect the negative effects of active/ uncontrolled KTPs. Species not recently observed in the locality (NSW BioNet records).

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Persicaria elatior</i>	V	V	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Grevillea caleyi</i>	E	E	Restricted to an 8 km square area around Terrey Hills, approximately 20 km north of Sydney. Occurs in three major areas of suitable habitat, namely Belrose, Ingleside and Terrey Hills-Duffys forest within the Ku-ring-gai, Pittwater and Warringah Local Government Areas. All sites occur on the ridgetop between elevations of 170 to 240m asl, in association with laterite soils and a vegetation community of open forest, generally dominated by <i>Eucalyptus sieberi</i> and <i>Corymbia gummifera</i> . Commonly found in the endangered Duffys forest ecological community.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Grevillea juniperina</i> subsp. <i>juniperina</i>	V	-	Endemic to Western Sydney, centred on an area bounded by Blacktown, Erskine Park, Londonderry and Windsor with outlier populations at Kemps Creek and Pitt Town. Recorded from Cumberland Plain woodland, Castlereagh Ironbark woodland, Castlereagh Scribbly Gum woodland and Shale-Gravel Transition forest. Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence), typically containing lateritic gravels.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Persoonia hirsuta</i> (Hairy Geebung)	E	E	Distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. A large area of occurrence, but occurs in small populations, increasing the species's fragmentation in the landscape. Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. Usually present as isolated individuals or very small populations. Probably killed by fire (as other <i>Persoonia</i> spp. are) but will regenerate from seed.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Persoonia mollis</i> subsp. <i>maxima</i>	E	E	Occurs in sheltered aspects of deep gullies or on the steep upper hillsides of narrow gullies on Hawkesbury Sandstone. These habitats support relatively moist, tall forest vegetation communities, often with warm temperate rainforest influences. Flowers are likely to be pollinated predominantly by native bees. Self-pollination is usually unsuccessful.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Galium australe</i>	E	-	Widespread in Victoria and is also found in South Australia and Tasmania. Once regarded as presumed extinct in NSW, this species is now known from the Towamba Valley near Bega, Lake Yarrunga near Kangaroo Valley, Cullendulla Creek Nature Reserve near Batemans Bay, Conjola National Park, Swan Lake near Swanhaven, and the Big Hole in Deua National Park. Grows in moist gullies of tall forest, Eucalyptus tereticornis forest, coastal Banksia shrubland, and Allocasuarina nana heathland. In other States the species is found in a range of near-coastal habitats, including sand dunes, sand spits, shrubland and woodland.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Asterolasia elegans</i>	E	E	Occurs north of Sydney, in the Baulkham Hills, Hawkesbury and Hornsby local government areas. Also likely to occur in the western part of Gosford local government area. Known from only seven populations, only one of which is wholly within a conservation reserve. Occurs on Hawkesbury sandstone in sheltered forests on mid- to lower slopes and valleys, e.g. in or adjacent to gullies which support sheltered forest.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Thesium australe</i> (Austral Toadflax)	V	V	Grows in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Occurs in grassland or grassy woodland. Grows on kangaroo grass tussocks but has also been recorded within the exotic coolatai grass.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Lasiopetalum joyceae</i>	V	V	Grows in heath on sandstone.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

REPORT

Scientific Name (Common Name)	BC Act	EPBC Act	Habitat	Number of Records (BCD 2019)	Likelihood of Occurrence
<i>Pimelea curviflora</i> var. <i>curviflora</i>	V	V	Confined to the coastal area of Sydney between northern Sydney in the south and Maroota in the north-west. Former range extended south to the Parramatta River and Port Jackson region including Five Dock, Bellevue Hill and Manly. Occurs on shaley-lateritic soils over sandstone and shale-sandstone transition soils on ridgetops and upper slopes amongst woodlands.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Pimelea spicata</i> (Spiked Rice-flower)	E	E	Once widespread on the Cumberland Plain, the Spiked Rice-flower occurs in two disjunct areas; the Cumberland Plain (Narellan, Marayong, Prospect Reservoir areas) and the Illawarra (Landsdowne to Shellharbour to northern Kiama). In both the Cumberland Plain and Illawarra environments this species is found on well-structured clay soils. On the inland Cumberland Plain sites it is associated with grey box and Ironbark. In the coastal Illawarra it occurs commonly in Coast Banksia open woodland with a better developed shrub and grass understorey.	0	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.
<i>Tetratheca 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.	32	None. Species specific habitat types (i.e. important habitat features) and known vegetation classification based habitat surrogates (i.e. PCT and/ or vegetation formations) are absent from the investigation area. The investigation area is also likely located outside the species known 'area of occurrence' and may also occur outside the species 'extent of occurrence' [i.e. standard grid size of 2x2km (IUCN 2017)]. Species incidence is not expected and, if detected, would likely represent atypical occurrence (e.g. incidence linked with transient activity). Presence unlikely associated with habitat occupancy involving important lifecycle processes.

Appendix B

BC Act Test of Significance

Threatened Species and Ecological Communities

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

The Proposal area does not contain a threatened species or its habitat. While there is low potential for a threatened species to be observed within the Proposal area as a vagrant, it is considered that the loss of habitat that may be used in this way 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

The Proposal area does not contain an EEC or CEEC. The Proposal is not likely to place an EEC or CEEC at risk of extinction.

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

The Proposal area does not contain an EEC or CEEC. The Proposal is not likely to place an EEC or CEEC at risk of extinction.

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

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

The Proposal area does not contain a threatened species or its habitat. The Proposal is not likely to remove or modify the habitat of a threatened species.

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 Proposal area does not contain a threatened species or its habitat. The Proposal is not likely to fragment or isolate the habitat of a threatened species.

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 Proposal area does not contain a threatened species or its habitat. The area impacted by the Proposal is not likely to have an impact on habitat important to a threatened species or fragment/ isolate two or more areas of important habitat such that the long term survival of the species or ecological community would be adversely effected.

(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 not activate or promote a listed key threatening process.

CONCLUSION

The Proposal is not likely to substantially reduce the extent of habitat for a threatened species or ecological community; nor will it increase the fragmentation/ isolation of habitat or adversely impact lifecycle processes for such matters. 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 threatened species, ecological communities or their habitats.

Appendix C

EPBC Act Significance Assessment

Vulnerable Species

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

The Proposal will not result in a reduction of habitat for a threatened species and/ or an extent of habitat 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 habitat for the species.

Fragment an existing population into two or more populations

The Proposal will not result in the fragmentation of any populations into two or more populations.

Adversely affect habitat critical to the survival of an important population

The Proposal will have no impact on habitat important to the species. The Proposal is unlikely to affect habitat critical to the survival of the species.

Disrupt the breeding cycle of a population

The Proposal will not disrupt the breeding cycle of a population.

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

The Proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that a listed vulnerable species is likely to decline.

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

The Proposal is not expected to result in additional invasive species that are harmful to a threatened species.

Introduce disease that may cause the species to decline

The Proposal is not expected to introduce a disease harmful to a threatened species.

Interfere with the recovery of the species

The Proposal is not expected to interfere with the recovery of a threatened species.

CONCLUSION

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