

14. Biodiversity

14.1 Existing environment and background

This chapter draws on information from Appendix M1 (Biodiversity development assessment report waiver request (BDAR waiver request)) and Appendix M2 (Biodiversity development assessment report waiver determination (BDAR waiver determination)). For information on landscape planted vegetation refer to Chapter 10 (Place, design and movement).

14.1.1 Overview

The project is located within a highly modified urban environment, with most of the project area consisting of built form and hardstand areas. Vegetation is limited to landscape planting in Eddy Avenue Plaza and mature trees in the Western Forecourt and along Pitt Street (see Figure 14-1). None of the mature trees present contain hollows, or other characteristic habitat features. Pictures are provided in Appendix M1 (BDAR waiver request).

The BDAR waiver survey found that the Sydney Terminal Building may provide limited habitat for small mammals such as microbats as well as transient fauna species such as birds adapted to the urban environment (see Appendix M1 (BDAR waiver request)). Overall, the survey area provides limited ecological habitat value or potential, with species with a moderate to high likelihood of occurring more likely to inhabit areas with more established vegetation such as Belmore Park to the north and Prince Alfred Park to the south.

Survey area

The survey area used for the biodiversity assessment extended slightly beyond the project area to consider the ecological value and habitat potential surrounding the Sydney Terminal Building. This meant including the landscape planted vegetation within the Western forecourt and along Pitt Street, as well as the chimneys in the Sydney Terminal Building. The survey area is shown on Figure 14-1.

The construction compound located within the Sydney Trains Yard, south of Platform 15, was not included in the survey area because there is no vegetation or other potential habitat in this area, as can be seen on Figure 14-1.

14.1.2 Policy and planning setting

Section 7.9 of the *Biodiversity Conservation Act 2016* (BC Act) requires that an application for State significant infrastructure must be accompanied by a Biodiversity Development Assessment Report (BDAR), unless the Planning Agency Head and the Environment Agency Head determine that the project is not likely to have any significant impact on biodiversity values. This determination is referred to as a BDAR waiver. As outlined above and in Figure 14-1, the project is in a highly modified, urban environment with very limited habitat and no remnant vegetation present. Under clause 7.9(2) of the BC Act it was determined that the project is not likely to have any significant impact on biodiversity values and therefore a BDAR is not required. This determination was provided on 26 July 2022 by the Department of Planning and Environment. The BDAR waiver is included in Appendix M1 (BDAR waiver request), and the determination is included in Appendix M2 (BDAR waiver determination).

In addition, the project has been assessed in relation to State and Commonwealth biodiversity legislation including the BC Act, *Biosecurity Act 2015* and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). As stated in Chapter 2 (Approval framework), a referral under the EPBC Act is not needed as the project will not significantly impact any Matters of National Environmental Significance.

14.1.3 Flora

Because the survey area is located in the Sydney CBD, in a busy, highly disturbed location, it has limited ecological value, with flora within the study area limited to 14 landscape planted trees.

Database searches

Searches of the NSW [BioNet](#) and EPBC Act [Protected Matters Search Tool](#) (PMST) databases identified protected flora species and ecological communities recorded within 10 kilometres of the survey area. A 10-kilometre radius search is the default minimum search area conducted by BioNet, and thus is a broadly accepted definition of the term 'locality'. A 10-kilometre buffer was used for the PMST searches as well for consistency.

The BioNet search found 17 threatened flora species and 37 threatened ecological communities recorded under State legislation. The PMST search found 29 threatened flora species and 12 threatened ecological communities recorded under Commonwealth legislation. A total of 14 flora species were common between both.

Site inspection results

An inspection of the survey area was carried out on 14 June 2022 (detailed in Appendix M1 (BDAR waiver request)). This confirmed the following:

- The only native species in the area are landscape planted trees. They include:
 - Spotted Gum and Lemon-scented Gum trees located in the Western Forecourt
 - Tuckeroo trees in Eddy Avenue Plaza.
- The remaining trees in the survey area are all planted exotics. They include:
 - Chinese Celtis, Jacaranda, and London plane trees in the Western Forecourt
 - London Plane trees in Eddy Avenue Plaza
 - London Plane trees along Pitt Street.

The vegetation within the survey area is shown on Figure 14-1.

Threatened flora species

No threatened flora were recorded within the survey area in the form of naturally occurring or planted species. It is considered unlikely that naturally occurring threatened flora would occur on site due to the absence of remnant native vegetation.

Vegetation communities

Given the similar age class and nature of vegetation in the landscape, the vegetation on site has been classified as 'urban exotic/planted vegetation'. The trees identified on site are either exotic or not endemic to the area, further emphasising their urban/planted nature. Thus, no plant community types have been assigned to this vegetation.

Priority weeds and pathogens

Priority weeds are plants classified under the *Biosecurity Act 2015* as presenting a biosecurity risk to the State or a particular region. 116 priority weeds are known to occur in the Greater Sydney area, although no priority weeds were recorded within the survey area during the site inspection. Pathogens were not found to occur on site during the site inspection.

Groundwater dependent ecosystems

The survey area does not contain any groundwater dependant ecosystems or waterbodies. Furthermore, there are no hydrological processes that could sustain threatened species and threatened ecological communities at the site.

14.1.4 Fauna

Database searches

Searches of the NSW BioNet and EPBC Act PMST databases identified protected fauna species recorded within 10 kilometres of the survey area. The BioNet search found 49 threatened fauna species protected under State legislation. The PMST search found 76 threatened fauna species recorded under Commonwealth legislation. A total of 13 fauna species were common between both.

Based on these searches, the species with an initial moderate likelihood of occurring within the survey area consisted of the:

- Large-eared Pied Bat
- Eastern Coastal Free-tailed Bat
- Little Bent-winged Bat
- Large Bent-winged bat
- Southern Myotis
- Grey-headed Flying Fox.

These findings informed the need for the detailed microbat survey, as described below.

Pests

While no targeted surveys were conducted for pest species, given the urban environment numerous pest species would be likely to occur within the survey area. These may include, but are not limited to:

- Exotic birds, for example, the rock dove or common myna
- Vermin, for example, the black rat.

Fauna habitat and threatened fauna species

There are no threatened ecological communities in the area and the urban exotic/planted trees provide limited habitat for urban adapted native and exotic fauna. The only species of concern in the survey area are macro and microbats, as discussed below.

Grey-headed flying-fox

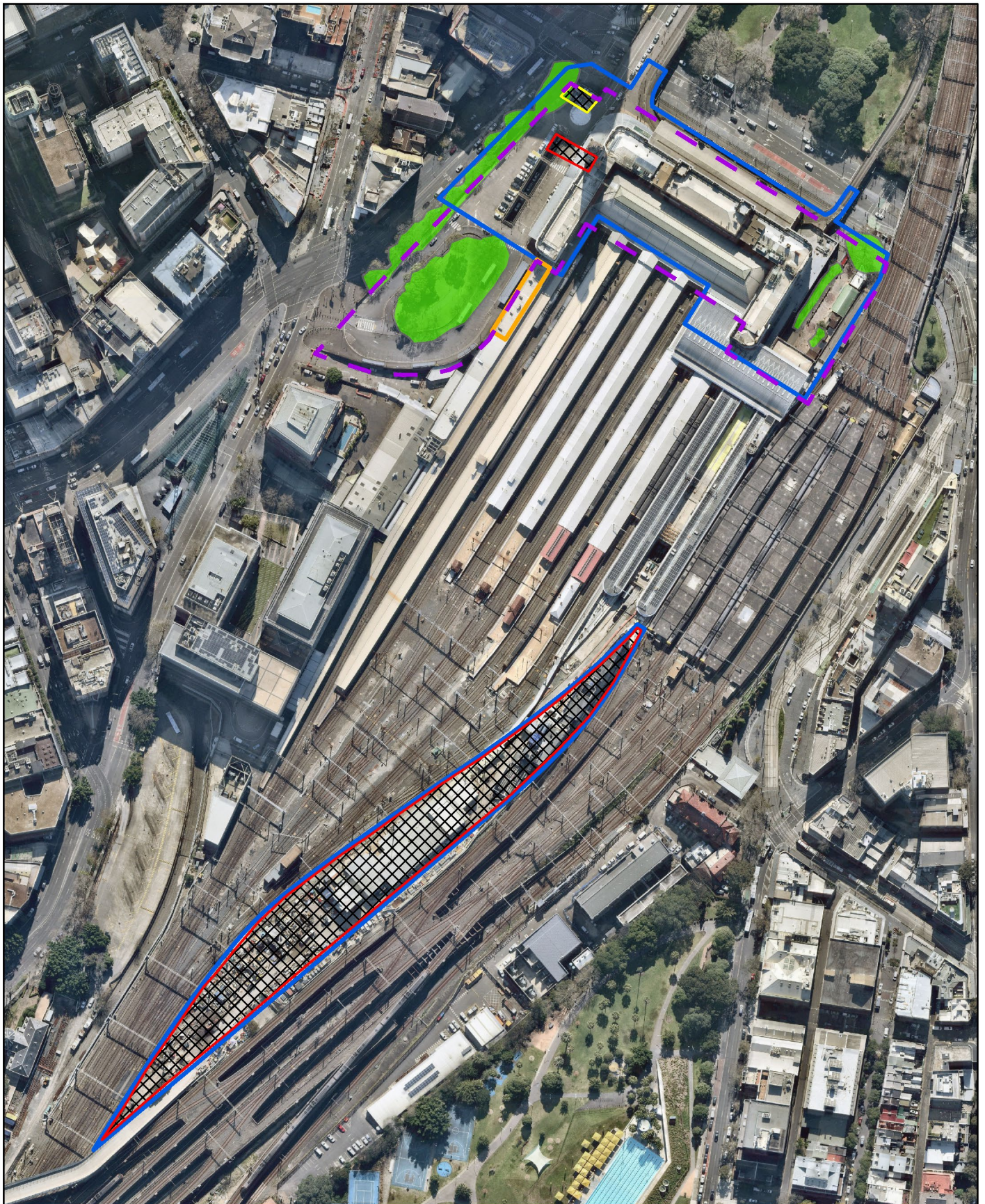
The native trees within the Western Forecourt and Eddy Avenue Plaza may provide foraging and/or occasional roosting habitat for the threatened grey-headed flying-fox. This is due to the trees being fruit-bearing and the grey-headed flying fox being known to occur within the locality and fly overhead (1417 BioNet records within 10 kilometres of the survey area). However, the small number of trees on site lack adequate habitat for a camp (which can comprise thousands of individuals). This, coupled with the high level of activity, disturbance, and street lighting, means the species or wider population is unlikely to rely on the environment for its survival. Furthermore, there are other locations locally such as Belmore Park to the north and Prince Alfred Park to the south that offer a far more attractive area for foraging and roosting.

Microbats

Of the 145 species that were recorded within 10 kilometres of the survey area (between both BioNet and PMST), the only other species with a moderate likelihood of occurring on site are cave-dependent microbats (listed above). These species are known to occasionally roost in man-made structures. The Sydney Terminal Building includes five disused fireplaces with attached open-top chimneys and a building façade that has missing bricks, all of which are characteristic of the man-made structures capable of supporting microbat habitat.

The chimneys were inspected during the site visit which found them to contain a tall vertical drop and smooth walls with no cracks or shelves. The chimneys were also internally exposed to direct natural sunlight through the open top, which was visible from below with the torch turned off. Thus, the microbat habitat potential was considered low. It was also considered unlikely to be utilised as breeding habitat, however it may still be utilised as roosting habitat on occasion.

The second structure that was identified as potential roosting habitat for microbat species was the external wall façade of the Sydney Terminal Building that had missing bricks and cracks, which may allow access for microbats into the building structure. While fissures or cracks provide potential roosting habitat, the noise and light in the wider area, backed by the fact that there are other locations locally such as Belmore Park to the north and Prince Alfred Park to the south that offer a far more attractive area for foraging (as mentioned above), minimises the potential for the building façade to support microbat roosts.



Coordinate System: GDA 1994 MGA Zone 56



Metres
0 30 60
Scale at A4
1:2,956

Data Source: © Nearnmap 2022

Prepared by: MD
Checked by: CS
Approved by: AS

Legend

- ▬ Construction footprint
- ▬ Survey area
- Urban exotic/planted vegetation
- Chimneys

Indicative construction compound

- ▬ Grand Concourse level
- ▬ Ground level

Sydney Terminal Building Revitalisation Project

Figure 14-1: Vegetation and fauna habitat mapping

Project Number: 287415

Drawings / Design Prepared By

ARUP

Client



Transport for NSW

14.2 Assessment of potential impacts

14.2.1 Construction

Vegetation impacts

Construction of the project would require the removal of the six London Plane trees and two Tuckeroo trees in Eddy Avenue Plaza. However as described in Section 14.2.2, trees would be replanted consistent with Transport's [Biodiversity Policy](#) (Transport for NSW, 2022a).

Fauna habitat impact

As outlined above, the vegetation to be removed is within a highly modified urban environment and would provide limited habitat for fauna. It is unlikely that threatened fauna species, such as the grey-headed flying fox, would rely on the habitat resources within the survey area for critical foraging or roosting resources, or habitat connectivity. Therefore, a significant impact upon these species is considered unlikely.

There are no works proposed to the chimneys or their immediate supporting structures. This removes the potential for any direct impact on any microbats that may take temporary refuge inside them. Despite this, the project would require works to the Sydney Terminal Building. This would consist of activities that would generate noise, vibration, dust, and other construction related impacts. The impacts would mainly take place during the day in accordance with standard construction working hours set in the [Interim Construction Noise Guideline](#) (NSW Department of Environment and Climate Change, 2009).

While the above impacts cannot be wholly avoided, they can be adequately mitigated to an acceptable level using proven measures that are widely adopted on projects. These are outlined in Section 14.3 below.

If there are any microbats using the chimneys periodically, they would be habituated (used) to noise, natural and artificial light, and general activity. This means that they could likely tolerate a degree of disturbance. Any unusual disturbance created during construction would, at worst, result in a startle response, likely causing the bats to leave the chimneys and seek temporary refuge elsewhere nearby.

Indirect impacts

Indirect impacts during construction could include:

- The use of machinery and other equipment increasing the risk of accidental spills of fuels, lubricants or paint which could cause harm to the surrounding ecosystems and waterways (if it were to enter stormwater)
- Machinery, vehicles and personnel dispersing weeds throughout the survey area and surrounding areas, as well as during the removal of spoil to offsite locations
- Injury or mortality of endemic invertebrate and other micro species associated with tree removal
- Increased light and noise, causing disturbance to nocturnal (if night work is required), foraging, roosting or mobile species within and around the survey area (for example, in Belmore Park)
- Increased movement of dust and spill leading to disturbance of urban planted vegetation.

With the implementation of standard measures that are proven to be effective in mitigating impacts (detailed in Section 14.3), these impacts would be unlikely to occur.

14.2.2 Operation

The project would change pedestrian and vehicle movements in the vicinity of the Sydney Terminal Building. While this may disturb fauna using the landscape trees in the wider Central Precinct, given that they are used to human activity, noise and light, they would be able to adjust to the changes without any impact on their health or condition.

Furthermore, the precinct wide [Green Infrastructure Strategy](#) (Transport for NSW, 2022k) will be applied (see Section 5.2.5 and 10.3.6 of the EIS). This is particularly relevant to Eddy Avenue Plaza, where a number of mature trees will be planted in place of the eight being removed, such that the overall canopy cover will be increased by 55.5 square metres to create a total of 696 square metres of canopy coverage (see Chapter 10 (Place, design and movement) for more detail). As the design develops, other opportunity areas will be considered for green infrastructure. The implementation of the strategy enables the delivery of a biophilic design, which acts to increase the community's connection with the natural environment, and strengthens the role of Eddy Avenue Plaza as a future key link connecting Belmore Park to other green spaces in the surrounding areas.

Vegetation offsets and/or landscaping would be carried out in accordance with Transport's [Biodiversity Policy](#) (Transport for NSW, 2022a). As per the Biodiversity Policy, all vegetation cleared would be offset with replacement tree planting. Table 14-1 provides guidance for the number of trees to be planted as an offset for individual tree removal.

Table 14-1 Offsetting ratio required under Transport's Biodiversity Policy (Transport for NSW, 2022a)

Tree type	Offset required per tree removed
Very large tree (DBH greater than 100cm)	Plant a minimum of 16 trees and provide 3 artificial hollows for every occupied hollow removed (assuming a 20 per cent occupancy rate)
Large tree (DBH between 50cm and 100cm)	Plant a minimum of 8 trees and provide 3 artificial hollows for every occupied hollow removed (assuming a 20 per cent occupancy rate)
Medium tree (DBH greater than 20cm, but less than 50cm)	Plant a minimum of 4 trees and provide 4 artificial hollows for every occupied hollow removed (assuming 20 per cent occupancy rate)
Small tree (DBH greater than 5cm, but less than 20cm)	Plant a minimum of 2 trees

14.2.3 Impacts on relevant key threatening processes

The only key threatening process associated with the project is the clearing of native vegetation, being the two Tuckeroo trees in Eddy Avenue Plaza. Given the small number of trees and their low habitat potential, the impact would be minimal.

14.2.4 Impact significance

A Test of Significance was conducted for the macro and microbat species that had a moderate likelihood of occurring. It found that the project was unlikely to have a significant impact on these species. Refer to Appendix M1 (BDAR waiver request) for more information.

One Assessment of Significance for the Grey-headed Flying Fox was conducted to assess associated impacts to threatened entities listed under the Commonwealth EPBC Act. It found that the project was unlikely to cause a significant impact on the species. Refer to Appendix M1 (BDAR waiver request) for more information.

14.3 Environmental management measures

Both positive and negative biodiversity impacts will be addressed in the form of management measures. Measures to minimise impacts relating to place and urban design, landscape and visual amenity, noise and vibration, air quality, and hazard and risk are addressed in other impact chapters and have not been included here. Table 14-2 lists the measures to manage biodiversity impacts specifically.

Table 14-2: Environmental management measures – biodiversity

Ref	Impact / Uncertainty	Environmental management measure	Timing
B01	Impact Vegetation / habitat removal	A qualified and experienced fauna spotter/ecologist will be engaged to inspect trees prior to removal and trimming to identify vegetation with fauna habitat potential. Pre-clearance surveys will be carried out in accordance with the Fauna Management Guideline (Transport for NSW, 2021d).	Construction
B02	Impact Impacts to threatened flora, fauna, and ecological communities due to an unexpected find.	An Unexpected Finds Procedure will be implemented. Works must be stopped if any previously undiscovered threatened flora or fauna species is discovered during works. An assessment of the impact and any required approvals must be obtained before proceeding.	Construction
B03	Impact Tree removal	Tree protection zones (TPZs) will be established around trees to be retained or requiring protection, using an appropriate physical demarcation. Tree protection will be carried out in line with AS 4970-2009 Protection of trees on development sites.	Construction

Ref	Impact / Uncertainty	Environmental management measure	Timing
		Where TPZs are not feasible, alternative measures will be implemented including branch and trunk protection.	
B04	Impact Vegetation / habitat removal	Vegetation offsets and/or landscaping will be carried out in accordance with the <u>Biodiversity Policy</u> (Transport for NSW, 2022a).	Operation