Biodiversity Impact Assessment

Normanhurst Station Upgrades

Prepared for Transport for NSW
February 2021

EMM Newcastle
Level 3, 175 Scott Street
Newcastle NSW 2300

T 02 4907 4800
E info@emmconsulting.com.au

www.emmconsulting.com.au

Biodiversity Impact Assessment

Normanhurst Station Upgrades

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Client

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Prepared by

Cecilia Phu
Associate Ecologist
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Approved by

Steven Ward
Associate Ecologist
4 February 2021

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1 Introduction

1.1 Background

Transport for New South Wales (Transport for NSW) have engaged EMM Consulting Pty Limited (EMM) to undertake the environmental assessment of proposed access upgrades at Normanhurst train station in Normanhurst, New South Wales (NSW).

Transport for NSW is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the Normanhurst Station Upgrades (the 'proposal'). The proposal is part of the Transport Access Program (TAP) which aims to achieve Disability Standards for Accessible Public Transport (DSAPT) compliance.

The proposal will be assessed under the provisions of Division 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This report comprises the biodiversity impact assessment of the proposal and supports the Review of Environmental Factors (REF) being prepared by EMM on behalf of Transport for NSW. The purpose of this report is to identify the ecological values of the environment where the proposal will be located, provide an assessment of potential impacts of the proposal on terrestrial biodiversity listed under NSW and Commonwealth legislation, and suggest avoidance or mitigation measures to reduce impacts on biodiversity.

1.2 Site location

The proposal is located in the suburb of Normanhurst, NSW, approximately 20 kilometres (km) north-west of the Sydney Central Business District (CBD) within the Hornsby local government area (LGA). The current location of Normanhurst Station was established in 1895 and is serviced by the T9 Northern Line of the Sydney Trains network.

The Normanhurst suburb is divided by Pennant Hills Road, a major north-south thoroughfare that leads north to the M1 Motorway, and south towards Parramatta. Both the east and west sections of Normanhurst have extensive bush access. On the east side, a small section of bush lies between Normanhurst and Fox Valley. On the western side, the suburb backs onto the southern reaches of the Berowra Valley, a continuous section of bush stretching to Broken Bay.

The proposal is located within the existing footprint of Normanhurst Station. Access to the site of the proposal would be via the existing station access locations on Denman Parade and Malsbury Road. Commuter and pedestrian access to the station will be ensured at all times, except for during scheduled rail line shutdown periods.

Figure 1.1 shows the local context for the proposal site.

1.3 Proposal description

The proposal would improve accessibility of Normanhurst Station in line with the requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA) and the Disability Standards for Accessible Public Transport 2002 (DSAPT).

A concept design for the proposal has been prepared and will be subject to future detailed design. An overview of the proposal concept design is shown in Figure 1 of the REF. The construction works will necessitate some vegetation clearing and tree trimming in places. The general layout of construction and trimming works are shown in Figure 1.2. These footprints have been used for the purpose of all impact assessment in this report. Should ecological impacts increase during the detailed design phase, revision of the ecological assessment would be required.

A detailed proposal description is provided in the REF; however, the key features of the proposal are as follows:

- minor alteration work on the existing footbridge and stairs to accommodate new lift landings, including upgrades to tactiles, nosings, stair treads and handrails as required;
- construction and installation of two new lifts and lift landings to connect to the existing overpass, including:
    - one lift at the Malsbury Road entrance;
    - one lift at the Denman Parade entrance;
    - concrete lift shafts;
    - accessible pathways to station facilities and Boarding Assistance Zones (BAZ) within the station area;
    - weather protection and safety screens to lifts and stairs; and
    - lift canopies;
- construction of two new kiss and ride parking zones on Denman Parade;
- new accessible station entrances at Denman Parade and Malsbury Road, including regrading work to create a forecourt area with accessible paths to station facilities, boarding assistance zones and wayfinding signage and new fencing (where required to be relocated or upgraded);
- soft landscaping, including revegetation work in existing planting boxes, adjustments to existing landscaping features (such as bench seating and bike racks) and creation of new green zones as a part of revegetation of disturbance areas created for lift installation;
- modifications to existing platform building on Platform 1 to provide one family accessible toilet and two ambulant toilets;
- installation of free-standing canopy shelters at the BAZ on Platform 1 and 2; and
- earthworks and construction activities at the existing station access zones in order to achieve DSAPT compliant grades.

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. Construction laydown areas are proposed for the following locations (refer to Figure 9 of the REF):

- a previously cleared area located in the rail corridor off Malsbury Road, east of Normanhurst station (where some minor vegetation trimming is required); and
- a cleared area within the rail corridor between Thornleigh and Normanhurst Stations, which will be utilised a joint laydown/storage area for Thornleigh and Normanhurst Station upgrade projects.

Subject to planning approval, construction is expected to commence in mid-2021 and to be completed by mid-2023.

1.4 Aims and objectives

This report aims to assess the potential impacts of the proposal on threatened species or ecological communities, or their habitats as listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), and to determine whether there is likely to be a significant impact on threatened entities in accordance with the Section 7.3 test of significance.

This report also aims to assess the potential impacts of the proposal on relevant Matters of National Environmental Significance (MNES) as listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and to determine whether there is likely to be a significance impact on MNES in accordance with the EPBC Act Significant Impact Guidelines 1.1 (DotE 2013) and any applicable referral guidelines.

1.5 Terms and definitions

The terms used in this report are defined below.

Table 1.1 Terms and definitions

Terms	Description
the proposal	the Normanhurst Station Upgrades, as described in Section 1.3
subject site	areas of direct impact; specifically, the vegetation clearing and trimming areas shown in Figure 1.2
study area	refers to the subject site, and surrounds that may be indirectly impacted by the proposal
search area	land within 10 km of the subject site in which database searches were conducted

Source: EMM (2020); DFSI (2017); GA (2011); ASGC (2006)

0 0.25 0.5 km

GDA 1994 MGA Zone 56

N

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KEY

- Normanhurst station
- Train station
- Rail line
- Major road
- Local road
- Named watercourse
- Watercourse/drainage line
- Local government area
- NPWS reserve

Local context

Transport for New South Wales
Normanhurst station access upgrades
Biodiversity impact assessment
Figure 1.1

EMM creating opportunities

Source: EMM (2020); DFSI (2017); GA (2011); ASGC (2006)

0 20 40 m

GDA 1994 MGA Zone 56

N

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KEY

- Rail line
- Watercourse/drainage line
- Cadastral boundary

Indicative site work areas

- Site office
- Material laydown
- Construction footprint
- Vegetation trimming

Location of construction and trimming works

Transport for New South Wales
Normanhurst station access upgrades
Biodiversity impact assessment
Figure 1.2

EMM creating opportunities

2 Legislative context

This project has been assessed against key biodiversity legislation and government policy, including:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Environmental Planning and Assessment Act 1979* (EP&A Act);
  - State Environmental Planning Policies; and
  - Hornsby Local Environmental Plan 2013 (HLEP 2013);
- *Biodiversity Conservation Act 2016* (BC Act);
- *Fisheries Management Act 1994* (FM Act); and
- *Biosecurity Act 2015* (BS Act).

A brief outline of the key biodiversity legislation and government policy considered in this assessment is provided below.

2.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the Australian Government's key piece of environmental legislation. Enacted at the Commonwealth level, the EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, heritage places and water resources that are defined as Matters of National Environmental Significance (MNES) under the EPBC Act. The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on MNES undergo an assessment and approval process.

MNES protected under the EPBC Act include:

- world heritage properties;
- places listed on the National Heritage Register;
- Ramsar wetlands of international significance;
- threatened flora and fauna species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- water resources, in relation to coal seam gas or large coal mining development.

Under the EPBC Act, an action includes a project, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things. An action that has, will have or is likely to have a significant impact on an MNES is deemed to be a 'controlled action' and may not be undertaken without prior approval from the
Australian Minister for the Environment.

An action that may have a significant impact on a MNES is to be referred to the Department of Agriculture, Water and the Environment (DAWE) for determination as to whether or not it is a controlled action. If deemed a controlled action the proposed activity is assessed under the EPBC Act and a decision made as to whether or not to grant approval.

Blue Gum High Forest of the Sydney Basin Bioregion is a threatened ecological community that has potential to be impacted by the proposal and is assessed in Section 6.3 and Appendix E.

2.2 Environmental Planning and Assessment Act 1979

The EP&A Act was enacted to encourage the consideration and management of impacts of proposed development or land-use changes on the environment and the community. The EP&A Act is administered by the NSW Department of Planning, Industry and Environment (DPIE).

The proposal will be undertaken under Part 5 of the EP&A Act. The proposed activity requires the preparation of a REF for submission to, and determination by Transport for NSW, as the Consent Authority. This report has been prepared to accompany the REF and assess the biodiversity values within the study area.

The EP&A Act provides the overarching structure for planning in NSW; however, is supported by other statutory environmental planning instruments (EPIs) including State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs). State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) aims to facilitate the effective delivery of infrastructure across NSW and provides for works undertaken for railway or railway infrastructure facilities; the Infrastructure SEPP therefore applies to the proposal. Other EPIs relevant to the management of biodiversity are discussed below with respect to the proposal.

2.2.1 State Environmental Planning Policy (Koala Habitat Protection) 2020

State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP) aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for the Koala (*Phascolarctos cinereus*) to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline.

Although Hornsby LGA is listed under Schedule 1 of the Koala SEPP, the Koala SEPP only applies to development applications requiring consent from councils and does not apply to Part 5 activities that do not require development consent. However, consideration has been given to the potential for the Koala populations or habitat to occur, and consequently to require assessment under the BC Act and the EPBC Act (refer to Section 4.4.2).

2.2.2 State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Coastal Management) 2018 (Coastal Management SEPP) applies to the coastal zone in NSW and aims to manage development and environmental assets on the coast, as well as establish a framework for decision-making in the coastal zone.

The coastal zone includes coastal management areas mapped as coastal wetlands and littoral rainforests, and also land mapped as proximity areas to coastal wetlands and littoral rainforests. The Coastal Management SEPP specifies assessment criteria that are tailored for each coastal management area. Councils and other consent authorities must apply these criteria when assessing proposals for development that fall within one or more of the mapped areas.

The proposal is not within any coastal zones identified in the Coastal Management SEPP.

2.2.3 Hornsby Local Environmental Plan 2013

The Hornsby Local Environment Plan 2013 (HLEP 2013) is Hornsby Council's key planning instrument and outlines the land use zones that describe what development is permissible in each zone. It also contains key development standards and special provisions to address land constraint issues, such as land acquisition, biodiversity and flood prone land.

Clause 6.4 of the HLEP 2013 aims to maintain terrestrial biodiversity within the Hornsby LGA and contains provisions for development of land identified as "Biodiversity" on the Terrestrial Biodiversity Map. The provisions aim to protect native flora and fauna, ecological processes and encourage conservation and recovery of native flora and fauna and their habitats. Section 1C.1.1 of the Hornsby Development Control Plan 2013 also provides general controls for the protection of land with biodiversity value, including land identified as "Biodiversity" on the Terrestrial Biodiversity Map.

The Terrestrial Biodiversity Map identifies "Biodiversity" land along the rail corridor on the Malsbury Road frontage north from the Malsbury Road station entrance, corresponding broadly to mapped occurrences of remnant Blue Gum High Forest ecological community identified in the Hornsby LGA vegetation mapping (Hornsby Shire Council 2019). The mapped "Biodiversity" land appears to exclude stands of Blue Gum High Forest represented by remnant trees only.

The Infrastructure SEPP prevails over other EPIs (including LEPs). However, consideration has been given to the potential for Blue Gum High Forest ecological community, and consequently to require assessment under the BC Act and the EPBC Act.

2.3 Biodiversity Conservation Act 2016

The BC Act, together with the *Biodiversity Conservation Regulation 2017* (BC Regulation), outlines the framework for addressing development impacts on biodiversity in NSW. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme (BOS).

The BOS is underpinned by the *Biodiversity Assessment Method* (BAM) (DPIE 2020), which provides an assessment methodology for assessing biodiversity impacts and determining offset requirements under the scheme. The BOS is triggered if a development or activity is determined to be likely to significantly affect threatened species or communities.

2.3.1 Biodiversity assessment pathway

For activities that are assessed under Part 5 of the EP&A Act, an activity is likely to significantly affect threatened species or communities if determined as such in accordance with the 'five-part' test of significance in Section 7.3 of the BC Act, or if it is carried out in a declared area of outstanding biodiversity value.

Under Section 7.8 of the BC Act if an activity proposed under Part 5 of the EP&A Act is likely to significantly affect threatened species or communities, the preparation of a species impact statement (SIS) or a Biodiversity Development Assessment Report (BDAR) is required.

The proposal will not be undertaken in a declared area of outstanding biodiversity value. Section 6 provides a description and assessment of the likely impacts of the proposal on threatened species and communities, and their habitats and assesses the significance of the predicted impacts in accordance with the five-part test of significance. Five-part tests of significance for threatened species and communities that are assessed as having potential to be impacted by the proposal are provided in Appendix D.

2.4 Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) contains provisions for the conservation of fish stocks, key fish habitat, biodiversity, threatened species, populations and ecological communities. It regulates the conservation of fish, vegetation and some aquatic macroinvertebrates and the development and sharing of the fishery resources of NSW for present and future generations. The FM Act lists threatened species, populations and ecological communities, key threatening processes (KTPs) and declared critical habitat. Assessment guidelines to determine whether a significant impact is expected are detailed in section 220ZZ and 220ZZA of the FM Act.

Another objective of the FM Act is to conserve key fish habitat (KFH). These are defined as aquatic habitats that are important to the sustainability of recreational and commercial fishing industries, the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. KFH is defined in Section 3.2.1 and Section 3.2.2 of the *Policy and Guidelines for Fish Conservation and Management* (DPI 2013).

The proposal requires no works to be undertaken within creeks or key fish habitat. There would be no obstruction (permanent or temporary) of fish passage or impacts on key fish habitat. As such the FM Act is not triggered by the proposal.

2.5 Biosecurity Act 2015

The *Biosecurity Act 2015* (BS Act) has superseded the *Noxious Weeds Act 1993*, which has now been repealed. The primary objective of the Biosecurity Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.

The BS Act stipulates management arrangements for weed biosecurity risks in NSW, with the aim to prevent, eliminate and minimise risks. Management arrangements include:

- any land managers and users of land have a responsibility for managing weed biosecurity risks that they know about or could reasonably be expected to know about;
- applies to all land within NSW and all waters within the limits of the State; and
- local strategic weed management plans will provide guidance on the outcomes expected to discharge duty for the weeds in that plan.

The proposal is located within the Greater Sydney Local Land Services (LLS) region and is subject to *Greater Sydney Regional Strategic Weed Management Plan 2017-2022* (Greater Sydney LLS 2019).

Relevant priority weeds for the Greater Sydney LLS region are identified in Section 4.2.

3 Methods

3.1 Desktop assessment

A desktop assessment was undertaken to identify threatened species and ecological communities that are predicted or known to occur in the search area to obtain an understanding of the potential threatened species values of the study area. The desktop assessment comprised database searches and review of relevant information, including:

- a search of the Protected Matters Search Tool, managed by DAWE, for matters protected by the EPBC Act (a copy of the search results is provided in Appendix A);
- a search of the BioNet Atlas of NSW Wildlife, managed by the Biodiversity Conservation Division (BCD) of DPIE, for threatened species and communities listed under the BC Act and EPBC Act;
- a review of regional vegetation mapping, including:
  - Hornsby Local Government Area Vegetation Map Update, 2017. VIS_ID 5065 (Hornsby Shire Council 2019);
  - The Native Vegetation of the Sydney Metropolitan Area – Version 3.1. VIS_ID 4489 (Office of Environment and Heritage 2016); and
  - Remnant Vegetation of the western Cumberland subregion, 2013 Update. VIS_ID 4207 (DPIE 2015);
- a review of NSW Vegetation Information System (VIS), managed by BCD, to review plant community types (PCTs) that may occur;
- a review of the NSW Weedwise website to identify priority weeds for the Greater Sydney LLS region; and
- a review of aerial imagery and other relevant spatial information such as soil mapping.

This desktop assessment was used to inform a field investigation and underpins an assessment of the likelihood of occurrence of threatened entities.

3.2 Field investigation

The field investigation was undertaken by two ecologists over one day (18 November 2020) and involved a detailed walkover of all the proposed vegetation clearing and trimming areas.

During the site investigation, observed flora species were recorded and photographs of each area was taken to assist with evaluation of vegetation type and condition. A flora species list is provided in Appendix B.

Rapid data points (RDP) were recorded at various locations and notes taken of the dominant (ie most frequently recorded and/or apparent) species at these locations. Focus was given to species that are characteristic of threatened ecological communities (TECs) known to occur in the search area to evaluate the likely presence of such TECs within the subject site.

Concurrently with the above, a habitat assessment was undertaken seeking to identify the following fauna habitat features within the survey area:

- habitat trees including large hollow-bearing trees and nests;
- availability of flowering shrubs and feed tree species;
- quantity of ground litter and logs; and
- searches for indirect evidence of fauna (such as diggings, scats or whitewash).

3.3 Survey limitations

The field investigation was not designed to detect all species but to provide an overall assessment of the ecological values of the study area. Although the site survey was limited to a habitat assessment for threatened species and no targeted surveys (other than searches for threatened flora over one day) were undertaken, this was considered suitable given the limited nature of the impacts of the proposed activity and considering that a conservative approach to assuming the presence of threatened species has been taken.

While some species have been assessed as having a low likelihood of occurrence, it is acknowledged that this does not indicate the species will never occur. Rather, it means that based on data collected during field investigations it was considered that the species was unlikely to occur in the subject site or use habitats in the subject site. A species may utilise the subject site on rare occasions.

Survey of tree locations was not available. Handheld GPS units were used by EMM and in the arboricultural assessment (Witten 2021) to record locations of saplings or trees. These can have location errors of up to 20 metres depending on conditions on the day, and therefore site survey including trunk diameter and canopy spread will be required to confirm locations and tree impacts during the detailed design phase.

3.4 Likelihood of occurrence assessment

The criteria for assessing likelihood of occurrence for threatened species, used to inform the assessments in Appendix C is listed in Table 3.1.

Table 3.1 Likelihood of occurrence criteria

Likelihood	Description	Further assessment conducted?
Negligible	• The potential for the species to occur is considered so unlikely as to not be worth considering.	No
Low	• Based on data collected during field investigations it was considered that the species was unlikely to occur in the study area or use habitats in the study area. A species may utilise the study area on rare occasions. • Species is considered vagrant in the bioregion and is thus considered unlikely to occur in the study area.	No
Moderate	• The species is known to occur in the bioregion and the study area provides some habitat value for the species. Habitat values are somewhat degraded and considered suboptimal.	Yes
High	• The species is known to occur in the bioregion and the study area supports optimal habitat features for the species.	Yes

Likelihood	Description	Further assessment conducted?
Recorded	• The species has been recorded during current surveys. • The species has been recorded in the study area previously and there has not been any change in habitat values since this time.	Yes

4 Results

4.1 Vegetation

The Hornsby district is situated on the Hornsby Plateau, a sandstone plateau to the north of Sydney Harbour. The railway line from Epping to Hornsby is located along a high ridge on the Hornsby Plateau, which occurs on the Glenorie soil landscape, an erosional soil landscape underlain by the Wianamatta Group Ashfield Shale and Bringelly Shale formations (Chapman & Murphy 1989). The key vegetation type endemic to this area is Blue Gum High Forest, which is a tall open forest or wet sclerophyll forest associated with high rainfall areas on Wianamatta Shale soils and which was historically characterised by very large Sydney Blue Gum (*Eucalyptus saligna*) and Blackbutt (*E. pilularis*) (Benson & Howell 1990). Since European settlement, the land was cleared for farms and orchards, followed by the development of the northern railway and subsequent urban settlement (Benson & Howell 1990). No sizable remnants of Blue Gum High Forest remain in Normanhurst but elements of original forest can be seen in remaining suburban remnants (Benson & Howell 1990).

Historically, the study area would have featured tall, sheltered Blue Gum High Forest. Local government area vegetation mapping (Hornsby Shire Council 2019) identifies occurrences of Blue Gum Shale Forest within the study area. Blue Gum Shale Forest is another name for Blue Gum High Forest and is described by Smith & Smith (2008). Blue Gum High Forest is classified as Plant Community Type (PCT) 1237-Blue Gum High Forest under the NSW Plant Community Type classification.

Based on the findings of the field investigation, the vegetation in the study area is characterised by:

- remnant Blue Gum High Forest along Malsbury Road within the road reserve, parts of the rail corridor (downside), and near the Malsbury Road station entrance, which is consistent with PCT 1237-Blue Gum High Forest;
- remnant Blue Gum High Forest within the rail corridor (upside), near Davidson Park, also consistent with PCT 1237-Blue Gum High Forest;
- introduced understorey grassland at the material laydown area off Malsbury Road, which does not conform to a PCT; and
- planted mix of native and introduced species near the Denman Parade station entrance, which does not conform to a PCT.

Remnant Sydney Blue Gum trees over exotic understorey occurs near the subject site but will not be affected by the proposal. Key occurrences of remnant trees are located along Malsbury Road opposite the station, and in Davidson Park off Denman Parade.

The local occurrence of Blue Gum High Forest extends beyond the study area and is estimated to be approximately 4.21 hectares. The local occurrence of Blue Gum High Forest includes all connected[1] remnant fragments (which includes stands of remnant trees as well as forest patches). A conservative approach has been taken and the local occurrence only considers fragments occurring to the north from Eaton Avenue.

A detailed description of the vegetation within the study area is provided below. A vegetation map of the subject site is shown in Figure 4.1 and is based on the Hornsby LGA mapping (Hornsby Shire Council 2019), with minor adjustments following the site investigation. A wider scale map showing the estimated local occurrence of Blue Gum High Forest is shown in Figure 4.2.

[1] A fragment is taken to be connected to another fragment where the two fragments are within 30 metres of each other.

Source: EMM (2020); DFSI (2017); GA (2011); Hornsby Shire Council (2019); ASGC (2006)

0 20 40 m

GDA 1994 MGA Zone 56

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KEY

- Subject tree
- Vegetation trimming

Vegetation community

- Blue Gum Shale Forest - Plant Community (EPBC Act and BC Act)
- Blue Gum Shale Forest - Remnant Trees (BC Act)
- Unresolved

Indicative site compound and laydown areas

- Site office
- Material laydown

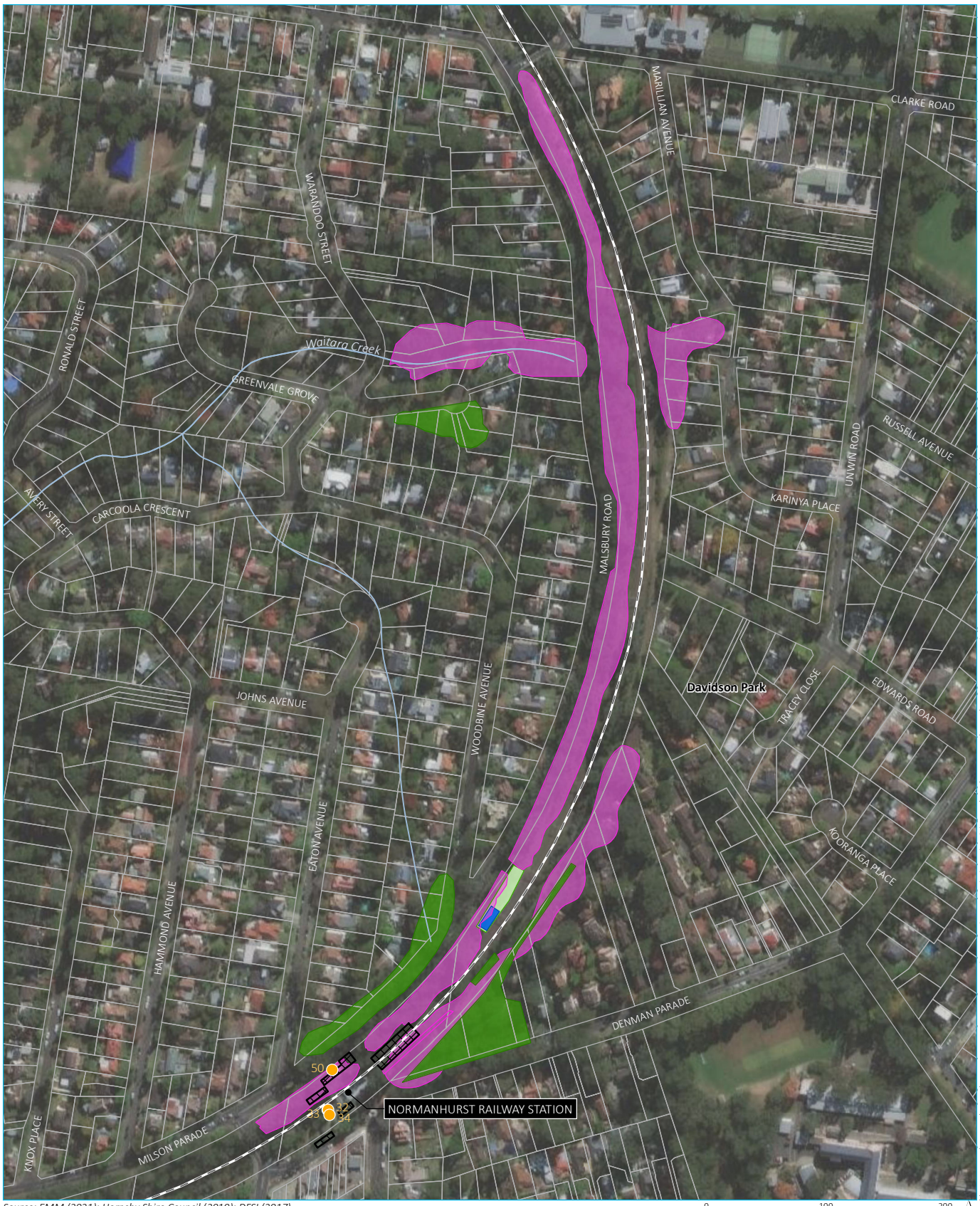
Existing environment

- Rail line
- Watercourse/drainage line
- Cadastral boundary

Vegetation map

Transport for New South Wales
Normanhurst station access upgrades
Biodiversity impact assessment
Figure 4.1

EMM
creating opportunities



Source: EMM (2021); Hornsby Shire Council (2019); DFSI (2017)

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GDA 1994 MGA Zone 56

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KEY

- Subject tree
- Vegetation trimming

Vegetation community

- Blue Gum High Forest - Plant Community (EPBC Act and BC Act)
- Blue Gum High Forest - Remnant Trees (BC Act)

Indicative site compound and laydown areas

- Site office
- Material laydown

Existing environment

- Rail line
- Named watercourse
- Cadastral boundary

Local occurrence of Blue Gum High Forest

Transport for New South Wales
Normanhurst station access upgrades
Biodiversity impact assessment
Figure 4.2

EMM
creating opportunities

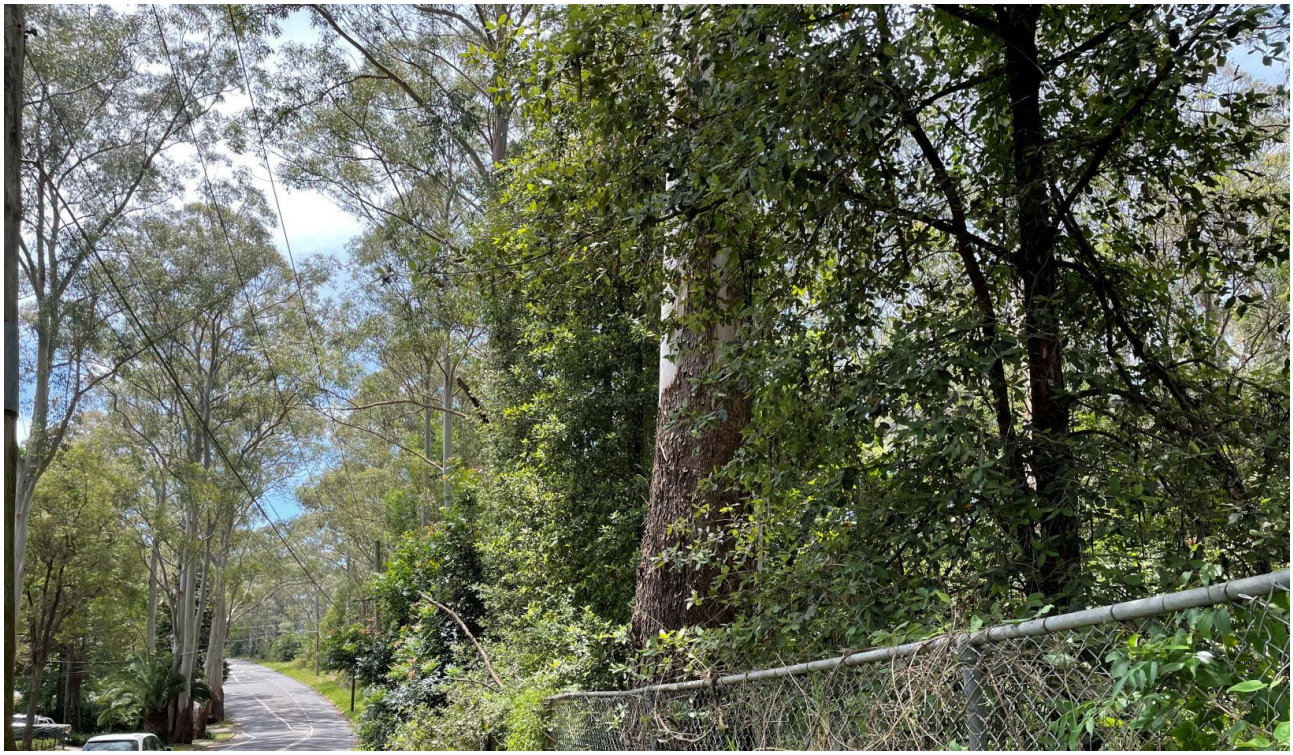
4.1.1 Blue Gum High Forest

Table 4.1 below provides a description of the occurrence of Blue Gum High Forest within the study area.

Table 4.1 Blue Gum High Forest

Attribute	Description
ID	**1237**
Estimate of percent cleared value of PCT	90%
Occurrence within the study area	Blue Gum High Forest occurs along Malsbury Road within the road reserve, near the Malsbury Road station entrance and within sections of the rail corridor on the downside (ie off Platform 2). There is a substantially large Sydney Blue Gum tree at the Malsbury Road station entrance (Tree ID 50) with a diameter at breast height (DBH) of 170 centimetres (cm) (Witten 2021); this tree occurs in the vicinity of the proposed lift (see Figure 4.1). Blue Gum High Forest also occurs within the rail corridor on the upside (Platform 1) near Davidson Park. Remnant Sydney Blue Gum trees over exotic understorey occurs near the subject site but will not be affected by the proposal. Key occurrences of remnant trees are located on Malsbury Road opposite the station, and in Davidson Park off Denman Parade The local occurrence of Blue Gum High Forest total approximately 4.21 ha.
Floristic assemblage	Species recorded that are characteristic of Blue Gum High Forest include: <u>Trees</u>: • Sydney Blue Gum • Blackbutt • Smooth-barked Apple (*Angophora costata*) • Turpentine (*Syncarpia glomulifera*) <u>Shrubs</u>: • Elderberry Panax (*Polyscias sambucifolia*) • Sweet Pittosporum (*Pittosporum undulatum*) • White Dogwood (*Ozothamnus diosmifolius*) <u>Groundcovers</u>: • Bracken (*Pteridium esculentum*) • Spiny-headed Mat-rush (*Lomandra longifolia*) • Wombat Berry (*Eustrephus latifolius*) • Blue Flax-lily (*Dianella caerulea*) • Whiteroot (*Lobelia purpurascens*) The remnants observed in the study area incorporates native species established as part of the existing station landscaping features, including native species such as Spiny-headed Mat-rush. The native plantings include species that are not indigenous to the area or to Blue Gum High Forest, such as Silky Oak (*Grevillea robusta*), Brush Box (*Lophostemon confertus*), Old-man Banksia (*Banksia serrata*), Lemon-scented Teatree (*Leptospermum petersonii*) and a Bottlebrush cultivar (*Callistemon* sp. cultivar).

Attribute	Description
ID	**1237**
Condition	Blue Gum High Forest occurrences within the study area are substantially weed-affected, and include the following environmental weeds: • Mickey Mouse Plant (*Ochna serrulata*) • Large-leaved Privet (*Ligustrum lucidum*) • Small-leaved Privet (*L. sinense*) • African Olive (*Olea europaea* subsp. *cuspidata*) • Asparagus Fern (*Asparagus aethiopicus*) • Montpellier Broom (*Genista monspessulana*) • *Senna pendula* var. *glabrata* • Cotoneaster (*Cotoneaster* sp.) • Moth Vine (*Araujia sericifera*) • Balloon Vine (*Cardiospermum grandiflorum*) • Morning Glory (*Ipomoea indica*) Other introduced woody species include: • Camphor Laurel (*Cinnamomum camphora*) • Jacaranda (*Jacaranda mimosifolia*) • a pine species (*Pinus* sp.) • a Cypress species (*Cupressus* sp.) Groundcover vegetation was dominated by introduced species, including: • Fruit Salad Plant (*Monstera deliciosa*) • Trad (*Tradescantia fluminensis*) • Kikuyu (*Cenchrus clandestinus*) • Panic Veldtgrass (*Ehrharta erecta*)
Status	Despite the prevalence of introduced species and environmental weeds within the study area, the areas of remnant Blue Gum High Forest conform to the following TECs: • Blue Gum High Forest in the Sydney Basin Bioregion (BC Act, critically endangered ecological community) • Blue Gum High Forest of the Sydney Basin Bioregion (EPBC Act, critically endangered ecological community). Only 3.22 hectares of Blue Gum High Forest within the study area meet the EPBC Act definition for the TEC. Approximately 0.99 hectares of are represented by remnant trees and these areas do not meet the EPBC Act definition for the TEC. This is discussed in more detail in Section 4.3.
Photographs	Refer to Photograph 4.1 to Photograph 4.5.

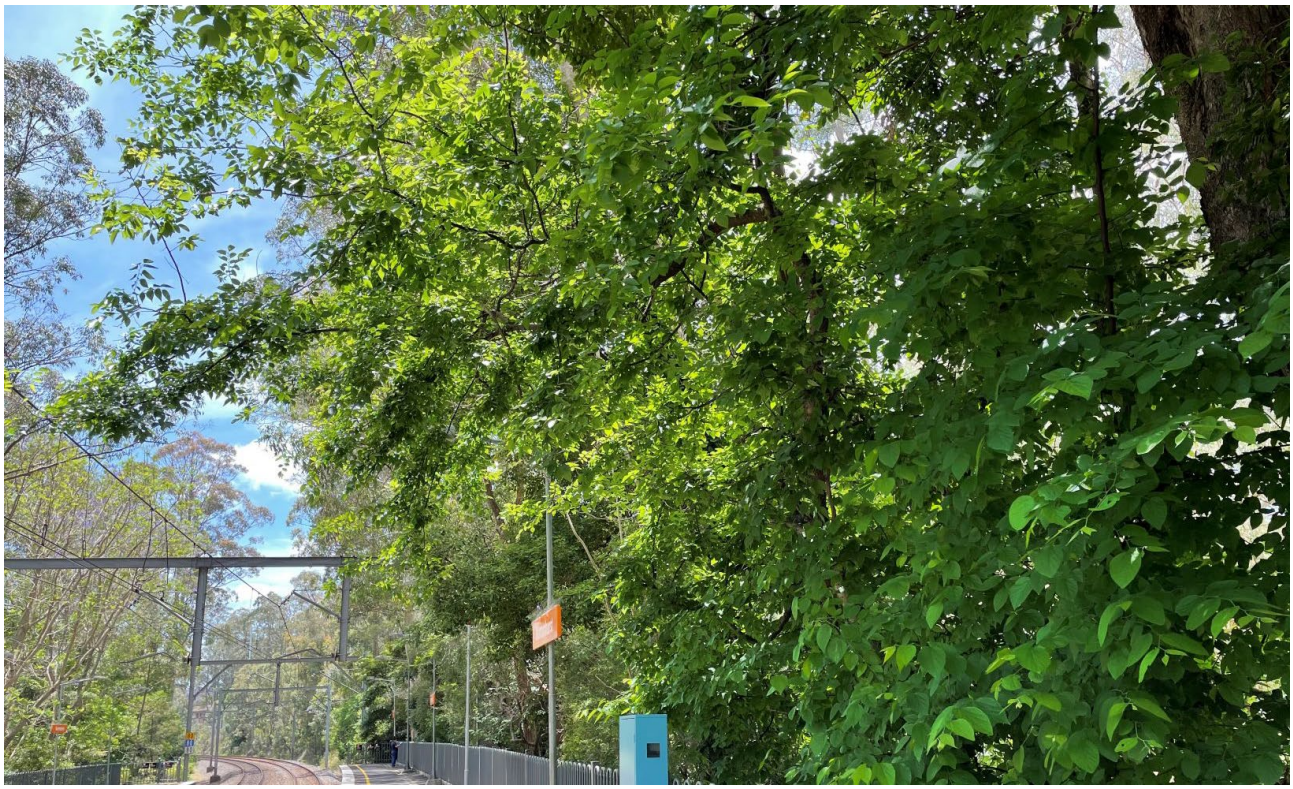


Photograph 4.1 **Blue Gum High Forest in the Malsbury Rd road reserve, near the proposed laydown and site compound**

Photograph 4.2 **Blue Gum High Forest in the rail corridor (downside), near Eaton Avenue**

Photograph 4.3 Blue Gum High Forest, along Platform 2

Photograph 4.4 Sydney Blue Gum tree (Tree ID 50) near station access and proposed lift, Malsbury Road



Photograph 4.5 Blue Gum High Forest, along Platform 1 (near Davidson Park)

Photograph 4.6 Blue Gum High Forest, remnant trees (opposite side of Malsbury Road to the station)

4.1.2 Vegetation at proposed material laydown and site compound)

The vegetation at the proposed material laydown area comprises introduced groundcovers with low frequencies of native groundcovers, mostly at the fence line to the rail corridor where there is an influence from adjacent Blue Gum High Forest in the Malsbury Road road reserve (refer to Photograph 4.7).

There are 29 introduced species within the laydown and site compound area, with the assemblage dominated by grasses Rat's-tail Fescue (*Vulpia* sp.), Perennial Ryegrass (*Lolium perenne*), Kikuyu, Quaking Grass (*Briza maxima*); and Bishop's Weed (*Ammi majus*) and Slender Celery (*Cyclospermum leptophyllum*).

Seven native species were recorded along the fence line and are restricted to groundcovers, such as Spiny-headed Mat-rush, False Sarsaparilla (*Hardenbergia violacea*), Whiteroot and Blady Grass (*Imperata cylindrica*).

No native trees were recorded within the proposed laydown and site compound area, although the crowns of adjacent Sydney Blue Gum and Turpentine were noted to be overhanging the subject site.

Photograph 4.7 Introduced grassland, proposed laydown area

4.1.3 Vegetation at station access, Denman Parade

Vegetation within the vicinity of the proposed lift at the Denman Parade frontage represents mixed planted natives and exotics comprising the station landscaping features. This includes an Old-man Banksia within a garden bed that will need to be trimmed (Photograph 4.8), as well as one Lemon-scented Teatree, two Jacaranda trees and a pine tree within the forecourt area (Photograph 4.9). Several Brush Box trees comprising street trees are located at the proposed kiss and ride parking zone on Denman Parade near the pedestrian crossing. All of these trees and shrubs have been planted, would not originally have occurred at the site, and are not part of Blue Gum High Forest threatened ecological community.

Photograph 4.8 Old-man Banksia requiring trimming at station access, Denman Parade

Photograph 4.9 Planted trees around station access, Denman Parade

4.2 Priority weeds

A total of 43 weed species were recorded within the study area. All plants in NSW are regulated under the Biosecurity Act with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose.

Of the weed species recorded, four are priority weeds for the Greater Sydney LLS region and additional regional and state measures apply (Table 4.2).

Table 4.2 Priority weed species recorded in the study area

Family	Species	Common name	Priority measure	Additional notes
Oleaceae	*Olea europaea* subsp. *cuspidata*	African Olive	Regional recommended measure - The plant or parts of the plant are not traded, carried, grown or released into the environment. Land managers prevent spread from their land where feasible. Land managers reduce impacts from the plant on priority assets.	
Asparagaceae	*Asparagus aethiopicus*	Asparagus Fern	Prohibition on dealings - Must not be imported into the State or sold	Also a Weed of National Environmental Significance
Fabaceae (Faboideae)	*Genista monspessulana*	Montpellier Broom	Prohibition on dealings - Must not be imported into the State or sold	Also a Weed of National Environmental Significance
Rosaceae	*Rubus fruticosus* sp. agg.	Blackberry complex	Prohibition on dealings - Must not be imported into the State or sold	Also a Weed of National Environmental Significance

4.3 Threatened ecological communities

4.3.1 Blue Gum High Forest of the Sydney Basin Bioregion (EPBC Act)

The remnant Blue Gum High Forest occurring in the study area conforms to the EPBC Act listing for the CEEC *Blue Gum High Forest of the Sydney Basin Bioregion* (TSSC 2005), on the following descriptive points:

- occurs in the Sydney Basin Bioregion on soils derived from Wianamatta Shales;
- occurs on the Hornsby Plateau within the Hornsby LGA and is therefore within the defined distributional limits of the CEEC;
- is, or once was, a tall forest and is characterised by a canopy layer dominated by Sydney Blue Gum;
- other characteristic trees are also present, namely Blackbutt and Smooth-barked Apple; and
- features an understorey assemblage that includes the following characteristic native species: Elderberry Panax, Sweet Pittosporum, Wombat Berry, Spiny-headed Mat-rush, and Blue Flax-Lily.

The EPBC Act listing advice for the CEEC states that to be included as part of the listed ecological community, characteristic native species from all structural layers must be present and the occurrence must have the following:

- canopy cover of greater than 10% and patch size greater than one hectare; or
- canopy cover of less than 10% and patch size greater than one hectare, and occur in areas of native vegetation in excess of five hectares.

The areas of Blue Gum High Forest within the study area that are represented by remnant forest that, whilst heavily weed affected, are still within condition threshold. The occurrences of the community, particularly around the station grounds where modification is most evident, have planted understorey components that include characteristic Blue Gum High Forest species.

The areas represented by stands of remnant trees over exotic understorey are located on the other side of Malsbury Road opposite the station and within Davidson Park (off Denman Parade). These areas do not meet the condition thresholds to be included as part of the listed community. The listing advice specifically states that single isolated trees or stands of trees without a native understorey do not form part of the listed community (TSSC 2005).

4.3.2 Blue Gum High Forest in the Sydney Basin Bioregion (BC Act)

The remnant Blue Gum High Forest occurring in the study area conforms to the BC Act listing for the critically endangered ecological community (CEEC) *Blue Gum High Forest in the Sydney Basin Bioregion* (NSW Scientific Committee 2011), on the following points:

- occurs in the Sydney Basin Bioregion on soils derived from Wianamatta Shales;
- occurs in the Hornsby LGA and is therefore within the known distributional range of the CEEC;
- is, or once was, a tall forest and is characterised by a canopy layer dominated by Sydney Blue Gum;
- features a native species assemblage that includes the following characteristic species: Sydney Blue Gum, Blackbutt, Smooth-barked Apple, Elderberry Panax, Sweet Pittosporum, Wombat Berry, Spiny-headed Mat-rush, Whiteroot, Blue Flax-Lily, and Bracken; and
- although occurrences in the study area are highly weed-affected, the BC Act listing recognises stands or clumps of trees that have highly modified understories where the native woody component has been largely replaced by woody species and/or exotic grasses.

Whilst not a diagnostic attribute, another point of consistency is that the remnant Blue Gum High Forest occurring in the study area is affected by weeds such as Camphor Laurel, Blackberry, Mickey Mouse Plant, Small-leaved Privet, Large-leaved Privet, Kikuyu, and Trad, which are recognised to be common and problematic weeds affecting Blue Gum High Forest.

4.4 Threatened species habitat

4.4.1 Current habitat features

The forest vegetation within the study area is modified from its original state by historical clearing and urban development. The study area features an actively managed rail corridor and a well-frequented train station.

None of the trees inspected within the study area within proximity of the subject site are hollow-bearing or contained active nests. No burrows, denning sites, or water features (including wet drains and soaks, or shallow pools) were observed within the study area. There were no observed flying-fox camps, signs of owl whitewash or other evidence of fauna usage of the study area. There was no timber debris, log piles or rail sleeper piles that would function as ground habitat or refugia for rare or cryptic species. Some ground fauna groups, such as common reptile species or urban pest species, may be encountered in the understorey within the study area but threatened ground mammals are unlikely to occur.

The habitat values of the study area for fauna are generally limited to foraging habitat represented by blossom-producing trees and shrubs, including planted vegetation within a landscaped matrix and street trees. It is expected that blossom- and canopy- foraging species would use the study area for foraging resources as part of a larger foraging range and/ or as part of movements within vegetation along the rail corridor.

4.4.2 Potential koala habitat

The vegetation within the study area does not support characteristic koala feed tree species from Schedule 2 of the Koala SEPP, nor does it include food tree species listed for the Central Coast Koala Management Area (DECC 2008). There are nine records of Koala (*Phascolarctos cinereus*) in the search area between 2017 and 2020, with the most recent being recorded within Ku-ring-gai Chase National Park. The study area is unlikely to provide potential koala habitat.

4.5 Threatened species

No threatened species were observed within the study area during the field investigation.

The threatened species atlas database and protected matters search report indicates that there are 50 threatened flora species and 49 threatened fauna species that have been recorded in the search area within the last 20 years or are predicted to occur. The threatened fauna species records are represented by four frog species, 22 bird species, two invertebrate species, 19 mammal species and two reptile species.

In addition, four migratory species have also been recorded, or are predicted to occur.

Protected marine species (including pelagic mammals, reptiles, birds and fish), wading birds and shorebirds are excluded from the assessment as there is no suitable habitats for these species within the study area.

4.5.1 Threatened flora

The majority of the threatened flora species known or predicted to occur in the search area are not associated with Blue Gum High Forest habitat but rather shale/sandstone transition habitats, heath woodlands, sandstone ridgetop habitats or moist habitats such as rainforests, swamp woodlands, riparian or gully habitats. No threatened flora species were observed within the study area during target survey and no threatened flora species are considered likely to occur within the subject site.

Considering the above, no further assessment of threatened flora is required.

4.5.2 Threatened fauna

Of the threatened fauna species known or predicted to occur in the search area, the species that are likely to utilise the habitats within the study area are highly mobile species that could forage over the study area as part of a larger foraging range. A likelihood of occurrence assessment has been prepared (Appendix C), which indicates that the threatened Powerful Owl (*Ninox strenua*), Gang-gang Cockatoo (*Callocephalon fimbriatum*), Grey-headed Flying-fox (*Pteropus poliocephalus*), Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*), Large Bent-winged Bat (*Miniopterus orianae oceanensis*) and Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) are known from the search area and there may be resident populations nearby. These species are likely to flyover, forage or rest in the canopy from time to time but are unlikely to be residing (roosting, nesting, breeding) in the vegetation in the study area.

There are no Grey-headed Flying-fox camps within the study area and considering their range, no further assessment is required for this species. However, considering the high number of records for Powerful Owl, Gang-gang Cockatoo and microbats within the search area, five-part tests have been completed on a conservative basis to assess the potential impacts of the proposal on suitable foraging habitat for the following species (Appendix D):

- Powerful Owl;
- Gang-gang Cockatoo;
- Large Bent-winged Bat;
- Little Bent-winged Bat (*Miniopterus australis*);
- Eastern Coastal Free-tailed Bat;
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*);
- Greater Broad-nosed Bat (*Scoteanax rueppellii*); and
- Eastern False Pipistrelle.

Nectarivorous birds like Little Lorikeet (*Glossopsitta pusilla*) and Swift Parrot (*Lathamus discolor*) have been recorded in the search area but are likely to utilise the site on a transient basis rather than rely on the habitats in the study area on a more permanent basis.

There is no breeding or foraging habitat for frog species, lakes and large waterbodies for White-bellied Sea-eagle (*Haliaeetus leucogaster*) or abundant *Allocasuarina* trees for Glossy Black-Cockatoo *(Calyptorhynchus lathami*).

Considering the above, no further assessment of remaining threatened fauna is required.

4.6 Migratory species

There are four migratory species that have been recorded in the search area or are predicted to occur:

- Fork-tailed Swift (*Apus pacificus*) – occurs in inland plains, coastal foothills and cliffs, and beaches;
- Satin Flycatcher (*Myiagra cyanoleuca*) – occurs in heavily vegetated sheltered gully forest;
- Yellow Wagtail (*Motacilla flava*) – utilises wetland habitats and marshlands; and

- Rufous Fantail (*Rhipidura rufifrons*) – occurs in tall wet sclerophyll forests with a dense shrubby understorey.

These species are unlikely to occur within the study area as there is a lack of suitable foraging, nesting and roosting habitat for these species.

Considering the above, no further assessment of migratory species is required.

5 Impact avoidance and mitigation

5.1 Mitigation measures

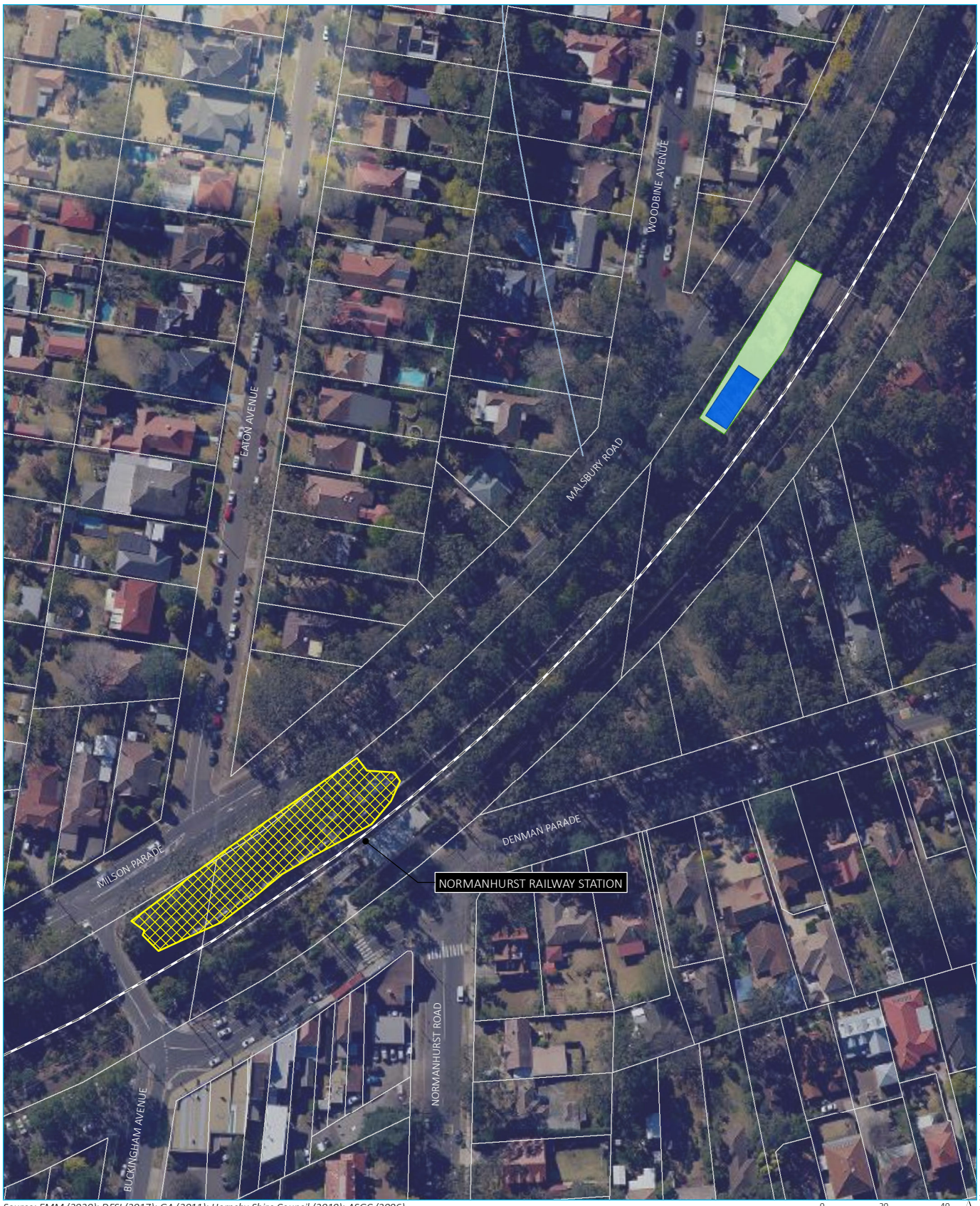
The specific safeguards below are prescribed to address the potential impacts of the proposal on biodiversity values. A construction environmental management plan (CEMP) will be prepared that would identify the specific measures for the 'Construction' stages, including work methods, contingencies, roles and responsibilities.

Table 5.1 Recommended mitigation measures

Factor	Safeguards	Responsibility	Staging
Vegetation clearing	CEMP is to include a map and details about the Blue Gum High Forest, noting that it has an extremely high level of conservation significance, with the vegetation listed as Critically Endangered. The CEMP should also note that whilst removal of specified landscape trees and tree branches is part of the project, that great care must be taken not to exceed the project's impacts without assessment and approval.	Construction contractor	Pre-construction
	Minimise the area of native vegetation to be cleared as far as is practicable through the detailed design process, particularly in areas of CEEC. Care must be taken during the detailed design and/or construction phase to limit impacts to areas assessed for ecological impacts. Should additional vegetation removal be sought above that assessed in this report, then assessment and approval must be obtained before these works occur.	Construction contractor	Pre-construction
	Delineating work areas by survey with a high visibility barrier such as bunting, flagging tape or the like to prevent accidental clearing or disturbance of retained vegetation.	Construction contractor	Pre-construction
Tree protection	Implement the tree protection measures as outlined in the arboricultural impact assessment (Witten 2021) to protect trees that will be retained. The tree protection measures include provisions for: • tree protection fencing; • site inspections by a qualified arborist at key project stages; and • specific measures to protect the large Sydney Blue Gum at the Malsbury Road station entrance (ie Tree ID 50).	Construction contractor	Pre-construction During construction
	Undertake site survey, including trunk diameter and canopy spread, to confirm precise tree locations and tree impacts during detailed design phase.	Construction contractor	Detailed design / Pre-construction
	Observe trimming specifications as outlined in the arboricultural impact assessment (Witten 2021) to minimise impacts on tree health and limit impacts on the overall integrity of CEEC. The specifications include the following: • pruning must not exceed 10% of the overall canopy volume; • no limbs greater than 150 mm in diameter are to be removed; and • the final pruning cut shall be at the branch collar in accordance with AS4373-2007.	Construction contractor Project arborist	During construction

Factor	Safeguards	Responsibility	Staging
Weed removal and spread	To mitigate the removal of a small area of Blue Gum High Forest understorey for the lift construction on the Malsbury Road side of the station access, control of woody weeds in the wider patch (Figure 5.1) is to be undertaken over a 5 year time period to improve the condition of the overall patch.	Weed contractor	Post-construction
	Implement protocols for preventing or minimising the spread of declared and environmental weeds as follows: • dispose of weeds correctly by pulling out all of the plant and covering loads when transporting to a disposal facility licensed to accept green waste; • separate declared weed species from remaining vegetation and do not mulch or re-use weed material on-site. Priority weed species must be disposed of in accordance with Department of Primary Industries' guidelines for the classification of weed using NSW Weedwise web browser; • prior to entering the construction corridor, inspect vehicle exterior and remove all plant propagules (such as seeds) from vehicle tyres, undercarriages, grills, floors and trays; • ensure that construction plant and equipment that has previously operated in or travelled from areas known to be contaminated with listed priority weeds are washed down prior to entering the site; • remove weeds immediately and dispose of without stockpiling; and • dispose of weed-contaminated soil at an appropriate waste management facility.	Construction contractor Weed contractor	During construction Post-construction
	For further guidance on weed control and management, refer to the Sydney Trains Blue Gum High Forest and Sydney Turpentine Ironbark Forest Management Plan – Main North Line and North Shore Line (Niche Environment and Heritage 2017).	Construction contractor Weed contractor	During construction Post-construction
Erosion and sedimentation	A Sediment and Erosion Control Plan will be incorporated in the CEMP and should contain detailed mitigation measures to reduce soil erosion and pollutant run-off during all construction activities. These should include the following: • erosion and sediment control measures are to be installed prior to any works; • erosion and sediment control measures are to be inspected regularly, particularly following rainfall events, to ensure their ongoing functionality; • construction and maintenance of sediment fences to capture and isolate any surface water runoff; and • implementation of measures to manage fuels, chemicals, and liquids required during construction.	Construction contractor	Pre-construction During construction
Tree planting	Undertake tree replacement in accordance with the Transport for NSW Vegetation Offset Guide (DMS-SD-087). It is recommended that Transport for NSW consider amending the application of the Vegetation Offset Guide in this instance to allow planting and maintenance of native species within the weed management area during the 5-year management period (Figure 5.1). Groundcover or understory species planting are particularly recommended, which would further improve the ecological condition of the vegetation.	Construction contractor	Post-construction

Factor	Safeguards	Responsibility	Staging
	Recommended understorey species for planting include the following: Small tree layer: • Sweet Pittosporum (*Pittosporum undulatum*) • Blueberry Ash (*Elaeocarpus reticulatus*) • Forest Oak (*Allocasuarina torulosa*) • Cheese Tree (*Glochidion ferdinandi*) Shrub layer: • Coffee Bush (*Breynia oblongifolia*) • Hairy Clerodendrum (*Clerodendrum tomentosum*) • Narrow-leaved Orangebark (*Denhamia silvestris*) • Wild Yellow Jasmine (*Pittosporum revolutum*) • Large Mock-olive (*Notelaea longifolia*) • Elderberry Panax (*Polyscias sambucifolia*) • Muttonwood (*Myrsine variabilis*) Ground layer: • Blue-flax Lily (*Dianella caerulea*) • Pastel Flower (*Pseuderanthemum variabile*) • Wombat Berry (*Eustrephus latifolius*) • Wonga Wonga Vine (*Pandorea pandorana*) • Bearded Tylophora (*Tylophora barbata*) • Bordered Panic (*Entolasia marginata*) • Creeping Beard Grass (*Oplismenus imbecillis*) • Old Man's Beard (*Clematis aristata*) • Whiteroot (*Pratia purpurascens*) • Rainbow Fern (*Calochlaena dubia*) • Spiny-headed Mat-rush (*Lomandra longifolia*)	Construction contractor	Post-construction
	For additional recommended planting species, refer to the Sydney Trains Blue Gum High Forest and Sydney Turpentine Ironbark Forest Management Plan – Main North Line and North Shore Line (Niche Environment and Heritage 2017).	Construction contractor	Post-construction



Source: EMM (2020); DFSI (2017); GA (2011); Hornsby Shire Council (2019); ASGC (2006)

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KEY

- Weed control area
- Indicative site compound and laydown areas
  - Site office
  - Material laydown
- Rail line
- Watercourse/drainage line
- Cadastral boundary

Location of weed control works

Transport for New South Wales
Normanhurst station access upgrades
Biodiversity impact assessment
Figure 5.1

EMM creating opportunities

6 Impact assessment

6.1 Vegetation removal

Vegetation removal works that would be required as part of the proposal are considered to be minor in nature.

The proposal would require the removal of approximately 0.0042 hectares (or 42 m^2) of Blue Gum High Forest for the construction of the lift at the Malsbury Road station entrance. This represents a removal of approximately 0.099% of the Blue Gum High Forest from the study area.

The vegetation removal would affect understorey vegetation, including a mix of native and exotic species such as Sweet Pittosporum, Black Wattle (*Acacia decurrens*), Large-leaved Privet, Cotoneaster and Spiny-headed Mat-rush. The construction works would not require the removal of the large Sydney Blue Gum (Tree ID 50) and is unlikely to impact on the tree health as the proposed works would result in minor encroachment (8%) of the tree protection zone (Witten 2021). Other tree species characteristic Blue Gum High Forest within proximity of the proposed construction works for the lift, including one Smooth-barked Apple, would not be removed.

Tree removal works on the Denman Parade side of the station access would include the removal of one Lemon-scented Teatree (Tree ID 33) and two Jacaranda trees (Tree ID 32 and 34). These trees are not locally occurring and were established as part of the station landscaping and do not represent a biodiversity constraint to the proposal.

6.2 Vegetation trimming

Vegetation trimming works that would be required as part of the proposal are also considered to be minor in nature.

Vegetation trimming works on the Denman Parade side of the station access would affect planted landscaped vegetation and does not represent a biodiversity constraint to the proposal. Vegetation to be trimmed would impact on the following species: Brush Box (street trees at the proposed kiss and ride parking zone on Denman Parade near the pedestrian crossing) and Old-man Banksia in a planted garden bed at the Denman Parade station entrance.

Trimming works to Blue Gum High Forest would be required along the boundary of Platform 1 (Photograph 4.5); however, the key species that would be affected by the trimming works are introduced species, including Camphor Laurel, Jacaranda, Small-leaved Privet, Illawarra Flame Tree (*Brachychiton acerifolius*). A Sydney Blue Gum and a Sydney Peppermint may also potentially require trimming at this location, following controls specified in
(Witten 2021).

The trimming works that would be required along Platform 2 would affect a limited area of Blue Gum High Forest and would include trimming of overhanging trees and shrubs, such as the lateral branches of Sydney Blue Gum and Black Wattle (Photograph 4.3).

Trimming works for the site laydown area along Malsbury Road would affect understorey shrubs and one Liquidambar (*Liquidambar styraciflua*). The Sydney Blue Gum trees in the road reserve outside of the rail corridor are tall and may not require trimming. If trimming is required, it should be in accordance with the TPP.

6.3 Impacts on critically endangered Blue Gum High Forest

An assessment of significance has been prepared in accordance with Section 7.3 of the BC Act (Appendix D) and the EPBC Act significant impact guidelines (Appendix E). Blue Gum High Forest has a highly restricted distribution and has suffered a severe reduction in extent from its original extent. It is severely fragmented and persists as small, often highly degraded or modified patches within an urban matrix. It continues to be affected by urban land use, particularly weed invasion, the effects of which are amplified in small, fragmented patches.

The proposal would involve a small area (approximately 0.0042 hectares) of understorey vegetation removal, representing 0.099% of the local occurrence of Blue Gum High Forest. Important components of the community, namely characteristic canopy trees, would be retained and contribute to the continued persistence of the community. Trimming works are also unlikely to adversely affect the persistence of the community within the study area, particularly as trimming will chiefly affect exotic trees or non-indigenous native species.

The implementation of mitigation measures and environmental safeguards as outlined in Table 5.1 will mitigate impacts on the integrity of the local occurrence of the community. The weed management works and replanting of native species identified within Table 5.1 are to be undertaken, and will counteract the loss of a small area of understorey, to improve the overall integrity of the existing patch of Blue Gum High Forest vegetation. The trimming specifications works identified in Table 5.1 are also to be observed to minimise the impact on the health of canopy trees of Blue Gum High Forest.

On the basis that the measures identified within Table 5.1, the assessments conclude that the proposal is unlikely to have a significant impact on the persistence of the local occurrence of Blue Gum High Forest.

6.4 Impacts on threatened species

An assessment of significance has been prepared in accordance with Section 7.3 of the BC Act (Appendix D) for the following threatened species:

- Powerful Owl;
- Gang-gang Cockatoo;
- Large Bent-winged Bat;
- Little Bent-winged Bat;
- Eastern Coastal Free-tailed Bat;
- Yellow-bellied Sheathtail-bat;
- Greater Broad-nosed Bat; and
- Eastern False Pipistrelle.

The assessments indicate that the proposal is unlikely to have a significant impact on the above species for the following reasons:

- is unlikely to interfere with critical life cycle stages such as breeding;
- would not reduce a substantial area of foraging habitat, provided that the mitigation measures and environmental safeguards as outlined in Table 5.1 are implemented;

- such foraging habitat is not considered to be critical to the long-term persistence of the species in the locality; and
- is unlikely to fragment or isolate foraging habitat.

None of the species listed above are listed under the EPBC Act.

7 Conclusion

Transport for NSW is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the proposal. The proposal is part of the Transport Access Program which aims to achieve Disability Standards for Accessible Public Transport (DSAPT) compliance. The proposal would improve accessibility of Normanhurst Station in line with the requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA) and the Disability Standards for Accessible Public Transport 2002 (DSAPT).

The proposal would involve clearing of 0.0042 hectares of understorey vegetation around the footbridge at the Malsbury Road access to the station within Blue Gum High Forest, which is critically endangered under the BC Act and EPBC Act. The proposal would also involve trimming of lateral branches of canopy trees at the edges of two patches of Blue Gum High Forest, along Platform 1 and 2, as well as along the boundary fence at the proposed laydown area.

The proposal would not remove critical components of the Blue Gum High Forest community, such as large Sydney Blue Gum trees and supporting canopy species like Smooth-barked Apple. Furthermore, some of the species that will be removed or trimmed are exotic trees and priority weed shrubs, or non-indigenous native species.

In combination with the implementation of environmental safeguard measures, including weed management and trimming specifications within the wider extent of local occurrences of Blue Gum High Forest, the proposal is considered unlikely to have a significant impact on Blue Gum High Forest and no BDAR, SIS or referral to the Commonwealth is required.

The proposal is also unlikely to have a significant impact on habitat for NSW and Commonwealth-listed threatened species that are known to occur, or are predicted to occur, within the search area of the subject site. On this basis, no BDAR, SIS or referral to the Commonwealth is required.

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Appendix A

EPBC Act Protected Matters search report

Australian Government

Department of Agriculture, Water and the Environment

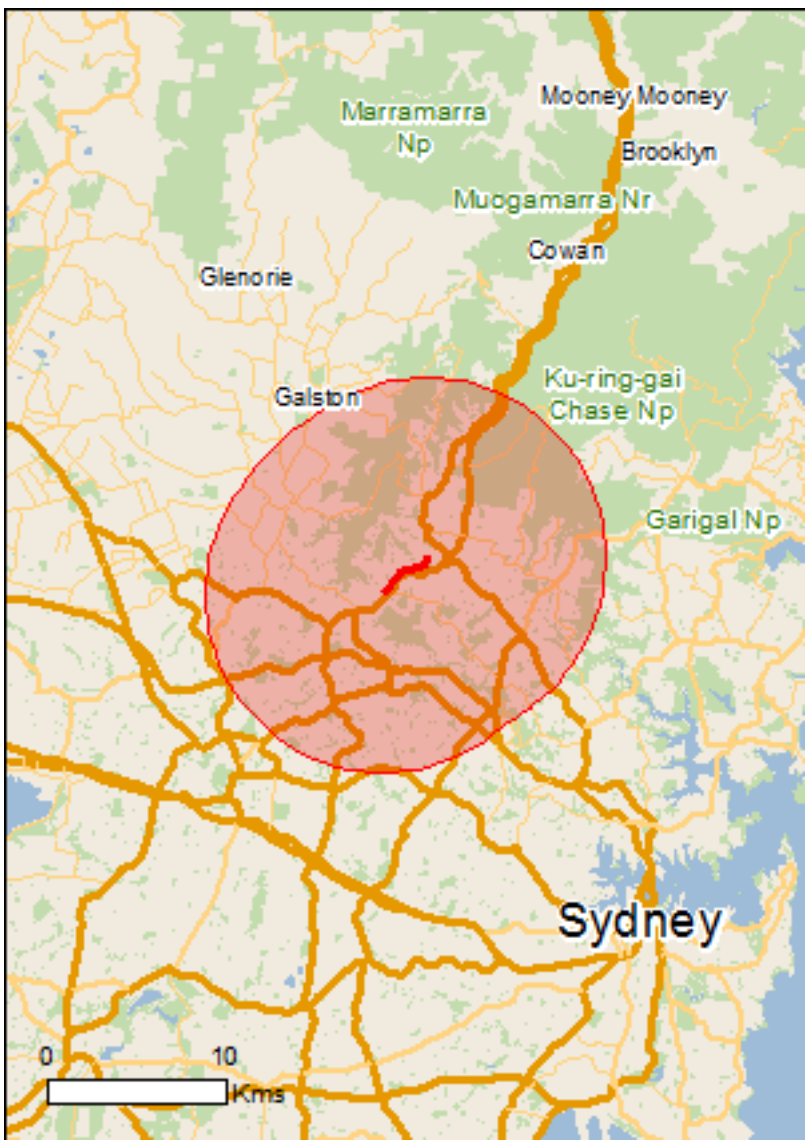
EPBC Act Protected Matters Report

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

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

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

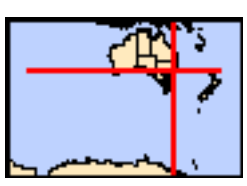
Report created: 15/12/20 09:42:18



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

Buffer: 10.0Km



Summary

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

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	9
Listed Threatened Species:	86
Listed Migratory Species:	56

Other Matters Protected by the EPBC Act

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

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

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

	14
Commonwealth Heritage Places:	None
Listed Marine Species:	66
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

	10
Regional Forest Agreements:	None
Invasive Species:	53
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties

Ku-ring-gai Chase National Park, Lion, Long and Spectacle Island Nature Reserves	NSW	Listed place

Listed Threatened Ecological Communities

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

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

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis cucullatus cucullatus Hooded Plover (eastern), Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Frogs		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat known to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Other		
Pommerhelix duralensis Dural Land Snail [85268]	Endangered	Species or species habitat known to occur within area
Plants		
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat known to occur within area
Acacia pubescens Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat known to occur within area
Allocasuarina glareicola [21932]	Endangered	Species or species habitat may occur within area
Asterolasia elegans [56780]	Endangered	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Darwinia biflora [14619]	Vulnerable	Species or species habitat known to occur within area
Deyeuxia appressa [7438]	Endangered	Species or species habitat likely to occur within area
Eucalyptus camfieldii Camfield's Stringybark [15460]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus sp. Cattai (Gregson s.n., 28 Aug 1954) [89499]	Critically Endangered	Species or species habitat likely to occur within area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchiid [7528]	Endangered	Species or species habitat known to occur within area
Grevillea caleyi Caley's Grevillea [9683]	Critically Endangered	Species or species

Name	Status	Type of Presence
		habitat known to occur within area
Grevillea shiressii [19186]	Vulnerable	Species or species habitat likely to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat may occur within area
Haloragodendron lucasii Hal [6480]	Endangered	Species or species habitat known to occur within area
Hibbertia spanantha Julian's Hibbertia [88475]	Critically Endangered	Species or species habitat known to occur within area
Lasiopetalum joyceae [20311]	Vulnerable	Species or species habitat known to occur within area
Leptospermum deanei Deane's Tea-tree [21777]	Vulnerable	Species or species habitat known to occur within area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat likely to occur within area
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat known to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat known to occur within area
Persoonia mollis subsp. maxima [56075]	Endangered	Species or species habitat known to occur within area
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat known to occur within area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat likely to occur within area
Prostanthera junonis Somersby Mintbush [64960]	Endangered	Species or species habitat may occur within area
Prostanthera marifolia Seaforth Mintbush [7555]	Critically Endangered	Species or species habitat may occur within area
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat may occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence
[20307]		within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Zieria involucrata [3087]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species

[Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur

Name	Threatened	Type of Presence
		within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Australian Postal Corporation
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Commonwealth Bank of Australia
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation
Commonwealth Land - Commonwealth Trading Bank of Australia
Commonwealth Land - Defence Housing Authority
Commonwealth Land - Defence Service Homes Corporation
Commonwealth Land - Director of War Service Homes
Commonwealth Land - Telstra Corporation Limited
Defence - NEWINGTON
Defence - PYMBLE MULTI-USER DEPOT

Name
Defence - TIMOR BARRACKS - DUNDAS

Listed Marine Species

[Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species

Name		
		habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Puffinus griseus Sooty Shearwater [1024]		Species or species habitat likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely

Name	Threatened	Type of Presence
		to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Extra Information

State and Territory Reserves

102 Rosedale Road	NSW
Berowra Valley	NSW
Berowra Valley	NSW
Dalrymple-Hay	NSW
Dural	NSW
Garigal	NSW
Ku-ring-gai Chase	NSW
Lane Cove	NSW
Newington	NSW
Wallumatta	NSW

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area

Name	
Asparagus scandens Asparagus Fern, Climbing Asparagus Fern [23255]	Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]	Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]	Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]	Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]	Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]	Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]	Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]	Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]	Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]	Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]	Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]	Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]	Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]	Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]	Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]	Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]	Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands

[Resource Information]

Name	State
Newington Wetlands	NSW

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-33.732575 151.077609,-33.723402 151.086106,-33.722296 151.088209,-33.721975 151.092071,-33.721332 151.095762,-33.719547 151.098723,-33.717905 151.099753,-33.716478 151.099967,-33.716478 151.099967

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Department of Agriculture Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111

Appendix B

Flora species list

Table B.1 Flora species recorded within the study area

Family	Scientific Name	Common Name	BC Status	EPBC Status	Weed status[1]
Trees					
Malvaceae	*Brachychiton acerifolius*	Illawarra Flame Tree	-	-	-
Meliaceae	*Melia azedarach*	White Cedar	-	-	-
Myrtaceae	*Angophora costata*	Smooth-barked Apple	-	-	-
Myrtaceae	*Eucalyptus grandis*	Flooded Gum	-	-	-
Myrtaceae	*Eucalyptus piperita*	Sydney Peppermint	-	-	-
Myrtaceae	*Eucalyptus saligna*	Sydney Blue Gum	-	-	-
Myrtaceae	*Lophostemon confertus*	Brush Box	-	-	-
Myrtaceae	*Syncarpia glomulifera*	Turpentine	-	-	-
Proteaceae	*Banksia serrata*	Old-man Banksia	-	-	-
Proteaceae	*Grevillea robusta*	Silky Oak	-	-	-
Shrubs					
Araliaceae	*Polyscias sambucifolia*	Elderberry Panax	-	-	-
Asteraceae	*Ozothamnus diosmifolius*	White Dogwood	-	-	-
Fabaceae (Mimosoideae)	*Acacia decurrens*	Black Wattle	-	-	-
Fabaceae (Mimosoideae)	*Acacia ulicifolia*	Prickly Moses	-	-	-
Myrtaceae	*Callistemon* spp. (cultivar)	-	-	-	-
Myrtaceae	*Kunzea ambigua*	Tick Bush	-	-	-
Myrtaceae	*Leptospermum petersonii*	Lemon-scented Teatree	-	-	-

Family	Scientific Name	Common Name	BC Status	EPBC Status	Weed status[1]
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum	-	-	-
Santalaceae	*Exocarpos cupressiformis*	Cherry Ballart	-	-	-
Groundcovers					
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	-	-	-
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla	-	-	-
Geraniaceae	*Geranium solanderi*	Native Geranium	-	-	-
Lobeliaceae	*Lobelia purpurascens*	Whiteroot	-	-	-
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush	-	-	-
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry	-	-	-
Phormiaceae	*Dianella caerulea*	Blue Flax-lily	-	-	-
Poaceae	*Cynodon dactylon*	Common Couch	-	-	-
Poaceae	*Imperata cylindrica*	Blady Grass	-	-	-
Poaceae	*Themeda triandra*	Kangaroo Grass	-	-	-
Introduced species					
Apiaceae	*Ammi majus*	Bishop's Weed	-	-	a
Apiaceae	*Cyclospermum leptophyllum*	Slender Celery	-	-	a
Apocynaceae	*Araujia sericifera*	Moth Vine	-	-	a
Araceae	*Monstera deliciosa*	Fruit Salad Plant	-	-	a
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	-	-	a
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	-	-	a
Asteraceae	*Coreopsis lanceolata*	Coreopsis	-	-	a

Family	Scientific Name	Common Name	BC Status	EPBC Status	Weed status[1]
Asteraceae	*Gnaphalium polycaulon*	Many-stemmed Cudweed, Indian Cudweed	-	-	a
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	-	-	a
Asteraceae	*Taraxacum officinale*	Dandelion	-	-	a
Bignoniaceae	*Jacaranda mimosifolia*	Jacaranda	-	-	a
Caryophyllaceae	*Petrorhagia dubia*	-	-	-	a
Commelinaceae	*Tradescantia fluminensis*	Trad	-	-	a
Convolvulaceae	*Ipomoea indica*	Morning Glory	-	-	a
Cupressaceae	*Cupressus* spp.	-	-	-	a
Fabaceae (Caesalpinioideae)	*Senna pendula* var. *glabrata*	-	-	-	a
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	-	-	a
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	-	-	a
Gentianaceae	*Centaurium* spp.	-	-	-	a
Hamamelidaceae	*Liquidambar styraciflua*	Sweetgum	-	-	a
Lauraceae	*Cinnamomum camphora*	Camphor Laurel	-	-	a
Linaceae	*Linum trigynum*	French Flax	-	-	a
Malaceae	*Cotoneaster* spp.	-	-	-	a
Malvaceae	*Modiola caroliniana*	Red-flowered Mallow	-	-	a
Myrsinaceae	*Lysimachia arvensis*	Scarlet Pimpernel	-	-	a
Ochnaceae	*Ochna serrulata*	Mickey Mouse Plant	-	-	a
Oleaceae	*Ligustrum lucidum*	Large-leaved Privet	-	-	a
Oleaceae	*Ligustrum sinense*	Small-leaved Privet	-	-	a

Family	Scientific Name	Common Name	BC Status	EPBC Status	Weed status[1]
Pinaceae	*Pinus* spp.	-	-	-	a
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	-	-	a
Poaceae	*Avena fatua*	Wild Oats	-	-	a
Poaceae	*Briza maxima*	Quaking Grass	-	-	a
Poaceae	*Bromus catharticus*	Prairie Grass	-	-	a
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	-	-	a
Poaceae	*Ehrharta erecta*	Panic Veldtgrass	-	-	a
Poaceae	*Lolium perenne*	Perennial Ryegrass	-	-	a
Poaceae	*Vulpia* spp.	Rat's-tail Fescue	-	-	a
Sapindaceae	*Cardiospermum grandiflorum*	Balloon Vine	-	-	a
Verbenaceae	*Verbena* spp.	-	-	-	a
Environmental weeds					
Oleaceae	*Olea europaea* subsp. *cuspidata*	African Olive	-	-	a, b
Asparagaceae	*Asparagus aethiopicus*	Asparagus Fern	-	-	a, b, c
Fabaceae (Faboideae)	*Genista monspessulana*	Montpellier Broom	-	-	a, b, c
Rosaceae	*Rubus fruticosus* sp. agg.	Blackberry complex	-	-	a, b, c

[1]Weed status key:
a – general biosecurity duty
b – priority weed for Greater Sydney Local Land Services region
c – Weed of National Significance under the National Weed Strategy

Appendix C

Likelihood of occurrence assessment

Table C.1 Likelihood of occurrence – threatened fauna and migratory species

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Frogs									
Litoria aurea	Green and Golden Bell Frog	E	V	Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (Gambusia holbrooki), have a grassy area nearby and diurnal sheltering sites available. It has also been found to inhabit many disturbed sites, including abandoned mines and quarries	Bionet, PMST	2010	3	Unlikely	The site lacks suitable foraging or breeding resources, or connectivity to these resources.
Heleioporus australiacus	Giant Burrowing Frog	V	V	The Giant Burrowing Frog is found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. They spend more than 95% of their time in non-breeding habitat in areas up to 300 m from breeding sites. Whilst in non-breeding habitat, the Giant Burrowing Frog burrows below the soil surface or in the leaf litter.	Bionet, PMST	2013	22	Unlikely	The site lacks suitable foraging or breeding resources, or connectivity to these resources.
Mixophyes balbus	Stuttering Frog	E	V	The Stuttering Frog is restricted to the eastern slopes of the Great Divide, from the Cann River catchment in far East Gippsland, Victoria, to tributaries of the Timbarra River near Drake, New South Wales. They are found in association with permanent streams through temperate and sub-tropical rainforest and wet sclerophyll forest, rarely in dry open tableland riparian vegetation.	PMST	-	-	Unlikely	The site lacks suitable foraging or breeding resources. The species has not been recorded within 10 kms of the site.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Pseudophryne australis	Red-crowned Toadlet	V	-	Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings. Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter. Breeding congregations occur in dense vegetation and debris beside ephemeral creeks and gutters. Red-crowned Toadlets have not been recorded breeding in waters that are even mildly polluted or with a pH outside the range 5.5 to 6.5. Red-crowned Toadlets are quite a localised species that appear to be largely restricted to the immediate vicinity of suitable breeding habitat. Red-crowned Toadlets are usually found as small colonies scattered along ridges coinciding with the positions of suitable refuges near breeding sites.	Bionet	2020	265	Unlikely	The site lacks suitable foraging or breeding resources, or connectivity to these resources.
Birds									
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	The White-bellied Sea-Eagle is found in coastal habitats (especially those close to the sea-shore) such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and around terrestrial wetlands in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. The habitats occupied by the sea-eagle are characterised by the presence of large areas of open water (larger rivers, swamps, lakes and the sea). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	Bionet	2020	56	Unlikely	There is no foraging habitat within the study area, and no emergent trees with large stick nests were observed within the study area. The species is unlikely to use the study area.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Hieraaetus morphnoides	Little Eagle	V	-	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. This species occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Bionet	2017	5	Unlikely	The preferred woodland and open forest habitats are not present within the study area. No nests were observed within the study area.
Lophoictinia isura	Square-tailed Kite	V	-	Within NSW the Square-tailed Kite is a regular resident in the north, north-east and along major flowing river systems and migrates to the south-east for breeding. The species is found in a variety of timbered habitats including dry woodlands and open forests, showing a particular preference for timbered watercourses. The species mainly inhabit open eucalypt forests and woodlands, often dominated by stringybarks, peppermints or box–ironbark eucalypts, as well as Woollybutt, Spotted Gum, Manna Gum, Messmate, River Red Gums, as well as other trees such as Angophora, cypress-pines and casuarinas. The species is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage The species appears to occupy large hunting ranges of more than 100km2. Nest sites are generally located along or near watercourses, in a fork or on large horizontal limbs (OEH 2018).	Bionet	2020	22	Low	The species is strongly associated with timbered watercourses and open forest habitats, which are not present within the study area. The species is unlikely to breed in the study area.
Pandion cristatus	Eastern Osprey	V	-	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Breed from July to September in NSW. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Bionet	2019	1	Unlikely	There is no foraging habitat within the study area, and no emergent trees with large stick nests were observed within the study area. The species is unlikely to use the study area.

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Hirundapus caudacutus	White-throated Needletail	-	V, Mi	The White-throated Needletail is widespread in eastern and south-eastern Australia. In NSW this species extends inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. In Australia, the White-throated Needletail is almost exclusively aerial, recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland (DoEE 2018). White-throated Needletails are non-breeding migrants in Australia.	Bionet, PMST	2019	36	Unlikely	The species is unlikely to utilise the habitats within the study area for breeding or foraging.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	The species occurs throughout most of NSW, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. The most common habitat for this species is in woodlands and dry open sclerophyll forests, usually dominated by eucalyptus, including mallee associations. The species has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests. Understorey is typically open with sparse Eucalyptus saplings, Acacia and other shrubs, including heath. The ground cover may consist of grasses, sedges or open ground, often with coarse woody debris (OEH 2018).	Bionet	2012	3	Unlikely	The species is unlikely to breed in the study area and does not contain preferred woodland or dry sclerophyll forest habitats. The species has only been recorded three times within 10 kms of the site, in 2001.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	In summer, the Gang-gang Cockatoo is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, they may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas. Gang-gang Cockatoos feed mainly on seeds of native and introduced trees and shrubs, with a preference for eucalypts, wattles and introduced hawthorns. They will also eat berries, fruits, nuts and insects and their larvae. They require tall trees for nest hollows.	Bionet	2020	38	Moderate	The species is unlikely to breed within the study area but may forage on eucalypts and wattles in the area.

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Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	The Glossy Black Cockatoo inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of She-oak species, particularly Black She-oak (Allocasuarina littoralis), Forest She-oak (A. torulosa) or Drooping She-oak (A. verticillata) occur.	Bionet	2020	58	Low	No Allocasuarina species were recorded within the study area, although the species is known to occur in the wider locality and might be encountered flying over as part of movements within a larger foraging range.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	The Brown Treecreeper is found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range. The Brown Treecreeper mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey. Fallen timber is an important habitat component for foraging.	Bionet	2018	1	Unlikely	There are no suitable woodland habitats with fallen timber debris within the study area. There is only one record within the search area.
Ptilinopus regina	Rose-crowned Fruit-Dove	V	-	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. They are shy pigeons, not easy to see amongst the foliage, and are more often heard than seen. They feed entirely on fruit from vines, shrubs, large trees and palms, and are thought to be locally nomadic as they follow the ripening of fruits. Some populations are migratory in response to food availability - numbers in north-east NSW increase during spring and summer then decline in April or May.	Bionet	2017	1	Unlikely	The site lacks suitable foraging or breeding resources, or connectivity to such resources. The species has only been recorded three times within 10 kms of the site.
Falco hypoleucos	Grey Falcon	E	V	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The species is usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey (OEH 2018).	PMST	-	-	Unlikely	The site lacks suitable foraging or breeding resources. The species has not been recorded within 10 kms of the site.

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Anthochaera phrygia	Regent Honeyeater	CE	CE	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Core breeding areas for this species is in the Capertee and in the Bundarra-Barraba regions. These birds are also found in drier coastal woodlands and forests in some years. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany (Eucalyptus robusta) and Spotted Gum (Corymbia maculata) forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast.	PMST	-	-	Low	The species is unlikely to breed within the study area but may forage on canopy blossoms on a transient basis.
Grantiella picta	Painted Honeyeater	V	V	The species is sparsely distributed from south-eastern Australia to north-western Queensland, with its greatest concentrations and breeding locations occurring on the inland slopes of the Great Dividing Range in NSW. It inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of Black Box (E. largiflorens) and River Red Gum (E. camaldulensis), Box-Ironbark-Yellow Gum woodlands, Acacia-dominated woodlands, Paperbarks, Casuarina, Callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips although it breeds in quite narrow roadside strips if ample mistletoe fruit is available (OEH 2018).	PMST	-	-	Unlikely	The site lacks suitable foraging or breeding resources and is outside the typical distribution of the species. There are no mistletoe resources preferred by the species. The species has not been recorded within 10 kms of the site.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Daphoenositta chrysoptera	Varied Sittella	V	-	The Varied Sittella is a sedentary species and inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. This species feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. It builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.	Bionet	2017	7	Unlikely	The species is unlikely to occur in the study area. There are low number of records in the search area, with the most recent being from 2017 and located at Hunts Creek Sanctuary, which is located over 9 km away from the study area. As the species is sedentary, it is unlikely that individuals would travel from these known locations to the study area. No cup-shaped nests were observed on site.
Petroica boodang	Scarlet Robin	V	-	In NSW, the Scarlet Robin occurs from the coast to the inland slopes. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.	Bionet	2001	1	Unlikely	The site lacks suitable foraging or breeding resources. The site lack fallen timber and fallen log features. The species has only been recorded once within 10 kms of the site, in 2001.
Glossopsitta pusilla	Little Lorikeet	V	-	The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. It forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used by this species, due to higher soil fertility and hence greater productivity.	Bionet	2020	20	Low	The species is unlikely to breed within the study area but may forage on canopy blossoms on a transient basis.

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Lathamus discolor	Swift Parrot	E	CE	This species migrates in the autumn and winter months to south-eastern Australia. In NSW, it mostly occurs on the coast and south-west slopes in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations (OEH 2018). Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood (C. gummifera), Mugga Ironbark and White Box. Commonly used lerp infested trees include Inland Grey Box, Grey Box (E. moluccana) and Blackbutt (E. pilularis).	Bionet, PMST	2019	21	Low	The species is unlikely to breed within the study area but may forage on canopy blossoms on a transient basis.
Neophema pulchella	Turquoise Parrot	V	-	Inhabiting the steep, rocky ridges and gullies, hills, river-flats, valleys and nearby plains of the Great Dividing Range, the Turquoise Parrot is found in open forest and eucalyptus woodlands with a low shrub understorey and grassy ground-cover. Generally, distribution of the species is patchy, determined by areas of suitable habitat and ranges from north-eastern Victoria through NSW to south-eastern Queensland. Individuals generally breed from August to January, usually nesting less than two metres above the ground. Nests may be located in hollows of small trees, dead eucalyptus or in holes or stumps, fence posts or even logs lying on the ground.	Bionet	2017	3	Unlikely	The site lacks suitable foraging or breeding resources, or connectivity to such resources. There are no ridge and gully habitats or woodlands on river flats.
Ninox connivens	Barking Owl	V	-	Barking Owls are found in open woodlands and the edges of forests, often adjacent to farmland. They are less likely to use the interior of forested habitat. They are usually found in habitats that are dominated by eucalyptus species, particularly red gum, and, in the tropics, paperbark species. They prefer woodlands and forests with a high density of large trees and particularly sites with hollows that are used by the owls as well as their prey. Roost sites are often located near waterways or wetlands. This species roosts in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species.	Bionet	2017	9	Unlikely	The site lacks suitable foraging or breeding resources. The associated canopy species are not present on site.

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Ninox strenua	Powerful Owl	V	-	In NSW, the Powerful Owl is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered, mostly historical records on the western slopes and plains. This species roosts by day in dense vegetation comprising species such as Turpentine (Syncarpia glomulifera), Black She-oak (Allocasuarina littoralis), Blackwood (Acacia melanoxylon), Rough-barked Apple (Angophora floribunda), Cherry Ballart (Exocarpus cupressiformis) and a number of eucalypt species.	Bionet	2020	1201	Moderate	There are numerous records throughout the search area, with many records concentrated in bushland at Pennant Hills Park, along Lane Cove River, Galston Gorge and Ku-ring-gai National Park, representing a resident population in the wider locality. The species requires large tracts of intact forest but can forage in fragmented habitats as well; the forest fragments within the study area are likely to form part of a larger foraging range, with Ringtail Possum being suitable prey species.
Tyto novaehollandiae	Masked Owl	V	-	The Masked Owl lives in dry eucalypt forests and woodlands from sea level to 1100 m. Its diet typically consists of tree-dwelling and ground mammals, especially rats.	Bionet	2019	2	Unlikely	The site lacks suitable foraging or breeding resources. The species has only been recorded twice within 10 kms of the site.
Tyto tenebricosa	Sooty Owl	V	-	The Sooty Owl occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Bionet	2008	1	Unlikely	The site lacks suitable foraging or breeding resources, or connectivity to such resources. Only one individual has been recorded within 10 kms of the site, in 2008.

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Invertebrates									
Meridolum corneovirens	Cumberland Plain Land Snail	E	-	The Cumberland Plain Land Snail lives in small areas on the Cumberland Plain west of Sydney, from Richmond and Windsor south to Picton and from Liverpool west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. It is known from over 100 different locations, but not all are currently occupied, and they are usually isolated from each other as a result of land use patterns. It primarily inhabits Cumberland Plain Woodland CEEC. This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities. It lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps, and occasionally shelters under rubbish.	Bionet	2010	1	Unlikely	Only one individual has been recorded within 10 kms of the site, in 2010. No grassy woodlands and Cumberland Plain vegetation types are present in the study area, and the site lacks Forest Red Gum trees and deep litter, grassy tussock and microsites.
Pommerhelix duralensis	Dural Land Snail	E	E	The species is a shale-influenced-habitat specialist, which occurs in low densities along the western and northwest fringes of the Cumberland IBRA subregion on shale-sandstone transitional landscapes. It favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. The species has also been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris. The species is found within the Local Government Areas of The Hills Shire, Hawkesbury Shire and Hornsby Shire. Records from the Blue Mountains City, Penrith City and Parramatta City may represent this species. Occurrence in Wollondilly Shire is considered unlikely in light of current knowledge.	Bionet, PMST	2019	97	Unlikely	The species is unlikely to occur in the study area. Most records from the search area are located in North Parramatta at Lake Parramatta Reserve, in North Rocks or in Dural. The closest record is from 2018 near the bushland at Lane Cove. The study area does not provide a complex ground layer of woody debris and leaf litter.

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Mammals									
Cercartetus nanus	Eastern Pygmy-possum	V	-	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum (Pseudocheirus peregrinus) dreys or thickets of vegetation, (eg grass-tree skirts). Agile climbers, but can be caught on the ground in traps, pitfalls or postholes; generally nocturnal.	Bionet	2020	215	Unlikely	There is no suitable woodland and heath habitats, hollow-bearing trees, or vegetation thickets within the study area.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	This species has been recorded from a wide range of habitats, including: coastal heathlands, open and closed eucalypt woodlands, wet sclerophyll and lowland forests (OEH 2018). Unlogged forest or forest that has been less disturbed by timber harvesting is preferable. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. Individuals require an abundance of food, such as birds and small mammals, and large areas of relatively intact vegetation through which to forage. Home ranges are estimated to be 620–2,560 ha for males and 90–650 ha for females (DoEE 2018).	Bionet, PMST	2019	9	Unlikely	The site lacks suitable den sites such as hollow logs, tree hollows, rock outcrops or caves and large areas of relatively intact vegetation.

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Saccolaimus flaviventris	Yellow-bellied Sheathtail-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.	Bionet	2019	36	Moderate	There are numerous records in the search area and the species has potential to roost in nearby buildings, bridge structures and other artificial structures. However, the trees within the study area do not contain hollows or well-developed decorticating bark that would provide suitable roost sites. The species is not likely to be breeding within the study area and is likely to be utilising the habitats within the study area for foraging, as part of a larger foraging range.
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	In NSW the Brush-tailed Rock Wallaby occurs from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. This species occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. The Brush-tailed Rock Wallaby browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	PMST	-	-	Low	The site lacks suitable cliff and escarpment habitat. It also lacks suitable foraging or breeding resources, or connectivity to such resources. The species has not been recorded within 10 kms of the site.

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Miniopterus australis	Little Bent-winged Bat	V	-	The Little Bentwing Bat is distributed on the East coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. It is generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	Bionet	2020	80	Moderate	There are numerous records in the search area and the species has potential to roost in nearby buildings, bridge structures and other artificial structures. However, the trees within the study area do not contain hollows or well-developed decorticating bark that would provide suitable roost sites. The species is not likely to be breeding within the study area and is likely to be utilising the habitats within the study area for foraging, as part of a larger foraging range.
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	Eastern Bentwing-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 structure. During non-breeding times, populations disperse within about 300 km range of maternity caves.	Bionet	2020	299	Moderate	There are numerous records in the search area and the species has potential to roost in nearby buildings, bridge structures and other artificial structures. However, the species is not likely to be breeding within the study area and is likely to be utilising the habitats within the study area for foraging, as part of a larger foraging range.

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Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	-	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. The species occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. It roosts mainly in tree hollows but will also roost under bark or in man-made structures.	Bionet	2020	53	Moderate	There are numerous records in the search area and the species has potential to roost in nearby buildings, bridge structures and other artificial structures. However, the trees within the study area do not contain hollows or well-developed decorticating bark that would provide suitable roost sites. The species is not likely to be breeding within the study area and is likely to be utilising the habitats within the study area for foraging, as part of a larger foraging range.
Pseudomys gracilicaudatus	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. It is associated with 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.	Bionet	2000	1	Unlikely	The site lacks suitable heath habitat. It also lacks suitable foraging or breeding resources, or connectivity to such resources.

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Pseudomys novaehollandiae	New Holland Mouse	-	V	Found from coastal areas and up to100 km inland on sandstone country. Known to inhabit a range of habitats including open heathland, open woodland with a heathland understory and vegetated sand dunes. Soil type may be an important indicator of suitability of habitat with deeper top soils and softer substrates being preferred for digging burrows. Other factors such as slope, geology and the amount of sun received in an area may also influence site selection.	Bionet, PMST	2017	5	Unlikely	The site lacks the required heathland and woodland habitats that provide suitable foraging or breeding resources for the species.
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	E	E	The Southern Brown Bandicoot has a patchy distribution. It is found in south-eastern NSW, east of the Great Dividing Range south from the Hawkesbury River, southern coastal Victoria and the Grampian Ranges, south-eastern South Australia, south-west Western Australia and the northern tip of Queensland. It is associated with heath or open forest with a heathy understorey on sandy or friable soils. Nests may be located under Grass trees (Xanthorrhoea spp.), blackberry bushes and other shrubs, or in rabbit burrows.	Bionet, PMST	2019	295	Unlikely	There is no suitable heath or open forest habitats within the study area.
Petaurus norfolcensis	Squirrel Glider	V	-	Inhabits dry sclerophyll forest and woodland where it is absent from the dense coastal ranges. Forages on pollen and nectar and the gum that acacias produce. Also eats sap from gums and the green seeds of the Golden Wattle. Associated with dry hardwood forest and woodlands. Habitats typically include gum-barked and high nectar-producing species, including winter flower species. The presence of hollow-bearing eucalypts is a critical habitat value. The Squirrel Glider is sparsely distributed along the east coast and immediate inland districts from western Victoria to north Queensland.	Bionet	2012	1	Unlikely	The site lacks suitable foraging or breeding resources, particularly hollow resources and understorey complexity.

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Phascolarctos cinereus	Koala	V	V	The Koala inhabits eucalypt woodlands and forests and feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species (OEH 2018). No koalas, koala scratches or scats were detected within the project area.	Bionet, PMST	2020	9	Unlikely	There are nine records of Koala in the search area between 2017 and 2020, with the most recent being recorded within Ku-ring-gai Chase National Park. However, the vegetation does not include food tree species listed for the Central Coast Koala Management Area (DECC 2008).
Petauroides volans	Greater Glider	-	V	Largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species.	Bionet, PMST	2014	3	Unlikely	The site lacks suitable foraging or breeding resources.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Grey-headed Flying foxes occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Bionet, PMST	2020	1131	Moderate	No camps were observed within the study area, with the closest permanent camps located at Gordon and at Parramatta Park. The species is likely to forage transiently within the study area as part of a larger foraging range.

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Chalinolobus dwyeri	Large-eared Pied Bat	V	V	In NSW this species has been recorded from a large range of vegetation types including: dry and wet sclerophyll forest; Cyprus Pine (Callitris glauca) dominated forest; tall open eucalypt forest with a rainforest sub-canopy; sub-alpine woodland; and sandstone outcrop country. The species requires a combination of sandstone cliff/escarpment to provide roosting habitat that is adjacent to higher fertility sites, particularly box gum woodlands or river/rainforest corridors which are used for foraging. Roosting has also been observed in disused mine shafts, caves, overhangs and disused Fairy Martin (Hirundo ariel) nests, also possibly roosts in the hollows of trees.	Bionet, PMST	2019	7	Low	The site is not situated near sandstone cliffs or escarpments for breeding and does not contain preferred box gum woodland or riparian habitats for foraging.
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. This species prefers moist habitats, with trees taller than 20 m, generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Bionet	2020	29	Moderate	There are numerous records in the search area and the species has potential to roost in nearby buildings, bridge structures and other artificial structures. However, the trees within the study area do not contain hollows or well-developed decorticating bark that would provide suitable roost sites. The species is not likely to be breeding within the study area and is likely to be utilising the habitats within the study area for foraging, as part of a larger foraging range.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Myotis macropus	Southern Myotis	V	-	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. They 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. Southern Myotis forage over streams and pools catching insects and small fish by raking their feet across the water surface.	Bionet	2020	42	Unlikely	The species fishes over waterbodies and uses forest and woodland vegetation around foraging sites in which to roost. The study area does not contain suitable foraging habitat.
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m. This species utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.	Bionet	2020	34	Moderate	There are numerous records in the search area. However, the trees within the study area do not contain hollows or well-developed decorticating bark that would provide suitable roost sites. The species is not likely to be breeding within the study area and is likely to be utilising the habitats within the study area for foraging, as part of a larger foraging range.
Vespadelus troughtoni	Eastern Cave Bat	V	-	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. Little is known of the biology, feeding, breeding and behaviour of this species. They are usually found in dry open forest and woodland, near rocky cliffs or overhangs. It has been recorded roosting in disused mine workings and caves, and is occasionally found in wet eucalypt forest and rainforest.	Bionet	2019	1	Unlikely	The site lacks suitable foraging or breeding resources.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Reptiles									
Hoplocephalus bungaroides	Broad-headed Snake	E	V	Often found in rocky outcrops and adjacent sclerophyll forest and woodland, the most suitable sites occur in sandstone ridgetops. Recorded sightingsin forests growing on shale or conglomerate slopes and bluffs with canopy species include Corymbia eximia, C. gummifera, Eucalyptus sieberi, E. punctata and E. piperita. Adult snakes show a seasonal, temperature induced, shift in habitat use. Adults use rocks and crevices as shelter sites in rocky outcrops in autumn, winter and early spring. During late spring and summer, adults move up into adjacent woodlands. Juvenile snakes remain in rocky habitat year round. The majority of occupied retreat sites occur on exposed cliff edges. In woodland, snakes shelter in hollows in a variety of tree species including Red Bloodwood (Eucalyptus gummifera), Grey Gum (E. punctata), Sydney Peppermint (E. piperita) and Blue Leaf Stringybark (E. agglomerata). Snakes show preferences for large trees, trees with multiple hollows, and dead trees. Most snakes use hollow branches rather than hollow stems. Individual snakes use between one and nine trees. Snakes spend long periods of inactivity in a single hollow, up to 48 days.	PMST	-	-	Unlikely	The site lacks any habitat for this species or connectivity with areas of potential habitat. The species has not been recorded within 10km of the site.
Varanus rosenbergi	Rosenberg's Goanna	V	-	Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens.	Bionet	2020	62	Unlikely	The site lacks suitable habitat for this species or connectivity with areas of potential habitat.
Migratory birds									
Apus pacificus	Fork-tailed Swift	-	Mi	In Australia, the Fork-tailed Swift mostly occurs over inland plains but sometimes above foothills or in coastal areas. This species can also occur over cliffs and beaches and also over islands and sometimes well out to sea.	Bionet, PMST	2018	2	Unlikely	The site lacks suitable habitat for this species.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Myiagra cyanoleuca	Satin Flycatcher	-	Mi	The Satin Flycatcher is widespread in eastern Australia and vagrant to New Zealand (Blakers et al. 1984; Coates 1990). Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	PMST	-	-	Unlikely	The site lacks suitable foraging or breeding resources. The species has not been recorded within 10 kms of the site.
Motacilla flava	Yellow Wagtail	-	Mi	This species occupies a range of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppe and grassy tundra (Birdlife International 2017). No records of this species exist within the locality.	PMST	-	-	Unlikely	The site lacks suitable foraging or breeding resources. The species has not been recorded within 10 kms of the site.
Rhipidura rufifrons	Rufous Fantail	-	Mi	In east and south-east Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (Eucalyptus microcorys), Mountain Grey Gum (E. cypellocarpa), Narrow-leaved Peppermint (E. radiata), Mountain Ash (E. regnans), Alpine Ash (E. delegatensis), Blackbutt (E. pilularis) or Red Mahogany (E. resinifera); usually with a dense shrubby understorey often including ferns.	PMST	-	-	Unlikely	The site lacks suitable foraging or breeding resources. The associated canopy species are not present on site. The species has not been recorded within 10 kms of the site.

Notes: CE – critically endangered; E – endangered; V – vulnerable; Mi - migratory

Table C.2 Likelihood of occurrence – threatened flora species

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Acacia bynoeana	Bynoe's Wattle	E	V	Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	Bionet, PMST	2014	8	Unlikely	No suitable habitat present.
Acacia clunies-rossiae	Kanangra Wattle	V	-	Kanangra Wattle grows in the Kowmung and Coxs River areas entirely within Kanangra-Boyd and Blue Mountains National Parks. It is associated with dry sclerophyll forest on skeletal soils on rocky slopes, or on alluvium along creeks.	Bionet	2010	1	Unlikely	No suitable habitat present.
Acacia pubescens	Downy Wattle	V	V	This species occurs on ridges, hillsides and flat areas, at altitudes up to 650 m. Grows in dry open sclerophyll forest, woodland and Melaleuca scrub on gravelly clay or sandy soils on alluviums, shales and at the interface between shales and sandstones.	Bionet, PMST	2020	42	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Allocasuarina glareicola	Allocasuarina glareicola	E	E	Grows on tertiary alluvial gravels, with yellow clayey subsoil and lateritic soil. These soils are low in fertility and are strongly to very strongly acidic. Rainfall in the area is lower than surrounding regions. Grows in Castlereagh woodland on lateritic soil. Found in open woodland with Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla and Melaleuca decora. Common associated understorey species include Melaleuca nodosa, Hakea dactyloides, Hakea sericea, Dillwynia tenuifolia, Micromyrtus minutiflora, Acacia elongata, Acacia brownei, Themeda australis and Xanthorrhoea minor.	PMST	-	-	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Asterolasia elegans	Asterolasia elegans	E	E	Occurs north of Sydney in the Baulkham Hills, Hawkesbury and Hornsby local government areas. The species is found in sheltered forests on mid- to lower slopes and valleys, eg in or adjacent to gullies which support sheltered forest. It occurs on Hawkesbury sandstone. Canopy species include Turpentine (Syncarpia glomulifera subsp. glomulifera), Smooth-barked Apple (Angophora costata), Sydney Peppermint (Eucalyptus piperita), Forest Oak (Allocasuarina torulosa) and Christmas Bush (Ceratopetalum gummiferum).	PMST	-	-	Unlikely	Unlikely to occur given the highly disturbed nature of the study area. Not observed during site investigations.
Caladenia tessellata	Thick Lip Spider Orchid	E	V	Thick-lipped Spider Orchid is generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. The single leaf regrows each year. Flowers appear between September and November (but apparently generally late September or early October in extant southern populations).	PMST	-	-	Unlikely	No suitable habitat present.
Callistemon linearifolius	Netted Bottle Brush	V	-	Grows in dry sclerophyll forest on the coast and adjacent ranges.	Bionet	2019	16	Unlikely	No suitable habitat present

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	The larger populations of these species typically occur in woodland dominated by Scribbly Gum (Eucalyptus sclerophylla), Silvertop Ash (E. sieberi), Red Bloodwood (Corymbia gummifera) and Black Sheoak (Allocasuarina littoralis); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (C. subulata) and the Tartan Tongue Orchid (C. erecta). Little is known about the ecology of the species; being leafless it is expected to have limited photosynthetic capability and probably depends upon a fungal associate to meet its nutritional requirements from either living or dead organic material. In addition to reproducing from seed, it is also capable of vegetative reproduction and thus forms colonies which can become more or less permanent at a site.	PMST	-	-	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Cynanchum elegans	White-flowered Wax Plant	E	E	The rare species is known in rainforest gullies scrub and scree slopes. Associated vegetation types include littoral rainforest; Coastal Tea-tree Leptospermum laevigatum – Coastal Banksia Banksia integrifolia subsp. integrifolia coastal scrub; Forest Red Gum Eucalyptus tereticornis aligned open forest and woodland; Spotted Gum Corymbia maculata aligned open forest and woodland; and Bracelet Honeymyrtle Melaleuca armillaris scrub to open scrub.	PMST	-	-	Unlikely	No suitable habitat present.
Darwinia biflora	Darwinia biflora	V	V	Darwinia biflora is 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. It occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone. It is associated overstorey species include Eucalyptus haemastoma, Corymbia gummifera and/or E. squamosa. The vegetation structure is usually woodland, open forest or scrub-heath.	Bionet, PMST	2020	715	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Darwinia peduncularis	Darwinia peduncularis	V	-	Darwinia peduncularis 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. It usually grows on or near rocky outcrops on sandy, well drained, low nutrient soil over sandstone.	Bionet	2009	1	Unlikely	No suitable habitat present.
Deyeuxia appressa	Deyeuxia appressa	E	E	Deyeuxia appressa has not been seen for over 60 years. It is endemic to NSW and is known only from two pre-1942 records in the Sydney area. It was first collected in 1930 at Herne Bay, Saltpan Creek, off the Georges River, south of Bankstown. It was then collected in 1941 from Killara, near Hornsby. It has not been collected since and may now be extinct in the wild due to the level of habitat loss and development that has occurred within these areas.	PMST	-	-	Unlikely	Unlikely to occur given the highly disturbed nature of the study area.
Dillwynia tenuifolia	Dillwynia tenuifolia	V	-	Commonly occurs in dry sclerophyll woodland on sandstone, shale or laterite. Eucalyptus fibrosa is usually the dominant canopy species.	Bionet	2010	1	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Epacris purpurascens var. purpurascens	Epacris purpurascens var. purpurascens	V	-	Grows in sclerophyll forest, scrubs and swamps on sandstone.	Bionet	2020	308	Unlikely	There are no suitable sclerophyll forest, scrubs or swamps on sandstone recorded within the study area.
Eucalyptus camfieldii	Camfield's Stringybark	V	V	Occurs in 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. Associated species frequently include stunted species of E. oblonga Narrow-leaved Stringybark, E. capitellata Brown Stringybark and E. haemastoma Scribbly Gum. Population sizes are difficult to estimate because its extensive lignotubers may be 20 m across. A number of stems arise from these lignotubers giving the impression of individual plants. Flowering period is irregular, flowers recorded throughout the year. Poor response to too frequent fires.	Bionet, PMST	2019	21	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	This species is sparsely distributed but widespread on the New England Tablelands from Nundle to north of Tenterfield, being most common in central portions of its range. Found largely on private property and roadsides, and occasionally in conservation reserves. Planted as urban trees, windbreaks and corridors. It typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock.	Bionet	2009	6	Unlikely	No suitable habitat present. Study area is outside its natural distribution.
Eucalyptus scoparia	Wallangarra White Gum	E	V	In NSW, Wallangara White Gum is known from only three locations near Tenterfield, including Bald Rock National Park. It is found in open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes. At lower elevations it can occur in less rocky soils in damp situations.	Bionet	2005	3	Unlikely	No suitable habitat present. Study area is outside its natural distribution.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Eucalyptus sp. Cattai	Eucalyptus sp. Cattai	CE	CE	Eucalyptus sp. Cattai occurs in The Hills Local Government Area, with known populations occurring within the area bounded by Kellyville - Maraylya - Glenorie. The species occurs as a rare emergent tree in scrub, heath and low woodland on sandy soils, usually as isolated individuals or occasionally in small clustered groups. The sites at which it occurs are generally flat and on ridge tops. Associated soils are laterised clays overlying sandstone. There are no known populations occur in conservation reserves.	Bionet, PMST	2019	10	Unlikely	No suitable habitat present.
Galium australe	Tangled Bedstraw	E	-	Tangled Bedstraw is widespread in Victoria and Tasmania and is also found in South Australia. In NSW, Tangled Bedstraw has been recorded in Turpentine forest and coastal Acacia shrubland. Following a taxonomic revision, many recent records in NSW have been re-determined as other species. Tangled Bedstraw has been recorded historically in the Nowra (Colymea) and Narooma areas and is extant in Nadgee Nature Reserve, south of Eden. Records in the Sydney area are yet to be confirmed.	Bionet	2011	5	Unlikely	Unlikely to occur given the highly disturbed nature of the study area. Not observed during site investigations.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Genoplesium baueri	Bauer's Midge Orchid	E	E	Usually found growing in heathland to shrubby woodland on sands or sandy loams or open forest, shrubby forest and heathy forest on well-drained sandy and gravelly soils.	Bionet, PMST	2020	52	Unlikely	No suitable habitat present.
Grammitis stenophylla	Narrow-leaf Finger Fern	E	-	Narrow-leaf Finger Fern occurs in eastern Queensland and eastern NSW. In NSW it has been found on the south, central and north coasts and as far west as Mount Kaputar National Park near Narrabri. It is associated with moist places, usually near streams, on rocks or in trees, in rainforest and moist eucalypt forest.	Bionet	2015	11	Unlikely	No suitable habitat present.
Grevillea caleyi	Caley's Grevillea	CE	CE	Caley's Grevillea occurs in the Sydney Basin Bioregion on ridgetops between 170 and 240 m asl. It is 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. It is found in association with open forests generally dominated by *Eucalyptus sieberi* and *E. gummifera*.	Bionet, PMST	2019	7	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	V	-	Juniper-leaved Grevillea occurs in the Sydney Basin Bioregion in Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest. It is 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.	Bionet	2003	1	Unlikely	No suitable habitat present.
Grevillea shiressii	Grevillea shiressii	V	V	Grevillea shiressii is known from two populations near Gosford, on tributaries of the lower Hawkesbury River north of Sydney (Mooney Mooney Creek and Mullet Creek). Both populations occur within the Gosford Local Government Area. There is also a naturalised population at Newcastle. The species grows along creek banks in wet sclerophyll forest with a moist understorey in alluvial sandy or loamy soils.	PMST	-	-	Unlikely	No suitable habitat present, no creek bank environments within the study area.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Haloragis exalata subsp. exalata	Square Raspwort	V	V	Square Raspwort occurs in 4 widely scattered localities in eastern NSW. It is disjunctly distributed in the Central Coast, South Coast and North Western Slopes botanical subdivisions of NSW. It appears to require protected and shaded damp situations in riparian habitats.	PMST	-	-	Unlikely	No suitable habitat present.
Haloragodendron lucasii	Haloragodendron lucasii	E	E	Haloragodendron lucasii is confined to a very narrow distribution within dry sclerophyll forest on the north shore of Sydney. It has been recorded in moist sandy loam soils occuring in sheltered aspects, and on gentle slopes below cliff-lines near creeks in low open woodland. It is associated with high soil moisture and relatively high soil-phosphorus levels.	Bionet, PMST	2020	59	Unlikely	No suitable habitat present.
Hibbertia spanantha	Julian's Hibbertia	CE	CE	Julian's Hibbertia is endemic to NSW where it is restricted to four known locations. Public records are restricted to South Turramura. It grows in forest with canopy species including *Eucalyptus pilularis*, E. *resinifera*, *Corymbia gummifera* and *Angophora costata*. It is associated with light clay soils occuring on a shale sandstone soil transition. The understorey is open with species of Poaceae, Orchidaceae, Fabaceae and Liliaceae.	Bionet, PMST	2018	6	Unlikely	No Hibbertia shrubs were observed during site investigations.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Hibbertia superans	Hibbertia superans	E	-	Hibbertia superans occurs from Baulkham Hills to South Maroota in the northern outskirts of Sydney, where there are currently 16 known sites, and at one locality at Mount Boss, inland from Kempsey. No populations are known from a formal conservation reserve. The species occurs on sandstone ridgetops often near the shale/sandstone boundary. It occurs in both open woodland and heathland, and appears to prefer open disturbed areas, such as tracksides.	Bionet	2015	84	Unlikely	No Hibbertia shrubs were observed during site investigations. The site does not occur on sandstone ridgetops and does not contain heath woodlands.
Kunzea rupestris	Kunzea rupestris	V	V	Kunzea rupestris is restricted, with most locations in the Maroota - Sackville - Glenorie area and one outlier in Ku-ring-gai Chase National Park, all within the Central Coast botanical subdivision of NSW. Currently known to exist in 20 populations, 6 of which are reserved. It grows in shallow depressions on large flat sandstone rock outcrops. It is characteristically found in short to tall shrubland or heathland.	Bionet	2013	1	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Lasiopetalum joyceae	Lasiopetalum joyceae	V	V	Lasiopetalum joyceae has a restricted range occurring on lateritic to shaley ridgetops on the Hornsby Plateau south of the Hawkesbury River. It is currently known from 34 sites between Berrilee and Duffys Forest. Seventeen of these are reserved. It grows in heath on sandstone.	Bionet, PMST	2020	1001	Unlikely	No suitable habitat present. Most of the records within the search area are from Ku-ring-gai Chase National Park.
Leptospermum deanei	Leptospermum deanei	V	V	Leptospermum deanei occurs in Hornsby, Warringah, Ku-ring-gai and Ryde LGAs. It is associated with woodland on lower hill slopes or near creeks, on sandy alluvial soil or sand over sandstone. It occurs in Riparian Scrub eg Tristaniopsis laurina, Baechea myrtifolia; Woodland eg Eucalyptus haemstoma; and Open Forest eg Angophora costata, Leptospermum trinervium, Banksia ericifolia.	Bionet, PMST	2017	31	Unlikely	No suitable habitat present.
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V	Rough-shelled Bush Nut is confined chiefly to the north of the Richmond River in north-east NSW, extending just across the border into Queensland. Many records, particularly those further south, are thought to be propagated. It is associated with subtropical rainforest (usually) near the coast.	Bionet	2001	1	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Melaleuca biconvexa	Biconvex Paperbark	V	V	Not recorded within a 10km radius of the project. Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Biconvex Paperbark generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects. Flowering occurs over just 3-4 weeks in September and October. This species resprouts following fire.	PMST	-	-	Unlikely	No suitable habitat present.
Melaleuca deanei	Deane's Paperbark	V	V	The species occurs mostly in ridgetop woodland, with only 5% of sites in heath on sandstone.	Bionet, PMST	2020	60	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Persicaria elatior	Tall Knotweed	V	V	Tall Knotweed has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). The species also occurs in Queensland. This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	PMST	-	-	Unlikely	No suitable habitat present.
Persoonia hirsuta	Hairy Geebung	E	E	Hairy Geebung has a scattered distribution around Sydney. The species is distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. Persoonia hirsuta has a large area of occurrence, but occurs in small populations, increasing the species' fragmentation in the landscape. It is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. It is usually present as isolated individuals or very small populations.	Bionet, PMST	2018	8	Unlikely	No suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Persoonia mollis subsp. maxima	Persoonia mollis subsp. maxima	E	E	Persoonia mollis subsp. maxima is highly restricted, known from the Hornsby Heights-Mt Colah area north of Sydney in the Sydney Basin Bioregion. Occurs in three populations (described on a catchment basis) located over an approximate north-south range of 5.75 km and east-west distance of 7.5 km. Additional locations may exist outside the current distribution. It 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.	Bionet, PMST	2018	364	Unlikely	No suitable habitat present.
Pimelea curviflora var. curviflora	Pimelea curviflora var. curviflora	V	V	Restricted to the coastal zone around Sydney occurring on ridge tops and upper slopes in open forest and woodland on sandy soil derived from sandstone on shaley/lateritic soils and shale/sandstone transition soils. It often grows among dense grasses and sedges.	Bionet, PMST	2017	63	Unlikely	Unlikely to occur given the highly disturbed nature of the study area. Not observed during site investigations.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Pimelea spicata	Spiked Rice-flower	E	E	Found on well-structured clay soils. It occurs commonly in Coast Banksia open woodland with a better developed shrub and grass understorey. Coastal headlands and hilltops are the favoured sites.	PMST	-	-	Unlikely	No suitable habitat present on site.
Pomaderris prunifolia	Plum Leaf Pomaderris	EP	-	The Plum Leaf Pomaderris in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas population is known from only three sites within the listed local government areas, at Rydalmere, within Rookwood Cemetery and at The Crest of Bankstown. At Rydalmere it occurs along a road reserve near a creek, among grass species on sandstone. At Rookwood Cemetery it occurs in a small gully of degraded Cooks River / Castlereagh Ironbark Forest on shale soils.	Bionet	2015	2	Unlikely	Outside of known range and no suitable habitat present.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Prostanthera junonis	Somersby Mintbush	E	E	Somersby Mintbush has a north-south range of approximately 19 km on the Somersby Plateau in the Gosford and Wyong local government areas. The species is restricted to the Somersby Plateau. It occurs on both the Somersby and Sydney Town soil landscapes on gently undulating country over weathered Hawkesbury sandstone within open forest/low woodland/open scrub. It occurs in both disturbed and undisturbed sites.	PMST	-	-	Unlikely	No suitable habitat present. Outside of the known distribution of the species.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Prostanthera marifolia	Seaforth Mintbush	CE	CE	Seaforth Mintbush is currently only known from the northern Sydney suburb of Seaforth and has a very highly restricted distribution within the Sydney Basin Bioregion. The single population is fragmented by urbanisation into three small sites. All known sites are within an area of 2x2 km. The sites are within the local government area of Northern Beaches Council. It occurs in localised patches in or in close proximity to the endangered Duffys Forest ecological community.; It is located on deeply weathered clay-loam soils associated with ironstone and scattered shale lenses, a soil type which only occurs on ridge tops and has been extensively urbanised.	PMST	-	-	Unlikely	No suitable habitat present. Outside of the known distribution of the species.
Pterostylis saxicola	Sydney Plains Greenhood	E	E	This species occurs in small pockets of shallow soil in flat areas on top of sandstone rock shelves above cliff lines or on mossy rocks in gullies.	PMST	-	-	Unlikely	No suitable habitat present

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Rhizanthella slateri	Eastern Australian Underground Orchid	V	E	The Eastern Australian Underground Orchid occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. The species is highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore, it is usually located only when the soil is disturbed.	Bionet, PMST	2020	1	Unlikely	Unlikely to occur given the highly disturbed nature of the study area.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Rhodamnia rubescens	Scrub Turpentine	CE	-	Scrub Turpentine occurs from Baulkham Hills to South Maroota in the northern outskirts of Sydney, where there are currently 16 known sites, and at one locality at Mount Boss, inland from Kempsey. No populations are known from a formal conservation reserve. It is found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Bionet	2018	9	Unlikely	No suitable habitat present
Syzygium paniculatum	Magenta Lilly Pilly	E	V	On the central coast, the Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Bionet, PMST	2020	46	Unlikely	No suitable habitat present

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Tetratheca glandulosa	Tetratheca glandulosa	V	-	Tetratheca glandulosa is restricted to the Baulkham Hills, Gosford, Hawkesbury, Hornsby, Ku-ring-gai, Pittwater, Ryde, Warringah, and Wyong Local Government Areas. There are approximately 150 populations of this plant ranging from Sampons Pass (Yengo NP) in the north to West Pymble (Lane Cove NP) in the south. The eastern limit is at Ingleside (Pittwater LGA) and the western limit is at East Kurrajong (Wollemi NP). There are historical collections of this species south to Manly, Willoughby and Mosman, however these populations are now extinct. The current north-south range is approximately 65km.	Bionet	2020	303	Unlikely	The study area does not contain heath woodlands on sandstone ridgetops.

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
				The species is associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, Gymea, 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. Vegetation communities correspond broadly to Benson & Howell's Sydney Sandstone Ridgetop Woodland (Map Unit 10ar).					
Thesium australe	Austral Toadflax	V	V	Occurs on the coast, tablelands and western slopes in shrubland, grassland or woodland, often on damp sites	PMST	-	-	Unlikely	No suitable grassland or grassy woodland habitats.
Wilsonia backhousei	Narrow-leafed Wilsonia	V	-	Mainly occurs on heavy soils in coastal saltmarshes and around the edges of inland salt lakes.	Bionet	2012	27	Unlikely	No suitable habitat present

Scientific name	Common name	Status BC Act	Status EPBC Act	Habitat requirement	Data source	Most recent record	Number of records in the 10 km search area	Likelihood of occurrence within the study area	Justification
Zieria involucrata	Zieria involucrata	E	V	Zieria involucrata has a disjunct distribution north and west of Sydney, in the Baulkham Hills, Hawkesbury, Hornsby and Blue Mountains local government areas. Recent records for the species come from 22 populations in the catchments of the Macdonald, Colo and Hawkesbury Rivers between Melon Creek and Mogo Creek in the north to Little Cattai Creek (Hillside) and Wheeny Creek (Colo) in the south and from a single population in the upper Blue Mountains north of Katoomba. In addition, historical records exist for at least two other localities in the eastern Blue Mountains: south of Springwood Valley Heights and north-west of Kurrajong. It occurs primarily on Hawkesbury sandstone, but also on Narrabeen Group sandstone and on Quaternary alluvium. It is found primarily in sheltered forests on mid- to lower slopes and valleys, eg in or adjacent to gullies which support sheltered forest, although some populations extend upslope into drier vegetation. It is also known from at least two atypical ridgetop locations	PMST	-	-	Unlikely	Unlikely to occur given the highly disturbed nature of the study area. Not observed during site investigations.

Notes: CE – critically endangered; E – endangered; V – vulnerable; EP – endangered population.

Appendix D

Five-part tests of significance (BC Act)

D.1 Blue Gum High Forest

D.1.1 Description

Blue Gum High Forest is a critically endangered ecological community listed under the BC Act. It is a tall, wet sclerophyll forest dominated by Sydney Blue Gum or Blackbutt, with a multi-layered mesophyllous understorey and a diverse ground layer of ferns, herbs and grasses. Other tree species that can occur in the community include Smooth-barked Apple and Grey Ironbark (*Eucalyptus paniculata*).

D.1.2 Distribution and habitat

Blue Gum High Forest is limited to the Sydney Basin Bioregion and generally occurs at altitudes above 100 metres above sea level (asl) in areas that receive high rainfall. It is strongly associated with deep soils derived from Wianamatta Shale.

Key occurrences are found on the Hornsby Plateau, North Shore and northern suburbs of Sydney, and predominantly in the local government areas of Ku-ring-gai, Hornsby and Baulkham Hills.

D.1.3 Key threats

Blue Gum High Forest is estimated to have covered an area of approximately 3,700 ha prior to European settlement. It is estimated that less than 5% of the original extent remains (NSW Scientific Committee 2011). Extant remnants are now typically small (<20 ha), severely fragmented and often highly modified relics of the original community.

Key factors contributing to the decline of Blue Gum High Forest are land clearing and fragmentation, historically for orchards and farms, and subsequently for urban development. Ongoing decline due to small-scale clearing and underscrubbing for residential subdivisions, maintenance and upgrade of roads and service easements as well as degradation from weeds and urban pollution, is associated continuing urbanisation of the landscape where Blue Gum High Forest occurs.

D.1.4 Occurrence in the wider locality

Within the wider locality, it is crudely estimated from various vegetation mapping sources (DPIE 2015; Office of Environment and Heritage 2016) that there is less than 790 ha of Blue Gum High Forest remaining, either as intact remnant patches or remnant stands of trees. However, other estimates of the current extent of Blue Gum High Forest are in the order of 100-200 ha (TSSC 2005; NSW Scientific Committee 2011).

D.1.5 Occurrence within the study area

The local occurrence of the community is based on LGA mapping (Hornsby Shire Council 2019) and is estimated to be approximately 4.21 ha. This estimate includes all connected[2] remnant fragments (which includes stands of remnant trees as well as forest patches). A conservative approach has been taken and the local occurrence only considers fragments occurring to the north from Eaton Avenue.

Within the study area, the community occurs along Malsbury Road within the road reserve, and within sections of the rail corridor on the downside (ie off Platform 2). An area of Blue Gum High Forest also occurs within the rail corridor on the upside (Platform 1) near Davidson Park. None of these stands occur in pristine condition, with all stands noticeably affected by exotic trees and shrubs, and invasive urban weeds.

[2] A fragment is taken to be connected to another fragment where the two fragments are within 30 metres of each other.

The proposal would require the removal of approximately 0.0042 ha (or 0.099%) of Blue Gum High Forest for the construction of the lift at the Malsbury Road station entrance. This would primarily involve removal of native and exotic understorey species, with retention of all Sydney Blue Gum trees.

The proposal would also involve tree trimming along the edges of existing patches of Blue Gum High Forest around the station platforms. The majority of trimming would affect exotic trees such as Camphor Laurel and Jacaranda but lateral branches of a few individual Sydney Blue Gum trees, Sydney Peppermint trees and Smooth-barked Apple may be required.

Weed management is to occur over an area of identified Blue Gum High Forest in proximity to Normanhurst station which is affected by weed species. This action will improve the ecological condition and quality of the vegetation.

D.1.6 Significant impact assessment

7.3. Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats

1. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats—

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

Not applicable

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity—

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

The proposal would require the removal of 0.0042 ha (or 0.099%) of Blue Gum High Forest for the construction of the lift at the Malsbury Road station entrance. The vegetation removal would affect understorey vegetation, including a mix of native and exotic species such as Sweet Pittosporum, Black Wattle (*Acacia decurrens*), Large-leaved Privet, Cotoneaster and Spiny-headed Mat-rush. The construction works would not require the removal of the large Sydney Blue Gum (Tree ID 50). Other characteristic Blue Gum High Forest trees within proximity of the proposed construction works for the lift, including one Smooth-barked Apple, would not be removed.

Trimming works would largely affect lateral branches of the canopy trees of Blue Gum High Forest where they overhang the station platform, other hard surfaces, and exotic groundcovers. Furthermore, a number of the trees that will be trimmed are represented by exotic woody species or non-indigenous natives. Weed management works will also occur.

Considering these points, the proposal is unlikely to reduce the extent of Blue Gum High Forest such that its local occurrence would be placed at risk of extinction. It is highly likely that the extent Blue Gum High Forest within the study area would continue to persist after the completion of the station access upgrades.

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,

None of the occurrences of Blue Gum High Forest within the study area occur in pristine condition, with all stands noticeably affected by exotic trees and shrubs, and invasive urban weeds.

The vegetation removal for the commuter lift at the Malsbury Road side would affect understorey vegetation, including a mix of native and exotic species such as Sweet Pittosporum, Black Wattle (*Acacia decurrens*), Large-leaved Privet, Cotoneaster and Spiny-headed Mat-rush. However, key overstorey species would be retained.

Trimming works to Blue Gum High Forest would be required along the boundary of Platform 1; however the key species that would be affected by the trimming works are introduced species, including Camphor Laurel, Jacaranda, Small-leaved Privet, and Illawarra Flame Tree. A Sydney Blue Gum and a Sydney Peppermint may also potentially require trimming at this location.

The trimming works that would be required along platform 2 would affect a limited area of Blue Gum High Forest and would include trimming of overhanging trees and shrubs, such as the lateral branches of Sydney Blue Gum and Black Wattle. Again, trimming works would largely affect lateral branches of the canopy trees of Blue Gum High Forest where they overhang the station platform and areas of exotic groundcovers.

Considering these points, the proposal is unlikely to substantially modify the composition of the existing patches of Blue Gum High Forest such that its local occurrence would be placed 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 will result in the removal of approximately 0.0042 ha or 0.099% of habitat currently occupied by mixed native and exotic Blue Gum High Forest understorey. The overstorey elements of the extent patches of Blue Gum High Forest will be retained and to this effect, the extent to which habitat for the community is likely to be removed or modified is expected to be minor.

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

Considered in context, the proposal is unlikely to increase the existing effects of fragmentation on Blue Gum High Forest in the study area. The extant patches of Blue Gum High Forest along the railway corridor are highly fragmented, with patches generally in the order of less than 3 ha around the study area. The proposal would result in the removal of approximately 0.0042 ha or 0.099% of habitat representing understorey vegetation around the Malsbury Road footbridge and would result in minor trimming along the margins of existing patches where they overhang the station platform, other hard surfaces and exotic groundcover.

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,

Considering the severely reduced extent of Blue Gum High Forest from its original geographic distribution, the cumulative impacts of ongoing residential development, and the continued effects of existing urbanisation (ie stormwater runoff, weed invasion), all areas of habitat could be regarded as being important to the survival of the ecological community in the locality.

Notwithstanding, the proposal is unlikely substantially modify the current habitat from its current state and the extent to which habitat for the community is likely to be removed is expected to be minor.

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),

There are no declared areas of outstanding biodiversity value within the study area.

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 proposed development has potential to exacerbate the key threatening processes without the implementation of environmental controls during construction works:

- clearing of native vegetation;
- invasion of native plant communities by exotic perennial grasses; and
- invasion and establishment of exotic vines and scramblers.

Conclusion

Blue Gum High Forest has a highly restricted distribution and has suffered a severe reduction in extent from its original extent. It is severely fragmented and persists as small, often highly degraded or modified patches within an urban matrix. It continues to be affected by urban land use, particularly weed invasion, the effects of which are amplified in small, fragmented patches.

Notwithstanding this, the proposal would involve a small area of understorey vegetation removal and important components of the community, namely characteristic canopy trees, would be retained and contribute to the continued persistence of the community. Trimming works are also unlikely to adversely affect the persistence of the community within the study area, particularly as trimming will chiefly affect exotic trees or non-indigenous native species.

The implementation of mitigation measures and environmental safeguards as outlined in Table 5.1 will mitigate the impacts on the integrity of the existing occurrences of the community. The weed management works and replanting of native species identified within Table 5.1 will counteract the loss of a small area of understorey, to improve the overall integrity of the existing patch of Blue Gum High Forest vegetation. The trimming specifications works identified in Table 5.1 will minimise the impact on the health of canopy trees of Blue Gum High Forest.

D.2 Powerful Owl

In NSW, the Powerful Owl is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered, mostly historical records on the western slopes and plains.

Powerful Owl requires large tracts of intact forest with dense understories for roosting, breeding and foraging, but can also forage in more fragmented habitats. The species requires large old growth trees to nest and roosts by day in dense vegetation comprising species such as Turpentine, Black She-oak (*Allocasuarina littoralis*), Blackwood (*Acacia melanoxylon*), Rough-barked Apple (*Angophora floribunda*), Cherry Ballart and a number of eucalypt species.

Powerful Owl hunts medium-sized arboreal marsupials, particularly Greater Glider (*Petaurus volans*), Common Ringtail Possum (*Pseudocheirus peregrinus*) and Sugar Glider (*Petaurus breviceps*). In the study area, the most likely prey species that would occur is Common Ringtail Possum.

There are numerous records throughout the search area, with many records concentrated in nearby bushland at Pennant Hills Park, along Lane Cove River, Galston Gorge and Ku-ring-gai National Park. These records are likely to represent a resident population in the wider locality. The species requires large tracts of intact forest but can forage in fragmented habitats as well; the forest fragments within the study area are likely to form part of a larger foraging range.

D.2.1 Significant impact assessment

7.3. Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats

1. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats—

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

Powerful Owl is only likely to forage within the vegetation in the study area and is unlikely to utilise the area for breeding. The proposal will affect a small area of foraging habitat through trimming works, and is unlikely to interrupt, disturb or otherwise interfere with critical life cycle stages of the species.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity—

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

Not applicable.

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

Not applicable.

c) in relation to the habitat of a threatened species or ecological community—

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

The proposal would remove approximately 0.0042 ha or 0.099% of habitat representing understorey vegetation around the Malsbury Road footbridge and would require trimming of lateral branches of canopy trees along the margins of existing patches where they overhang the station platform, other hard surfaces and exotic groundcover.

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

The high mobility of the Powerful Owl means that the current fragmentation of existing habitat is unlikely to be hindering movement or otherwise impacting on the species' ability to forage.

Considered in context, the proposal is unlikely to increase the existing effects of fragmentation on habitat for the Powerful Owl in the study area. The extant patches of forest habitat along the railway corridor are highly fragmented, with fragments generally in the order of less than three hectares around the study area. The proposal would result in the removal of approximately 0.0042 ha or 0.099% of habitat representing understorey vegetation around the Malsbury Road footbridge and would result in minor trimming along the margins of existing patches where they overhang the station platform, other hard surfaces and exotic groundcover.

As such the proposal is unlikely to increase fragmentation or further isolate fragments of habitat for Powerful Owl.

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

The habitat within the study area is likely to form part of a much larger foraging range for Powerful Owl and is not considered critical to the long-term persistence of the species in the locality. Notwithstanding, the proposal is unlikely substantially modify the current habitat from its current state and the extent to which habitat for the community is likely to be removed is expected to be minor.

> *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),*

There are no declared areas of outstanding biodiversity value within the study area.

> *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 proposed development has potential to exacerbate the key threatening processes without the implementation of environmental controls during construction works:

- clearing of native vegetation.

Conclusion

The proposal is unlikely to have a significant impact on the assessed microbat species for the following reasons:

- is unlikely to interfere with critical life cycle stages such as breeding;
- would not reduce a substantial area of foraging habitat;
- such foraging habitat is not considered to be critical to the long-term persistence of the species in the locality; and
- is unlikely to fragment or isolate foraging habitat.

D.3 Gang-gang Cockatoo

Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes.

In summer, the Gang-gang Cockatoo is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, they may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas.

Gang-gang Cockatoo feeds mainly on seeds of native and introduced trees and shrubs, with a preference for eucalypts, wattles and introduced hawthorns. They will also eat berries, fruits, nuts and insects and their larvae.

Gang-gang Cockatoo requires tall trees for nest hollows. The species nests in deep hollows, usually at least 9 m above the ground. The breeding season takes place from October and January.

There are numerous records throughout the search area but the species is unlikely to breed in the study area due to the lack of hollow-bearing trees. However, the species is likely to forage on the eucalypts and wattles in the study area.

D.3.1 Significant impact assessment

7.3. Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats

1. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats—

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

Gang-gang Cockatoo is only likely to forage within the vegetation in the study area and is unlikely to utilise the area for breeding. The proposal will affect a small area of foraging habitat through trimming works, and is unlikely to interrupt, disturb or otherwise interfere with critical life cycle stages of the species.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity—

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

Not applicable.

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

Not applicable.

c) in relation to the habitat of a threatened species or ecological community—

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

The proposal would remove approximately 0.0042 ha or 0.099% of habitat representing understorey vegetation around the Malsbury Road footbridge and would require trimming of lateral branches of canopy trees along the margins of existing patches where they overhang the station platform, other hard surfaces and exotic groundcover.

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

The high mobility of the species means that the current fragmentation of existing habitat is unlikely to be hindering movement or otherwise impacting on the species' ability to forage.

Considered in context, the proposal is unlikely to increase the existing effects of fragmentation on habitat for the species in the study area. The extant patches of forest habitat along the railway corridor are highly fragmented, with fragments generally in the order of less than 3 ha around the study area. The proposal would result in the removal of approximately 0.0042 ha or 0.099% of habitat representing understorey vegetation around the Malsbury Road footbridge and would result in minor trimming along the margins of existing patches where they overhang the station platform, other hard surfaces and exotic groundcover.

As such the proposal is unlikely to increase fragmentation or further isolate fragments of habitat for Powerful Owl.

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

The habitat within the study area is likely to form part of a much larger foraging range for Gang-gang Cockatoo and is not considered critical to the long-term persistence of the species in the locality. Notwithstanding, the proposal is unlikely substantially modify the current habitat from its current state and the extent to which habitat for the community is likely to be removed is expected to be minor.

> *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),*

There are no declared areas of outstanding biodiversity value within the study area.

> *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 proposed development has potential to exacerbate the key threatening processes without the implementation of environmental controls during construction works:

- clearing of native vegetation.

Conclusion

The proposal is unlikely to have a significant impact on the assessed microbat species for the following reasons:

- is unlikely to interfere with critical life cycle stages such as breeding;
- would not reduce a substantial area of foraging habitat;
- such foraging habitat is not considered to be critical to the long-term persistence of the species in the locality; and
- is unlikely to fragment or isolate foraging habitat.

D.4 Threatened microbat species

This assessment of significance evaluates the potential significance of the proposal impacts on the following microbat species:

- Large Bent-winged Bat (*Miniopterus orianae oceanensis*);
- Little Bent-winged Bat (*Miniopterus australis*);
- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*);
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*);
- Greater Broad-nosed Bat (*Scoteanax rueppellii*); and
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*).

Large Bent-winged Bat is listed as a vulnerable species under the BC Act. The species occurs in a broad range of habitats including rainforest, wet and dry sclerophyll forest, paperbark forest and open grasslands. It has a fast, direct flight and forages for flying insects (particularly moths) above the tree canopy and along waterways. Large Bent-winged Bat forms large maternity roosts (up to 100,000 individuals) in caves and mines in spring and summer. Individuals may fly several hundred kilometres to their wintering sites, where they roost in caves, culverts, buildings, and bridges. Potential foraging habitat is present in the study area.

Little Bent-winged Bat is listed as a vulnerable species under the BC Act. It prefers well-timbered areas including rainforest, vine thicket, wet and dry sclerophyll forests, *Melaleuca* swmaps and coastal forests. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. Potential foraging habitat is present in the study area.

Eastern Coastal Free-tailed Bat is listed as a vulnerable species under the BC Act. The Eastern Coastal Free-tailed Bat occurs in dry sclerophyll forest, woodland, swamp forest and mangrove forests east of the Great Dividing Range. It roosts mainly in tree hollows but will also roost under bark or in artificial structures. It forages for insects in the canopy of vegetation. Potential foraging habitat is present in the study area.

Yellow-bellied Sheathtail-bat is listed as a vulnerable species under the BC Act. The Yellow-bellied Sheathtail-bat roosts singly or in groups of up to six, in tree hollows and forages in most habitats across its very wide range, with and without trees. Potential foraging habitat is present in the study area.

Greater Broad-nosed Bat is listed as a vulnerable species under the BC Act. This species utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. It forages for beetles and other insects in the canopy of trees. Potential foraging habitat is present in the study area.

Eastern False Pipistrelle is listed as a vulnerable species under the BC Act. It prefers wet high-altitude sclerophyll and coastal mallee habitat, preferring wet forests with a dense understorey but being found in open forests at lower altitudes. The species roosts in tree hollows and sometimes in buildings in colonies of between 3 and 80 individuals, and often change roosts every night. The species forages for beetles, bugs and moths below or near the canopy in forests with an open structure, or along trails. The species has a large foraging range, up to 136 ha. Records show movements of up to 12 km between roosting and foraging sites. Potential foraging habitat is present in the study area.

D.4.1 Significant impact assessment

7.3. Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats

1. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats—

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

The microbats species assessed are only likely to forage within the vegetation in the study area and are unlikely to utilise the area for breeding. The proposal will affect a small area of foraging habitat through trimming works, and is unlikely to interrupt, disturb or otherwise interfere with critical life cycle stages of the species.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity—

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

Not applicable.

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

Not applicable.

c) in relation to the habitat of a threatened species or ecological community—

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

The proposal would remove approximately 0.0042 ha or 0.099% of habitat representing understorey vegetation around the Malsbury Road footbridge and would require trimming of lateral branches of canopy trees along the margins of existing patches where they overhang the station platform, other hard surfaces and exotic groundcover.

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

The high mobility of the assessed species means that the current fragmentation of existing habitat is unlikely to be hindering movement or otherwise impacting on the species' ability to forage.

Considered in context, the proposal is unlikely to increase the existing effects of fragmentation on habitat for the assessed microbat species in the study area. The extant patches of forest habitat along the railway corridor are highly fragmented, with fragments generally in the order of less than 3 ha around the study area. The proposal would result in the removal of approximately 0.0042 ha or 0.099% of habitat representing understorey vegetation around the Malsbury Road footbridge and would result in minor trimming along the margins of existing patches where they overhang the station platform, other hard surfaces and exotic groundcover.

As such the proposal is unlikely to increase fragmentation or further isolate fragments of habitat for the assessed microbat 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 habitat within the study area is likely to form part of a much larger foraging range for the assessed species and is not considered critical to the long-term persistence of the species in the locality. Notwithstanding, the proposal is unlikely substantially modify the current habitat from its current state and the extent to which habitat for the community is likely to be removed is expected to be minor.

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),

There are no declared areas of outstanding biodiversity value within the study area.

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 proposed development has potential to exacerbate the key threatening processes without the implementation of environmental controls during construction works:

- clearing of native vegetation.

Conclusion

The proposal is unlikely to have a significant impact on the assessed microbat species for the following reasons:

- is unlikely to interfere with critical life cycle stages such as breeding;
- would not reduce a substantial area of foraging habitat, provided that the mitigation measures and environmental safeguards as outlined in Table 5.1 are implemented;
- such foraging habitat is not considered to be critical to the long-term persistence of the species in the locality; and
- is unlikely to fragment or isolate foraging habitat.

Appendix E

Significant impact assessment (EPBC Act)

E.1 Blue Gum High Forest

E.1.1 Significant impact criteria for critically endangered and endangered ecological communities

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

- *reduce the extent of an ecological community*

The proposal would require the removal of approximately 0.0042 ha, or 0.099% of Blue Gum High Forest for the construction of the lift at the Malsbury Road station entrance. The vegetation removal would affect understorey vegetation, including a mix of native and exotic species such as Sweet Pittosporum, Black Wattle (Acacia decurrens), Large-leaved Privet, Cotoneaster and Spiny-headed Mat-rush. The construction works would not require the removal of the large Sydney Blue Gum (Tree ID 50). Other characteristic Blue Gum High Forest trees within proximity of the proposed construction works for the lift, including one Smooth-barked Apple, would not be removed.

Trimming works would largely affect lateral branches of the canopy trees of Blue Gum High Forest where they overhang the station platform, other hard surfaces, and exotic groundcovers. A number of the trees that will be trimmed are represented by exotic woody species or non-indigenous natives.

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines*

Considered in context, the proposal is unlikely to increase the existing effects of fragmentation on Blue Gum High Forest in the study area. The extant patches of Blue Gum High Forest along the railway corridor are highly fragmented, with patches generally in the order of less than 3 ha around the study area. The proposal would result in the removal of approximately 0.0042 ha of understorey vegetation around the Malsbury Road footbridge and would result in minor trimming along the margins of existing patches where they overhang the station platform, other hard surfaces and exotic groundcover.

- *adversely affect habitat critical to the survival of an ecological community*

Considering the severely reduced extent of Blue Gum High Forest from its original geographic distribution, the cumulative impacts of ongoing residential development, and the continued effects of existing urbanisation (ie stormwater runoff, weed invasion), all areas of habitat could be regarded as being important to the survival of the ecological community in the locality.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

The station access upgrades would be undertaken on existing developed land in an urban matrix. The proposal would not involve deep penetrating groundworks or substantially alter surface drainage patterns that underpin the community's survival. Impacts on abiotic factors critical to the survival of the community are unlikely.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting*

None of the occurrences of Blue Gum High Forest within the study area occur in pristine condition, with all stands noticeably affected by exotic trees and shrubs, and invasive urban weeds.

The vegetation removal for the commuter lift at the Malsbury Road side would affect understorey vegetation, including a mix of native and exotic species such as Sweet Pittosporum, Black Wattle (Acacia decurrens), Large-leaved Privet, Cotoneaster and Spiny-headed Mat-rush. However, key overstorey species would be retained.

Trimming works to Blue Gum High Forest would be required along the boundary of Platform 1; however the key species that would be affected by the trimming works are introduced species, including Camphor Laurel, Jacaranda, Small-leaved Privet, and Illawarra Flame Tree. A Sydney Blue Gum and a Sydney Peppermint may also potentially require trimming at this location.

The trimming works that would be required along Platform 2 would affect a limited area of Blue Gum High Forest and would include trimming of overhanging trees and shrubs, such as the lateral branches of Sydney Blue Gum and Black Wattle. Again, trimming works would largely affect lateral branches of the canopy trees of Blue Gum High Forest where they overhang the station platform and areas of exotic groundcovers at the compound area.

- *cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*
    - *assisting invasive species, that are harmful to the listed ecological community, to become established, or*
    - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or*

The proposed development has potential to exacerbate existing threats on the community without the implementation of environmental controls during construction works, including facilitating further spread of invasive weeds or increasing nutrient load and sedimentation from urban runoff. However, standard practices in construction to manage and control erosion and runoff and weed spread would be implemented to minimise the risks on the community as detailed in Section 5.1.

- *interfere with the recovery of an ecological community.*

The proposal is considered unlikely to substantially interfere with the recovery of the community. The proposal would involve a small area of understorey vegetation removal and important components of the community, namely characteristic canopy trees, would be retained and contribute to the continued persistence of the community. Trimming works are also unlikely to adversely affect the persistence of the community within the study area, particularly as trimming will chiefly affect exotic trees or non-indigenous native species. The implementation of mitigation measures and environmental safeguards as outlined in Table 5.1 will mitigate the proposal impacts and have potential to improve the condition of the community.

Conclusion

The implementation of mitigation measures and environmental safeguards as outlined in Table 5.1 will mitigate the impacts on the integrity of the existing occurrences of the community. The weed management works and replanting of native species identified within Table 5.1 will counteract the loss of a small area of understorey, to improve the overall integrity of the existing patch of Blue Gum High Forest vegetation. The trimming specifications works identified in Table 5.1 will minimise the impact on the health of canopy trees of Blue Gum High Forest.