INNER WEST

Council's Alternate Approach for New Housing in the Inner West

APPENDIX 8

Biodiversity Study for Housing Investigation Area Stage 1

May 2025

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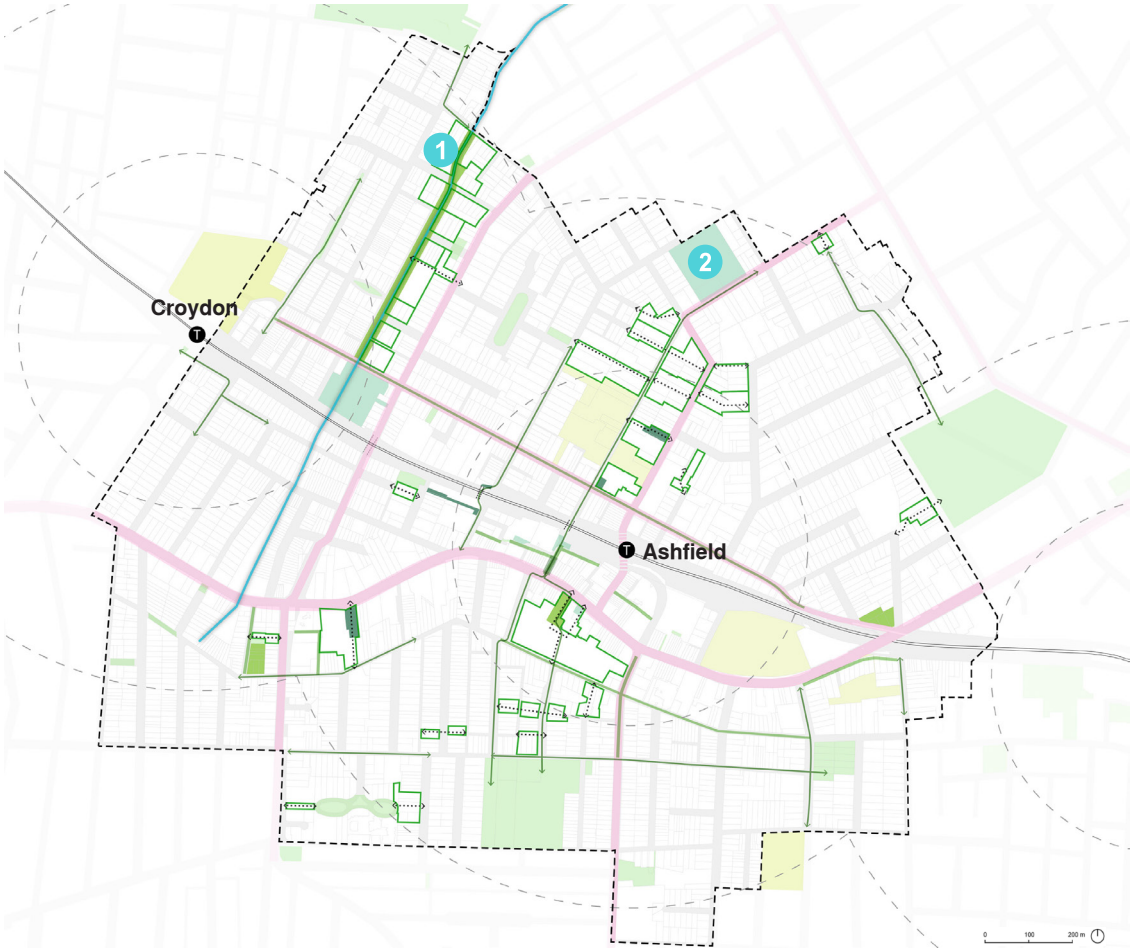
Ashfield - Croydon HIA Biodiversity Values



Legend

- Study Area
- Existing public open space
- Existing publicly accessible space
- Existing infrastructure, services
- Key urban spines
- Proposed upgrades, green spines
- Incentives for greener spaces, new links
- Potential greener spaces
- Potential greener streets

Key habitat features within the housing investigation area include hollow-bearing trees, foraging nectar and fruit trees, and large storm water culverts (providing potential habitat for native microbats). Housing investigation ensured preservation of these features within the study area and may provide opportunities for further biodiversity connectivity corridors between the Iron Cove Creek Canal and St. John's Church.

1 Proposed uplift will increase housing density along sections of the **Iron Cove Creek Canal**, a key north-south biodiversity corridor that forms part of the Greenway and the Blue-Green grid to Elizabeth Street at the southernmost point. The Greenway, connects the natural areas of the Sydney Harbour around Rodd Point to the Ashfield-Croydon area. It also provides an important biodiversity corridor connection from the Harbour to the St. John's Church, which has high biodiversity value in the area. Redevelopment along the Iron Cove Creek Canal provides opportunities for the biodiversity values of the corridor to be enhanced during construction of additional/new housing through appropriate planning controls (such as revegetation requirements) along the canal.

2 The grounds of **St John's Church** in Ashfield contain a number of locally endemic native species which may have grown from soil-stored seed or re-sprouted from cleared vegetation, in addition to a number of planted non-endemic native and exotic canopy trees. The vegetation present within this location is highly likely to be foraging habitat for Grey-headed Flying Fox, as well as a potential foraging habitat for microbat species, including the threatened Large Bent-winged Bat. It could also provide foraging and shelter resources for prey species of the Powerful Owl.

Iron Cove Creek Canal

St John's Church

Dulwich Hill - Marrickville HIA Biodiversity Values

Legend

- Structure Plan Circuit
- Precinct Boundary
- 400 & 800m catchments
- Inner West blue green grid
- GreenWay

Key habitat features within the housing investigation area include hollow-bearing trees, foraging nectar and fruit trees, and large storm water culverts (providing potential habitat for native microbats). Housing investigation ensured preservation of these features within the study area.

1. Proposed increased densities avoids impacts to the **Greenway**, a key north-south biodiversity corridor that connects the natural areas of the Sydney Harbour around Rodd Point, through to the Cooks River along the Light Rail corridor. The Greenway also forms a key connection of the Blue-Green grid.

2. The **Dibble Avenue Waterhole** is a priority biodiversity area of historical significance for the Inner West. This site forms part of the Marrickville Parklands and Golf Course and is covered by the plan of management for those areas. The Dibble Avenue Waterhole has undergone extensive restoration efforts and now supports a diverse range of native vegetation and fauna habitat. It forms a key component of the east-west Cooks River biodiversity corridor.

Native vegetation within the Greenway

Dibble Avenue Waterhole

biosis
APEM Group

Inner West Housing Investigation Area: Biodiversity assessment

Final Report

Prepared for Inner West Council

13 November 2024

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- NSW Department of Primary Industries Fisheries for access to the predicted distribution maps for threatened species and fish communities.

Biosis staff involved in this project were:

- Aleksei Aitkin
- Matthew Hyde
- Aaron Christensen
- Dylan Mason
- Azka Abid (GIS and mapping)

Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.

We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.

Contents

Tables

Figures

Definitions

BC Act	*Biodiversity Conservation Act 2016*
Biosecurity Act	*Biosecurity Act 2015*
BOS	Biodiversity Offsets Scheme
BV Map	Biodiversity Values Map
Cth DCCEEW	Australian Commonwealth Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DPI	Department of Primary Industries
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FM Act	*Fisheries Management Act 1994*
GIS	Geographic Information System
HIA	Housing Investigation Area
IWLEP	*Inner West Local Environmental Plan 2022*
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Services
MNES	Matters of National Environmental Significance
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
PCT	Plant Community Type
SEPP	NSW State Environmental Planning Policy
SSROC	Southern Sydney Regional Organisation of Councils
Study area	Area encompassing the Ashfield and Croydon HIA and the Dulwich Hill and Marrickville HIA
TEC	Threatened Ecological Community
WM Act	*Water Management Act 2000*

Summary

Biosis Pty Ltd was commissioned by Inner West Council (Council) to undertake a biodiversity assessment of the Dulwich Hill – Marrickville Housing Investigation Area (Dulwich Hill - Marrickville HIA) and the Ashfield - Croydon Housing Investigation Area (Ashfield – Croydon HIA) within the Inner West Local Government Area (LGA), in New South Wales (NSW).

Biosis understands that Council is preparing a Master Plan for Transport Oriented Development (TOD) covering these two HIAs and requires a detailed biodiversity assessment to be undertaken to inform this Master Plan.

The purpose of this biodiversity assessment is to investigate the existing biodiversity values within the Dulwich Hill - Marrickville HIA and Ashfield – Croydon HIA and gain a better understanding of the ecosystems present and their sensitivities, as well as identify any areas of high biodiversity value that should be conserved as part of the master planning process. The assessment also suggests mitigation measures for the protection of biodiversity, provides guidance to inform future amendments to the *Inner West Local Environmental Plan 2022* (IWLEP), the *Comprehensive Inner West Development Control Plan 2016* (Comprehensive Inner West DCP) and the *Marrickville Development Control Plan 2011* (Marrickville DCP), which will ultimately inform built form outcomes and provide guidance for the two HIAs on development controls to protect and promote recovery of threatened entities and habitat connectivity.

The study area for this assessment encompasses the two HIAs which are defined as follows:

- The Dulwich – Marrickville HIA includes the suburbs of Dulwich Hill and Marrickville which encompasses approximately 466 hectares and is defined as being loosely confined by Old Canterbury Road and Garnet Street to the west, Cooks River to the south, Carrington Road and Meeks Road to the east, and Eltham Street, Frazer Street, Pile Street and Sydenham Road to the north (Figure 1-1).
- The Ashfield – Croydon HIA includes the suburbs of Ashfield and Croydon which encompasses approximately 258 hectares and is defined as being loosely confined by Old Canterbury Road and Garnet Street to the west, Cooks River to the south, Carrington Road and Meeks Road to the east, and Eltham Street, Frazer Street, Pile Street and Sydenham Road to the north (Figure 1-2).

The study area is highly urbanised and primarily consists of developed areas for the purpose of low, medium and high-density residential dwellings, with supporting local centres, roads and public recreation areas. There are no significant patches of intact remnant native vegetation within the study area, instead much of the vegetation consists of urban native/exotic plantings as part of landscaped gardens and backyards.

Within the Dulwich Hill – Marrickville HIA, the largest patches of vegetation are associated with the Sydney Light Rail corridor that runs along a north-south alignment from the Lewisham West station, located just to the north of the study area, through to Dulwich Hill Station in the south.

Within the Ashfield – Croydon HIA the largest patches of vegetation are associated with the Sydney Light Rail corridor that runs along a north-south alignment from the Lewisham West station, located just to the north of the study area, through to Dulwich Hill Station in the south.

Key ecological values

Key ecological values include:

- Vegetated areas along transport corridors associated with the Sydney train and light rail network.
- Hollow-bearing trees and drainage culverts with suitable avifauna roosting habitat.

There are no significant patches of remnant intact native vegetation within the study area.

Two Threatened Ecological Communities (TECs) listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) were present with the study area – Sydney Turpentine Ironbark Forest (Critically Endangered), and Swamp-oak Floodplain Forest (Endangered). No TEC listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were identified within the study area. One threatened flora species, Wallangarra White Gum *Eucalyptus scoparia*, was recorded during the survey with two further species (Narrow-leaved Black Peppermint *Eucalyptus nicholii* and Magenta Lilly Pilly *Syzygium paniculatum*) considered likely to occur. Records of four threatened fauna species occur within the study area, including

- Grey-headed Flying-fox *Pteropus poliocephalus*
- Long-nosed Bandicoot *Perameles nasuta*
- Large Bent-winged Bat *Miniopterus orianae oceanensis*
- Powerful Owl *Ninox strenua*

Two additional threatened species (Eastern False Pipistrelle *Falsistrellus tasmaniensis* and Southern Myotis *Myotis macropus*) were considered likely to occur based on the presence of suitable habitat within, and proximal records to the study area.

There are two waterways within the HIAs; Iron Cove Creek, which occurs within the Ashfield – Croydon HIA and Gumbramorra Creek which occurs within the Dulwich Hill – Marrickville HIA. Both of these waterways are classified as a Strahler order one streams, under the *Water Management Act 2000* (WM Act). Removal of riparian vegetation within 40 metres of a waterway may require an application for a controlled activity permit. Additionally, the Dulwich Hill – Marrickville HIA borders the Goolay'yari - Cooks River, a Strahler order three system located to the south.

Recommendations

The primary measure for the development to minimise impacts to ecological values on the site is to minimise removal of native vegetation and areas identified as potential habitat for native species, as well as avoiding disruption to the habitat linkages identified along the Sydney Light Rail corridor and Sydney Train corridor. To retain these values, they should be protected as part of the master plan for the Dulwich – Marrickville and Ashfield – Croydon HIA, as well as being considered in the development design process of any new buildings adjacent to the areas identified as part of this assessment. Further opportunities are identified in Section 5.2 of the report.

1 Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Council to undertake a biodiversity assessment of the Dulwich Hill – Marrickville HIA (Figure 1-1) and Ashfield – Croydon HIA (Figure 1-2) within the Inner West LGA, in NSW .

Biosis understands that Council is preparing a Master Plan for future TOD, and requires a detailed biodiversity assessment to be undertaken to inform this Master Plan.

The purpose of this biodiversity assessment is to investigate the existing biodiversity values within the two HIAs and gain a better understanding of the ecosystems present and their sensitivities, as well as identify any areas of high biodiversity value that should be conserved as part of the master planning process. The assessment also suggests mitigation measures for the protection of biodiversity, provides guidance to inform future amendments to the IWLEP, the Comprehensive Inner West DCP and the Marrickville DCP, which will ultimately inform built form outcomes and provide guidance of the HIAs on development controls to protect and promote recovery of threatened entities and habitat connectivity.

1.2 Scope of study

The objectives of this investigation are to:

- Undertake a literature review and desktop assessment of the study area.
- Identify areas of biodiversity value in the Dulwich Hill – Marrickville HIA and the Ashfield – Croydon HIA and describe the vascular flora and vertebrate fauna (birds, mammals, reptiles, frogs, and fish) found within the study area.
- Evaluate existing ecological connectivity in the study area, and identify opportunities to protect and enhance connectivity in the Master Plans.
- Map all native vegetation and other habitat features.
- Assess the presence of TECs or threatened flora or fauna species, or potential habitat.
- Assess potential direct and indirect impacts to biodiversity associated with potential built form changes as a consequence of redevelopment within the Dulwich Hill – Marrickville HIA and the Ashfield Croydon HIA and identify areas requiring careful consideration.
- Provide recommendations including mitigation measures for consideration in the Master Plan and future changes to planning controls in the IWLEP and supporting DCPs.

1.3 Location of the study area

The study area occurs on the unceded lands of the Gadigal and Wangal clans of the Eora nation, within the Midjuburi ward (Dulwich Hill – Marrickville HIA) and the Djarrawunang and Gulgadya wards (Ashfield – Croydon HIA) of the Inner West Council area (Inner West Council 2024). The study area is located approximately 8 kilometres south-west of the Sydney Central Business District and includes both the Dulwich Hill – Marrickville HIA and the Ashfield – Croydon HIA which are described in the subsections below.

The study area is within the:

- Cumberland IBRA subregion within the broader Sydney Basin Bioregion (Cth DCCEEW 2024a).
- Sydney Metropolitan Catchment Management Authority area.
- Greater Sydney Local Land Services (LLS) Management Area.
- Inner West LGA.

Dulwich Hill – Marrickville HIA

The Dulwich Hill – Marrickville HIA is defined as being loosely confined by Old Canterbury Road and Garnet Street to the west, Cooks River to the south, Carrington Road and Meeks Road to the east, and Eltham Street, Frazer Street, Pile Street and Sydenham Road to the north (Figure 1-1). It encompasses approximately 466 hectares of private and public land, transport corridors and adjacent road reserves. The study area accommodates multiple land uses, with zonings under the IWLEP including:

- E1 – Local Centre.
- E2 – Commercial Centre.
- E3 – Productivity Support.
- E4 – General Industrial.
- MU1 – Mixed Use
- R1 – General Residential.
- R2 – Low Density Residential.
- R3 – Medium Density Residential.
- R4 – High Density Residential.
- RE1 – Public Recreation.
- RE2 – Private Recreation.
- SP2 – Infrastructure.

The Dulwich Hill – Marrickville HIA contains some small linear areas included within the Biodiversity Values Map (BV Map) (DPE 2022a), located within mangrove vegetation along the Goolay'yari – Cooks River corridor in the south of the study area.

Ashfield – Croydon HIA

The Ashfield – Croydon HIA includes the suburbs of Ashfield and Croydon which encompasses approximately 258 hectares of private and public land, transport corridors and adjacent road reserves.

The study area accommodates multiple landuses, with zonings under the IWLEP including:

- E1 – Local Centre.
- E2 – Commercial Centre.
- E4 – General Industrial.
- MU1 – Mixed Use
- R1 – General Residential.

- R2 – Low Density Residential.
- R3 – Medium Density Residential.
- RE1 – Public Recreation.
- SP2 – Infrastructure.

The Ashfield – Croydon HIA does not contain any features included within the Biodiversity Values Map (BV Map) (DPE 2022a), with the closest areas mapped being located within Go-mo-ra – Iron Cove, located to the north of the study area.

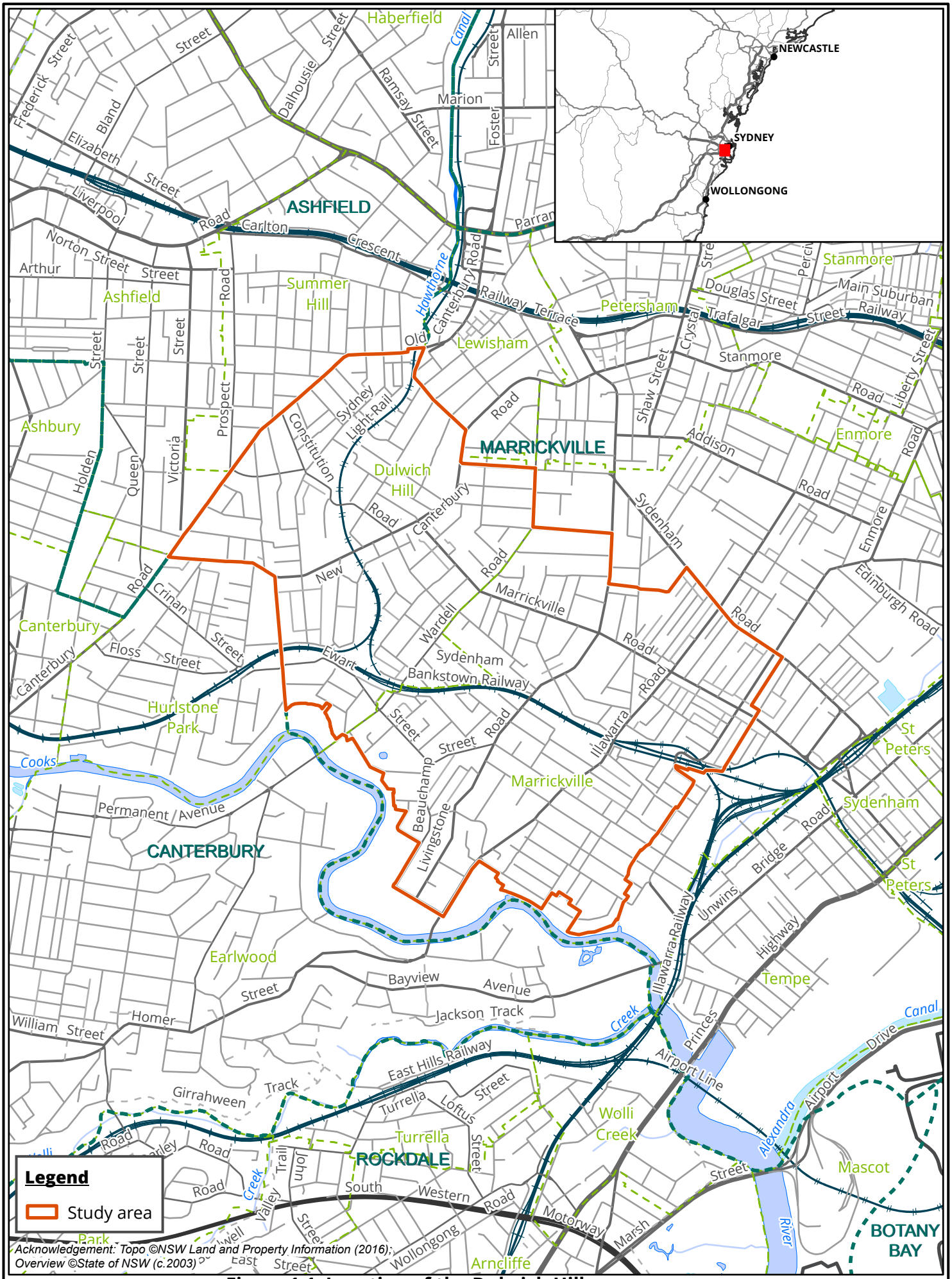

Figure 1.1 Location of the Dulwich Hill - Marrickville HIA

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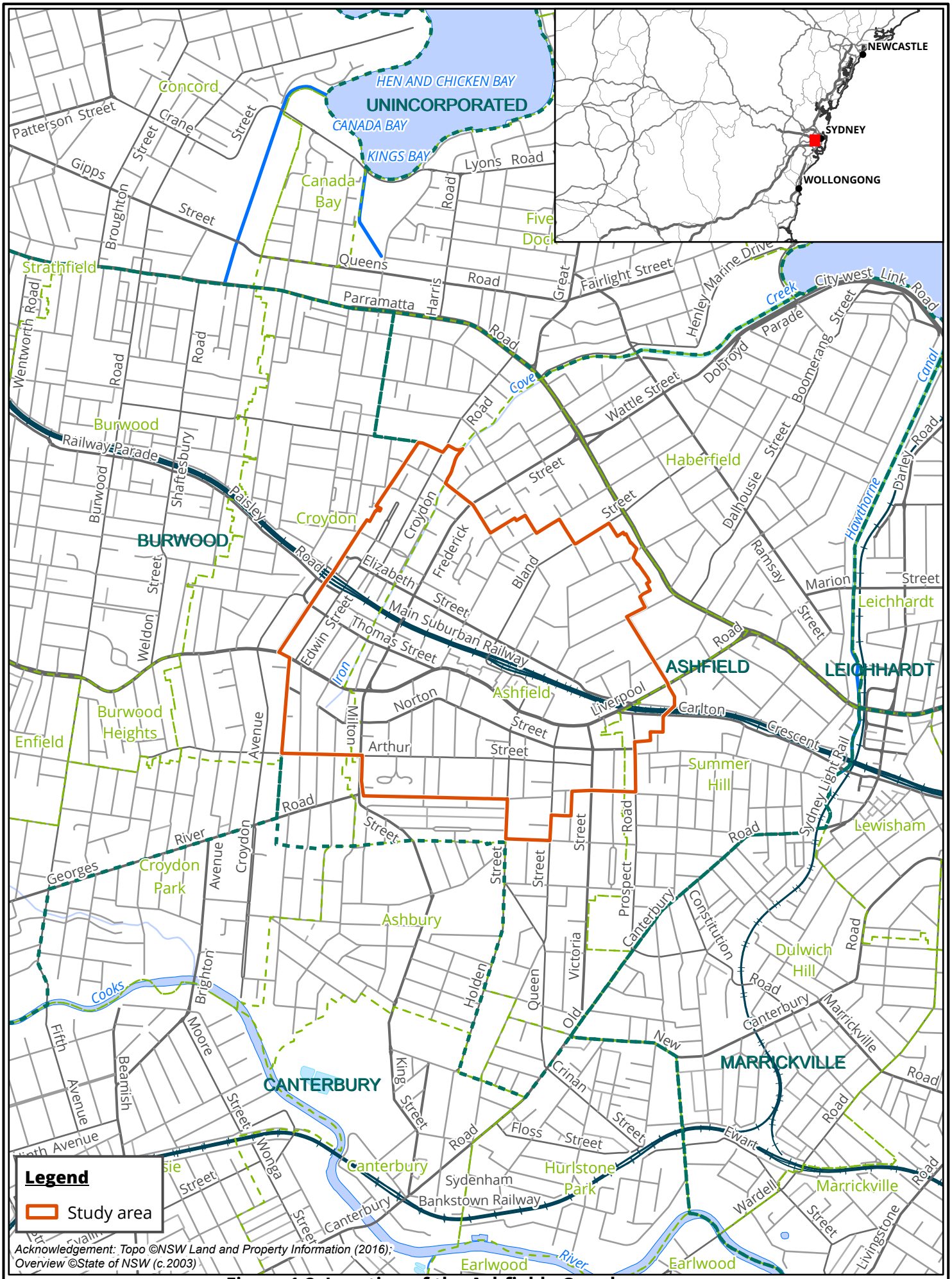

Figure 1.2 Location of the Ashfield - Croydon HIA

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Layout: 41346_AC_F1.2_Locality

0 200 400 600 800 1,000
Metres
Scale 1:25,000@ A4, GDA2020 MGA Zone 56

N

2 Methods

2.1 Database and literature review

Prior to completing the field investigation, information provided by Council as well as other key information was reviewed, including relevant legislation, policy and strategies that provide guidance on biodiversity protection and management proximate to the study area. A desktop assessment of the existing biodiversity values in the study area was completed to identify threatened species records, habitat descriptions of known threatened flora and fauna species, wildlife corridors and vegetation communities in the locality. Sources reviewed as part of this database and literature review included:

- Australian Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) Protected Matters Search Tool for matters protected by the EPBC Act.
- NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) BioNet Atlas of NSW Wildlife, for items listed under the BC Act.
- Existing NSW DCCEEW vegetation mapping including the NSW *State Vegetation Type Map* (NSW DCCEEW 2023a) and *The Native Vegetation of the Sydney Metropolitan Area - Version 3.1 VIS_ID 4489* (OEH 2016).
- NSW Department of Primary Industries (DPI) WeedWise database for NSW *Biosecurity Act 2015* (Biosecurity Act) listed priority weeds for Greater Sydney region.
- The NSW DPI Spatial Data Portal (DPI 2024) for *Fisheries Management Act 1994* (FM Act) listed threatened species, populations and communities.
- Southern Sydney Regional Organisation of Councils (SSROC) 2016/2017 mapping of Biodiversity Corridors (SSROC 2023).

The implications for the project were assessed in relation to key biodiversity legislation, policy and impact assessments undertaken within the HIAs, including:

- *Inner West Biodiversity Strategy 2036* (IWC 2024).
- *Greenway Master Plan: Cooks to Cove GreenWay* (Mcgregor Coxall 2018).
- *Cooks to Cove Greenway, In-corridor Works: MMP Exclusion Report* (Eco Logical Australia 2024a).
- *Cooks to Cove Greenway – Compensatory Microbat Habitat Installation* (Eco Logical Australia 2023).
- *Review of Environmental Factors The Cooks to Cove GreenWay (In-Corridor Works) Review of Environmental Factors Appendix E Flora and Fauna Assessment* (Eco Logical Australia 2021).
- *Review of Environmental Factors The Cooks to Cove GreenWay (In-Corridor Works) Review of Environmental Factors Appendix F Biodiversity Development Assessment Report* (Eco Logical Australia 2021).
- *Sydney Metro City and Southwest - Sydenham to Bankstown Environmental Impact Statement - Technical Paper 9 - Biodiversity assessment report* (GHD 2017).
- *Cooks River to Iron Cove GreenWay – Flora and Fauna Literature Review* (Ashfield Council 2010).
- *GreenWay Revegetation and Bushcare Plan; Creating an indigenous flora and fauna corridor Prepared as part of the GreenWay Sustainability Project – a partnership between Ashfield, Leichhardt, Marrickville and City of Canterbury Councils* (Eco Logical Australia 2011).

- *Greenway Biodiversity Strategy* (Australian Wetlands Consulting 2012).
- *Iron Cove Creek Masterplan* (Inner West Council 2023).
- *Inner West Blue-Green Grid Strategy* (McGregor Coxall 2023).
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- *Biodiversity Conservation Act 2016* (BC Act).
- *Local Land Services Act 2013* (LLS Act).
- *Fisheries Management Act 1994* (FM Act)
- *Water Management Act 2000* (WM Act).
- *Biosecurity Act 2015* (Biosecurity Act).
- State Environmental Planning Policy (Biodiversity and Conservation) 2021.
- *Inner West Local Environmental Plan 2022*.
- *Comprehensive Development Control Plan 2016 for Ashbury, Ashfield, Croydon, Croydon Park, Haberfield, Hurlstone Park and Summer Hill.*
- *Marrickville Development Control Plan 2011*.

2.2 Field investigation

A baseline ecological survey was undertaken in the study area on 23 and 24 September 2024 by Aleksei Atkin (Principal Ecologist) to identify areas of biodiversity value.

The aim of the field investigation was to:

- Validate the extent and quality of native vegetation including the presence of any TECs.
- Inspect mapped SSROC Biodiversity Corridors within or surrounding the study area, in particular the Greenway corridor, and any areas of potential linkages between the vegetation of the study area and corridors further afield such as the green spaces associated with the Goolay'yari – Cooks River corridor.
- Identify the presence of threatened species or populations or their habitat including species of local conservation significance.
- Identify habitat that could provide shelter and foraging habitat throughout the study area.
- Identify any threatening ecological processes or factors impacting existing biodiversity within the study area.

General classification of native vegetation in NSW is usually based on the classification system in Keith (2004) which uses three groupings of vegetation: vegetation formation, vegetation class and vegetation type, with vegetation type the finest grouping. The specific vegetation groupings typically used in NSW for describing vegetation communities is Plant Community Type (PCT) as defined by the Biodiversity Assessment Method (BAM) (DPIE 2020) and has been the standard used across NSW since 2016. Where remnant vegetation occurs, a "best fit" PCT has been designated. However, as the vast majority of vegetation within the study area would not be considered remnant native vegetation, classification within this report has been based on what the available vegetation offers in terms of habitat for native species.

A habitat-based assessment was completed to determine the presence of suitable habitat for threatened species and species considered to have conservation significance previously recorded (DPE 2022b) or predicted to occur (Cth DCCEEW 2024b) within 5 kilometres of the study area. This list was filtered according to species descriptions, life history, habitat preference and soil preference to determine those species most likely to be present within the study area. Flora and fauna species, preliminary vegetation mapping and other habitat values were recorded in the field using Samsung Galaxy Tablets and the ArcGIS Field Maps application as well as a hand-held GPS in the field.

2.2.1 Permits and licences

This biodiversity study was conducted under the terms of Biosis' Scientific Licence issued by the NSW DCCEEW under the BC Act (SL100758, expiry date 30 June 2026).

3 Database and literature review results

For the purposes of this assessment, the study area has been divided into portions. The purpose of this division is to more accurately describe the land uses, vegetation management practices, habitat values and ecological opportunities which occur. These portions are described further below.

For the Dulwich Hill – Marrickville HIA, three portions have been identified, being the southern, central and northern. For the Ashfield – Croydon HIA, two portions have been identified, being the southern and northern. These portions are described further below.

3.1 Dulwich Hill – Marrickville HIA

3.1.1 Southern portion

General description and land use

The southern portion of the study area occurs within an entirely modified, cleared and developed landscape, with few remnant native trees remaining. The southern portion is bounded on the southern border by the Goolay'yari – Cooks River corridor, running along the northern edge of Marrickville Golf Course, HJ Mahoney Memorial Park, Steel Park, Warren Park, Marrickville Peace Park, and along the western edge of Mackey Park. It is bounded to the east by the western edge of the former Gumbramorra Swamp, with a drainage channel following the approximate route of the former Gumbramorra Creek (Marrickville Heritage Society 2022). The northern boundary of this portion ends at the T3 Bankstown Line, an east-west railway corridor comprising Marrickville station in the east, and Dulwich Hill station in the west, and is bound to the west by Garnet Street.

Within this southern portion of the study area, land use is predominantly low to medium density residential, with concentrated pockets of higher density residential. In the centre of this area, a concentrated commercial area exists along Illawarra Road, containing numerous shops and shopping centres, leading to an east-west railway corridor comprising Marrickville station in the east, and Dulwich Hill station in the west. Land use to the east of this southern portion includes industrial warehouses and transport infrastructure.

The southern portion of the study area occurs generally on undulating south-facing slopes and small gullies, with a central south-east to north-west ridge approximately 400 – 600 metres north of the southern boundary of the HIA, broadly in alignment with Ewart Street – Beauchamp Street – Warren Road. This ridge generally corresponds to the boundary of soil types within the southern portion of the study area, shown on Figure 3-1.

Soil landscapes

Soil landscapes within the southern portion of the study area comprise Birrong within the lower slopes in the south western portion, Gymea in a broad band along the south-facing slope, a horseshoe shaped band of exposed Hawkesbury sandstone within the south east, transitioning to Birrong again in the east. Patches of disturbed soil are mapped as occurring in areas along the Goolay'yari – Cooks River (Chapman et al. 1989).The soil landscapes within the study area are shown on Figure 3-1.

Birrong soil landscape

The Birrong soil landscape is a fluvial deposit, typically dominated by silt and clay sized alluvial materials derived from the Wianamatta Group. The Wianamatta Group consists mostly of shale with some

carbonaceous claystone, laminite, and occasional fine to medium grain lithic sandstones. The topography of this soil landscape is typically level to gently undulating alluvial floodplains with local relief <5 metres and slope gradients <3%, with broad concave valleys. Historically, drainage lines have been converted to lined concrete and brick channels. Vegetation within this landscape has been extensively cleared, however some small relict stands of Grey Ironbark *Eucalyptus paniculata*, Turpentine *Syncarpia glomulifera*, and Sydney Blue Gum *Eucalyptus saligna* forest and woodland can remain (Chapman et al. 1989).

Gymea soil landscape

The Gymea soil landscape is an erosional landscape derived from Hawkesbury Sandstone, which is a medium to coarse-grained quartz sandstone with minor shale and laminite lenses. The landscape occurs as undulating to rolling low hills with local relief 20–80 metres and slopes of 10–25%. Sideslopes occur with narrow to wide outcropping sandstone rock benches (10–100 metres), often forming broken scarps of <5 metres. The original dry sclerophyll woodland and open-forest have been extensively cleared. Low, dry sclerophyll open-woodland dominates ridges and upper slopes. Common species include Red Bloodwood *Corymbia gummifera*, Yellow Bloodwood *E. eximia*, Scribbly Gum *E. haemastoma*, Brown Stringybark *E. capitellata* and Old Man Banksia *Banksia serrata*. On the more sheltered slopes, Black ash *Eucalyptus sieberi*, Sydney Peppermint *E. piperita* and Smooth-barked Apple *Angophora costata* are common tree species. The dry sclerophyll understorey consists of shrubs from the families Epacridaceae, Myrtaceae, Fabaceae and Proteaceae (Chapman et al. 1989).

Hawkesbury soil landscape

The Hawkesbury soil landscape is a colluvial landscape of steep, rugged Hawkesbury Sandstone slopes and ridges. The underlying geology of the landscape consists of Hawkesbury Sandstone, comprising medium to coarse-grained quartz sandstone with minor shale and laminite lenses. Sandstones are either massive or cross-bedded sheet facies with vertical or subvertical joint sets. The combination of bedding planes and widely spaced joints gives sandstone outcrops a distinctive blocky appearance. The topography pf the landscape comprises rolling to very steep hills. Local relief varies from 40–200 metres. Slope gradients range from 25–70%. Crests and ridges are convex and narrow, at >300 metres wide. Slopes are moderately inclined to precipitous. Rock outcrop occurs as horizontal benches and broken scarps up to 10 metres high. Boulders and cobbles cover up to 50% of the ground surface. Valleys are narrow and incised. Large areas of this soil landscape remain vegetated due to its relative infertility and thus inadequacy as historical farming country. Vegetation within the soil landscape typically contains uncleared open-woodland (dry sclerophyll) with pockets of tall open-forest (wet sclerophyll) and closed-forest (rainforest).

On exposed crests and ridges there is usually a low open-woodland containing Red Bloodwood, Narrow-leafed Stringybark *Eucalyptus oblonga*, Scribbly Gum, Brown Stringybark and Old Man Banksia. On the more sheltered sideslopes, a dry sclerophyll open-forest containing Black Ash, Sydney Peppermint, Smooth-barked Apple and Black Sheoak *Allocasuarina littoralis* predominate. The understorey is dominated by shrub species of the families Epacridaceae, Myrtaceae, Fabaceae and Proteaceae.

Within sheltered gullies, wet sclerophyll closed-forests of Blackbutt *Eucalyptus pilularis*, Sydney Blue Gum, Water Gum *Tristania laurina* and occasionally coachwood *Ceratopetalum apetalum* occur. *Callicoma serratifolia*, Native Myrtle *Backhousia m*yrtifolia and Bracken *Pteridium esculentum* form a closed scrubby understorey. Many sheltered valley floors are overrun with weeds (garden escapes washed in with sediment). Weed species include small and large-leaved privets *Ligustrum* spp., Lantana *Lantana camara*, Morning Glory *Ipomoea indica* and Wandering Jew *Tradescantia albiflora* (Chapman et al. 1989).

Vegetation and connectivity

The southern portion of the study area contains some larger patches of canopy vegetation within backyards, schools and as street tree plantings. These larger trees and shrubs constitute suitable foraging habitat for a

variety of folivorous and nectivorous species of fauna, in addition to supporting invertebrate loads to facilitate foraging of insectivores and omnivores. These trees, both exotic and native, also provide suitable shelter and roosting habitat for arboreal mammals, nocturnal birds, diurnal birds, amphibians, reptiles and invertebrates, with garden vegetation supporting the presence of these groups. Additionally, numerous yards contain fruit trees, typically fig, citrus and olive, which further support the presence of fauna across the southern portion of the study area. One patch of restored vegetation exists surrounding the Dibble Street Waterhole, in addition to restored areas outside of (but immediately adjacent to) the HIA within the eastern extent of Steel Park, and along the Goolay'yari – Cooks River corridor to Mackey Park.

Vegetative connectivity within this portion is limited, with very few natural vegetation corridors containing understory without obstacles such as fences, roads and railway lines occurring. However, corridors for movement occur along the Goolay'yari – Cooks River corridor for arboreal fauna, and between street and yard trees for more mobile fauna species such as birds, bats and arboreal mammals.

3.1.2 Central portion

General description and land use

The central portion of the study area is bound to the south by the T3 Bankstown railway line, to the east by Meeks Road and Victoria Lane, to the north by Sydenham Road, Frazer Street and New Canterbury Road, and to the west by Garnet Street. This central portion contains predominantly industrial land use in the eastern portion, and low to medium density residential throughout the remainder. Some pockets of higher density residential exist within Marrickville, and mixed business occurs along Victoria road and Illawarra Road within the Dulwich Hill and Marrickville town centres. In the western part of this area, the L1 Light Rail occurs, a north-south light rail corridor with vegetation along its embankments, and low to medium density residential occurs on the western edge of this portion. The light rail corridor forms part of the greenway, a significant vegetation restoration and active transport project currently under construction by the Inner West Council. This portion generally slopes south in the western part, and east to a broad floodplain in the eastern part. A ridgeline occurs along New Canterbury Road, which slopes east down Frazer Street and flattening along Sydenham Road.

Soil landscapes

The soil landscapes of this area are similar to those listed above, with the western and eastern ends having south-facing lobes of the Gymea soil landscape, and the eastern edge being bound by the Birrong soil landscape, associated with the former Gumbramorra Swamp. An additional soil landscape commences within this central portion, being the Blacktown soil landscape. The soil landscapes within the study area are shown on Figure 3-1.

Blacktown soil landscape

The Blacktown soil landscape is residual, and has an underlying geology of the Wianamatta Group– Ashfield Shale, consisting of laminite and dark grey siltstone and Bringelly Shale which consists of shale, with occasional calcareous claystone, laminite and coal. Topographically, this soil landscape exists as gently undulating rises on Wianamatta Shale with local relief 10–30 metres and slopes generally <5%, but up to 10%. Crests and ridges are broad (200–600 metres) and rounded with convex upper slopes grading into concave lower slopes. Rock outcropping is absent. Remnant vegetation has been almost completely cleared, and formerly comprised tall open-forest (wet sclerophyll forest) and open-woodland (dry sclerophyll forest). Remaining traces of the original wet sclerophyll forest containing Sydney Blue Gum and Blackbutt are located at Ashfield Park (outside this HIA). The original woodland and open-forest in drier areas to the west were

dominated by Forest Red Gum *Eucalyptus tereticornis*, Narrow-leaved Ironbark *E. crebra* and Grey Box *E. moluccana*. This has been almost completely cleared (Chapman et al. 1989).

Vegetation and connectivity

Vegetation structure within this portion of the study area predominantly occurs as planted street trees, canopy trees within parks and schools, native and exotic trees within yards, and within infrastructure corridors such as the greenway. A number of significant patches of trees exist, in particular around residential complexes in Dulwich Hill which were built in the 1960's/1970's, as well as older street tree plantings, and in the southern portion of the greenway around Jack Shanahan Reserve. Shrubs are limited in their presence, persisting mostly as exotic species within rail and light rail corridors, with occasional plantings in smaller parks and gardens.

Similarly to the southern portion of the study area, vegetative connectivity within this portion is limited, with very few natural vegetation corridors containing understory without obstacles such as fences, roads and railway lines occurring. A north-south movement corridor for terrestrial fauna exists within the greenway, and vegetation within schools, parks, yards and street trees would support the foraging, breeding and movement of arboreal mammals, as well as bird and bat species. Small areas of microhabitats such as frog ponds exist within individual backyards and within drainage areas of the greenway, which would support reptile, amphibian and invertebrate diversity.

3.1.3 Northern portion

General description and land use

The northern portion of the study area is bounded to the south and east by New Canterbury Road, to the north and west by Eltham Street and Old Canterbury Road. The majority of the landuse within this portion of the study area is low to medium density residential, with some areas of higher density residential. The L1 Light Rail line and greenway corridor run in a north-south direction in the western part of this portion, and the majority of vegetation occurs as street trees, trees within yards and trees within parks and schools. Sporting facilities exist in the western part of this portion, in addition to businesses and shopfronts along New Canterbury Road.

The aspect of this portion of the study area slopes generally north, with New Canterbury Road forming a watershed between the Goolay'yari – Cooks River catchment to the south and the Sydney harbour catchment to the north.

Soil landscapes

This portion of the study area occurs entirely within the Blacktown soil group, as described above. The soil landscapes within the study area are shown on Figure 3-1.

Vegetation and connectivity

Significant patches of vegetation occur within JF Laxton Reserve, Johnson Park and Hoskins Park, the latter of which is known to infrequently support a roosting Powerful Owl. Additionally, extensive shrub and canopy vegetation exists within developments constructed in the 1990's/2000's along the greenway corridor within Williams Parade and Waratah Mills, and along the western edge of the greenway. The northern edge of the study area ends at Old Canterbury Road, and is approximately 350 metres south of a known Large Bent-winged Bat overwinter roost within an old tunnel. The roost is currently subject to a roost exclusion through a Microbat Management Plan to avoid disturbance to the species from construction work on the greenway (Eco

Logical Australia 2024b). Vegetation within this portion of the precinct would be utilised by these species as foraging and occasional roost habitat, in addition to providing flyways and corridors for movement.

3.2 Ashfield – Croydon HIA

3.2.1 Southern portion

General description and land use

The southern portion of the study area occurs within an entirely modified, cleared and developed landscape, with few remnant native trees remaining. The southern portion is bounded Robert Street, Clissold Street, Pratten Park, Park Lane and Arthur Street. The western edge of the precinct is bound by Greenhill Street, Dickinson Avenue, with the northern edge being bound by the T1 North Shore and Western train line. The eastern side of the precinct is bound approximately by Prospect Road, The Sydney Private Hospital and Queen Street. The precinct drains to Iron Cove Creek which in turn feeds into the southern end of Go-mo-ra – Iron Cove Creek.

Within this southern portion of the study area, land use is predominantly low to medium density residential, with concentrated pockets of higher density residential. In the centre of this area, a concentrated commercial area exists along Liverpool Road, containing numerous shops and shopping centres, leading to an east-west railway corridor comprising Ashfield station in the east, and Croydon station in the west. Within the HIA, land use is typically low to medium density residential, with some areas of higher density residential. Some battle-axe style blocks exist with larger patches of vegetation within them.

The southern portion of the study area occurs generally on undulating north-facing slopes and small gullies, with a central gully in alignment with Iron Cove Creek. Slight ridges exist to the east and west of this gully, sloping generally north. Soil types within the southern portion of the study area are shown on Figure 3-2.

Soil landscapes

Soil landscapes within the southern portion of the study area comprise Blacktown across the majority of the southern portion of the study area, with a gully containing the Birrong soil landscape along Iron Cove Creek. The soil landscapes within the study area are shown on Figure 3-2 and are described in the subsections above.

Vegetation and connectivity

The southern portion of the study area contains some larger patches of canopy vegetation within backyards, schools and as street tree plantings. These larger trees and shrubs constitute suitable foraging habitat for a variety of folivorous and nectivorous species of fauna, in addition to supporting invertebrate loads to facilitate foraging of insectivores and omnivores. These trees, both exotic and native, also provide suitable shelter and roosting habitat for arboreal mammals, nocturnal birds, diurnal birds, amphibians, reptiles and invertebrates, with garden vegetation supporting the presence of these groups. Additionally, numerous yards contain fruit trees, typically fig, citrus and olive, which further support the presence of fauna across the southern portion of the study area. Significant fig trees occur around the Sydney Private Hospital, and north south connectivity exists on many streets as a result of street tree plantings.

3.2.2 Northern portion

General description and land use

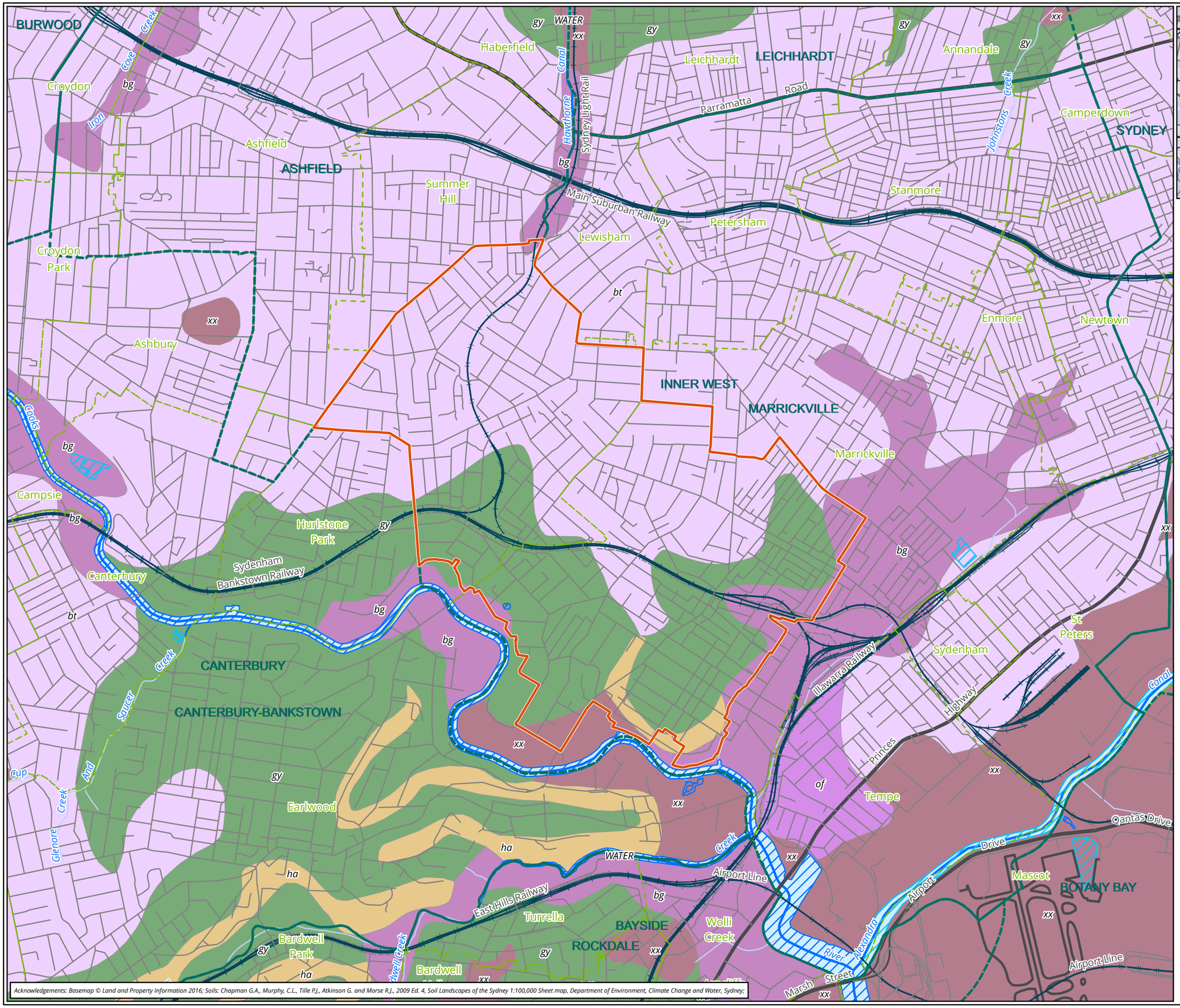
The northern portion of the study area occurs within an entirely modified, cleared and developed landscape, with few remnant native trees remaining. To the south the Northern portion is bounded by the Presbyterian Ladies College and a line in a northeast – south west orientation connecting to Queen Street. The northern boundary includes a portion of Iron Cove Creek, then travels down John Street, zig-zagging via Taringa Street, Church Street, Alt Street, Julia Street, Chandos Street to Parramatta Road, then in a south-eastern orientation to Pembroke Street and Pembroke Avenue, terminating at the T1 North Shore and Western train line, being the southern boundary of the northern portion of the study area.

Soil landscapes

Soil landscapes within the northern portion of the study area comprise Blacktown across the majority of the study area, with a gully containing the Birrong soil landscape along Iron Cove Creek in the western part of the northern portion. A small area of Gymea soil landscape occurs on the north-western corner of the study area, in addition to a small area mapped as Disturbed along the Iron Cove Creek corridor, north of the HIA. The soil landscapes within the study area are shown on Figure 3-2 and are described in the subsections above.

Vegetation and connectivity

Vegetation structure within the northern portion of the study area contains some larger patches of canopy vegetation within backyards, schools and as street tree plantings, with a significant patch of vegetation occurring in a church grounds. These larger trees and shrubs constitute suitable foraging habitat for a variety of folivorous and nectivorous species of fauna, in addition to supporting invertebrate loads to facilitate foraging of insectivores and omnivores. These trees, both exotic and native, also provide suitable shelter and roosting habitat for arboreal mammals, nocturnal birds, diurnal birds, amphibians, reptiles and invertebrates, with garden vegetation supporting the presence of these groups. Additionally, numerous yards contain fruit trees, typically fig, citrus and Olive, which further support the presence of fauna across the southern portion of the study area.



Acknowledgements: Basemap © Land and Property Information 2016; Soils: Chapman G.A., Murphy, C.L., Tille P.J., Atkinson G. and Morse R.J., 2009 Ed. 4, Soil Landscapes of the Sydney 1:100,000 Sheet map, Department of Environment, Climate Change and Water, Sydney;

Figure 3.1 Soil landscapes within the Dulwich Hill - Marrickville HIA

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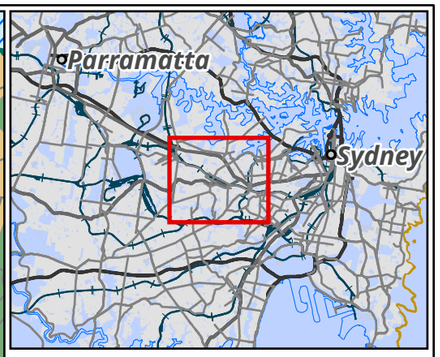
APEM Group

Matter: 41346, Date: 13 November 2024,
Prepared for: AC, Prepared by: AA, Last edited by: aabid
Location: P:\41300s\41346\Mapping\41346_Inner_West_HIA,
Layout: 41346_DM_F3.1_Soils



Legend

Study area

Soil landscape units

- bg - BIRRONG
- bt - BLACKTOWN
- gy - GYMEA
- ha - HAWKESBURY
- la - LAMBERT
- WATER - WATER
- xx - DISTURBED TERRAIN

Figure 3.2 Soil landscapes within the Ashfield - Croydon HIA

0 160 320 480 640 800

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

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Prepared for: AC, Prepared by: AA., Last edited by: aabid
Location: P:\41300s\41346\Mapping\
41346_Inner_West_HIA,
Layout: 41346_AC_F3.2_Soils

Acknowledgements: Basemap © Land and Property Information 2016; Soils: Chapman G.A., Murphy, C.L., Tille P.J., Atkinson G. and Morse R.J., 2009 Ed. 4, Soil Landscapes of the Sydney 1:100,000 Sheet map, Department of Environment, Climate Change and Water, Sydney;

3.3 Legislative and regulatory context

The following key legislation would need to be considered regarding future development in the study area as part of the proposed Master Plan.

3.3.1 *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act is the Australian Government's key piece of environmental legislation. The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (MNES) protected under the Act. Under the EPBC Act, activities that have potential to result in significant impacts on MNES must be referred to the Commonwealth Minister for the Environment and Water for assessment.

Four threatened species listed under the EPBC Act were assessed to have a medium to high potential to occur within the study area (including Narrow-leaved Black Peppermint *Eucalytpus nicholii*, Wallangarra White Gum, Magenta Lilly Pilly and Grey-headed Flying-fox. Impacts to MNES as part of any future development would need to be appropriately assessed. No EPBC Act listed TECs were recorded in the study area.

3.3.2 *Environmental Planning and Assessment Act 1979*

The EP&A Act was enacted to encourage the proper consideration and management of impacts of proposed development or land-use changes on the environment (both natural and built) and the community. The EP&A Act is administered by the NSW DCCEEW.

The EP&A Act provides the overarching structure for planning in NSW and is supported by other statutory environmental planning instruments (EPIs). EPIs of primary relevance to the natural environment are outlined further below.

3.3.3 Biodiversity Conservation Act 2016

The BC Act is the key piece of legislation providing for the protection and conservation of biodiversity in NSW through the listing of threatened species and communities and key threatening processes. Impacts to threatened species and communities are assessed under section 7.3 of the BC Act. No TECs listed under the BC Act were found to occur in the study area, given the complete modification of the landscape. Nine threatened species listed under the BC Act have a medium or greater likelihood of occurring, or are known to occur within the study area (including Narrow-leaved Black Peppermint *Eucalyptus nicholii*, Wallangarra White Gum, Magenta Lilly Pilly, Eastern False Pipistrelle *Falsistrellus tasmaniensis,* Southern Myotis, Grey-headed Flying-fox, Long-nosed Bandicoot, Large Bent-winged Bat, and Powerful Owl).

Biodiversity Offsets Scheme

Future development projects assessed under the EP&A Act and the BC Act in the study area could trigger the Biodiversity Offsets Scheme (BOS). Triggers are described in Table 1 below.

Table 1 Biodiversity Offset Scheme assessment

BOS Trigger	Justification
Clearing threshold	The BOS is triggered if the total clearing of vegetation associated with a proposed development exceeds the minimum clearing threshold, based on the minimum lot size.
BV Map	The BOS is triggered if a proposed development impacts on areas mapped within the BV Map.

BOS Trigger	Justification
Significant impact	The BOS is triggered if a proposed development results in a significant impact on threatened species, populations or communities listed under the BC Act.

3.3.4 Biosecurity Act 2015

The Biosecurity Act outlines biosecurity risks and impacts, which in relation to the study area, includes those risks and impacts associated with weeds. A biosecurity risk is defined as the risk of a biosecurity impact occurring, which for weeds includes the introduction, presence, spread or increase of a pest into or within the State or any part of the State. A pest plant that has the potential to out-compete other organisms for resources, including food, water, nutrients, habitat and sunlight and / or harm or reduce biodiversity.

Under the Biosecurity Act a priority weed is any weed identified in a local strategic plan, for a region that includes that land or area, as a weed that is or should be prevented, managed, controlled or eradicated in the region. A local strategic plan here refers to a local strategic plan approved by the Minister under Division 2 of Part 4 of the LLS Act.

The Biosecurity Act also introduces the General Biosecurity Duty, which states:

All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Priority weeds within the study area are discussed in Section 4.4.1.

3.3.5 Fisheries Management Act 1994

The FM Act provides for the protection and conservation of aquatic species and their habitat throughout NSW. Impacts to threatened species, populations and communities, and critical habitats listed under the FM Act must be assessed under the EP&A Act.

The desktop assessment and field investigation did not find any threatened species, populations and communities listed under the FM Act and no key fish habitat is mapped within the study area. However, for the Dulwich Hill – Marrickville HIA, key fish habitat is mapped as occurring within Goolay'yari – Cooks River to the south, and within the Sydenham Drainage Pit, approximately 600 metres to the east. Gumbramorra Creek, which occurs within the Dulwich Hill – Marrickville HIA flows to this key fish habitat. For the Ashfield – Croydon HIA, key fish habitat is mapped as occurring within sections of Iron Cove Creek occurring to the north. As these habitats occur within the stormwater catchment area of development within the study area, developments within these areas would require assessment of their potential impacts to key fish habitat through alteration of hydrological flow.

3.3.6 Water Management Act 2000

The WM Act provides for the sustainable and integrated management of the State's water for the benefit of both present and future generations based on the concept of ecologically sustainable development. Under the WM Act an approval is required to undertake controlled activities on waterfront land, unless that activity is otherwise exempt under Section 91E. Waterfront land is defined within the Act as the bed of any river, lake or estuary and any land within 40 metres of the riverbanks, lake shore or estuary mean high water mark.

The southern extent of the Dulwich Hill – Marrickville HIA occurs immediately adjacent to Goolay'yari – Cooks River, with lot boundaries occurring within approximately 2 metres of mapped water areas. Additionally, lot boundaries occur in proximity to Gumbramorra Creek within the HIA. As such, any proposed development within 40 metres of these areas would require assessment of whether a controlled activity permit was required, and if required, the development application would need to include an impact assessment sufficient to satisfy the granting of a permit. For the Ashfield – Croydon HIA, assessment would be required as to whether the upper reaches of Iron Cove Creek would constitute waterfront land, and if so, any proposed development within 40 metres of these areas would require assessment of whether a controlled activity permit was required.

3.3.7 State Environmental Planning Policies

Biodiversity and Conservation SEPP 2021

Chapter 2: Vegetation in non-rural areas

This chapter aims to protect the biodiversity values of trees and other vegetation in non-rural areas of NSW and to preserve the amenity of non-rural areas through the preservation of trees and other vegetation by ensuring that the BOS will apply to all clearing of native vegetation that exceeds the offset thresholds in urban areas and environmental conservation zones that do not require development consent.

This chapter applies to land zoned in the Inner West LGA as defined in Clause 2.3. Consent is required for clearance of vegetation within land zones and LGAs to which this chapters applies.

Chapter 3: Koala Habitat Protection 2020

This chapter applies to land zoned RU1, RU2 or RU3. As the proposal does not contain land zoned these categories, this chapter does not apply.

Chapter 4: Koala Habitat Protection 2021

Chapter 4 Koala Habitat Protection aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

The study area is located within the Inner West Council LGA which is not listed under Schedule 2, Chapter 4 of SEPP, therefore this chapter does not apply.

Chapter 13: Strategic conservation planning

This chapter aims to facilitate appropriate development on biodiversity certified land. It requires asset protection zones (associated vegetation clearance) to be wholly located on Certified – Urban Capable Land and the approved mitigation measure be complied with. As the study area is not located on biodiversity certified land, this chapter does not apply to the project.

3.3.8 Development Control Plans and Local Environmental Plans

The current extent of the Inner West LGA is the result of Local Council amalgamations in 2016 where the former LGAs of Ashfield, Leichhardt and Marrickville were amalgamated. Because of this, there are three operational DCPs under the IWLEP, with each DCP applicable within the boundaries of the respective former LGA.

The Ashfield – Croydon HIA is located within areas of the Inner West LGA that are subject to the Comprehensive DCP, and the Dulwich Hill – Marrickville HIA is located within areas of the Inner West LGA that are subject to the Marrickville DCP.

Comprehensive DCP 2016 for Ashbury, Ashfield, Croydon, Croydon Park, Haberfield, Hurlstone Park and Summer Hill

The Ashfield–Croydon HIA does not contain any mapped biodiversity corridors under the Comprehensive DCP. For opportunities to amend the Comprehensive DCP and the IWLEP to protect biodiversity within the study area please refer to Section 5.1.

Marrickville DCP 2011

The Marrickville DCP 2011 (Marrickville DCP) includes biodiversity mapping of known wildlife corridors and Bandicoot Protection Area in the former Marrickville LGA. The study area contains a large proportion of this mapped area (shown in Figure 3-3), and as such, developments within this mapped area are subject to Part 2 Section 2.13 Biodiversity provisions.

These provisions include the following:

2.13.3 - Protection of endangered/threatened species

Development on land identified on the Biodiversity Map as Bandicoot Protection Area, provided in Appendix 3, may be required to undertake an assessment of significance. Figure 1 outlines the decision making framework used to determine whether there may be a significant impact on the long-nosed bandicoot population and the need to undertake an assessment of significance.

2.13.4 – Wildlife corridors

Development on land identified on the Biodiversity Map as Wildlife Corridor, provided in Appendix 3, must incorporate native vegetation as part of any landscaping works.

2.13.5 - Development near parks, bushland reserves and other public open spaces

-Buildings must be located to provide an outlook to public open space without appearing to privatise that space.

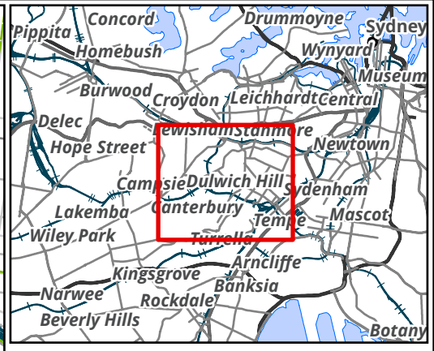
-Development must provide a visual transition between open space, bushland reserves or other public spaces and buildings, including avoiding abutting public open space with back fences.

-Development must protect views to and from public open spaces.

2.13.6 – Waterways and riparian lands

Infrastructure such as roads, drainage, stormwater structures or services must be located outside land identified as a waterway and riparian land.

It is understood that the boundaries of the wildlife corridors mapped within the Marrickville DCP are proposed to be expanded under a new DCP for the Inner West LGA. These corridors would include east-west linkages along the T3 Bankstown line, and within the Sydenham locality (outside of the study area). For opportunities to amend DCPs and the IWLEP to protect biodiversity within the study area please refer to Section 5.1.



Legend

- Study area
- Bandicoot protection area

Figure 3.3 Marrickville DCP Bandicoot Protection Area within the Dulwich Hill - Marrickville HIA

0 150 300 450 600

Metres

Scale: 1:15,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

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Matter: 41346, Date: 13 November 2024 ,
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3.3.9 Inner West Biodiversity Strategy

Inner West Council has developed a biodiversity strategy which aims to improve indigenous biodiversity within the Inner West Local Government Area. The strategy assesses the current state of the local environment and provides three key themes, with associated goals and actions to achieve those goals. These are detailed below.

Theme 1: Increase Biodiversity

Goal: Increase terrestrial biodiversity throughout the Inner West Council area

- Explore potential for additional Priority Biodiversity Areas land designation to other valuable ecological sites in the broader LGA (1.1.1.1).
- Install carved tree hollows/nest boxes in suitable parks and Natural Areas (1.1.1.2).
- Utilise Council's Community Native Nurseries to provide locally native plants to a mid-storey and ground cover planting program to improve habitat quality on suitable Council-owned land (1.1.1.3).
- Identify current Dark Sky Zones, investigate potential establishment of new zones, and implement wildlife friendly lighting standards around Natural Areas (1.1.1.4).
- Recognise the Gadigal Bat Roost as a key threatened species habitat site and ensure ongoing protection and monitoring (1.1.1.5).

Goal: Increase marine, freshwater, and riparian biodiversity throughout the Inner West

- Investigate and prioritise opportunities for water sensitive urban design (WSUD) to be incorporated into Council managed land and collaborate with private landholders to increase WSUD uptake (1.2.1.1).
- Support residents looking to install rainwater harvesting systems through the Rainwater Tank Rebate Program (1.2.1.2).
- Review Council managed rainwater gardens and swales to assess current conditions and effectiveness (1.2.1.3).
- Investigate opportunities to naturalise channelised waterways and reduce stormwater runoff (1.2.2.1).
- Appreciate and protect existing natural riparian zones such as the unnamed Hercules St creek line and Mort Bay ephemeral creek (1.2.2.2).
- Investigate opportunities to expand on existing wetlands, remediate degraded wetlands and build new wetlands across the LGA (1.2.2.3).
- Plan for the loss and adaptation of identified Natural Areas to sea level rise scenarios (1.2.2.4).

Goal: Establish baselines and bridge knowledge gaps

- Develop monitoring programs for target/indicator species within our Natural Areas to measure ecosystem health, habitat values and species richness/diversity (1.3.1.1).
- Develop a River Report Card system for monitoring and reporting water quality throughout the LGA (1.3.1.2).
- Identify key threatening processes to local biodiversity, mitigation strategies and natural recovery processes (1.3.1.3).
- Complete mapping and condition reporting on threatened species and Endangered Ecological Communities (EEC) (1.3.2.1).

- Review local impacts of climate change on biodiversity and natural assets to identify knowledge gaps and mitigation methods (1.3.2.2).
- Audit currently installed nest boxes, map all locations and assess whether in use by native animals (1.3.2.3).

Theme 2: Unite Community

Goal: Increase opportunities for people to connect with, and care for, biodiversity in the Inner West

- Increase opportunities and participation in environmental citizen science (2.1.1.1).
- Work in partnership with citizen science, environmental and Bushcare groups on the collection and integration of data with proposed Council managed databases (2.1.1.2).
- Provide volunteering opportunities through Adopt-a-Spot and Verge Garden, Native Community Nurseries and Bushcare programs (2.1.1.3).
- Develop concept plans for a bird watching hide at the Dibble Avenue Waterhole (2.1.1.4).
- Establish a new Native Community Nursery in the Southern LGA and increase nursery capacity (2.1.1.5).
- Activate Council's Sustainability Hub with Urban Ecology staff for consultation with public and hold events on site (2.1.2.1).
- Develop an education program on the threatened and unique species of the Inner West and habitat creation (2.1.2.2).
- Conduct Natural Area tours (2.1.2.3).
- Install 'cues to care' in appropriate Natural Areas to better inform and engage the community in the protection of valuable habitat zones, such as the Gadigal Bat Roost (2.1.2.4).
- Investigate the development of a Biodiversity Sensitive Urban Design (BSUD) workshop to help residents create native habitat in their backyards (2.1.2.5).

Goal: Strengthen the representation and integration of Aboriginal ecological knowledge in the protection of biodiversity

- Investigate opportunity for equal partnerships including partnering the Native Community Nursery with Indigenous providers and educators (2.2.1.1).
- Partner with Aboriginal and Torres Strait Islander peoples to integrate appropriate methods of Caring for Country principles in Urban Ecology programs and projects, such as reintroduction of fire protocols into the landscape (2.2.1.2).
- Co-design programs in collaboration with Aboriginal and Torres Strait Islander peoples to support engagement and participation in decision making (2.2.1.3).

Theme 3: Lead by Example

Goal: Council is a leader in supporting urban biodiversity

- Investigate solutions to risks posed by domestic animals to local wildlife (for example potential curfews for domestic pets close to Priority Biodiversity Areas, Catch, Neuter and Release programs etc.) (3.1.1.1).
- Review existing policies, strategies, and Plans of Management (PoM) to ensure biodiversity outcomes are prioritised and identify on ground actions that have not yet been realised (3.1.1.2).
- Develop a Natural Areas Policy for nature regenerating lands (3.1.1.3).

- Establish best practice principles for decision making to address impact and dependency on nature (3.1.2.1).
- Facilitate truth telling and embed Caring for Country principles (3.1.2.2).
- Develop and deliver Biodiversity Training for Council staff (3.1.2.3).
- Include Natural Areas and Waterways in open space and recreation needs analyses (3.1.2.4).

Goal: Strengthen partnerships to improve biodiversity outcomes

- Investigate suitable planning controls, policies, projects, targets, or incentives to:

    a. Reduce decline of habitat on private land

    b. Protect and increase mid/low-storey vegetation cover

    c. Establish a "Greenweb" program to identify existing vegetation links.

    d. Improve management of transition zones between Natural Areas and parks/streetscape

    e. Advise on the financial value of blue-green infrastructure (3.2.1.1).
- Establish cross Council collaboration for effective delivery of Council biodiversity projects (3.2.1.2).
- Collaborate with external agencies (such as Sydney Water, Transport for NSW, Local Land Services, and other local Councils) and participate in regional partnerships (such as SSROC, Parramatta River Catchment Group and the Cooks River Alliance) (3.2.2.1).
- Investigate and pursue relevant grant opportunities which increase natural capital (3.2.2.2).
- Recognise Callan Park and Marrickville Golf Course as significant biodiversity refuges and collaborate with land managers to protect remnant habitats (3.2.2.3).
- Facilitate local research opportunities through external agencies, such as universities, CSIRO etc., to improve knowledge and foster innovation in the urban ecology sector (3.2.2.4).

In order for the strategy to achieve its goals, future development within the LGA would need to be consistent with the goals and actions within the plan, and integrate with council's programs to achieve these goals. Opportunities exist through amendments to the DCP to ensure this integration and incorporate developers as an intrinsic component of the success of the strategy, and are further detailed in Section 5.

3.3.10 Greenway Biodiversity Strategy

The Greenway Biodiversity Strategy was developed in 2011 and was prepared to provide a framework and action plan for protecting and enhancing biodiversity on both public and private land within the GreenWay catchment. The strategy had the following objectives:

Biodiversity Objectives

The content and actions for the GreenWay Biodiversity Strategy are structured according to the six biodiversity objectives, developed and agreed by community stakeholders to support the realization of the GreenWay Biodiversity vision.

1. *Create a flora and fauna corridor which supports the original vegetation of the area, provides habitat, and facilitates movement and migration for a wide range of native plant and animal species throughout the GreenWay catchment;*

2. *Identify areas within and adjacent to the GreenWay catchment with high biodiversity values that require protection and improve the connectivity between these areas;*
3. *Protect and enhance the habitat and migration opportunities for locally significant or threatened native species, populations and communities (including the endangered population of Long-nosed Bandicoot), and allow for their continued evolution and survival in and beyond the GreenWay catchment;*
4. *Engage and educate residents and the broader community , including local businesses and visitors to the GreenWay, to encourage a sense of ownership and participation in protecting and restoring biodiversity in the GreenWay catchment;*
5. *Mitigate key threats to biodiversity to increase the survival and adaptive capacity of species, populations and ecological communities of plants and animals.*
6. *Provide strategic guidance to councils, private landowners and major stakeholders on how to coordinate biodiversity management across the four local government areas.*

The guidance from this strategy is understood to have largely been incorporated into the Inner West Biodiversity Strategy, and as such, future development should consider the more recent strategy as the primary guidance document.

3.3.11 Inner West Blue-Green Grid Strategy

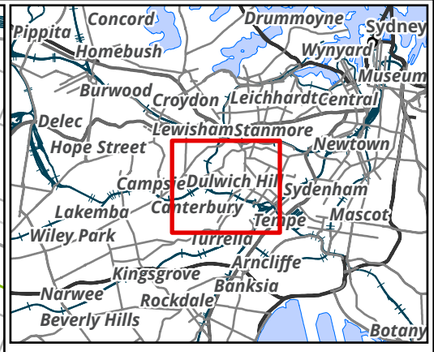
The Blue-Green Grid Strategy was developed in 2023, as part of Council's Local Strategic Planning Statement. The purpose of the strategy is to provide guidance for the creation of a network of interconnected, multi-purpose links across the Inner West and into neighbouring Council areas. The Strategy provides an aspirational vision for creating a network of interconnected open spaces. Specifically, a number of grid links are targeted at biodiversity connectivity and enhancement, and these links are shown in Figure 3-4 and Figure 3-5 below. Specifically, this grid aims to define areas for targeted canopy tree planting and enhancement.

3.3.12 South Sydney Regional Organisation of Councils Connected Corridors for Biodiversity

The SSROC Connected Corridors for Biodiversity project aimed to produce a habitat corridor map, based largely on existing habitat mapping, for use by the South Sydney Councils as a tool to facilitate increased habitat connectivity across the project area, and to thereby increase resilience of biodiversity to climate change and other threats. The project involved incorporating existing council corridors and searching for opportunities to support these through adjacent land tenures, such as green open space including playing fields, school, university and hospital grounds. These layers were combined, and potential habitat linkages between areas of existing and potential habitats were identified by placing a 100 metre buffer around the existing and potential habitat and clipping the resulting buffered polygons back to their outline. Where gaps remained, a minimum of 50 metre either side of railway corridors or roads was used as a linkage and incorporated into the corridor map.

Within the Dulwich Hill – Marrickville HIA, a corridor is identified, as detailed in Figure 3-6. Opportunities exist in amendments to the DCP to ensure that any future development within or adjacent to this corridor would support and enhance the presence of the corridor, particularly in areas identified as Priority Habitats and Supporting Habitats.

There are no SSROC mapped corridors within the Ashfield – Croydon HIA.



Legend

- Study area
- Blue-green grid July 2024

Figure 3.4 Inner West Blue Green Grid within the Dulwich Hill – Marrickville HIA

0 100 200 300 400 500

Metres

Scale: 1:12,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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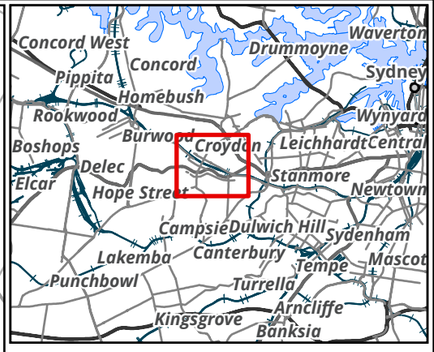
Matter: 41346, Date: 13 November 2024 ,
Prepared for: AC, Prepared by: AA, Last edited by: aabid
Location: P:\41300s\41346\Mapping\
41346_Inner_West_HIA.aprx
Layout: 41346_F3.4_DM_Grid

Acknowledgements: Basemap © Land and Property Information 2016



Legend

- Study area
- Blue-green grid July 2024

Figure 3.5 Inner West Blue Green Grid within the Ashfield – Croydon HIA

0 60 120 180 240 300

Metres

Scale: 1:8,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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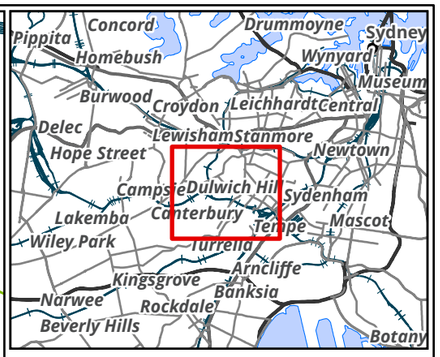
Location: P:\41300s\41346\Mapping\
41346_Inner_West_HIA.aprx
Layout: 41346_F3.5_AC_Grid

Summer Hill
Lewisham
Petersham
Stanmore
Enmore
Ashbury
Ashfield
Dulwich Hill
Canterbury
Hurlstone Park
Marrickville
Earlwood
Sydenham
Tempe
Main Suburban Railway
Sydenham Bankstown Railway
Cooks River
Illawarra Railway
East Hills Railway



Legend

Study area

Biodiversity corridors

Priority Habitats

Supporting Areas

Supporting Habitats

Acknowledgements: Basemap © Land and Property Information 2016,

Figure 3.6 SSROC Biodiversity Corridors within the Dulwich Hill - Marrickville HIA

0 100 200 300 400 500

Metres

Scale: 1:12,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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3.3.13 Biodiversity in Place Framework

The NSW Department of Planning, Housing and Infrastructure via the Government Architect NSW has released a framework for the design of new and existing developments in urban areas that support urban habitat, natural values and biodiversity. The principles underpinning the Biodiversity in Place Framework are:

1. Nature as partner. Understand the role of nature and natural processes in our public spaces.
2. For humans and non-humans. Create niches and habitat opportunities for fauna in urban spaces.
3. Guided by the landscape. Use indigenous species and landscaping guided by the natural features specific to an area such as soils, aspect, rainfall, and uses when planning urban spaces in a way that supports wildlife.
4. Highly diverse planting. Diverse indigenous species including understorey shrubs, grasses, and flowering plants provide resources for fauna as well as enhanced beauty of public spaces.
5. Sensitive and skilled management. Management must consider wildlife and biodiversity, for example when using pesticides or mowing.
6. Connected across scales. Natural plantings, even at small local scales, are important in the creation of corridors and stepping stones through the urban landscape.

The recommendations provided in this study are to be implemented wherever practicable, as they enable future development to align with the Biodiversity in Place Framework.

3.4 Vegetation communities

Prior to the field investigation, a review of the following vegetation mapping schemes was undertaken to determine the presence of remnant native vegetation within the study area:

- *The Native Vegetation of the Sydney Metropolitan Area - Version 3.1 VIS_ID 4489* (OEH 2016).
- NSW *State Vegetation Type Map* (NSW DCCEEW 2023a).
- NSW *State Vegetation Type Map (Pre-Clearing)*(DPE 2022c).

Descriptions of vegetation mapped under these schemes are provided within the following sections.

3.4.1 The Native Vegetation of the Sydney Metropolitan Area

The Native Vegetation of the Sydney Metropolitan Area (OEH 2016) maps patches of vegetation within the study area as the following Urban exotic/native vegetation. The mapping layer does not identify any patches of vegetation the conform to a naturally occurring Plant Community Type (PCT) in NSW. Urban exotic/native is used as a generic signifier to describe vegetation within an urban context, typically planted street, park and garden vegetation.

Adjacent to the Dulwich Hill – Marrickville HIA, one PCT was identified within the Goolay'yari – Cooks River corridor, being PCT 920 Mangrove Forests in estuaries of the Sydney Basin Bioregion and South East Corner Bioregion. This PCT fits the description of mangroves under the Part 7, Section 205 of the FM Act. Impacts to mangrove vegetation must not occur without the authority of a permit issued by the Minister.

The Native Vegetation of the Sydney Metropolitan Area (OEH 2016) map for the study area and surrounding areas is shown on Figure 3-7.

No additional PCTs were found within the Ashfield – Croydon HIA as shown on Figure 3-8.

Legend

Study area

Plant community type (Sydney Metro Area v3.1 2016)

0,Urban Exotic/Native

Figure 3.7 Extant vegetation within the Dulwich Hill – Marrickville HIA from the Native Vegetation of the Sydney Metropolitan Area mapping project

0 100 200 300 400 500

Metres

Scale: 1:11,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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41346_Inner_West_HIA,
Layout: 41346_DM_F3.7_VegetationSydMetro

Legend

Study area

Plant community type (Sydney Metro Area v3.1 2016)

0,Urban Exotic/Native

Figure 3.8 Extant vegetation within the Ashfield – Croydon HIA from the Native Vegetation of the Sydney Metropolitan Area mapping project

0 80 160 240 320 400

Metres

Scale: 1:8,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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Matter: 41346, Date: 13 November 2024,
Prepared for: AC, Prepared by: AA, Last edited by: aabid
Location: P:\41300s\41346\Mapping\
41346_Inner_West_HIA,
Layout: 41346_AC_F3.8_VegetationSydMetro

3.4.2 NSW State Vegetation Type Map

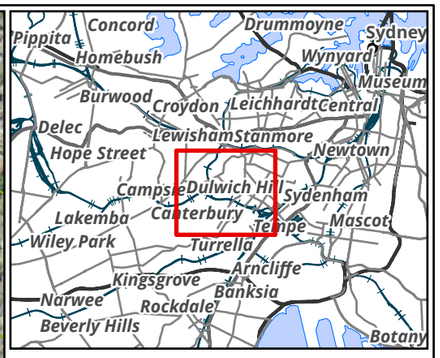
The NSW *State Vegetation Type Map* (NSW DCCEEW 2023a) identified the entire study area as containing PCT0, which is used in instances where there is a lack of remnant native vegetation.

For the Dulwich Hill – Marrickville HIA Areas of PCT 4091 Grey Mangrove-River Mangrove Forest are mapped adjacent to the southern boundary of the study area, along the Goolay'yari – Cooks River corridor. As above, these patches of vegetation constitute mangroves as defined under the FM Act.

NSW BioNet Vegetation Classification describes PCT 4091 as low, mid-high or tall mangrove open forest or woodland, sometimes including a saltmarsh ground layer, occurring on tidal flats of the NSW coast. The tree canopy is sparse, mid-dense or sometimes dense and is almost always dominated by Grey Mangrove *Avicennia marina* subsp. *australasica*. River Mangrove *Aegiceras corniculatum* is common, occurring at around half of the known locations, however usually with a more sparse projected foliage cover than Grey Mangrove. Other trees are rare, however may include a sparse cover of Red Mangrove *Rhizophora stylosa*, or on mangrove fringes Swamp Oak *Casuarina glauca*, Flax-leaved Paperbark *Melaleuca linariifolia* or Port Jackson Fig *Ficus rubiginosa*. Salt-tolerant ground cover species make a significant contribution to the species richness of this PCT overall, however are not always present. Where present, the ground layer is sparse to mid-dense. *Sarcocornia quinqueflora* subsp. *quinqueflora* occasionally occurs with sparse cover, while Sand Couch *Sporobolus virginicus* or Creeping Brookweed *Samolus repens* rarely occur however generally with higher projected foliage cover. Other rare species with variable cover include Sea Rush *Juncus kraussii* subsp. *australiensis*, *Tecticornia arbuscula*, *Sesuvium portulacastrum* and Lesser Sea-spurrey *Spergularia marina* amongst other salt-tolerant grasses, forbs and sedges.

The NSW *State Vegetation Type Map* (NSW DCCEEW 2023a) for the Dulwich Hill – Marrickville HIA and surrounding areas is shown on Figure 3-9.

No additional PCTs were identified for the Ashfield – Croydon HIA as shown on Figure 3-10.



Legend

Study area

Plant community type (NSW State Vegetation Type Map vC2 2023)

0, Not classified

Figure 3.9 Extant vegetation within the Dulwich Hill – Marrickville HIA from the NSW State Vegetation Type mapping project

0 80 160 240 320 400

Metres

Scale: 1:11,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

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APEM Group

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Prepared for: AC, Prepared by: AA, Last edited by: aabid
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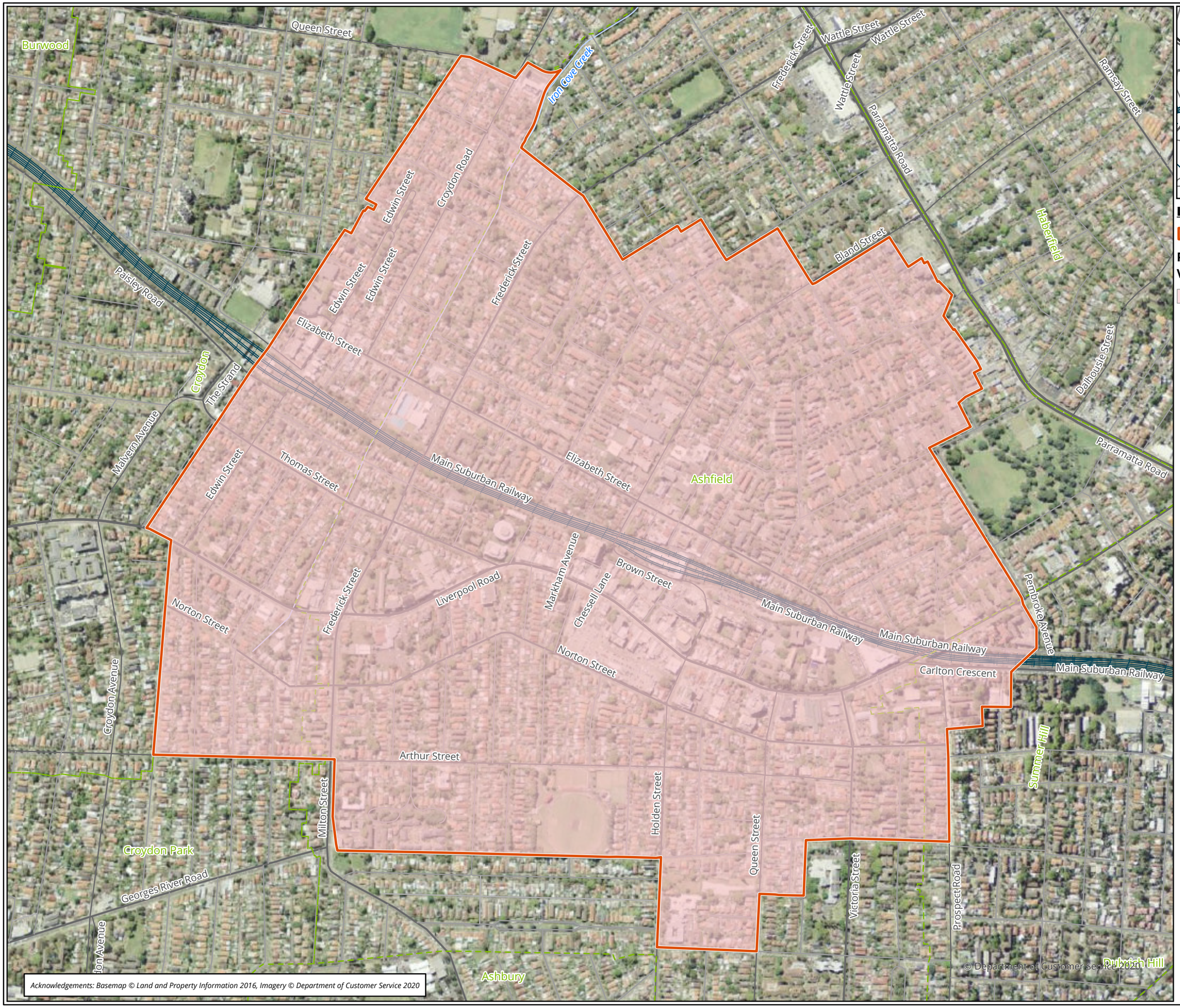

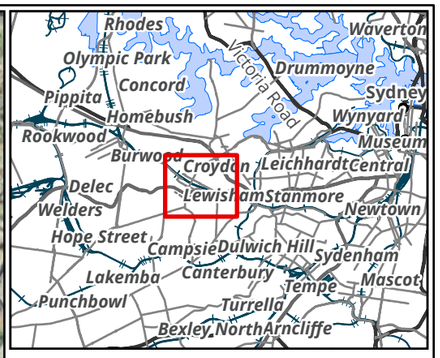

Legend

Study area

Plant community type (NSW State Vegetation Type Map vC2 2023)

0,Not classified

Figure 3.10 Extant vegetation within the Ashfield-Croydon HIA from the NSW State Vegetation Type mapping project

0 60 120 180 240 300

Metres

Scale: 1:8,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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APEM Group

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3.4.3 NSW State Vegetation Type Map (Pre-Clearing)

The NSW State Vegetation Type Map (Pre-Clearing) (DPE 2022c) interpolates plot based data within remnant vegetation, as well as soil, aspect, slope and other data to estimate the pre-clearing extent of PCTs within NSW.

Within the Dulwich Hill – Marrickville HIA, pre-clearing PCTs corresponded broadly to the soil types mapped in Chapman et al. (1989), and included the following:

- PCT 3262 Sydney Turpentine Ironbark Forest
- PCT 3594 Sydney Coastal Sandstone Foreshores Forest
- PCT 4028 Estuarine Swamp Oak Twig-rush Forest
- PCT 4091 Grey Mangrove-River Mangrove Forest

Within the Ashfield – Croydon HIA, pre-clearing PCTs corresponded broadly to the soil types mapped in Chapman et al. (1989), and included the following:

- PCT 3262 Sydney Turpentine Ironbark Forest

A brief description of the pre-clearing vegetation structure and composition of these PCTs is provided below, as described within the NSW BioNet Vegetation Classification (DCCEEW, 2024). Extent of these PCTs within the Dulwich Hill – Marrickville HIA is shown in Figure 3-11 below.

PCT 3262 Sydney Turpentine Ironbark Forest

PCT 3262 Sydney Turpentine Ironbark Forest is mapped as having previously occurred (pre-clearing) within the central and northern portions of the study area, broadly conforming to the soil boundaries of the Blacktown soil group, having a higher fertility soil derived from weathering of the underlying Wianamatta group shales.

Sydney Turpentine Ironbark Forest is a tall to very tall sclerophyll open forest with mid-stratum of mixed sclerophyll and mesophyll shrubs and a ground layer of grasses and forbs, found on shale or sheltered shale-sandstone soils mainly in the northern suburbs of Sydney and lower Blue Mountains. The tree canopy very frequently includes Turpentine either as a canopy dominant or as a smaller tree or both. Other species which are localised and occasionally dominant or co-dominant occasionally include Blackbutt, Smooth-barked Apple and Grey Gum *Eucalyptus punctata*, rarely with one of several species from the ironbark, stringybark or mahogany eucalypt groups of which Grey Ironbark, White Stringybark *Eucalyptus globoidea* and Red Mahogany *Eucalyptus resinifera* are the most frequent of each group. The mid-stratum is layered, with a sparse cover of small trees that includes eucalypts, occasionally Parramatta Wattle *Acacia parramattensis* and Forest Oak *Allocasuarina torulosa*, rarely with Black Sheoak. The lower shrub layer very frequently includes Sweet Pittosporum *Pittosporum undulatum* and Prickly Beard-heath *Leucopogon juniperinus*, commonly with Coffee Bush *Breynia oblongifolia*, Ornamental Ash *Polyscias sambucifolia*, Rice Flower *Ozothamnus diosmifolius* and Large-leaved Olive *Notelaea longifolia*. The ground layer includes a diverse cover of grasses that very frequently includes Weeping Grass *Microlaena stipoides* and Wiry Panic *Entolasia stricta*, commonly with Blady Grass *Imperata cylindrica*, Bordered Panic *Entolasia marginata* and Kangaroo Grass *Themeda triandra*. Small forbs including Whiteroot *Lobelia purpurascens* are also very frequent, together with Spiny-headed Mat-rush *Lomandra longifolia*. This PCT typically occurs as small remnants in mosaics of urban land use in the shale-dominated landscapes in higher rainfall zones of the Sydney Metropolitan area.

This PCT conforms to the BC Act listed Critically Endangered Ecological Community (CEEC) *Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion*, and the EPBC Act listed CEEC *Turpentine-Ironbark Forest of the*

Sydney Basin Bioregion where remnants meet the criteria defined within the Final Determination of the NSW Threatened Species Scientific Committee (NSW Threatened Species Scientific Committee 2019), and/or Conservation Advice provided by the federal Threatened Species Scientific Committee (DoE 2014).

PCT 3594 Sydney Coastal Sandstone Foreshores Forest

This PCT is mapped as having previously occurred (pre-clearing) along the southern edge of the central portion of the study area, and in lobes of the southern portion of the study area, broadly conforming to the Gymea and Hawkesbury soil landscapes, those having a lower fertility with soils derived from weathering of underlying Hawkesbury sandstone, but with some areas of enrichment from erosion of the Blacktown soil landscape upslope. Vegetation structure and composition is likely to have been reflective of this lower fertility and the lower water-holding capacity of the sandier soil.

Sydney Coastal Sandstone Foreshores Forest is a tall, occasionally very tall, sclerophyll open forest with a mixed understorey of dry shrubs and mesic small trees found along the foreshores of major waterways and coastal escarpments of Sydney. The tree canopy is very frequently dominated by Smooth-barked Apple with occasional local stands of Bangalay *Eucalyptus botryoides* or rarely other eucalypt species. A sparse taller layer in the mid-stratum commonly includes Coastal Banksia *Banksia integrifolia* or Black Sheoak and occasionally Port Jackson Fig. A combination of hardy mesic small trees including Sweet Pittosporum, Cheese Tree *Glochidion ferdinandi* and Blueberry Ash *Elaeocarpus reticulatus* are almost always present with Large-leaved Olive also common. In the suburban environment, the proliferation of these mesic species in the understorey at long unburnt sites has generated considerable debate, particularly as there appears to be strong correlation between time since fire and their density. Data suggests these species are also more common in these littoral zones than other sheltered sandstone forests situated further away from the coast. Sclerophyll shrubs are less frequent however include *Acacia longifolia*, Sweet Wattle *Acacia suaveolens*, Coffee Bush and Tree Broom-heath *Monotoca elliptica*. The ground layer is characterised by a mid-dense cover of ferns, graminoids, climbers and grasses. The low elevations adjoining major waterways expose the vegetation to a maritime influence brought by salt laden southerly winds.

This PCT is not associated with any TECs listed under the BC Act or EPBC Act.

PCT 4028 Estuarine Swamp Oak Twig-rush Forest

The previous occurrences (pre-clearing) of this PCT within the study area would have broadly conformed to the Birrong soil landscape, being a fluvial deposit of silts and sands, with low to moderate fertility and high salinity due to regular saltwater inundation. These areas occur within the southern portion of the study area.

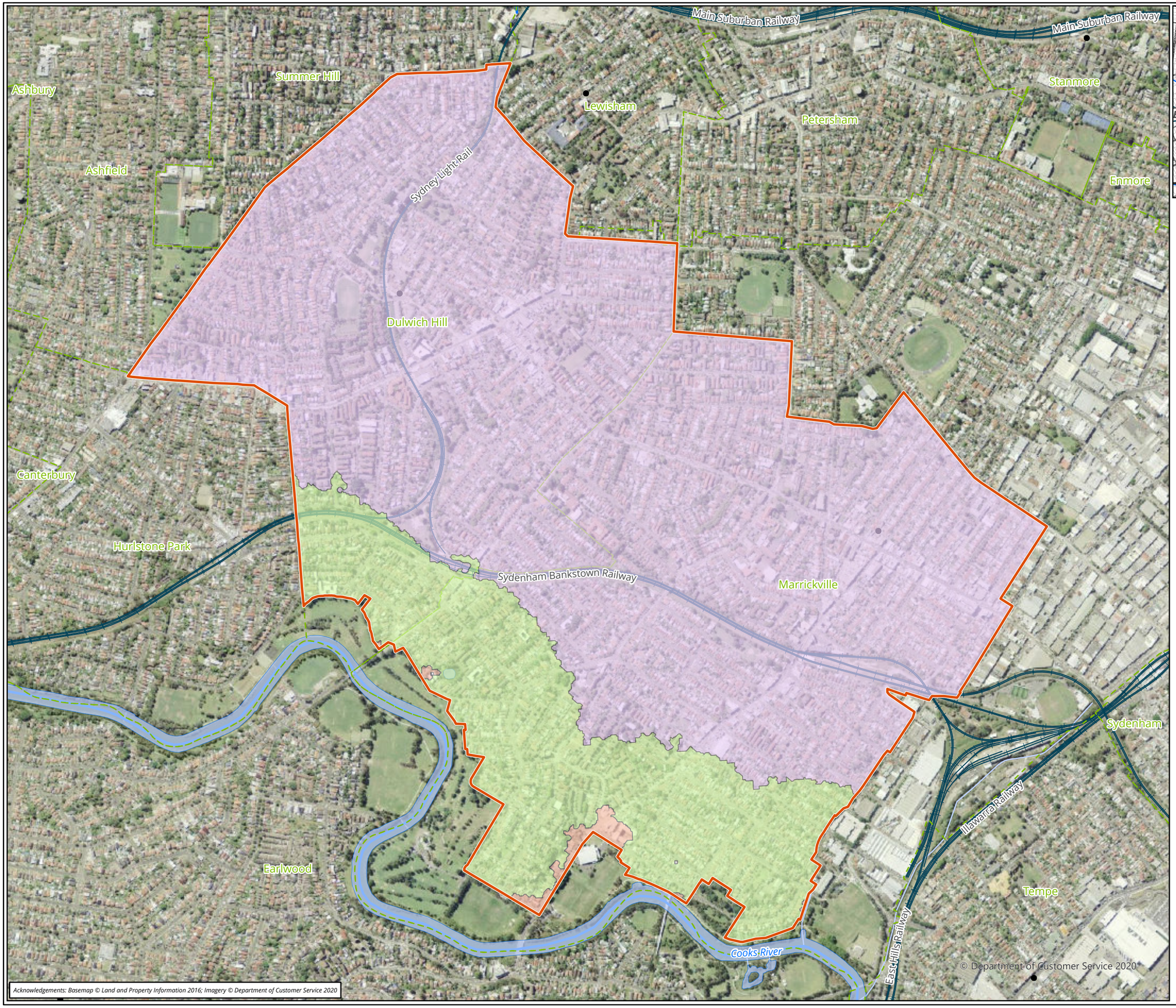
Estuarine Swamp Oak Twig-rush Forest is a tall to very tall open forest or woodland featuring Swamp Oak and usually Bare Twig-rush *Machaerina juncea* and Sea Rush, occurring on the edges of tidal estuarine flats and tidal creek flats along the NSW coast, usually at elevations of below 10 metres above sea level. Swamp Oak almost always forms a sparse to mid-dense tree layer, rarely accompanied by Broad-leaved Paperbark *Melaleuca quinquenervia*. A sparse or very sparse small tree or scrub layer of Swamp Paperbark *Melaleuca ericifolia* is occasionally present, while other *Melaleuca* species and other trees or shrubs only rarely occur. The mid-dense ground layer is primarily comprised of sedges, rushes, reeds and grasses that are tolerant of inundation, very frequently including Bare Twig-rush and Sea Rush, commonly with Common Reed *Phragmites australis*. Other species occasionally occurring in the ground layer include Creeping Brookweed, *Lobelia anceps* and Tall Saw-sedge *Gahnia clarkei*, while more rare species include Sand Couch, Se Celery *Apium prostratum* and Matgrass *Hemarthria uncinata*, the latter three with variable cover from site to site.

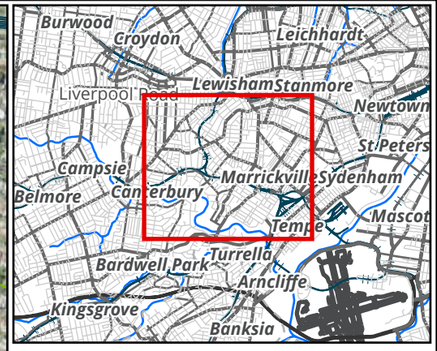
This PCT conforms to the BC Act listed Endangered Ecological Community (EEC) *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*, and the EPBC Act listed EEC *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological*

community where remnants meet the criteria defined within the Final Determination of the NSW Threatened Species Scientific Committee(NSW Scientific Committee 2011), and/or Conservation Advice provided by the Department of Environment and Energy(DEE 2018).

PCT 4091 Grey Mangrove-River Mangrove Forest

The occurrence and composition of this PCT are described in Section 3.4.2 above.





Legend

Study area

Plant community type (NSW State Vegetation Type Map - Pre-Clearing)

- 3262-Sydney Turpentine Ironbark Forest
- 3594-Sydney Coastal Sandstone Foreshores Forest
- 4028-Estuarine Swamp Oak Twig-rush Forest
- 4091-Grey Mangrove-River Mangrove Forest

Figure 3.11 Previous (pre-clearing) vegetation within the Dulwich Hill–Marrickville HIA from the NSW State Vegetation Type mapping project

0 125 250 375 500

Metres

Scale: 1:12,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

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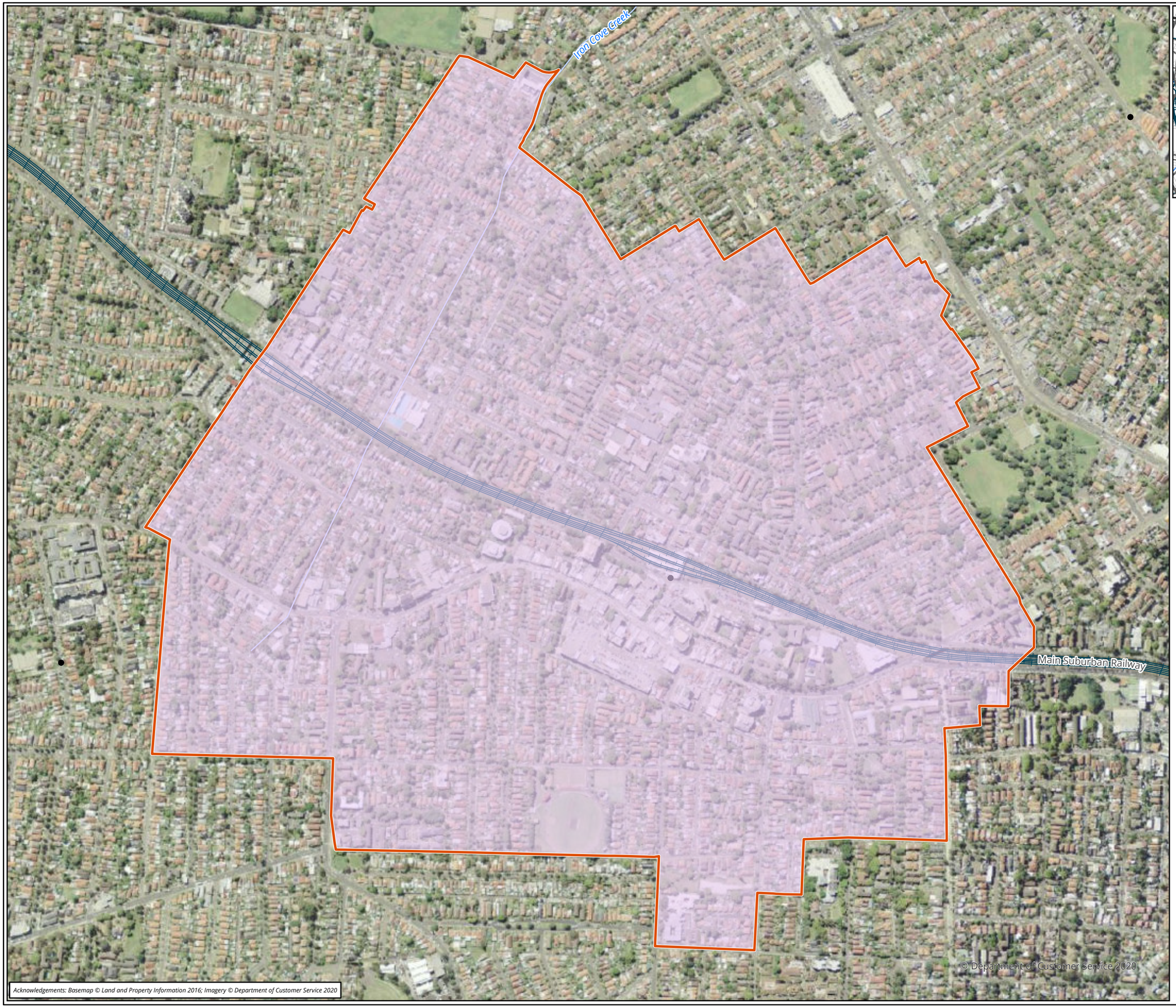

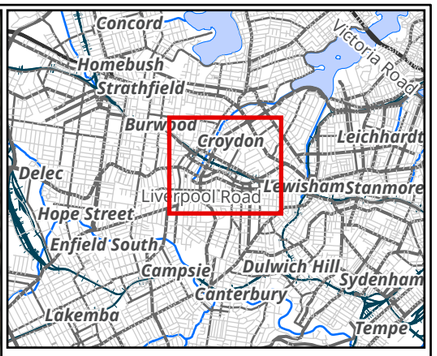

Legend

Study area

Plant community type (NSW State Vegetation Type Map - Pre-Clearing)

3262-Sydney Turpentine Ironbark Forest

Figure 3.12 Previous (pre-clearing) vegetation within the Ashfield–Croydon HIA from the NSW State Vegetation Type mapping project

0 110 220 330 440 N

Metres

Scale: 1:8,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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4 Field investigation results

4.1 Vegetation communities

Vegetation and habitat within the study area was surveyed using the random meander technique (Cropper 1993) over 28 person hours. Prior to the field investigation, Biosis confirmed that the vegetation mapped within the study area was Urban Exotic/Native in the NSW *State Vegetation Type Map* (NSW DCCEEW 2023).This was largely confirmed during the field investigation, with the vast majority of native flora present being planted, managed native vegetation within the parks, reserves, streetscapes and gardens. Some individual plants within the study area may be remnant, potentially having grown from soil-stored seed following clearing. However, two small patches of vegetation were detected that could be prescribed a Plant Community Type (PCT). These areas are described in Table 2 and Table 3 below. The presence of TECs within the study area should still be assessed in detail when impacts are proposed to occur to locally endemic native species.

Within the TOD buffer areas around the train stations, native managed vegetation was broadly stratified into the following categories during the field investigation (and mapped on Figure 4-1):

- Nectar and fruit-producing feed trees.
- Nectar and seed-producing feed trees.
- Nectar-producing feed trees.
- Mature fruit-producing feed trees.
- Seed-producing trees.
- Exotic and shelter habitat.

Table 2 PCT 3262 within the study area

Sydney Turpentine Ironbark Forest	
PCT	3262 Sydney Turpentine Ironbark Forest
Extent within study area	Approximately 0.52 ha of this PCT occurs within the study area. The examples of this PCT occur in the northern portion of Johnson Park, within the light rail corridor, and to the west of Hoskins Park, in Dulwich Hill.
Description including fauna habitat	The occurrences of the PCT occur as a result of restoration works. Assessment of aerial photography from 1943 shows the locations of the PCT being completely devoid of vegetation. It is understood that restoration has been undertaken by the Inner West Environment Group, and has included planting of canopy, shrub and groundcover species diagnostic of Sydney Turpentine Ironbark Forest. While survey was unable to access a number of areas of the PCT, species diagnostic of the PCT identified included: • Grey Gum • Sydney Blue Gum • Turpentine • Coffee Bush • Cheese Tree • Native Blackthorn *Bursaria spinosa* • Blueberry Ash • Tickbush *Kunzea ambigua*

Sydney Turpentine Ironbark Forest	
	• Durawi (D'harawal) - Spiny-headed Mat-rush • Blue Flax-lily *Dianella caerulea* • Weeping Meadow Grass *Microlaena stipoides* • White Dogwood *Ozothamnus diosmifolius* • Native Geranium *Geranium solanderi* • Kidneyweed *Dichondra repens* The fauna habitat values within these patches are higher than those of the surrounding built areas, containing native flowering plants, shelter habitat for terrestrial and arboreal fauna, a dense groundcover layer which would support invertebrate, reptile and amphibian species, and connectivity between other areas of potential habitat for terrestrial mammals.
Condition	The community is generally in moderate to high condition due to ongoing restoration and bush regeneration works. Areas of vegetation were not able to be accessed due to fences, however the vegetation was observed to contain a high diversity of diagnostic canopy, small tree, shrub and understory species, and minimal coverage of invasive exotic species, with particularly high structural and floristic diversity within the Hoskins Park patch.
Associated soils, rainfall and landscape position	Sydney Turpentine-Ironbark Forest has been reported as occurring in areas receiving moderate rainfall (900-1100 mm) on soils derived either from Wianamatta Shale or from Wianamatta Shale interbedded with Hawkesbury Sandstone. Within the study area, the patches occur within areas with a gently undulating topography, with a slight north slope. While the soils are modified as a result of previous clearing, their landscape position and extant soil mapping indicate that the soils would be clays derived from underlying Wianamatta Shale geology.
Threatened ecological community	**Commonwealth EPBC Act:** The occurrence in the study area does not meet the criteria for *Turpentine–Ironbark Forest in the Sydney Basin Bioregion* (Critically Endangered Ecological Community [CEEC]). The approved conservation advice for *Turpentine–Ironbark Forest in the Sydney Basin Bioregion* under s226B of the EPBC Act states that: *Occurrences of the Turpentine–Ironbark Forest in the Sydney Basin Bioregion ecological community are considered to be part of the nationally listed ecological community if patches are in good condition.* *Good condition is generally determined as:* • *the vegetation has some characteristic components from all structural layers (tree canopy, small tree/shrub midstorey, and understorey); and* • *the tree canopy cover is greater than 10%; and o the patch size is greater than one hectare.* *However, patches with a tree canopy cover of less than 10% are also included in the ecological community, if:* • *the patch of the ecological community is greater than one hectare in size; and* • *it is part of a remnant of native vegetation that is 5 hectares or more in area.* The occurrence of the PCT within the study area comprises a total area of 0.52 ha, and as such, does not meet the minimum area requirement for the presence of the EPBC Act-listed form of the CEEC. **NSW BC Act:** The occurrence within the study area does meet the criteria of *Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion* (CEEC, BC Act). The extent of the PCT mapped within the study area is considered likely to conform to the description of the BC Act form of *Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion* provided within the Final Determination (NSW Threatened Species Scientific Committee 2019). The following factors are considered in this assessment:

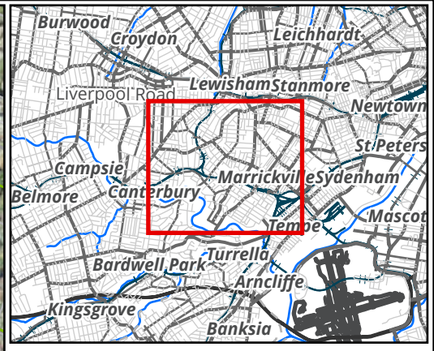
Sydney Turpentine Ironbark Forest	
	• The PCT within the study area contains diagnostic canopy, mid story and groundcover species listed within Section 1.1 of the Final Determination, including Grey Gum, Sydney Blue Gum, Turpentine, Coffee Bush, Cheese Tree, Native Blackthorn, Blueberry Ash, Tickbush, Durawi (D'harawal) - Spiny-headed Mat-rush, Blue Flax-lily, Weeping Meadow Grass, White Dogwood, Native Geranium and Kidneyweed. As access was restricted to higher quality patches during the survey, it is considered likely that additional diagnostic species are present within the PCT. • The PCT within the study area occurs on soils derived from Wianamatta Shale geology. • The PCT within the study area occurs in a landscape position conforming with the description of landscape position for the CEEC, with pre-1788 vegetation mapping indicating that the locations would have contained the CEEC prior to clearing. • The Final Determination acknowledges that the structure and composition of the community can be variable as a result of the previous clearing and landuse history, and does not preclude the presence of the CEEC based on the presence of modified or non-original soils. Based on these factors, the PCT within the study area is considered likely to conform to the BC Act listing of the CEEC.
Threatened species habitat	The PCT is considered to provide marginal habitat for the following threatened fauna: • Grey-headed Flying-fox • Long-nosed Bandicoot • Large Bent-winged Bat • Powerful Owl
Photo	 **Photo 1 PCT 3262 within the study area**

Table 3 PCT 4028 within the study area

4028 Estuarine Swamp Oak Twig-rush Forest	
PCT ID	4028 Estuarine Swamp Oak Twig-rush Forest
Extent within study area	Approximately 0.23 ha of this PCT occurs within the study area. The example of this PCT occurs in the area surrounding Dibble Avenue Waterhole, in Dulwich Hill.
Description	The occurrence of the PCT occurs as a result of restoration works. Assessment of aerial photography from 1943 shows the location of the PCT being completely devoid of

4028 Estuarine Swamp Oak Twig-rush Forest	
	vegetation. It is understood that restoration has been undertaken by the Inner West Council, and has included planting of canopy, shrub and groundcover species diagnostic of Estuarine Swamp Oak Twig-rush Forest. While survey was unable to access a number of areas of the PCT, species diagnostic of the PCT identified included: • Broad-leaved Paperbark • Guman (Cadigal) - Swamp Oak • Port Jackson Fig • Budjur (Gadigal) | Flax-leaved Paperbark • Durawi (D'harawal) | Spiny-headed Mat-rush • Blue Flax-lily • Berry Saltbush *Einadia hastata* • Sedge *Carex* sp. • Weeping Meadow Grass • Knotwed *Persicaria* sp. • *Eleocharis* sp. • *Hibbertia scandens* • *Syzygium* sp. The following PCTs contain similar floristic and environmental overlap with PCT 4028: • 4026 Estuarine Sea Rush Swamp Oak Forest • 4090 Far North Estuarine Mangrove-Swamp Oak Forest • 4000 Northern Estuarine Paperbark Sedge Forest • 4048 Northern Swamp Oak-Paperbark Forest • 3993 Far North Swamp Oak-Paperbark Tidal Forest • 4029 Far North Creekflat Paperbark Swamp Forest • 4030 Far North Estuarine Swamp Oak Forest • 4032 Far North Floodplain Red Gum Sedge Forest • 3987 Far North Floodplain Paperbark-Swamp Oak Forest These PCTs are not considered likely to occur within the study are due to the physical location of the study area, within the Sydney basin, with these PCTs predominantly being associated with bioregions north of Sydney. PCT 4026 has been excluded due to landscape position, with this PCT being described as "occurring on the edges of tidal estuarine flats along the NSW coast, usually at elevations of below 10 m asl". The location of the PCT within the study area does not conform to this landscape description. The fauna habitat values within the patch are high than those of the surrounding built areas, containing native flowering plants, shelter habitat for terrestrial and arboreal fauna, a dense groundcover layer which would support invertebrate, reptile and amphibian species.
Condition	The community is generally in moderate to high condition due to ongoing restoration and bush regeneration works. Areas of vegetation were not able to be accessed due to fences, however the vegetation was observed to contain a high diversity of diagnostic canopy, small tree, shrub and understory species, and minimal coverage of invasive exotic species.
Threatened ecological community	**Commonwealth EPBC Act**: The occurrence in the study area does not meet the criteria for *Coastal Swamp Oak Forest of New South Wales and South East Queensland* (Endangered Ecological Community [EEC, EPBC Act). Patches of remnant vegetation meet the condition thresholds for the Coastal Swamp Oak Forest under the EPBC Act as the canopy cover is less than 20% exotic. However to be consider patches need to be greater than 0.5 ha and as the patch in the study area comprises only 0.23 ha, the PCT within the study area is not considered to conform to the

4028 Estuarine Swamp Oak Twig-rush Forest	
	EPBC Act form of the EEC. **NSW BC Act**: The occurrence in the study area does meet the criteria for *Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions* (EEC, BC Act). The extent of the PCT mapped within the study area is considered likely to conform to the description of the EEC provided within the Final Determination (NSW Scientific Committee 2011). The following factors are considered in this assessment: • The PCT within the study area contains diagnostic canopy, mid story and groundcover species listed within Section 1.1 of the Final Determination, including Broad-leaved Paperbark, Guman (Cadigal) - Swamp Oak, Durawi (D'harawal) | Spiny-headed Mat-rush, Blue Flax-lily, Sedge *Carex sp.* and Knotweed. • The PCT within the study area occurs on soil mapped as the Birrong soil landscape, which conforms to the grey-black clay-loams and sandy loams described within the Final Determination. • The PCT within the study area occurs in a landscape position conforming with the description of landscape position for the EEC, with pre-1788 vegetation mapping indicating that the locations would have contained the EEC prior to clearing. • The Final Determination acknowledges that the structure and composition of the community can be variable as a result of the previous clearing and landuse history, and does not preclude the presence of the EEC based on the presence of modified or non-original soils. Based on these factors, the PCT within the study area is considered likely to conform to the BC Act listing of the EEC.
Threatened species	The PCT is considered to provide marginal habitat for the following threatened fauna: • Grey-headed Flying-fox • Long-nosed Bandicoot • Large Bent-winged Bat • Southern Myotis • Powerful Owl
Photo	 **Photo 2 PCT 4028 within the study area**



Legend

Study area

Hollow-bearing trees

Hollow-bearing tree

Microbat bat box

Habitat features

Stormwater culvert

Plant community type

3262 Sydney Turpentine Ironbark Forest

4028 Estuarine Swamp Oak Twig-rush Forest

Habitat type

Exotic and shelter habitat

Fruit producing tree

Nectar and fruit producing trees

Nectar and seed producing trees

Nectar producing trees

Seed producing tree

Figure 4.1 Ecological values of the Dulwich Hill–Marrickville HIA

0 80 160 240 320 400

Metres

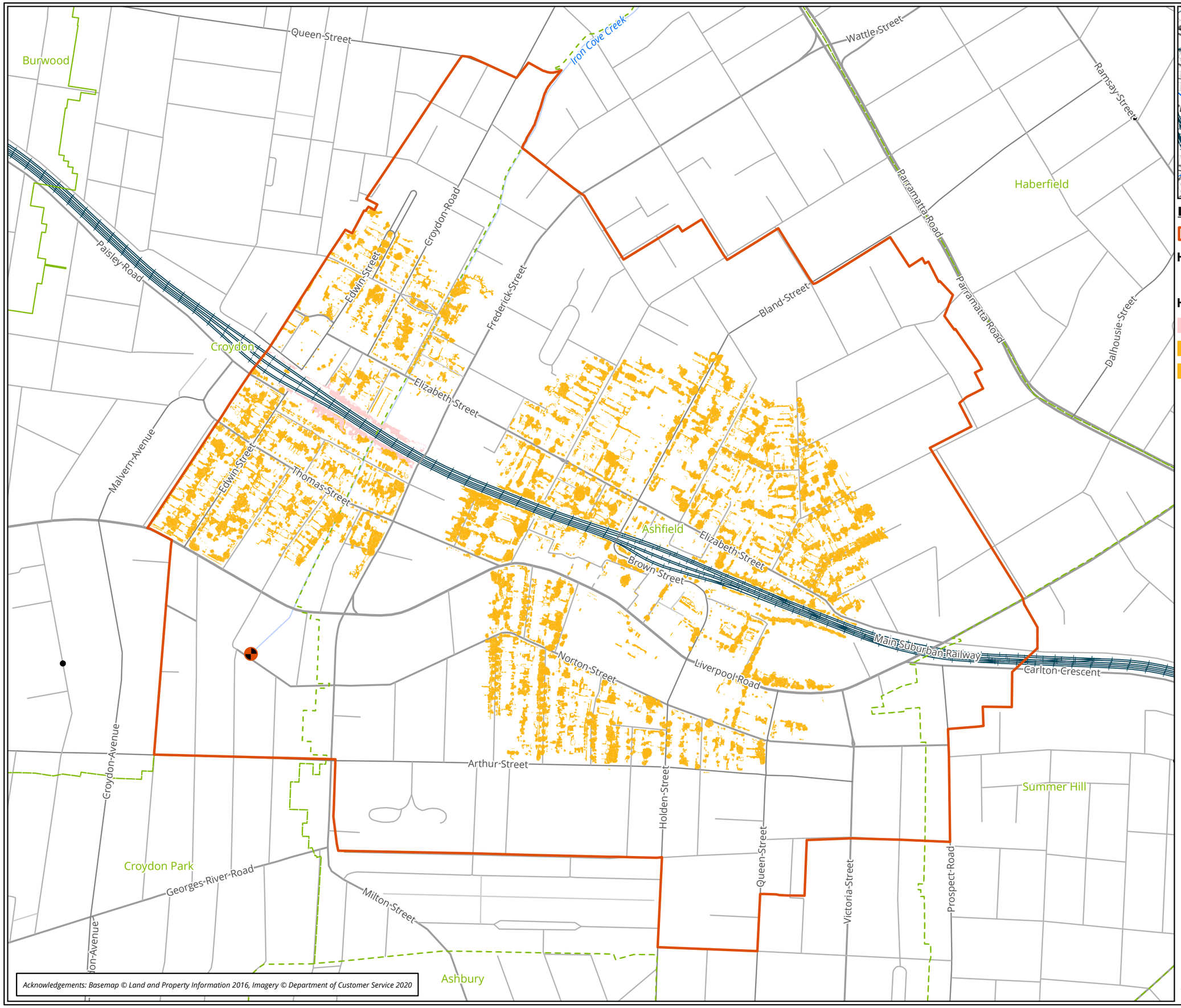
Scale: 1:11,000 @ A3

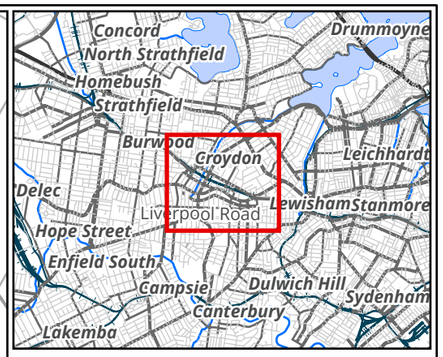
Coordinate System: GDA2020 MGA Zone 56

N

biosis APEM Group

Matter: 41346, Date: 13 November 2024,
Prepared for: MH, Prepared by: AA., Last edited by: aabid
Location: P:\41300s\41346\Mapping\
41346_Inner_West_HIA,
Layout: 41346_F4.1_EcoValues_DM





Legend

Study area

Habitat features

Stormwater culvert

Habitat type

Exotic and shelter habitat

Nectar and fruit producing trees

Nectar producing trees

Figure 4.2 Ecological values of the Ashfield – Croydon HIA

0 60 120 180 240 300

Metres

Scale: 1:8,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

N

biosis

APEMGroup

Matter: 41346, Date: 13 November 2024 ,
Prepared for: MH, Prepared by: AA, Last edited by: aabid
Location: P:\41300s\41346\Mapping\
41346_Inner_West_HIA.aprx
Layout: 41346_F4.2_EcoValues_AC

4.2 Areas of biodiversity value

Areas of particular interest detected across the Dulwich Hill – Marrickville HIA during the field investigation are shown on Figure 4-3 and include the following:

- Greenway Corridor in Dulwich Hill – Marrickville HIA (Table 4).
- Dibble Avenue Waterhole in Dulwich Hill – Marrickville HIA (Table 5).
- Goolay'yari – Cooks River Corridor (Table 6).
- Gumbramora Creek Corridor in the Dulwich Hill – Marrickville HIA (Table 7).
- Street tree and garden plantings.
- Culverts, crossings and artificial habitat.

Areas of particular interest detected across the Ashfield – Croydon HIA during the field investigation are shown on Figure 4-4 and include the following:

- Iron Cove Creek (Table 8).
- St. John's Church (Table 9)
- Street tree and garden plantings.
- Culverts, crossings and artificial habitat.

Table 4 Greenway Corridor in Dulwich Hill – Marrickville HIA

Greenway Corridor	
Managed native vegetation characteristics and condition	The Greenway Corridor commences at the intersection of the western end of Marrickville Golf Course, and travels north via several urban streets and crossings, into a light rail corridor, with areas of reserved vegetation surrounding it. The corridor more broadly encompasses surrounding streets, with areas surrounding the corridor being mapped on the LEP as Terrestrial Biodiversity. The vegetative structure of the corridor is highly variable. Some areas of the corridor have been subject to long-term bush regeneration efforts, such as vegetation adjacent to Waratah Mills, Hoskins Park and north of Davis Street, as well as vegetation within the northern portion of Johnston Park. These areas have high floristic and structural complexity, comprising a high diversity of groundcover grasses and forbs, shrubs, small trees and canopy trees, typically diagnostic of, or associated with, Sydney Turpentine Ironbark Forest. These areas also contain some coarse woody ground debris. Other areas of the corridor contain exotic and native plantings, or are dominated by weeds. Further areas of the corridor exist as spaces managed for recreation or street amenity, such as within the golf course areas, and within the streets surrounding the corridor. The corridor is disjunct in areas, particularly within its southern extent, with hard physical barriers and impermeable surfaces occurring frequently including buildings, fences, roads, and railway corridors. As such, ground-level connectivity is limited in some portions, and would limit the movement of invertebrates, reptiles, amphibians, small birds and terrestrial mammals. Connectivity along the corridor exists for species able to cross these barriers, such as bats and larger birds.
Description including fauna habitat	A variety of flora species were identified throughout the investigation, which provide an array of habitats for predominantly highly mobile and urban-adapted fauna species. The majority of these are considered likely to have been planted, however some may exist as a result of remnant soil-stored seed, with a large number of garden plants and street trees being exotic

Greenway Corridor	
	and non-endemic native species. Some larger trees contained hollows suitable for small to medium sized mammals and birds. Flora species recorded within the Greenway Corridor included: **Southern portion** Canopy species: • Port Jackson Fig • Sydney Blue Gum • Queensland Brush Box *Lophostemon confertus* • Guman (Cadigal) - Swamp Oak • Broad-leaved Paperbark • Camphor Laurel *Cinnamomum camphora* (exotic) Midstorey and ground cover species: • Blueberry Ash • *Notelaea* sp. **Central Portion** Canopy species: • Port Jackson Fig • Turpentine • Tallowwood *Eucalyptus microcorys* • Smooth-barked Apple • Guman (Cadigal) | Swamp Oak • Spotted Gum *Corymbia maculata* • Red Bloodwood Midstorey and ground cover species: • Durawi (D'harawal) | Spiny-headed Mat-rush • Berry Saltbush • Crimson Bottlebrush *Callistemon citrinus* **Northern Portion** Canopy species: • Queensland Brush Box • Grey Gum • Sydney Blue Gum • Bangalay • Turpentine • Rough-barked Apple *Angophora floribunda* • Muggago (D'harawal) | Narrow-leaved Ironbark *Eucalyptus crebra* • Guman (Cadigal) | Swamp Oak Midstorey and ground cover species: • *Lepidosperma laterale* • Coffee Bush • Cheese Tree • Native Blackthorn • Blueberry Ash • Broad-leaved Paperbark

Greenway Corridor	
	• *Melaleuca decora* • Crimson Bottlebrush • Tickbush • Guman (Cadigal) | Swamp Oak • Camphor Laurel * • Curtain Fig *Ficus macrocarpa** • Tantoon *Leptospermum polygalifolium* • Durawi (D'harawal) | Spiny-headed Mat-rush • Brush Cherry *Syzygium australe* • Blue Flax-lily • Weeping Meadow Grass • *Hibbertia scandens* • White Dogwood • Native Geranium • Kidneyweed * Indicates exotic species
Threatened species habitat	Threatened fauna habitat within the Greenway Corridor is extensive. Foraging habitat for Grey-headed Flying Fox, Large Bent-winged Bat and Powerful Owl exists in the form of canopy and shrub vegetation including flowering and fruiting tree species, suitable habitat for Ringtail Possums *Pseudocheirus peregrinus* and for invertebrates. Suitable habitat for Southern Myotis occurs in the form of potential roost habitat within culverts along stormwater drains, and for Long-nosed Bandicoot in areas with contiguous dense understory vegetation and open grasslands within parks and garden beds.
Photos	 **Photo 3 Vegetation structure within Johnson Park**

Greenway Corridor	
	

Photo 4 Vegetation structure adjacent to Hoskins Park

Table 5 Dibble Avenue Waterhole in the Dulwich Hill – Marrickville HIA

Dibble Avenue Waterhole	
Managed native vegetation characteristics and condition	Dibble Avenue waterhole is the location of a formerly natural spring and then disused brickpit. Bank stabilisation work and revegetation around the site has been undertaken, and vegetation surrounding the waterhole was restored in 2021 to recreate the *Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions* (EEC, BC Act). Vegetation structure surrounding the waterhole includes a number of mature canopy trees, in addition to a layer of small trees, dense shrubs and understory layer with a high floristic diversity. The vegetation is non-contiguous with other surrounding patches, such as within the Goolay'yari – Cooks River corridor, with physical barriers surrounding the vegetation on all sides. Interaction between vegetation within the waterhole and the surrounding areas would occur predominantly via aerial pollinators.
Description including fauna habitat	Flora species recorded during the field investigation would provide foraging and shelter resources for a number of fauna species, in particular those moving through the landscape and utilising the area as a "stepping stone". The vegetation would also support reptiles, amphibians and invertebrates. Flora species identified during the field survey included the following: Canopy species: • Broad-leaved Paperbark • Guman (Cadigal) - Swamp Oak • *Melaleuca decora* • Port Jackson Fig • Sydney Peppermint Midstorey and ground cover species: • Durawi (D'harawal) | Spiny-headed Mat-rush • Blue Flax-lily • Berry Saltbush • Sydney Blue Gum. • Knob Sedge *Carex inversa* • Black Wattle *Acacia decurrens*

Dibble Avenue Waterhole	
	• *Callistemon* sp. • Weeping Meadow Grass • Common Rush *Juncus usitatus* • Tall Knotweed *Persicaria elatior* • *Eleocharis* sp. • *Hibbertia scandens* • Plum Pine *Podocarpus elatior* • Budjur (Gadigal) | Flax-leaved Paperbark • *Syzygium* sp.
Threatened species habitat	The habitat available with and surrounding the waterhole would provide foraging habitat for the Grey-heading Flying Fox, and potential foraging and shelter habitat for Powerful Owl and Large Bent-winged Bat. Additionally, the waterhole would provide foraging habitat for the Southern Myotis, and understory vegetation surrounding the waterhole would likely be suitable foraging and shelter habitat for the Long-nosed Bandicoot in the future, once a deeper layer of decomposing material has built up suitable to support mycorrhizal fungi.
Photo	 **Photo 5 Planted juvenile Eucalypts and understory within Dibble Avenue Waterhole**

Table 6 Goolay'yari – Cooks River Corridor in the Dulwich Hill – Marrickville HIA

Goolay'yari – Cooks River Corridor	
Managed native vegetation characteristics and condition	The Goolay'yari – Cooks River Corridor predominantly contains parklands and the Marrickville Golf Course, and contains a variety of tree species, some of which may have regenerated from soil-stored seed following clearing, but many of which are planted. Vegetation throughout the corridor typically consists of canopy species with an open exotic understory utilised for recreational activities, however patches have been subject to significant bush regeneration and restoration efforts, such as within Princess Street Reserve, wetlands at the northern end of Steele Park, and within Warren Park and Marrickville Peace Park. These areas have a diverse native understory and shrub layers.
Description including fauna habitat	A broad diversity of flora species occur within the Goolay'yari – Cooks River Corridor, ranging from those associated with the saline soils adjacent to the river up to shale and sandstone derived soils such as in Marrickville Peace Park. Additionally, due to the number of planted

Goolay'yari – Cooks River Corridor	
	species, there is a large species diversity, particularly of canopy species. Flora species identified included: Canopy species: • Illawarra Flame Tree *Brachychiton acerifolius* • Bangalay • Sydney Blue Gum • Turpentine • Tallowwood • Queensland Brush Box • Moreton Bay Fig *Ficus macrophylla* subsp. *macrophylla* • Grey Gum • Muggago (D'harawal) | Narrow-leaved Ironbark • Port Jackson Fig • Grey Gum • Spotted Gum • Swamp Mahogany • Water Gum | Kanooka • Rough-barked Apple • Forest She-oak • Lemon-scented Gum *Corymbia citriodora* Midstorey and ground cover species: • Bangalow Palm *Archontophoenix cunninghamiana* • Brush Cherry • Coastal Rosemary *Westringia fruticosa* • Tickbush • Sweet Pittosporum • Plum Pine • *Hakea sericea* • Cheese Tree • Southern Silky Oak *Grevillea robusta* • Old Man Banksia *Banksia serrata* • Broad-leaved Paperbark • White Dogwood • Sydney Green Wattle *Acacia parramattensis* • Durawi (D'harawal) | Spiny-headed Mat-rush • Berry Saltbush • Blue Flax-lily • Gymea Lily *Doryanthes excelsa* • Lacy Tree Fern *Cyathea cooperi* • Bracken Fern • Coffee Bush • Guman (Cadigal) | Swamp Oak • Bordered Panic Grass • Basket Grass *Oplismenus aemulus* • Blady Grass • Kangaroo Apple *Solanum aviculare*

Goolay'yari – Cooks River Corridor	
Threatened species habitat	The habitat available along the corridor provides extensive foraging habitat for the Grey-heading Flying Fox and Large Bent-winged Bat, and potential foraging and shelter habitat for Powerful Owl. Additionally, the river provides foraging habitat for the Southern Myotis, and understory vegetation along the corridor would likely be suitable foraging and shelter habitat for the Long-nosed Bandicoot were it present.
Photos	 **Photo 6 Vegetation adjacent to the Princess Street park**
	 **Photo 7 Vegetation within Marrickville Peace Park**

Table 7 Gumbramorra Creek Corridor in the Dulwich Hill – Marrickville HIA

Gumbramora Creek	
Managed native vegetation characteristics and condition	The Gumbramorra Creek Corridor is not clearly defined, as the creek occurs as a concrete drainage channel commencing in Marrickville in proximity to the T3 rail line, and extending south to the Goolay'yari – Cooks River. Nonetheless, some areas of vegetation occurring as native canopy trees exist along the corridor.

Gumbramora Creek	
Description including fauna habitat	Limited vegetation occurs along the corridor, however street trees, trees in yards and within local schools all constitute a semi-contiguous corridor for mobile aerial and arboreal fauna species. Flora species identified included: Canopy species: • Broad-leaved Paperbark • Bangalay • Queensland Brush Box Midstorey and ground cover species: • Blue Flax-lily • Kikuyu *Cenchrus clandestinus* • *Agave* sp.
Threatened species habitat	The vegetation present in this corridor is highly likely to be foraging habitat for Grey-headed Flying Fox, as well as a potential flyway for microbat species, including the threatened Large Bent-winged Bat. It could also provide foraging resources for prey species of the Powerful Owl. The culverts along Gumbramora Creek have the potential to also constitute suitable roosting habitat for the Southern Myotis.
Photos	 **Photo 8 Altered channel along Gumbramorra Creek Corridor**

Table 8 Iron Cove Creek in the Ashfield – Croydon HIA

Iron Cove Creek	
Managed native vegetation characteristics and condition	The Iron Cove Creek corridor lacks vegetation within the southern portion of the Ashfield – Croydon HIA, however overstory canopy trees commence north of Ashfield Aquatic Centre, with street trees and planted garden trees forming the majority of the vegetation along the corridor. Trees commence within the managed corridor itself north of John Street, and comprise predominantly exotic canopy species, with some native species present.
Description including fauna habitat	Limited vegetation occurs along the corridor, however street trees, trees in yards and within the corridor itself all constitute a semi-contiguous corridor for mobile aerial and arboreal fauna species. Flora species recorded included: Canopy species: • Sydney Blue Gum • Queensland Brush Box

Iron Cove Creek	
	• Muggago (D'harawal) | Narrow-leaved Ironbark • Port Jackson Fig Midstorey and ground cover species: • Sweet Pittosporum • Broad-leaved Paperbark • Canary Island Date Palm *Phoenix canariensis*
Threatened species habitat	The vegetation present in this corridor is highly likely to be foraging habitat for Grey-headed Flying Fox, as well as a potential flyway for microbat species, including the threatened Large Bent-winged Bat. It could also provide foraging and shelter resources for prey species of the Powerful Owl. The culverts along Iron Cove Creek have the potential to also constitute suitable roosting habitat for the Southern Myotis.
Photos	 **Photo 9 Iron Cove Creek Southern extent**  **Photo 10 Iron Cove Creek Northern extent**

Table 9 St Johns Church in the Ashfield – Croydon HIA

St Johns Church	
Managed native vegetation characteristics and condition	The grounds of St Johns Church in Ashfield contain a number of locally endemic native species which may have grown from soil-stored seed or resprouted from cleared vegetation, in addition to a number of planted non-endemic native and exotic canopy trees.
Description including fauna habitat	Vegetation within the church grounds exists as large canopy trees over a predominantly exotic understory, with formal garden beds and lawn areas. Species present include: Canopy species: • Turpentine • Port Jackson Fig • Curtain Fig • Blackbutt Midstorey and ground cover species: • Southern Silky Oak • Water Gum • Broad-leaved Paperbark • Smooth-barked Apple • Guman (Cadigal) | Swamp Oak • Spotted Gum • Native Cherry *Exocarpus cupressiformis* • Canary Island Date Palm
Threatened species habitat	The vegetation present within this location is highly likely to be foraging habitat for Grey-headed Flying Fox, as well as a potential foraging habitat for microbat species, including the threatened Large Bent-winged Bat. It could also provide foraging and shelter resources for prey species of the Powerful Owl. Were it present, the grounds would be considered likely to provide suitable shelter and foraging habitat for the Long-nosed Bandicoot.
Photos	 **Photo 11 St Johns Church vegetation**

Table 10 Street tree and garden plantings

Street and Garden Trees	
Managed native vegetation characteristics and condition	A significant proportion of the canopy cover within the two HIAs occurs as planted street trees, and as plantings within private residences and schools. These areas of vegetation are critical for the creation of contiguous canopy connectivity between areas of reserved vegetation, and as a foraging and roosting resource for a multitude of species, particularly those plantings that flower throughout the year. Some of the street trees and plantings within the HIAs are species which may have originally occurred within the *Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion* CEEC, and thus are considered to be of high value.
Description including fauna habitat	Street trees and garden plantings identified during the field investigation included: • Native Cherry • Moreton Bay Fig • Port Jackson Fig • Cheese Tree • Broad-leaved Paperbark • Plum Pine • Turpentine • Lilly Pilly *Syzygium* sp. • Orange, lemon *Citrus* × *sinensis* • Fig *Ficus carica* • Curtain Fig • Frangipani *Plumeria* sp. • Privet (Large-leaf) *Ligustrum lucidum* • Privet (Small-leaf) *Ligustrum sinense* • African Olive *Olea europaea* subsp. *cuspidata* • Canary Island Date Palm • Cocos Palm *Syagrus romanzoffiana* • Star Jasmine *Trachelospermum jasminoides*
Threatened species habitat	The vegetation present in this corridor is highly likely to be foraging habitat for Grey-headed Flying Fox, as well as a potential foraging habitat for microbat species, including the threatened Large Bent-winged Bat. It could also provide foraging resources for prey species of the Powerful Owl.

Street and Garden Trees

Photos

Photo 12 **Planted Wallangarra White Gum containing small hollows**

Photo 13 **Planted trees within 28 Constitution Road, Dulwich Hill**

Street and Garden Trees	
	

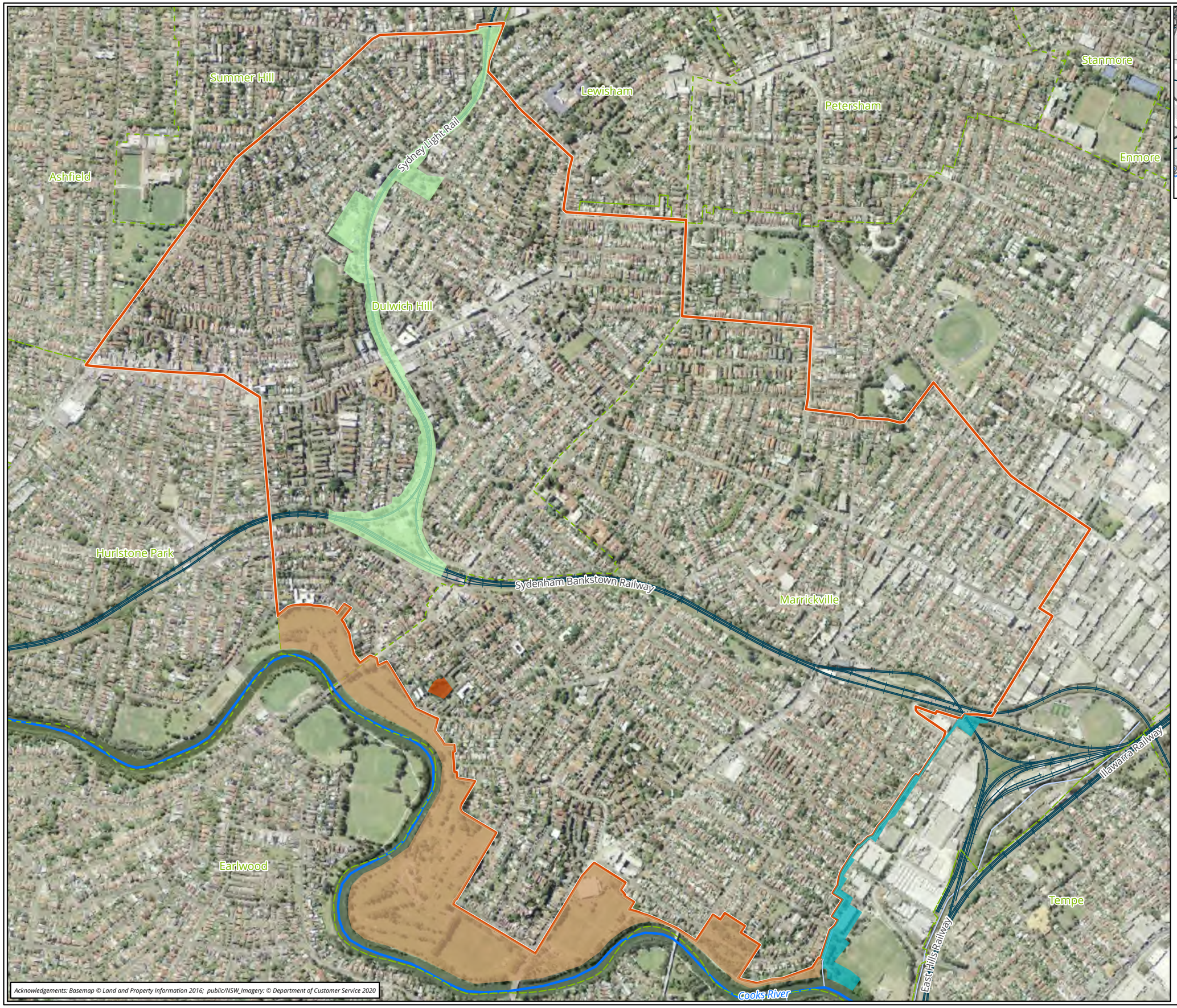
Photo 14 **Planted Mugga Ironbark at Marrickville Golf Course**

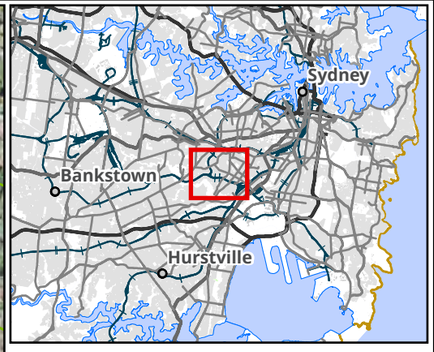
Photo 15 **Planted street and garden trees along The Boulevarde, Dulwich Hill**

Table 11 **Culverts, crossings and artificial habitat**

Culverts, crossings and artificial habitat	
Description including fauna habitat	These habitat features do not correspond to a particular type of managed native vegetation. Culverts are typically associated with drain and road crossings, while crossings exist where drainage channels and tunnels under roads and railway lines occur. Artificial habitat features include nest boxes installed in trees, and artificial hollows cut into existing live or dead trees.
Threatened species habitat	Culverts are regularly used by the Southern Myotis as roost and breeding habitat, and can occur in relatively close proximity to disturbance (pers. obs.). The species often uses culverts in close proximity to large areas of open water, which constitute suitable foraging habitat. Large Bent-wing Bat may also use culverts and tunnels as roost habitat, or as a temporary roost during nocturnal foraging, where the temperature and humidity conditions are appropriate.

Culverts, crossings and artificial habitat	
	Crossings beneath hostile barriers such as roads, railway lines and over stormwater drains may be used on occasion by Long-nosed Bandicoot as a means of movement between areas of shelter and foraging habitat. These can include smaller drains, and road underpasses. Artificially constructed habitat such as nest boxes and carved hollows have the potential to be utilised by threatened microbat species which utilise tree hollows as a roost resource, in addition to their regular use by non-threatened species, such as Ringtail Possums, which are a foraging resource for Powerful Owl.
Photos	 **Photo 16 Culvert containing potential Southern Myotis roosting habitat within Gumbramorra Creek**  **Photo 17 Artificial microbat roosting boxes and carved hollows in a stag within Marrickville Golf Course**





Legend

Study area

Areas of interest

- Greenway Corridor
- Dibble Avenue Waterhole
- Goolay'yari – Cooks River Corridor
- Gumbramora Creek Corridor

Figure 4.3 Areas of interest identified within the Dulwich Hill - Marrickville HIA

0 80 160 240 320 400

Metres

Scale: 1:11,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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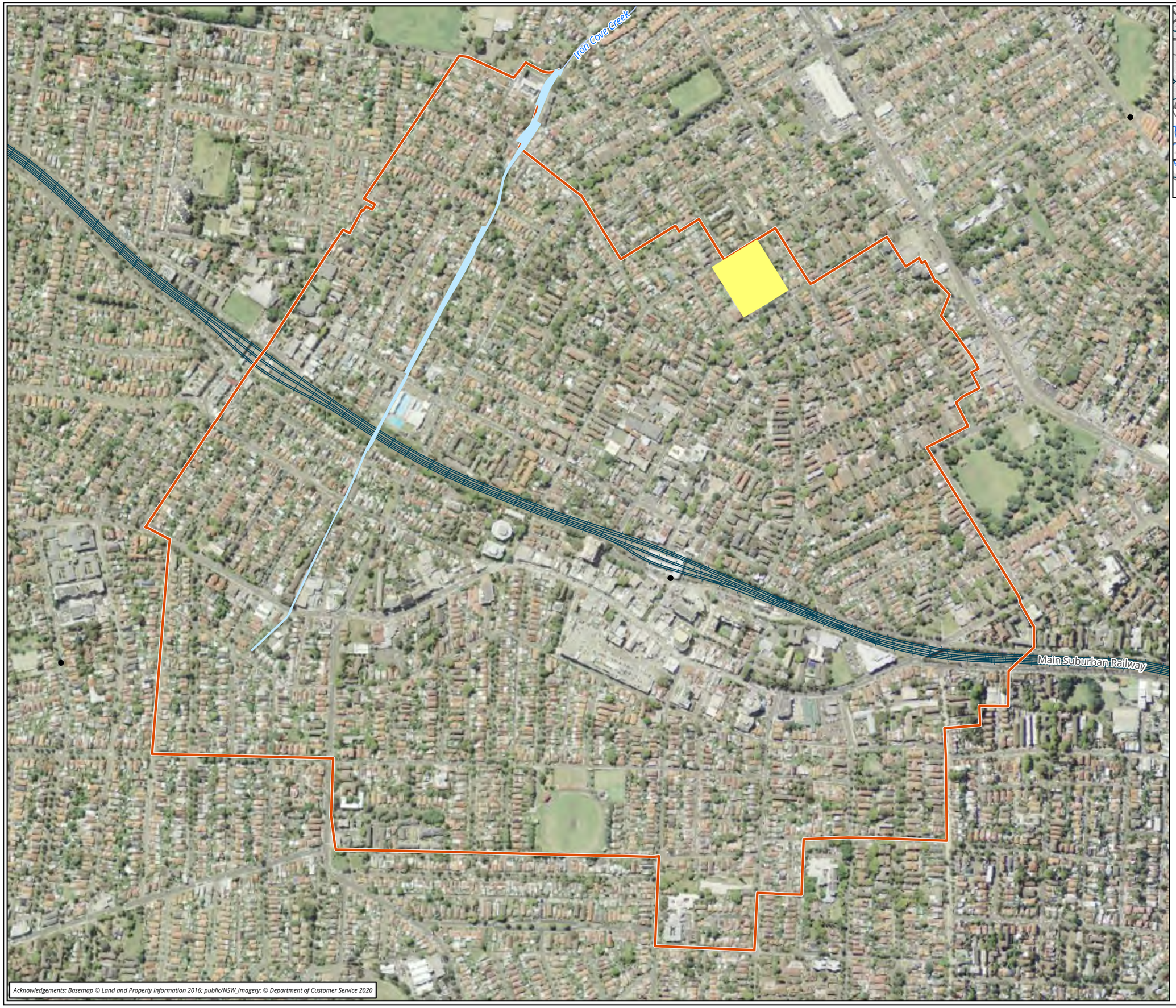
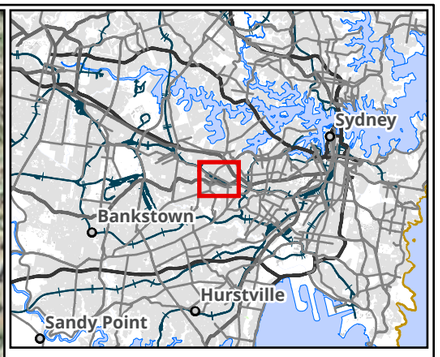
Layout: 41346_F4.3DM_Areasofinterest





Legend

Study area

Areas of interest

Iron Cove Creek

St John's Church

Figure 4.4 Areas of interest identified within the Ashfield - Croydon HIA

0 60 120 180 240 300

Metres

Scale: 1:8,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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4.3 Aquatic habitats

Four major aquatic habitat features were found to occur within or adjacent to the study area, as described in the subsections below.

4.3.1 Goolay'yari – Cooks River in the Dulwich Hill – Marrickville HIA

Goolay'yari – Cooks River is defined as a Strahler order 3 river, and as Key Fish Habitat. The river flows to Botany Bay, and supports a significant number of species of flora and fauna. It acts as a contiguous aquatic and vegetation corridor, providing connectivity for fauna along its 23 kilometre length, and provides core roosting and foraging habitat for a range of species. Movement of fish within this waterway is regularly observed, with avian predators frequently detected foraging within the waterbody. The tidal influence exposes large mud flats at low tide, with significant areas of mangrove providing habitat for both marine and terrestrial invertebrates.

While the river occurs outside the study area, a significant proportion of the Dulwich Hill-Marrickville HIA flow into it, and as such, changes to overland flows, stormwater flow, nutrient load, acidity, dissolved oxygen, temperature, gross pollutants and chemical pollutants as a result of intensified housing development may occur if not effectively managed and mitigated. These factors have the potential to impact Mangrove and Coastal Saltmarsh vegetation communities adjacent to the river, in addition to fish and invertebrate populations and their predators (including the threatened Southern Myotis). Assessment would need to be undertaken for each proposed development within the Dulwich Hill – Marrickville HIA for impact that any future developments would have on surface water flow, stormwater flow, and the potential for impacts during both construction and operation, and masterplanning of the Dulwich Hill – Marrickville HIA should incorporate water pollution mitigation structures in accordance with Water Sensitive Urban Design Principles. This may include the installation of biofiltration features, on-site water detention within developments, and restoration of natural embankments within concreted stormwater drains to slow and filter water prior to it reaching the river.

4.3.2 Dibble Avenue Waterhole in the Dulwich Hill – Marrickville HIA

Dibble Avenue waterhole provides freshwater aquatic habitat for a number of aquatic species including Eastern Snake-necked Turtle *Chelodina longicollis* and Eels *Anguilla* sp. The waterhole would likely also support a population of aquatic macroinvertebrates, and supports vegetation within and surrounding the waterhole that has been restored to recreate the *Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions* EEC.

Impacts to the waterhole from development could include alteration to overland flows, stormwater flow, nutrient load, acidity, dissolved oxygen, temperature, gross pollutants and chemical pollutants. Assessment of these potential impacts should be incorporated into master planning of the Dulwich Hill – Marrickville HIA, as the waterhole falls within the Dulwich Hill TOD zone. As such, masterplanning to include water filtration, retention and management within and between proposed developments should be considered, and development applications must avoid and minimise their impacts to the waterbody.

4.3.3 Gumbramorra Creek Corridor in the Dulwich Hill – Marrickville HIA

The Gumbramorra Creek Corridor exists as a highly-modified concrete-lined drainage channel, with little to no in-stream vegetation. It is mapped as a Strahler order 1 creek and flows into Goolay'yari – Cooks River. Within its lower reaches it is likely subject to tidal flow, and experiences high volumes of stormwater flow during large rainfall events, capturing a large catchment area in the south-western portion of Marrickville. The

creek currently has limited faunal habitat value, other than for microbat species such as the Southern Myotis, which may roost within the culverts along the length of the creek.

Any development which flows into the creek would require assessment to determine whether the increased or modified flows would impact the Southern Myotis, and whether there would be significant increases in the risk of pollution to the Goolay'yari – Cooks River and thus on Key Fish Habitat. Ideally, the creek would be restored over time to have the banks naturalised, and include water calming and filtration structures, and vegetation.

4.3.4 Iron Cove Creek in the Ashfield – Croydon HIA

Iron Cove Creek exists as a concrete-lined drainage channel running south to north, commencing in the south at Croydon and flowing to Iron Cove. The majority of the channel within the Ashfield – Croydon HIA contains limited fauna habitat value, being devoid of vegetation, however areas in the north extent of the creek contain some isolated trees and fringing vegetation adjacent to the creek. The creek is currently subject to rubbish dumping and was noted during survey to contain gross pollutants such as plastic water bottles.

While the creek itself currently has limited fauna habitat value, it flows to Iron Cove which contains Mangrove and Coastal Saltmarsh communities and is Key Fish Habitat. As such, development within the Ashfield and Croydon TOD sites would require planning to ensure that alteration to overland flows, stormwater flow, nutrient load, acidity, dissolved oxygen, temperature, gross pollutants, and chemical pollutants did not increase as a result of development, and that potential impacts were managed through design. These could include measures such as the use of biofiltration, rain gardens, increasing permeability of surfaces within street architecture, on site detention of stormwater within developments, and the application of Water Sensitive Urban Design within masterplanning of streetscapes.

4.4 Threatened species

Background searches identified 31 threatened flora species and 101 threatened fauna species recorded (DPE 2022b) or predicted to occur (Cth DCCEEW 2024b) within 5 kilometres of the Dulwich Hill – Marrickville HIA and 33 threatened flora species and 87 threatened fauna species within 5 kilometres of the Ashfield – Croydon HIA. This is based on a filtered list where migratory and marine species, for which habitat values are not present, have been removed. The results of these background searches are provided in Appendix 1.1 (flora) and Appendix 1.2 (fauna).

BioNet records within 5 kilometres of the Dulwich Hill – Marrickville HIA are shown on Figure 4-5, and records within 5 kilometres of the Ashfield – Croydon HIA are shown on Figure 4-6.

Those species considered most likely to utilise habitat within the study area based on the background research and field investigation are as follows:

Flora

- Magenta Lilly Pilly (Vulnerable, EPBC Act and Endangered, BC Act).
- Wallangarra White Gum (Vulnerable, EPBC Act and Endangered, BC Act).
- Narrow-leaved Peppermint *Eucalyptus nicholii* (Vulnerable, EPBC Act and Vulnerable, BC Act).

Fauna

- Grey-headed Flying-fox (Vulnerable, EPBC Act and BC Act).
- Large Bent-winged Bat (Vulnerable, BC Act).

- Southern Myotis (Vulnerable, BC Act).
- Powerful Owl (Vulnerable, BC Act).
- Long-nosed Bandicoot (Endangered Population, BC Act).

There are records of Common Ringtail Possum in addition to Grey-headed Flying Fox in the study area, which could both be important at a local scale as a prey species for the Powerful Owl. An assessment of the habitat values of the study area is provided in Table 12 for threatened flora species and Table 13 for threatened fauna species.

Table 12 Assessment of habitat for threatened fauna species

Species	Local distribution and habitat requirements	Likelihood of occurrence or impact
Magenta Lilly Pilly	Magenta Lilly Pilly is a commonly planted street tree and the nearby records of this tree almost certainly relate to plantings. No Magenta Lily Pillies were recorded during the field investigation.	As the landscape of the study area is completely disturbed and there was no remnant vegetation observed during the field investigation, it's unlikely the Magenta Lilly Pilly occurs naturally. Any planted specimens should be recorded, protected, and retained.
Wallangarra White Gum	Wallangarra White Gum is a commonly planted street tree and the nearby records of this tree almost certainly relate to plantings. One Wallangarra White Gum was identified during the field investigation, however survey was not exhaustive and additional individuals of the species are considered highly likely to occur within the HIAs.	As the landscape of the study area is completely disturbed and there was no remnant vegetation observed during the field investigation, it's unlikely the Wallangarra White Gum occurs naturally. Furthermore, the study area is a significant distance from any naturally occurring populations of the species, and thus impacts to individuals within the HIA are considered unlikely to impact the species as a whole. Any planted specimens should be recorded, protected, and retained.
Narrow-leaved Peppermint	Narrow-leaved Peppermint is a commonly planted street tree and the nearby records of this tree almost certainly relate to plantings. No individuals of the species were identified during the field investigation; however, survey was not exhaustive and individuals of the species are considered highly likely to occur within the HIAs.	As the landscape of the study area is completely disturbed and there was no remnant vegetation observed during the field investigation, it's unlikely the Narrow-leaved Peppermint occurs naturally. Furthermore, the study area is a significant distance from any naturally occurring populations of the species, and thus impacts to individuals within the HIA are considered unlikely to impact the species as a whole. Any planted specimens should be recorded, protected and retained.

Impact assessments for development applications should include floristic survey of any vegetation impacted directly or indirectly, including searches for these species.

Table 13 Assessment of habitat for threatened and common fauna species

Habitat feature	Threatened fauna association	Likelihood of occurrence or impact
Feed trees	Eucalypts and other flowering perennial species recorded in the study area provide nectar resources suitable for a range of arboreal and	Grey-headed Flying fox are recorded within the study area with 2,166 records in the 5 km radius of the Dulwich Hill – Marrickville HIA (noting that a large portion of those records are wildlife rehabilitation records). There are known camps

Habitat feature	Threatened fauna association	Likelihood of occurrence or impact
	flying fauna (such as Grey-headed Flying-fox and nectivorous bird species) whilst in flower. The mature Port Jackson Figs, Moreton Bay Figs, other *Ficus* spp. assorted Lilly Pilly genus and Illawarra Plums are highly likely to provide fleshy fruit resources suitable for the Grey-headed Flying-fox and other frugivores. In a heavily built-up environment such as the Dulwich Hill, Marrickville, Ashfield and Croydon TOD sites, all nectar and fruit resources are important as they provide seasonal variation in food resources. *Ficus* spp. would be particularly important for frugivores given they may produce fruit year-round. Both nectar and fruit-producing species would provide invertebrate habitat and foraging resources, in turn supporting insectivorous microbat species, such as the Large Bent-winged Bat with food resources. Prey species of the Powerful Owl would utilise such feed trees.	located at Wolli Creek, Turrella and Centennial Park that would utilise food resources within the study area. Large Bent-winged Bat has been recorded roosting approximately 100 metres north of the Dulwich Hill – Marrickville HIA portion of the study area within the Gadigal bat roost, and records of the species foraging within the study area exist. The Powerful Owl has been recorded within the study area in Hoskins Park (Dulwich Hill – Marrickville HIA), with 27 recorded occurrences within the 5km radius of this HIA.
Hollow-bearing trees	Six hollow-bearing trees were detected during the survey (Figure 4-1). These were found to contain nine small and five medium sized hollows, which would support predominantly common fauna species such as Rainbow Lorikeets and Common Brushtail Possums. Threatened fauna species considered likely to occur are not dependant on small and medium sized hollows, however, were large hollows present in the future, these may constitute suitable breeding habitat for the Powerful Owl.	It is recommended that these hollow-bearing trees be retained as an important habitat feature in the landscape, both for potential occupation for threatened and general fauna species.
Nest boxes and artificial hollows	One nest box and four artificially created hollows were identified throughout the survey, all being microbat size (Figure 4-1). This nest box and artificial hollows may provide roosting and/or nesting habitat for microbats. These hollows and the nest box are considered unsuitable for a Powerful Owl.	It is recommended that these hollows and nest box be inspected to ensure they are providing suitable habitat for fauna. Nest boxes and artificial hollows should be inspected annually to ensure they do not become damaged or taken over by invasive species.
Grassland and garden beds	Areas of garden bed and grasses within yards and parks were identified as constituting suitable sheltering and foraging habitat for Long-nosed Bandicoots. These included yards with dense vegetation and open/unobstructed fences, grasslands within parks suitable for foraging, and native gardens within newer residential apartment complexes which contained significant areas of dense groundcover vegetation, suitable for bandicoot shelter, movement, and foraging.	One recent (2018) record of the Long-nosed Bandicoot exists in proximity to Waratah Mills. It is recommended that groundcover vegetation density and connectivity is supported within residential gardens in this locality and is enhanced during additional development activities in the future.

Habitat feature	Threatened fauna association	Likelihood of occurrence or impact
Greenway Corridor	The habitat features within the Greenway (Dulwich Hill – Marrickville HIA) are considered likely to be a flyway and foraging resource for the Powerful Owl, Grey-headed Flying Fox, and Large Bent-winged Bat. Other habitat features within this corridor include exotic trees with dense canopy that provide roosting habitat for Powerful Owl, as well as provide habitat for their prey species.	This is a vital corridor for a range of fauna. It's likely that threatened and non-threatened native fauna species would utilise these habitat features if moving through the study area.
Man-made structures	As demonstrated by the Photo 8 in Table 7, there are numerous culverts present in Gumbramorra Creek, and within the upper reaches of Hawthorne Canal, which originate near the Waratah Mills light rail stop. These culverts contain potential roosting habitat for microbat species.	Known microbat species and potentially threatened microbat species utilise these habitat features for roosting and/or as hunting grounds.

Impact assessments for development applications should include targeted survey of any vegetation impacted directly or indirectly, including searches for these species. Considering all these factors, new development in the TOD sites would need to be planned around protecting the potential and known habitat for the above listed species as well as general fauna species.

4.4.1 Priority weeds

Nine priority weeds for the Greater Sydney LLS, which includes the Inner West Council LGA, have been recorded in the study area, and are listed in Table 14, along with their associated Biosecurity Duty in accordance with the Biosecurity Act.

The Biosecurity Act provides for the identification, classification, and control of priority weeds with the purpose of determining if a biosecurity risk is likely to occur. A priority weed is any weed identified in a local strategic plan, for a region that includes that land or area, as a weed that is or should be prevented, managed, controlled, or eradicated in the region.

The General Biosecurity Duty as outlined in the Biosecurity Act states:

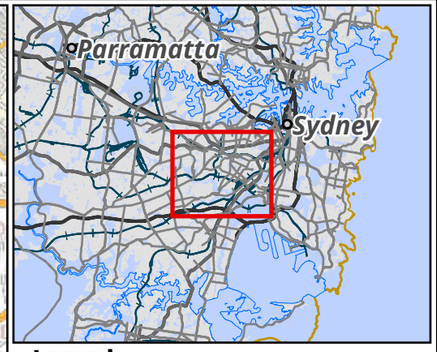
> *All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*

Table 14 Priority weeds within the study area

Scientific name	Common name	Relevant biosecurity duty
Anredera cordifolia	Madeira Vine	**General Biosecurity Duty**
Araujia sericifera	Moth Vine	**General Biosecurity Duty**
Celtis sinensis	Chinese Celtis	**General Biosecurity Duty**
Cestrum parqui	Green Cestrum	**Regional Recommended Measure** Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread

Scientific name	Common name	Relevant biosecurity duty
		of the plant from their land. A person should not buy, sell, move, carry, or release the plant into the environment.
Cinnamomum camphora	Camphor Laurel	**General Biosecurity Duty**
Lantana camara	Lantana	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged, or offered for sale.
Mimosa pigra	Mimosa	**Prohibited Matter** A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries
Olea europaea* subsp. *cuspidata	African Olive	**Regional Recommended Measure** Whole region: The plant or parts of the plant are not traded, carried, grown or released into the environment. Core infestation area: Land managers prevent spread from their land where feasible. Land managers reduce impacts from the plant on priority assets.
Schinus spp.	Pepper Tree	**General Biosecurity Duty**

To prevent biosecurity impacts from occurring as a result of the presence of the above listed priority weeds within the study area, all practical steps should be taken to control and eradicated the weeds from the study area as per the relevant biosecurity duties outlined above, or prior to or during any future vegetation removal. These priority weeds can suppress the growth of native species and create a monoculture (Chinese Celtis, Camphor Laurel, African Olive and Pepper Tree) and/or can smother other vegetation (Madeira and Moth Vine).



Legend

Study area

Assessment area

Flora (BioNet records)

- *Caladenia tessellata*
- *Eucalyptus nicholii*
- *Melaleuca deanei*
- *Persoonia hirsuta*
- *Syzygium paniculatum*
- *Tetratheca juncea*

Fauna

- Diamond Firetail
- Dusky Woodswallow
- Green and Golden Bell Frog
- Grey-headed Flying-fox
- Koala
- Large Bent-winged Bat
- Long-nosed Bandicoot
- Pied Honeyeater
- Powerful Owl
- Regent Honeyeater
- Scarlet Robin
- South-eastern Glossy Black-Cockatoo
- Superb Fruit-Dove
- Yellow-bellied Sheathtail-bat

NOT TO BE MADE PUBLIC

Figure 4.5 BioNet records within the Dulwich Hill – Marrickville HIA

0 200 400 600 800 1,000

Metres

Scale: 1:25,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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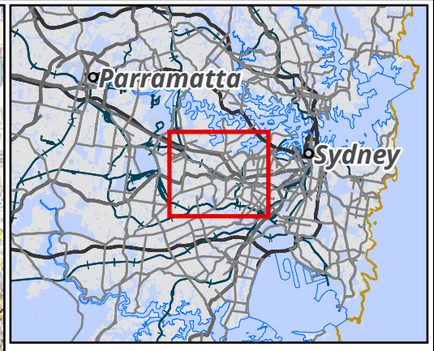
Acknowledgements: LPIMap: © Department of Finance, Services & Innovation 2018, Key corridor species © City of Sydney, (COS Urban Biodiversity Connectivity Planning Project, pp. 103); BioNet records © State Government of NSW and NSW Department of Climate Change, Energy, the Environment and Water 2010 (Records retrieved 06 September 2024)



Legend

- Study area
- Assessment area

Flora (BioNet records)

- *Eucalyptus nicholii*

Fauna

- Bush Stone-curlew
- Flame Robin
- Grey-headed Flying-fox
- Large Bent-winged Bat
- Loggerhead Turtle
- Long-nosed Bandicoot
- Powerful Owl
- Scarlet Robin

NOT TO BE MADE PUBLIC

Figure 4.6 BioNet records within the Ashfield – Croydon HIA

0 200 400 600 800 1,000

Metres

Scale: 1:25,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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5 Constraints and opportunities

5.1 Constraints

The ecological constraints within the study area are shown in Figure 5-1 and described in Table 15. Areas identified as having higher biodiversity values should be protected via planning controls.

Table 15 Ecological constraints in the study area

Constraint	Values	Justification
Higher biodiversity values	• Greenway Corridor. • Goolay'yari – Cooks River Corridor. • Dibble Avenue Waterhole. • Larger patches of contiguous nectar-producing feed trees.	Areas of known habitat that support threatened species foraging, roosting and shelter. Areas of vegetation that provide connectivity and support for non-threatened fauna.
Moderate biodiversity values	• Scattered patches of nectar-producing feed trees. • Areas of canopy vegetation with high connectivity value • Individual large trees.	Areas of habitat which support the core areas of threatened species habitat.
Low biodiversity values	All areas outside of mapped higher and moderate biodiversity values.	Existing areas are already built upon. Street vegetation is less crucial than high and moderate constraint areas.

Legend

Study area

Ecological constraints

Hab_val,PCT,Hab_Type

- High
- High,Exotic and shelter habitat
- High,Fruit producing tree
- High,Nectar and fruit producing trees
- High,Nectar and seed producing trees
- High,Nectar producing trees
- High,Seed producing tree
- High,3262 Sydney Turpentine Ironbark Forest,
- High,4028 Estuarine Swamp Oak Twig-rush Forest,
- High,4028 Estuarine Swamp Oak Twig-rush Forest,Nectar and fruit producing trees
- High,4028 Estuarine Swamp Oak Twig-rush Forest,Nectar and seed producing trees

Figure 5.1 Ecological considerations within the Dulwich Hill – Marrickville HIA

0 80 160 240 320 400

Metres

Scale: 1:11,000 @ A3

Coordinate System: GDA2020 MGA Zone 56

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Figure 5.2 Ecological considerations within the Ashfield – Croydon HIA

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5.2 Opportunities

The urban environment presents unique challenges and opportunities for biodiversity, and specifically, wildlife conservation. There are some specific modifications to consider in retaining and enhancing habitat for native fauna and establishing ecological resilience in native managed vegetation.

5.2.1 Connectivity and corridors

Corridors should seek to maximise vegetation cover and include vertical stratification such that groundcovers, shrub layers and canopy species are all represented well for differing fauna groups. To the fullest extent practicable, minimise disturbance to any native vegetation within the study area, but particularly nectar and fruit-producing feed trees within and surrounding the Goolay'yari – Cooks River and Greenway corridors. Where possible and available, debris material such as reclaimed hollow logs and bush rock should be utilised within areas of managed native vegetation that are being maintained within the Greenway corridor to provide escape cover for small mammals and reptiles. Further opportunities for improving connectivity and corridors are provided in the subsections below.

Native planting recommendations

When revegetation is proposed, the species composition should reflect the soil profile of the area, and include species listed below specific to the pre-clearing Plant Community Types from the location of the proposed revegetation. Species selection should also be chosen to include those that are known to tolerate the harsh conditions (e.g. micro and macro pollution, altered hydrological regimes, altered soils, etc.) of this heavily built environment. Some suggestions for species are identified in Table 16 and the species identified in Section 4.1 should be used initially given they are shown to withstand conditions within the study area. Planting additional species not already in the study area should be completed in stages. These plantings should be monitored, and if successful could be added to the existing species lists, diversifying the existing vegetation. If they fail in high numbers (e.g. >50% mortality), they should be avoided, or other seed stock should be used. This could then be repeated with other species to reduce wasted resources.

Bandicoot-friendly design

Bandicoot presence should be supported through the implementation of bandicoot-friendly design features in new developments, such as incorporation of raised walkways, complex native garden beds in contiguous corridors, limitation of physical barriers to movement, and limitations on lighting intensity. An example of Bandicoot-friendly urban design is shown in Photo 18.

Photo 18 Example of Bandicoot-friendly urban design at Arlington

Seed collection

Where possible seed should both be collected from site as well as nearby localities from microclimates with harsh conditions (such as roadside reserves and headlands) as vegetation in these areas will be already be adapted to the landscape settings with similarly harsh conditions. Where possible canopy species should be mixed such that flowering periods overlap throughout the corridor (i.e. avoid planting just winter-flowering species in one area). This will ensure feeding resources are available throughout the corridor.

Gumbramorra Creek and Hawthorne Canal

Council could consider the feasibility of developing a strategy to rehabilitate sections of Gumbramorra Creek and the upper reaches of Hawthorne Canal within the Greenway corridor by reviewing funding, such as grant opportunities, and entering discussions with Sydney Water. This could involve naturalising sections of these creeks between the T3 rail line and Goolay'yari – Cooks River along Gumbramorra Creek, and from Waratah Mills north along the upper reaches of Hawthorne Canal. Recommendations from the Greenway Master Plan could be applied to the study area, such as incorporating stormwater management systems to capture, treat, and reuse water, reducing environmental impact and supporting sustainable parkland irrigation. If the landscape and design allows, shaping of low points into the corridor to attract water for frogs and access points for fauna should be investigated. Alternatively, if the naturalisation of sections of Gumbramorra Creek and the upper reaches of Hawthorne Canal is not feasible due to limited area available in the urban landscape, incorporating appropriate water sensitive urban design (WSUD) principles that allow for stormwater to be treated close to its source could achieve some positive outcomes for downstream water quality and ecosystem function. To that end, constructing small pocket raingardens, where appropriate, would assist in improving water quality as well as creating habitat. Stormwater capture could be incorporated into a system that would allow for treatment and reuse in local parks and green spaces, minimising reliance on drinking water.

Removal of priority weeds

Nine priority weeds were identified within the study area. Appropriate measures should be implemented to minimise the spread of these species during any future works involving soil disturbance. Exotic vegetation within the Greenway Corridor should be slowly removed in stages, i.e. removing a small patch of Lantana, treating the soil to prepare it for revegetation and planting it out with a variety of native nectar and fruit-producing feed trees with an understory of appropriate native species. Incorporating dense canopy revegetation requirements in DCPs for all new builds in streetscapes of the TOD precincts would not only increase habitat for native fauna but could assist cooling streetscapes in the context of a heating climate. Species should be selected based on their ability to deal with the harsh environment of a streetscape as well as their contribution as a habitat resource.

Actions for threatened species

Minimise disturbance to native vegetation and fauna habitat, and enhance these values where possible, particularly in consideration to threatened mobile fauna, such as the Grey-headed Flying Fox, the Powerful Owl and microbat species such as the Large Bent-winged Bat and Southern Myotis. Specific recommendations for these species and threatened flora are identified below in Table 16.

Table 16 Connectivity management actions specific to target threatened species and key corridor species

Species	Actions
Grey-headed Flying Fox	• Utilise urban parks, gardens, and streetscapes to plant large trees with dense canopies (Welbergen & Eby 2016). • Focus on retaining, replacing and adding to exotic and monocultural tree canopies within streets (such as Camphor Laurel and Queensland Brush Box monocultures) and streetscapes by planting a higher diversity of native flowering and fruiting trees, focusing on extending existing corridors. • Advised tree planting species: Forest Red Gum, Spotted Gum, Smooth-barked Apple, Coast Banksia *Banksia integrifolia*, Broad-leaved Paperbark and *Ficus* spp.
Large Bent-winged Bat, Gould's Wattled Bat and other microbats	• Establish green corridors along major roads and railway lines with continuous canopy cover to facilitate movement between roosting and foraging sites. • Focus on enhancing existing corridors by planting small trees, shrubs and groundcovers beneath canopy trees to provide a diversity of habitats for prey items. • Bury power cables beneath ground in new development areas, allowing for large canopy tree growth without height restriction and a need for management. • Encourage the planting of trees in rows or clusters to create stepping stones of habitat throughout the study area. • Increase structural complexity of vegetation to support a denser humic layer in the soil, and more flowering species suitable for moth foraging. • Create linear strips of vegetation along roadsides, bike paths, and pedestrian walkways. • Where appropriate consider, green roofs and vertical gardens to provide additional foraging areas and connectivity in these densely built areas (Gaston et al. 2013). • Install specifically designed habitat structures on buildings, poles, and trees to provide alternative roosting sites. Ensure these are placed in quiet, sheltered locations and are monitored and maintained regularly. • Enhance urban green spaces with native vegetation that supports insect populations. Include water features such as ponds and fountains to attract insects. • Use a mix of canopy and understorey plants to support foraging needs. • Advised tree and shrub planting species: Tallowood, *Callistemon* spp. and *Leptospermum* spp., Swamp Oak and *Acacia* spp.
Southern Myotis	• Survey for presence within culverts, and support persistence within culverts where present by revegetating surrounding areas. • Limit lighting in proximity to culverts and limit physical obstacles and barriers at entrances and exits to culverts.
Powerful Owl	• Retain and protect large, mature trees in urban parks and gardens. Maintain and enhance park and streetscape vegetation and ensure these areas have a diverse understory to support prey species. • Advised tree and shrub planting species: Sydney Blue Gum, Rough-barked Apple, Turpentine and *Acacia* spp.
Long-nosed Bandicoot	• Decrease physical barriers between gardens, such as implementing gaps beneath fences or spaces for Bandicoots to move through. • Limit the number of "pitfalls" where animals may become trapped with no means of escape. • Support linear and contiguous native vegetation plantings with board walks above. • Minimise lighting in known locations of the species. • Investigate limiting cat movement at night within certain areas. • Ensure that all future developments include areas suitable for Bandicoot foraging and shelter.

Species	Actions
Threatened Flora	• Any threatened flora species observed in the study area should be recorded, retained and protected. • Consult with the NSW Saving Our Species team about the appropriateness of planting Magenta Lilly Pilly into appropriately shaded areas of the Greenway corridor and along Gumbramorra creek.

5.2.2 Microbat flyways

Microbats have the potential to traverse distances of 500 metres or more between habitat corridors in the urban landscape, however, large, and heavily used main roads and other hostile barriers such as train lines are a known barrier (White 2011). These barriers may be deterring microbat species moving from roosting habitats in the north of the study area to foraging habitats throughout the wider locality. Council could investigate the potential to encourage flyway corridors for microbats between the Gadigal bat roost and the remainder of the Greenway to the north and south of the roost through the installation of flyway structures. Law et al. (2011) provide detailed insights into the creation of flyover structures specifically designed to facilitate safe passage for microbats across urban landscapes. A summary of the key points are below:

- The primary goal of the flyover structure is to create a safe passage for microbats over busy roads and other urban obstacles, ensuring connectivity between feeding and roosting sites without the risk of collision with vehicles. The design should take into account the following features:
  - The structure should be elevated at a minimum height of five meters to ensure microbats can comfortably pass over vehicular traffic.
  - The flyover should span the entire width of the road or obstacle, with an additional clearance on either side to account for the potential lateral movement of bats.
  - Utilise materials that blend into the natural environment, such as wood or natural fibres. This can reduce visual pollution and create a more inviting pathway.
  - Incorporating native vegetation on and around the structure can provide additional habitat and foraging opportunities, enhancing the attractiveness of the flyover.
  - The flyover should be designed to minimise light pollution, which can deter microbats from using the structure. This includes avoiding direct lighting on the pathway and using low-intensity, warm-coloured lights.
  - Flyovers should be strategically placed, such as positioning the flyover at points where the distance between sites is shortest.
- Regular maintenance is required to ensure the structure remains in good condition and continues to serve its purpose effectively.
- Periodic monitoring to assess the usage by microbats and any necessary adjustments to the design or placement should be conducted to optimize the structure's effectiveness.

Microbat movements can be encouraged to a lesser degree by considering the impact of lighting and the importance of tree cover in encouraging and directing movement through the landscape. Where flyways are not feasible in urban design, the following principles should be considered to enhance movement of microbats through the landscape:

- Reduce obstacles to movement including:
  - Brightly lit corridors (e.g. lighting over roads).
  - Heavy traffic.
  - High rise buildings.

  - 'Dead ends' – areas where tree cover forms a corridor which stops abruptly at a roadway.
- Facilitate movement through:
  - Tree cover forming an uninterrupted canopy.
  - Tall shrub plantings.
  - Native vegetation.
  - Barriers either side of a crossing which direct movement to the crossing (e.g. lines of trees).

In light of the above factors, movement through the landscape could be encouraged by avoiding barriers to movement during the design of new developments, by incorporating vegetated corridors within and surrounding the developments, and by providing clear linear canopy connectivity to larger areas of habitat.

5.2.3 General strategies to minimise light pollution in existing and future infrastructure

General strategies for minimising the impacts of light pollution on biodiversity from Stone et al. (2012) and Rowse et al. (2016) are provided below:

- Consider retrofitting or incorporating directional lighting into new development or when old lighting needs replacing e.g. directing light downwards to reduce the brightening of the night sky and minimise light spill into vegetation. Use shielded fixtures that focus light where it is needed, such as pathways and building entrances. Avoid upward-facing lights.
- Use warm and low-intensity lighting as these are less disruptive to nocturnal wildlife than blue or white lights. Install lights with colour temperatures below 3000K. Use LEDs with adjustable settings to reduce brightness.
- Reducing lighting during critical nocturnal hours will help limit wildlife disturbance. Implement curfews where non-essential lighting is turned off or dimmed during specific hours, typically from dusk to dawn.
- Use motion sensors and timers to ensure lights are only on when needed. Limiting light to when it is necessary reduces overall light pollution.
- Avoid high-intensity and UV-emitting lights as these attract insects and can disrupt the foraging behaviour of nocturnal species and affects their prey. Choose low-intensity lights and avoid those that emit UV light. Use bug lights or filters that block UV emission.
- Ensure potential microbat roosting sites such as trees, habitat boxes and culverts (where appropriate) are kept in darkness as much as possible. Preserve dark flight paths and foraging areas by minimising light along known and potential flyways.
- Use vegetation or physical barriers to block light from reaching important microbat habitats.

5.2.4 General principles for solar access

Maintaining solar access for native vegetation is an important consideration to avoid shading caused by new development and the disruption of photosynthesis. Buffer zones around existing, established vegetation should be proportional to the height and aspect of the proposed new development. Taller buildings cast longer shadows and thus may require larger buffer zones. Buildings positioned to the north cast a greater shadow, in particular during winter months. On average, for every three meters of building height, an area of four to five meters should be considered for its impacts on shading (NSW DPIEa 2018); (Victoria Department of Transport and Planning 2024); (NSW DPEa 2023).

The orientation of the building relative to the sun's path throughout the year also affects the amount of shade cast and requires consideration in new zoning and builds. For example, vegetation located to the south of

buildings has a greater potential to be affected by overshadowing here in the southern hemisphere (due to shading during winter months when the sun is lower in the sky) (Victoria Department of Transport and Planning 2024).

It should be noted that most existing published recommendations regarding building setbacks relate to amenity, and not biodiversity management. The amount of light required to enable native vegetation to persist in urban landscapes varies depending on tree species, site history, and a variety of local site factors. A few principles should be considered with respect to building heights when a building is located to the north of a vegetated area:

- In areas subject to a greater degree of shading, native trees and shrubs which naturally grow in shaded situations should be considered for new plantings, for example rainforest species including Lilly Pillys, Illawarra Flame Tree, Cheese Tree, and Figs.
- Generally it is best not to increase the shadow cast over parklands beyond the existing condition for reasons of amenity. Existing vegetation may be negatively affected as well, however tree and shrub plantings can adapt to local conditions, so vegetation planted in a parkland after shadow conditions have increased are likely to adapt to these conditions in situ. Existing vegetation may experience stress from lack of sunlight, particularly if these are species which typically grow in open conditions and full sun in their natural environment.

5.2.5 Community engagement and additional development opportunities

Opportunities for community engagement regarding the biodiversity in their neighbourhood, as well as additional development opportunities include:

- Engage with local residents who have significant vegetation within their properties and discuss options for council support of management and enhancement of vegetation patches.
- Educate local residents and businesses about the importance of urban wildlife and encourage them to participate in habitat creation and maintenance on private and public property through programs like Councils' 'Verge Gardens and Adopt-a-spot'. An example verge garden is shown in Photo 19 below.
- Implement measures to mitigate human-wildlife conflicts, such as developing, displaying and sharing guidelines (that are translated into different languages) about how to coexist with wildlife. Content that could be included:
  - The important role Grey-headed Flying Foxes play in pollinating canopy trees and how the diet requirements of wildlife like microbats and frogs can assist with mosquito populations.
  - Infographics explaining the vulnerability of our wildlife to heat stress, habitat loss and a heating climate.
  - Measures such as wildlife-friendly fencing in courtyards and planting endemic native species.
- Engaging wildlife experts to talk at libraries and other public venues in the wider LGA to promote awareness and custodianship of native species.
- Install educational signage that relies heavily on imagery and infographics in areas where Council has undertaken management actions to protect biodiversity explaining the why and how. E.g. in areas where revegetation has taken place or where street lighting has been altered to reduce skyglow.
- Establish citizen science programs to monitor urban wildlife populations and their habitat use. Use this data to adapt management practices as needed.
- In accordance with the *Guidelines for Water Sensitive Urban Design in Sydney*, rooftop, vertical, or midstory gardens should, where appropriate, be considered in new developments to increase foraging resources

for mobile native NSW wildlife species, thereby enhancing urban biodiversity and contributing to sustainable development practices (Soga, M et al. 2014, Jansson & Polasky 2010) (DPIE 2021). New developments could also be required to consider raingardens as part of their design to reduce the amount of hard surfaces and subsequent stormwater run-off. New developments should require a diverse selection of native species as discussed earlier.

- Butterfly habitat can be augmented with plantings of native Rutaceae (citrus), such as *Citrus australasica* Australian Native Finger Lime, the leaves of which are preferred food for its caterpillars.
- Native bee habitat can be augmented by installing clay nest blocks, or 'Bee Hotels', in or near parklands. *How to Make Nest Blocks for Blue Banded Bees* (Dollin 2006) describes a simple method for constructing clay nest blocks. Native bees also nest in soft sandstone cliffs, soft mortar in old brick buildings, and soft earthen banks underneath houses. Landscape features could include elements of soft earth or mortar to encourage nesting as well.
- Even in taller buildings, plantings on ground floor or central courtyards, or even streetside raised planters, vertical gardens, or rooftop gardens can be planted with a variety of native flowering plants which would provide food for pollinators, and in turn attract native birds such as the Superb Fairy-wren.
- Incorporating loose rock walls (i.e., without mortar) and other rock features in parklands and landscaping can provide shelter and basking sites for Eastern Blue-Tongue Lizard and other reptiles. Rock feature should ideally be in sunny locations to enable basking.
- Promote amphibian diversity through the provision of suitable breeding and shelter habitats throughout the study area. Suitable artificial waterbodies could include water features, ponds, even a large pot, basin, or trough would be suitable. The NSW DCCEEW Sydney Nature Team details how to create artificial breeding habitat for frogs in an urban environment at their Frogs in Sydney website.
- Wherever possible with new developments, trees should be retained should be protected in accordance with Australian Standard AS4970 – 2009. Protection of trees on development sites, during construction, operation and decommissioning of the development site. Appropriate erosion and sediment control measures should be installed at all sites to avoid sedimentation of receiving water bodies or other indirect impacts to surrounding biodiversity values.

Photo 19 Example of verge garden on High Street, Marrickville

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Appendices

Appendix 1 Threatened species, populations and communities

Notes to table:

Status – EPBC Act: CE – Critically Endangered EN – Endangered VU – Vulnerable	**Status – BC Act:** E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V – vulnerable (Part 1, Schedule 2)
Status – Exotic ^ – Native species outside natural range * – priority weed species declared under the Biosecurity Act	
Status – Additional # species predicted to occur by the DEE database (not recorded on other databases) ## species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched Year – most recent recorded occurrence of species on databases	

Examples of criteria for determining the likelihood of occurrence for threatened biota as a guide for writing the rationale for likelihood have been listed below.

Likelihood of occurrence	Potential criteria
High	• Species/ecological communities recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies near the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies near the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 5 kilometres or from the relevant catchment/basin.
Medium	• Records of terrestrial biota within 5 kilometres of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 5 kilometres of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality & extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area. • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.

Appendix 1.1. Threatened flora species recorded, or predicted to occur, within 5 kilometres of the study area

The following table includes a list of the threatened flora species and ecological communities that have potential to occur within the study area. The list of species is sourced from the NSW BioNet Wildlife Atlas and the Protected Matters Search Tool.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Acacia bynoeana	Bynoe's Wattle, Tiny Wattle	VU	EN	1913#	Both	Low	Soils and vegetation communities within study area completely modified.	Semi prostrate shrub growing in central eastern NSW spanning from the Hunter District, west to the Blue Mountains and south to the Southern Highlands. Grows in a variety of communities including; Southern Tableland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands and Sydney Coastal Heaths. Prefers open, slightly disturbed sites on sandy soils.
Acacia pubescens	Downy Wattle, Hairy Stemmed Wattle	VU	VU	2018#	Both	Low	Soils and vegetation communities within study area completely modified.	A spreading shrub primarily confined to the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers at Barden Ridge, Oakdale and Mountain Lagoon. Grows in Cooks/River Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland, usually within roadside and bushland remnants. Grows on shale, sandstone, alluvium and gravely soils, often including ironstone.
Acacia terminalis subsp. *Eastern Sydney*	Sunshine wattle	EN	EN	2018	Both	Low	Soils and vegetation communities within study area completely modified.	Erect or spreading shrub limited to coastal areas spanning from the northern shores of Sydney Harbour to Botany Bay. Grows on creek banks, hillslopes or in shallow soil in rock crevices and sandstone platforms in cliffs in Sydney Coastal Dry Sclerophyll Forests, Coastal Headland Heaths, Sydney Coastal Heaths and Wallum Sand Heaths. Grows in sandy soils.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Allocasuarina glareicola	-	EN	EN	#	Both	Low	Soils and vegetation communities within study area completely modified.	Small, depauperate shrub restricted to a few populations in the Richmond district with an outlier population at Voyager Point in Liverpool. Grows in Castlereagh Woodlands, Cumberland Dry Sclerophyll Forest, Sydney Hinterland Dry Sclerophyll Forest, Sydney Sand Flats Dry Sclerophyll Forests. Grows in lateritic soil.
Caladenia tessellata	Thick Lip Spider Orchid	VU	EN	2008#	Both	Low	Soils and vegetation communities within study area completely modified.	Small orchid recorded from the Wyong, Ulladulla and Braidwood regions with the Kiama and Queanbeyan populations believed to be extinct. Found in a wide variety of communities including Central Gorge Dry Sclerophyll Forests, Cumberland Dry Sclerophyll Forests, Coastal Floodplain Woodlands and Subalpine Woodlands. Grows on clay loam or sandy soils.
Calochilus pulchellus	Pretty Beard Orchid, Pretty Beard-orchid	EN	EN	#	Dulwich Hill - Marrickville HIA only	Low	Soils and vegetation communities within study area completely modified.	Terrestrial herb endemic to New South Wales, known only to occur in the Shoalhaven region. This orchid is a cryptic species, which grows on sandy-loam soils in the low wet heath understory of woodlands dominated by Scribbly Gum (Eucalyptus haemastoma).
Cryptostylis hunteriana	Leafless Tongue-orchid	VU	VU	#	Both	Low	Soils and vegetation communities within study area completely modified.	Orchid with a distribution spanning from Gibraltar Range National Park southwards to the coastal area near Orbost in Victoria. Grows in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, Coastal Heath Swamps, New England Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows in sandy soils.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Darwinia biflora	-	VU	VU	#	Both	Low	Soils and vegetation communities within study area completely modified.	Erect shrub distributed in the Ku-ring-gai, Hornsby, Baulkham Hills and Ryde local government areas. Grows on edges of weathered shale capped ridges in the vicinity of an intergrade with Hawkesbury sandstone in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows in shale-sandstone transitional soils.
Eucalyptus camfieldii	Camfield's Stringybark	VU	VU	#	Both	Low	Soils and vegetation communities within study area completely modified.	Mallee tree restricted to a narrow band stretching from Raymond Terrace to the north and Waterfall in the south. Grows in scattered, localised distributions including sites at Norah Head, Terrey Hills, North Head, Menai, Mt Colah, Peats Ridge and Elvina Bay Trail. Grows in scattered stands near the boundaries of tall coastal heath and low open woodland in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, Eastern Riverine Forests, Sydney Coastal Heaths and Wallum Sand Heaths. Grows in sandy soils on Hawkesbury sandstone.
Eucalyptus nicholii	Narrow-leaved Black Peppermint	VU	VU	2006	Both	High	Commonly planted street tree, one record from Summer Hill immediately adjacent to study area. Likely to occur but not locally endemic.	Medium sized tree, sparsely distributed from Nundle through to the north of Tenterfield, also in urban tree plantings. Grows on slopes and ridges in a variety of communities including New England Dry Sclerophyll Forests, Western Slopes Dry Sclerophyll Forests, New England Grassy Woodlands and Tableland Clay Grassy Woodlands. Grows on shallow, infertile soils on shale substrates.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Eucalyptus scoparia	Wallangarra White Gum	VU	EN	2024	Dulwich Hill - Marrickville HIA only	Known	Commonly planted street tree, detected within study area. Not locally endemic.	In NSW it is known from only three locations near Tenterfield, including Bald Rock National Park. In Queensland it is equally rare, occurring at three sites on the Stanthorp Plateau including one population in Girrawween National Park. Only one Queensland population has more than a dozen trees. 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 can occur in less rocky soils in damp situations. Commonly planted street tree.
Genoplesium baueri	Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid	EN	EN	#	Both	Low	Soils and vegetation communities within study area completely modified.	Terrestrial orchid with 13 populations totalling 200 plants distributed between Ulladulla and Port Stephens. Grows on moss gardens in a variety of communities including Sydney Coastal Dry sclerophyll Forests, Sydney Coastal Heaths, Sydney Montane Heaths, Southern Lowland Wet Sclerophyll Forests and Sydney Hinterland Dry Sclerophyll Forests. Grows on sandstone substrates
Leucopogon exolasius	Woronora Beard-heath	VU	VU	#	Both	Low	Soils and vegetation communities within study area completely modified.	Erect shrub confined to the upper Georges River area and Heathcote National Park. Grows in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Sydney Montane Dry Sclerophyll Forests, Eastern Riverine Forests, and Sydney Coastal Heaths. Grows on sandstone substrates.
Macadamia integrifolia	Macadamia Nut	VU	-	2021	Both	Low	Soils and vegetation communities within study area completely modified.	Medium sized tree found growing from Mount Bauple, near Gympie to Currumbin Valley in the Gold Coast hinterland in south-east Queensland. Occurs in the Northern Rivers region of NSW in remnant rainforest, mixed notophyll forest and rainforest margins.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Melaleuca biconvexa	Biconvex Paperbark	VU	VU	#	Both	Low	Soils and vegetation communities within study area completely modified.	Large shrub or small tree confined to NSW with scattered, widely dispersed populations around the Jervis Bay area in the south and the Gosford-Wyong area to the north. Grows in damp places, often near streams or low lying areas on low slopes or sheltered aspects in a variety of communities including Hunter-Macleay Dry Sclerophyll Forests, Coastal Swamp Forests, Coastal Floodplain Wetlands, Coastal Freshwater Lagoon and North Coast Wet Sclerophyll Forests. Grows in alluvial soils.
Melaleuca deanei	Deane's Paperbark	VU	VU	1912#	Both	Low	Soils and vegetation communities within study area completely modified.	Medium sized shrub found growing in two distinct populations in the Ku-ring-gai/Berowra and Holsworthy/Wedderburn areas along with a few outliers at Springwood and in the Wollemi National Park, Yalwal and the Central Coast regions. Grows in ridgetop woodland in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, South East Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands, Sydney Coastal Heaths. Grows on sandstone substrates in alluvial soils.
Persicaria elatior	Knotweed, Tall Knotweed	VU	VU	#	Both	Low	Soils and vegetation communities within study area completely modified.	Erect herb found growing in south-eastern NSW at Mount Dromedary, Moruya State Forest near Turlinjah, Upper Avon River catchment north of Robertson, Bermagui and Picton Lakes. Also grows in northern NSW around Raymond Terrace near Newcastle and Cherry Tree and Gibberagee State Forests in the Grafton area. Grows in damp places usually on the margins of waterbodies and in swamp forests in a variety of communities including Coastal Floodplain Wetlands, Coastal Swamp Forests, Eastern Riverine Forests, Coastal Freshwater Lagoons and Coastal Heath Swamps.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Persoonia hirsuta	Hairy Geebung	EN	EN	1898	Both	Low	Soils and vegetation communities within study area completely modified.	Spreading, hairy shrub with a scattered distribution throughout Sydney from Singleton to the north, the east coast of Bargo to the south and the Blue Mountains to the west. Grows at elevations between 350 - 600 metres in a variety of communities including Southern Tableland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Western Slopes Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands, Sydney Coastal Heaths and Southern Escarpment Wet Sclerophyll Forests. Grows in sandy soils on sandstone substrates.
Pimelea curviflora var. *curviflora*	-	VU	VU	1907#	Both	Low	Soils and vegetation communities within study area completely modified.	Small to medium sized shrub restricted to the coastal areas of Sydney between northern Sydney and Maroota with an outlying population at Croom Reserve near Albion Park in the Illawarra region. Grows on ridgetops and upper slopes amongst grasses and sedges in a variety of communities including Cumberland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands, Sydney Coastal Heaths and Northern Hinterland Wet Sclerophyll Forests. Can be inconspicuous amongst grasses and sedges although easier to find in October to May when flowering. Grows on sandstone substrates in shale/lateritic soils and shale/sandstone transition soils.
Pimelea spicata	Spiked Rice-flower	EN	EN	#	Both	Low	Soils and vegetation communities within study area completely modified.	Small erect or spreading shrub with populations occurring in two disjunct areas, one occurring on the Cumberland Plain from Marayong and Prospect Reservoir south to Narellan and Douglas Park, and the other occurring in the Illawarra from Landsdowne to Shellharbour and north Kiama. Grows in Maritime Grasslands and Coastal Valley Grassy Woodlands including Cumberland Plain Woodlands and Moist Shale Woodlands within the Cumberland Basin and in Coast Banksia Open Woodland Coastal Grasslands in

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
								the Illawarra region. Grows on well structured clay soils.
Pomaderris brunnea	Rufous Pomaderris, Brown Pomaderris	VU	EN	#	Dulwich Hill - Marrickville HIA only	Low	Soils and vegetation communities within study area completely modified.	Medium sized shrub with a distribution limited to the area around the Colo, Nepean and Hawkesbury Rivers including the Bargo area and near Camden. Grows on floodplains and creeklines in a variety of communities including Sydney Hinterland Dry Sclerophyll Forests, Central Gorge Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Coastal Valley Grasslands and North Coast Wet Sclerophyll Forests. Grows in clay and alluvial soils.
Pterostylis saxicola	Sydney Plains Greenhood	EN	EN	#	Both	Low	Soils and vegetation communities within study area completely modified.	Deciduous terrestrial orchid restricted to a few small populations located in Western Sydney between Freemans Reach in the north and Picton in the south including Georges River National Park. Found growing near streams in depression on sandstone rock shelves above cliff lines faces, moist, sheltered ridges and creek banks on mossy rocks in Temperate Montane Grasslands, Northern Warm Temperate Rainforests, Southern Warm Temperate Rainforests and Southern Tableland Wet Sclerophyll Forests. Grows in small pockets of shallow shale or shale/sandstone transition soils over sandstone substrates.
Pterostylis spp.	Greenhood	CE	-	2018	Both	Low	Soils and vegetation communities within study area completely modified.	The Illawarra Greenhood is a deciduous orchid that is only visible above the ground between late summer and spring, and only when soil moisture levels can sustain its growth. The leaf rosette grows from an underground tuber in late summer, followed by the flower stem in winter. After a spring flowering, the plant begins to die back and seed capsules form (if pollination has taken place).

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Rhizanthella slateri	Eastern Underground Orchid	EN	VU	#	Both	Low	Soils and vegetation communities within study area completely modified.	Terrestrial orchid with a distribution spanning from south-east NSW to south-east Queensland. Recorded in ten populations in NSW including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wisemans Ferry Area, Agnes Banks and near Nowra. A cryptic species which grows beneath the soil surface with flowers being the only part of the plant to occur aboveground in Sydney Sand Flats Dry Sclerophyll Forests, Eastern Riverine Forests, Northern Warm Temperate Rainforests, North Coast Wet Sclerophyll Forests, Northern Hinterland Wet Sclerophyll Forests and Southern Lowland Wet Sclerophyll Forests. Grows in deep loam soils.
Rhodamnia rubescens	Scrub Turpentine	CE	CR	#	Both	Low	Soils and vegetation communities within study area completely modified.	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.
Rhodomyrtus psidioides	Native Guava	CR	CR	#	Both	Low	Soils and vegetation communities within study area completely modified.	Shrub or small tree which typically grows to 12 metres high. Populations are typically restricted to coastal regions of low elevation between Sydney and Maryborough, Queensland. Often found in littoral, warm temperate and subtropical rainforests and wet sclerophyll forests near creeks and drainage lines. This species is known to be particularly susceptible to myrtle rust.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Syzygium paniculatum	Magenta Lilly Pilly	VU	EN	2022#	Both	Medium	Although no individuals were recorded during the field investigation, there are records within the 5 kilometre radius. Likely to have been planted as a street tree.	Small to medium sized rainforest tree restricted to a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Found growing on stabilized dunes near the sea in South Coast Sands Dry Sclerophyll Forests, Coastal Swamp Forests, Coastal Headland Heaths, Littoral Rainforests, Northern Hinterland Wet Sclerophyll Forests and Southern Lowland Wet Sclerophyll Forests. Grows on grey sandy, gravelly, silty or clay soils over sandstone substrates.
Tetratheca juncea	Black-eyed Susan	VU	VU	1913	Both	Low	Soils and vegetation communities within study area completely modified.	Small shrub confined to the northern area of the Sydney Basin bioregion and the southern area of the North Coast bioregion in the Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock Local Government Areas. Found growing at well drained sites which experience annual rainfall levels between 1000 and 1200 mm at elevations below 200 metres in swampy heath and moist forests. Usually found growing in soils from the Awaba soil landscape comprising of low nutrient sandy, skeletal soils, sandy loam soils and clay soils on sandstone or conglomerate substrates.
Thelymitra kangaloonica	Kangaloon Sun Orchid	CR	CR	#	Both	Low	Soils and vegetation communities within study area completely modified.	Terrestrial orchid confined to the southern tablelands in the Moss Vale, Kangaloon, Fitzroy Falls area with the majority growing on land managed by the Sydney Catchment Authority. Found growing in swamps and sedgelands at elevations between 550 and 700 metres in Temperate Highland Peat Swamps on Sandstone, Coastal Heath Swamps and Montane Bogs and Fens. A cryptic species which is most visible when flowering between late October and early November. Grows in grey silty or grey loam soils.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Thesium australe	Austral Toadflax, Toadflax	VU	VU	#	Both	Low	Soils and vegetation communities within study area completely modified.	Small, straggling herb with a distribution comprising of small populations scattered along the coast of eastern NSW including the Northern and Southern Tablelands, Tasmania, Queensland and eastern Asia. A root parasite found growing on damp sites in grassland, grassy woodlands and coastal headlands often in association with Kangaroo Grass Themeda triandra in a variety of communities including New England Dry Sclerophyll Forests, Western Slopes Grasslands, Northern Tableland Wet Sclerophyll Forests, Brigalow Clay Plain Woodlands, Subalpine Woodlands and Maritime Grasslands.
Wilsonia backhousei	Narrow-leafed Wilsonia	-	VU	1905	Both	Low	Soils and vegetation communities within study area completely modified.	Small, sprawling, matted shrub confined to the coastal between Mimosa Rocks National Park and Wamberal north of Sydney including Nelson's Lake, Potato Point, Sussex Inlet, Wowly Gully, Parramatta River at Ermington, Clovelly, Voyager Point, Wollongong and Royal National Park. Found growing on the margins of coastal saltmarshes and lakes in Coastal Floodplain Wetlands, Temperate Montane Grasslands, Mangrove Swamps and Saltmarshes.
Callistemon linearifolius	Netted Bottle Brush	-	VU	2008	Ashfield - Croydon HIA only	Low	Soils and vegetation communities within study area completely modified.	Shrub recorded from the Georges River to the Hawkesbury River, north of the Nelson Bay area and south at Coalcliff in the Illawarra region. Grows on the coast and adjacent ranges in a variety of communities including Cumberland Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Sydney Coastal Heaths and North Coast Wet Sclerophyll Forests.
Deyeuxia appressa	-	EN	EN	#	Ashfield - Croydon HIA only	Low	Soils and vegetation communities within study area completely	Erect, perennial grass, endemic to NSW. Restricted to two records, one in 1930 at Herne Bay south of Bankstown and the other in 1941 from Killara near Hornsby. Grows on wet ground in Sydney Coastal Dry Sclerophyll Forests and Eastern Riverine Forests.

Scientific Name	Common Name	Conservation status		Most recent record	Occurrence within 5 km of HIAs	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
							modified.	
Epacris purpurascens var. purpurascens	-	-	VU	2023	Ashfield - Croydon HIA only	Low	Soils and vegetation communities within study area completely modified.	Erect shrub distributed from Gosford in the north, Silverdale to the west, Narrabeen in the east and Avon Dam in the south. Grows in scrubs and swamps in a variety of communities including Cumberland Dry, Sydney Hinterland Dry, Northern Hinterland Wet, and Southern Tableland Wet Sclerophyll Forests, Eastern Riverine Forests, and Coastal Valley Grassy Woodlands. Grows in soils with a strong shale influence on sandstone substrates.
Prostanthera marifolia	Seaforth Mintbush	CE	CR	1905	Ashfield - Croydon HIA only	Low	Soils and vegetation communities within study area completely modified.	Small erect straggly shrub restricted to a single population fragmented by urbanisation into three sites located in the northern Sydney suburb of Seaforth. Found growing on ridge tops in association with Silvertop-ash Eucalyptus sieberi and Red Bloodwood within or in close proximity to Duffys Forest and in Sydney Coastal Dry Sclerophyll Forests. Grows in deeply weathered clay associated with ironstone nodules and scattered shale lenses.

* - habitat descriptions have been adapted by qualified ecologists from the Cth DCCEEW Species Profile and Threats (SPRAT) Database, NSW DCCEEW Threatened Species online profiles and the NSW Scientific Committee final determinations for listed species, references within the above table are provided within the report reference list.

Appendix 1.2. Threatened fauna species recorded, or predicted to occur, within 5 kilometres of the study area

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
Birds									
Anthochaera phrygia	Regent Honeyeater	CE	CR		1996#	Both	Negligible	Habitat absent.	Regent Honeyeaters are semi-nomadic, occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests. Nectar and fruit from mistletoes are also eaten. This species usually nest in tall mature eucalypts and sheoaks.
Ardenna carneipes	Flesh-footed Shearwater, Fleshy-footed Shearwater	Mi	VU		#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	The Flesh-footed Shearwater is an oceanic species usually found beyond the edge of the continental shelf.
Ardenna grisea	Sooty Shearwater	Mi			2012#	Both	Negligible	Habitat absent.	The Sooty Shearwater is a seabird species with a widespread distribution across the Southern Hemisphere. It inhabits pelagic waters, nesting on remote islands and coastal cliffs, and undertakes long-distance migrations.
Arenaria interpres	Ruddy Turnstone	VU, Mi			1992#	Both	Negligible	Habitat absent.	Inhabits tidal reefs, sandy beaches mudflats and exposed or shallow seaweed beds.
Artamus cyanopterus cyanopterus	Dusky Woodswallow		VU		2007	Both	Negligible	Habitat absent.	Primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
Botaurus poiciloptilus	Australasian Bittern	EN	EN		2014#	Both	Negligible	Habitat absent.	The Australasian Bittern is distributed across south-eastern Australia. Often found in terrestrial and estuarine wetlands, generally where there is permanent water with tall, dense vegetation including Typha spp. and *Eleoacharis* spp.. Typically this bird forages at night on frogs, fish and invertebrates, and remains inconspicuous during the day. The breeding season extends from October to January with nests being built amongst dense vegetation on a flattened platform of reeds.
Burhinus grallarius	Bush Stone-curlew		EN		2015	Both	Negligible	Habitat absent.	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Occurs in lightly timbered open forest and woodland, or partly cleared farmland with remnants of woodland, with a ground cover of short sparse grass and few or no shrubs where fallen branches and leaf litter are present.
Calidris acuminata	Sharp-tailed Sandpiper	VU, Mi			2017#	Both	Negligible	Habitat absent.	This species is a migratory visitor to Australia, and spends its breeding season in Siberia. In the non-breeding season, the Sharp-tailed Sandpiper is known to occur mostly in the south-east of Australia, but has been found on coastlines all throughout the country.
Calidris alba	Sanderling	Mi	VU		2000#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	Occurs on the coast mostly on open sand beaches exposed to open sea-swells.
Calidris canutus	Red Knot, Knot	EN, Mi			2003#	Both	Negligible	Habitat absent.	Typically located within intertidal mudflats, sandflats and sandy beaches of sheltered coasts. Occasionally found on

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
									sandy open beaches or shallow pools, or in saline wetlands close to the coast.
Calidris ferruginea	Curlew Sandpiper	CE, Mi	EN		2013#	Both	Negligible	Habitat absent.	Inhabits sheltered intertidal mudflats. Also non-tidal swamps, lagoons and lakes near the coast. Infrequently recorded inland.
Calidris tenuirostris	Great Knot	CR, Mi	VU		2000#	Both	Negligible	Habitat absent.	Mainly found on intertidal mudflats, sandflats and sandy beaches. Rarely found on inland lakes and swamps, instead preferring sheltered coastal habitats. In hot conditions, the Great Knot often roosts on damp substrates to keep cool.
Callocephalon fimbriatum	Gang-gang Cockatoo	EN	EN		#	Both	Negligible	Habitat absent.	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.
Calyptorhynchus lathami	South-eastern Glossy Black-Cockatoo	VU	VU		2020#	Both	Negligible	Habitat absent.	Inhabits forest with low nutrients, characteristically with key Allocasuarina species. Tends to prefer drier forest types. Often confined to remnant patches in hills and gullies. Breed in hollows stumps or limbs, either living or dead.
Charadrius leschenaultii	Greater Sand Plover	VU, Mi	VU		2000#	Both	Negligible	Habitat absent.	Entirely coastal in NSW, foraging on intertidal sand and mudflats in estuaries and roosting during high tide on sandy beaches or rocky shores. Individuals have been recorded on inshore reefs, rock platforms, small rocky islands and sand cays on coral reefs, within Australia. Occasional sightings have also occurred on near-coast saltlakes, brackish swamps, shallow freshwater wetlands and grassed paddocks.

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
Charadrius mongolus	Lesser Sand Plover	EN, Mi	VU		2000#	Both	Negligible	Habitat absent.	In Australia, the species is known to favour coastal environs including beaches, mudflats and mangroves. Within NSW, individuals have been observed on intertidal sand and mudflats in estuaries or roosting on sandy beaches or rocky shores at high tide.
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	VU	VU		#	Both	Negligible	Habitat absent.	Lives in eucalypt woodlands, especially areas of relatively flat open woodland typically lacking a dense shrub layer, with short grass or bare ground and with fallen logs or dead trees present.
Dasyornis brachypterus	Eastern Bristlebird	EN	EN		#	Both	Negligible	Habitat absent.	Found in coastal woodlands, dense scrub and heathlands, particularly where it borders taller woodlands.
Diomedea antipodensis	Antipodean Albatross	VU, Mi	VU		#	Both	Negligible	Habitat absent.	A marine pelagic species endemic to New Zealand, which is known to forage off the coast of New South Wales. This species is known to feed on cephalopods, fish and crustaceans.
Diomedea epomophora	Southern Royal Albatross	VU, Mi			#	Both	Negligible	Habitat absent.	During the non-breeding season, it has a wide and possibly circumpolar distribution, ranging north to about 35°S. The Royal Albatross is moderately common throughout the year in offshore waters of southern Australia, mostly off southeastern NSW, Victoria and Tasmania. Off South Australia, they are mostly seen May to September.
Diomedea exulans	Wandering Albatross	VU	EN		1968#	Both	Negligible	Habitat absent.	A marine, pelagic and aerial species. Versatile feeders in pelagic and shelf waters. Breed on subantarctic and antarctic islands.
Diomedea gibsoni	Gibson's Albatross	VU	VU		#	Both	Negligible	Habitat absent.	A marine pelagic species which breeds on the Auckland islands, New Zealand.

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
Diomedea sanfordi	Northern Royal Albatross	EN, Mi			#	Both	Negligible	Habitat absent.	The Northern Royal Albatross ranges widely over the Southern Ocean, with individuals seen in Australian waters off south-eastern Australia. The Northern Royal Albatross feeds regularly in Tasmanian and South Australian waters, and less frequently in NSW waters.
Epthianura albifrons	White-fronted Chat		VU		1992	Ashfield - Croydon HIA only	Negligible	Habitat absent.	Sydney Metropolitan CMA: The White-fronted Chat occupies foothills and lowlands below 1000 m above sea level. In NSW it occurs mostly in the southern half of the state, occurring in damp open habitats along the coast, and near waterways in the western part of the state. The White-fronted Chat is found in damp open habitats, particularly wetlands containing saltmarsh areas that are bordered by open grasslands or lightly timbered lands. Along the coastline, they are found in estuarine and marshy grounds with vegetation less than 1 m tall. The species is also observed in open grasslands and sometimes in low shrubs bordering wetland areas. Inland, the species is often observed in open grassy plains, saltlakes and saltpans that are along the margins of rivers and waterways. In Victoria White-fronted Chats have been observed breeding from late July through to early March. Nests are built in low vegetation and in the Sydney region nests have also been observed in low isolated mangroves. An Endangered Population occurs in the Sydney Metropolitan CMA area, at Newington Nature Reserve near Homebush and at Towra Point Nature Reserve.
Erythrotriorchis radiatus	Red Goshawk	EN	EN		#	Both	Negligible	Habitat absent.	Occur in forest and woodland habitat near permanent water. In NSW prefer Melaleuca swamp forest and open eucalypt woodland. Require greater than 20 m tall trees for nesting.

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
Falco hypoleucos	Grey Falcon	VU	VU		#	Both	Negligible	Habitat absent.	Found over open country and wooded lands of tropical and temperate Australia. Mainly found on sandy and stony plains of inland drainage systems with lightly timbered acacia scrub.
Falco subniger	Black Falcon		VU		1990	Ashfield - Croydon HIA only	Negligible	Habitat absent.	Mainly occur in woodlands and open country where can hunt. Often associated with swamps, rivers and wetlands. Nest in tall trees along watercourses.
Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	VU	VU		#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	The White-bellied Storm-Petrel (Tasman Sea) breeds on small offshore islets and rocks in the Lord Howe Island group, including Roach Island and Balls Pyramid. Its pelagic distribution is poorly understood, but it has been recorded north and east of its breeding islands to the tropics, in the Tasman Sea, Coral Sea, and north of New Zealand, and it is thought that some birds also reach the central Pacific Ocean. It has also been recorded over near-shore waters off the coasts of Queensland, NSW and Tasmania, and a single dead bird has been collected from the southeastern coast of Tasmania.
Gallinago hardwickii	Latham's Snipe	VU, Mi	VU		2019#	Both	Negligible	Habitat absent.	Typically found on wet soft ground or shallow water with good cover of tussocks. Often found in wet paddocks, seepage areas below dams.
Glossopsitta pusilla	Little Lorikeet		VU		2022	Both	Low	Preferred remnant habitat absent, unlikely to utilise the habitat	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts.

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
								within the study area.	Most breeding records come from the western slopes.
Grantiella picta	Painted Honeyeater	VU	VU		2021#	Both	Negligible	Habitat absent.	Found mainly in dry open woodlands and forests, where it is strongly associated with mistletoe. Often found on plains with scattered eucalypts and remnant trees on farmlands.
Haematopus fuliginosus	Sooty Oystercatcher		VU		2000	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	The Sooty Oystercatcher is found on undisturbed tidal rocks on ocean shores and islands. Occasionally it is observed on sandspits and mudflats. It forages on exposed rock or coral at low tide for limpets and mussels. The Sooty Oystercatcher breeds in spring and summer almost exclusively offshore or on isolated promontories
Haematopus longirostris	Pied Oystercatcher		EN		2021	Both	Negligible	Habitat absent.	An intertidal forager found on undisturbed sandy beaches and spits, tidal mudflats and estuaries. Its food supply (beach macroinvertebrates) have been negatively affected by human impacts. The Pied Oystercatcher is restricted to the littoral zone of beaches and estuaries, nesting on the ground above the tideline. A pair will re-nest in the same spot each year, rarely shifting their territory. Occasionally the Pied Oystercatcher is found in paddocks near the coast.
Haliaeetus leucogaster	White-bellied Sea-Eagle		VU		2016#	Both	Low	Preferred habitat absent.	A migratory species that is generally sedentary in Australia, although immature individuals and some adults are dispersive. Found in terrestrial and coastal wetlands; favouring deep freshwater swamps, lakes and reservoirs; shallow coastal lagoons and saltmarshes. It hunts over open terrestrial habitats. Feeds on birds, reptiles, fish, mammals,

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
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									crustaceans and carrion. Roosts and makes nest in trees.
Hieraaetus morphnoides	Little Eagle		VU		1986	Both	Low	Preferred habitat absent.	The Little Eagle is most abundant in lightly timbered areas with open areas nearby providing an abundance of prey species. It has often been recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. The Little Eagle nests in tall living trees within farmland, woodland and forests.
Hirundapus caudacutus	White-throated Needletail	VU, Mi	VU		2019#	Both	Low	Preferred habitat absent.	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges. This species roosts in trees in forests and woodlands and feeds on insects. The White-throated Needletail breeds in forests and sparse hills in Asia.
Ixobrychus flavicollis	Black Bittern		VU		2017	Dulwich Hill - Marrickville HIA only	Low	Preferred habitat absent.	The Black Bittern is found along the coastal plains within NSW, although individuals have rarely being recorded south of Sydney or inland. It inhabits terrestrial and estuarine wetlands such as flooded grasslands, forests, woodlands, rainforests and mangroves with permanent water and dense waterside vegetation. The Black Bittern typically roosts on the ground or in trees during the day and forages at night on frogs, reptiles, fish and invertebrates. The breeding season extends from December to March. Nests are constructed of reeds and sticks in branches overhanging the water.
Lathamus discolor	Swift Parrot	CE	EN		2023#	Both	Low	May occasionally forage within the study area	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum, Red Bloodwood, Mugga

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									Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis. This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.
Limicola falcinellus	Broad-billed Sandpiper	Mi	VU		2000#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	Occurs in sheltered parts of coasts, such as estuaries, harbours, embayments and lagoons, which have shell or sandbanks nearby.
Limosa lapponica baueri	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	EN			#	Both	Negligible	Habitat absent.	The Bar-tailed Godwit (northern Siberian) occurs mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats.
Limosa limosa	Black-tailed Godwit	EN, Mi	VU		2000#	Both	Negligible	Habitat absent.	The Black-tailed Godwit is a migratory wading bird that breeds in Mongolia and Eastern Siberia and flies to Australia for the southern summer, arriving in August and leaving in March. In NSW, it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state.
Macronectes giganteus	Southern Giant-Petrel,	EN, Mi	EN		#	Both	Negligible	Habitat absent.	The Southern Giant-Petrel is a marine species found throughout the Antarctic to subtropical waters occasionally

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	Southern Giant Petrel								venturing to inshore waters.
Macronectes halli	Northern Giant Petrel	VU, Mi	VU		#	Both	Negligible	Habitat absent.	Marine, pelagic species found mainly in subantarctic waters.
Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)	EN	EN		#	Both	Negligible	Habitat absent.	This species lives in a wide range of temperate woodland habitats, and a range of woodlands and shrublands in semi-arid areas.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)		VU		2016	Both	Negligible	Habitat absent.	Found mostly in open forests and woodlands dominated by box and ironbark eucalypts. It is rarely recorded east of the Great Dividing Range.
Neophema chrysogaster	Orange-bellied Parrot	CR	CR		#	Both	Negligible	Habitat absent.	A single breeding population of fewer than 200 individuals occurs in a narrow coastal strip of south-west Tasmania. Adult birds depart Tasmania for the mainland in February. The first adults begin leaving the mainland for Tasmania in September with the last birds having departed by November. It is a coastal species inhabiting saltmarshes, sedgeplains, coastal dunes, pastures, shrublands and moorlands, generally within 10 km of the coast. Critical winter habitat for the species includes natural saltmarshes dominated by Sarcocornia quinqueflora (Beaded Glasswort) and Sclerostegia arbuscula (Shrubby Glasswort), as well as the associated grassy or weedy pastures. Historical records indicate that the Orange-bellied Parrot was formerly more abundant and widespread in NSW than it is now, however the species' distribution continues to extend into south-eastern NSW where suitable habitat is still available.

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Neophema chrysostoma	Blue-winged Parrot	VU	VU		#	Both	Negligible	Habitat absent.	The Blue-winged Parrot is a small parrot found in Tasmania and southeast mainland Australia. Some populations are known to migrate to Tasmania from the mainland during summer months. The species feeds predominantly on the ground, and occurs in savannah woodlands and grasslands.
Neophema pulchella	Turquoise Parrot		VU		2015	Both	Negligible	Habitat absent.	Occurs in open woodlands and eucalypt forests with a ground cover of grasses and understorey of low shrubs. Generally found in the foothills of the Great Divide, including steep rocky ridges and gullies. Nest in hollow-bearing trees, either dead or alive; also in hollows in tree stumps. Prefer to breed in open grassy forests and woodlands, and gullies that are moist.
Ninox strenua	Powerful Owl		VU		2024	Both	Known	Foraging habitat and prey species present. Recorded recently within study area in Hoskins Park.	The Powerful Owl occupies wet and dry eucalypt forests and rainforests. It may inhabit both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm. It has a large home range of between 450 and 1450 ha.
Numenius madagascariensis	Eastern Curlew	CR, Mi			2006#	Both	Negligible	Habitat absent.	Occurs in sheltered coasts, especially estuaries, embayments, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats often with beds of seagrass.

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Pachyptila turtur subantarctica	Fairy Prion (southern)	VU			#	Both	Negligible	Habitat absent.	Fairy Prions (including other subspecies) are often beachcast on the south-eastern coast of Australia, and are commonly seen offshore over the continental shelf and over pelagic waters. Observations are less common off Western Australia and Queensland than in south-eastern Australia. Beachcast birds are found along the whole coast of NSW, and the species is common offshore along the entire Victorian coast, where thousands are sometimes seen. In Tasmania, the Fairy Prion is an abundant visitor to all offshore waters. In South Australia, this species is regularly seen and often beachcast.
Pandion haliaetus	Osprey	Mi	VU		#	Both	Negligible	Habitat absent.	Found in coastal waters, inlets, estuaries and offshore islands. Occasionally found 100 km inland along larger rivers. It is water-dependent, hunting for fish in clear, open water. The Osprey occurs in terrestrial wetlands, coastal lands and offshore islands. It is a predominantly coastal species, generally using marine cliffs as nesting and roosting sites. Nests can also be made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.
Petroica boodang	Scarlet Robin		VU		2021	Both	Negligible	Habitat absent.	The Scarlet Robin inhabits dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. During autumn and winter it moves to more open and cleared areas. The Scarlet Robin forages amongst logs and woody debris for insects. The nest is an open cup of plant fibres and cobwebs, sited in the fork of a tree.
Petroica phoenicea	Flame Robin		VU		2018	Both	Negligible	Habitat absent.	Flame Robins are found in a broad coastal band from southern Queensland to just west of the South Australian border. The preferred habitat in summer includes moist

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									eucalyptus forests and open woodlands, in winter prefers open woodlands and farmlands. It is considered migratory. Diet consists mainly of invertebrates.
Pluvialis squatarola	Grey Plover	VU, Mi			2021#	Both	Negligible	Habitat absent.	Almost entirely coastal, but occasionally recorded on inland wetlands. Mainly on marine shores, inlets, estuaries and lagoons where there are nearby large tidal mudflats or sandflats for feeding and sandy beaches for roosting.
Polytelis alexandrae	Princess Parrot	VU			2014	Both	Negligible	Habitat absent.	The Princess Parrot inhabits sand dunes and sand flats in the arid zone of western and central Australia. It occurs in open savanna woodlands and shrublands that usually consist of scattered stands of Eucalyptus (including *E. gongylocarpa*, *E. chippendalei* and mallee species), Casuarina or Allocasuarina trees; an understorey of shrubs such as Acacia (especially *A. aneura*), Cassia, Eremophila, Grevillea, Hakea and Senna; and a ground cover dominated by Triodia species. It also frequents Eucalyptus or Allocasuarina trees in riverine or littoral areas. The Princess Parrot is not known to occur in any of the threatened ecological communities listed under the EPBC Act. It does not associate with any other threatened species listed under the EPBC Act.
						Both			
Pterodroma leucoptera leucoptera	Gould's Petrel, Australian Gould's Petrel	EN	VU		#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	The Gould's Petrel is a marine species which only comes to shore to breed. It breeds exclusively on Cabbage Tree Island, 1.4 km offshore from Port Stephens and on nearby Boondelbah Island. The first arrival of Gould's petrel on cabbage tree Island occurs from mid to late September. Fledglings depart the island from late March to early May.

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Pterodroma neglecta neglecta	Kermadec Petrel (western)	VU	VU		#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	Marine pelagic, in subtropical and tropical waters. They breed on islands, atolls and rock cliff where they nest on the ground or in rock crevices under ferns, shrubs or trees. Forage far away from breed sites (Marchant & Higgins 1990).
Ptilinopus regina	Rose-crowned Fruit-Dove		VU		2020	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	Occurs in tall tropical and subtropical, evergreen or semi-deciduous rainforest, especially with dense growth of vines. Prefers large patches of rainforest, but sometimes occurs in remnant patches surrounded by suboptimal habitat including farmlands.
Ptilinopus superbus	Superb Fruit-Dove		VU		2021	Both	Negligible	Habitat absent.	The Superb Fruit Dove ranges from northern NSW to as far south as Moruya. It is found in rainforests, closed forests (including mesophyll vine forests) and sometimes in eucalypt and acacia woodlands with fruit-bearing trees. It forages in the canopy of fruiting trees such as figs and palms.
Pycnoptilus floccosus	Pilotbird	VU	VU		#	Both	Negligible	Habitat absent.	The pilotbird is found from the Wollemi National Park and Blue Mountains National Park in New South Wales through to the Dandenong Ranges, near Melbourne in Victoria. Its natural habitat is temperate wet sclerophyll forests and occasionally temperate rainforest, where there is dense undergrowth with abundant debris. [ALA 2022]
Rostratula australis	Australian Painted Snipe	EN	EN		#	Both	Negligible	Habitat absent.	Usually found in shallow inland wetlands including farm dams, lakes, rice crops, swamps and waterlogged grassland. They prefer freshwater wetlands, but have been recorded in brackish waters. Forages on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.
Stagonopleura guttata	Diamond Firetail	VU	VU		2018#	Both	Negligible	Habitat absent.	The Diamond Firetail is widely distributed, found in a range of habitat types including open eucalypt forest, mallee and acacia scrubs. Often occur in vegetation along watercourses.

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									Feeds exclusively on the ground on ripe grass and herb seeds, green leaves and insects.
Sternula albifrons	Little Tern	Mi	EN		2003#	Both	Negligible	Habitat absent.	The Little Tern favours sheltered coasts, harbours, bays, lakes, inlets, estuaries, coastal lagoons and ocean beaches especially with sand-spits and sand islets. It forages over shallow waters close inshore or over sandbars and reefs.
Sternula nereis nereis	Australian Fairy Tern	VU			#	Both	Negligible	Habitat absent.	The Fairy Tern nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. This species will also frequent embayments, estuarine habitats, wetlands and mainland coastlines.
Thalassarche bulleri	Buller's Albatross, Pacific Albatross	VU, Mi			#	Both	Negligible	Habitat absent.	A marine pelagic species which breeds in New Zealand, and regularly visits Australian waters. When in Australia, Buller's Albatross can be seen over inshore, offshore and pelagic waters.
Thalassarche bulleri platei	Northern Buller's Albatross, Pacific Albatross	VU			#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	A marine pelagic species occurring in subtropical and subantarctic waters, with a preference for waters of the East Australia Current. Known to breed on subtropical and subantarctic islands and rock stacks in the New Zealand region.
Thalassarche carteri	Indian Yellow-nosed Albatross	VU, Mi			#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	The Indian Yellow-nosed Albatross is a migratory marine bird species, occurring in subtropic and warm subantarctic waters. These birds have been recorded along continental shelves, often around upwellings and the boundaries of ocean currents. This species nests on tussock-covered coastal cliffs and slopes, particularly those dominated by rocks.
Thalassarche cauta	Shy Albatross	EN, Mi	EN		#	Both	Negligible	Habitat absent.	The Shy Albatross is a marine pelagic species inhabiting sub-antarctic and subtropical waters, spending the majority of

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									their time at sea. Occasionally it is observed in continental shelf waters in bays and harbours.
Thalassarche eremita	Chatham Albatross	EN, Mi			#	Both	Negligible	Habitat absent.	The Chatham Albatross is a medium sized albatross, with a wing-span less than 2.1 m. The bright yellow bill has a distinctive black spot near the tip of the lower mandible, allowing discrimination from the similar Shy Albatross. Breeding for the Chatham Albatross is restricted to Pyramid Rock, Chatham Islands, off the coast of New Zealand. The principal foraging range for this species is in coastal waters off eastern and southern New Zealand, and Tasmania.
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	VU, Mi			#	Both	Negligible	Habitat absent.	Inhabits Antarctic, subantarctic and subtropical waters. Although the Campbell Albatross does not breed in Australia, it can be found in Australian waters, typically in the winter months.
Thalassarche melanophris	Black-browed Albatross	VU, Mi	VU		#	Both	Negligible	Habitat absent.	Inhabits Antarctic, subantarctic and subtropical waters. Although generally pelagic the species also occurs on the continental shelf and can be seen from land.
Thalassarche salvini	Salvin's Albatross	VU, Mi			#	Both	Negligible	Habitat absent.	Salvin's Albatross is a non-breeding visitor to Australian waters. This species predominantly feeds on cephalopods and fish found along continental shelves.
Thalassarche steadi	White-capped Albatross	VU, Mi			#	Both	Negligible	Habitat absent.	The White-capped Albatross is probably common off the coast of south-east Australia throughout the year. It has been observed that juveniles are rare in New Zealand waters, being more common off south-east Australia and South Africa. Breeding colonies occur on islands south of New Zealand.

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Tringa nebularia	Common Greenshank, Greenshank	Mi			#	Both	Negligible	Habitat absent.	Widely distributed throughout a range of inland wetlands and sheltered coastal habitats. Occurs in habitats with varying salinity.
Tyto novaehollandiae	Masked Owl		VU		1985	Both	Negligible	Habitat absent.	The Masked Owl is found in range of wooded habitats that provide tall or dense mature trees with hollows suitable for nesting and roosting. It is mostly seen in open forests and woodlands adjacent to cleared lands. Prey includes hollow-dependent arboreal marsupials and terrestrial mammals.
Xenus cinereus	Terek Sandpiper	VU, Mi	VU		2000#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	Mainly found on saline intertidal mudflats in sheltered estuaries, embayments, harbours and lagoons.
Mammals									
Chalinolobus dwyeri	Large-eared Pied Bat	EN	EN		2019#	Both	Low	Preferred habitat absent	Occurs from the Queensland border to Ulladulla, with largest numbers from the sandstone escarpment country in the Sydney Basin and Hunter Valley. Primarily found in dry sclerophyll forests and woodlands, but also found in rainforest fringes and subalpine woodlands. Forages on small, flying insects below the forest canopy. Roosts in colonies of between three and 80 in caves, Fairy Martin nests and mines, and beneath rock overhangs, but usually less than 10 individuals. Likely that it hibernates during the cooler months. The only known existing maternity roost is in a sandstone cave near Coonabarabran.

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Dasyurus maculatus	Spotted-tailed Quoll	EN	VU		2021	Both	Low	Preferred habitat absent.	Occurs along the east coast of Australia and the Great Dividing Range. Uses a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Occasional sightings have been made in open country, grazing lands, rocky outcrops and other treeless areas. Habitat requirements include suitable den sites, including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage. Seventy per cent of the diet is medium-sized mammals, and also feeds on invertebrates, reptiles and birds. Individuals require large areas of relatively intact vegetation through which to forage. The home range of a female is between 180 and 1000 ha, while males have larger home ranges of between 2000 and 5000 ha. Breeding occurs from May to August.
Falsistrellus tasmaniensis	Eastern False Pipistrelle		VU		2021	Dulwich Hill - Marrickville HIA only	Moderate	May forage within the study area on occasion	Distribution extending east of the Great Dividing Range throughout the coastal regions of NSW, from the Queensland border to the Victorian border. 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. Apparently hibernates in winter. Roosts in tree hollows and sometimes in buildings in colonies of between 3 and 80 individuals. Often change roosts every night. Forages for beetles, bugs and moths below or near the canopy in forests with an open structure, or along trails. Has a large foraging range, up to 136 ha. Records show movements of up to 12 km between roosting and foraging sites.

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Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern)	EN	EN		#	Both	Low	Preferred habitat absent.	This species prefers sandy soils with scrubby vegetation and/or areas with low ground cover that are burn from time to time. A mosaic of post fire vegetation is important for this species.
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat		VU		2021	Dulwich Hill - Marrickville HIA only	Low	Preferred habitat absent.	Distribution extends east of the Great Dividing Range from southern Queensland to south of Sydney. Most records are from dry eucalypt forests and woodland. Individuals tend to forage in natural and artificial openings in forests, although it has also been caught foraging low over a rocky river within rainforest and wet sclerophyll forest habitats. The species generally roosts in hollow spouts of large mature eucalypts (including paddock trees), although individuals have been recorded roosting in the roof of a hut, in wall cavities, and under metal caps of telegraph poles. Foraging generally occurs within a few kilometres of roosting sites.
Miniopterus australis	Little Bent-winged Bat		VU		2022	Both	Low	Preferred habitat absent, but potential foraging and roosting habitat is present.	Occurs from Northern Queensland to the Hawkesbury River near Sydney. Roost sites encompass a range of structures including caves, tunnels and stormwater drains. Young are raised by the females in large maternity colonies in caves in summer. Shows a preference for well timbered areas including rainforest, wet and dry sclerophyll forests, Melaleuca swamps and coastal forests. The Little Bentwing bat forages for small insects (such as moths, wasps and ants) beneath the canopy of densely vegetated habitats.

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Miniopterus orianae oceanensis	Large Bent-winged Bat		VU		2022	Both	Known	Recorded within study area. Breeding habitat absent but foraging and roosting habitat present.	Occurs from Victoria to Queensland, on both sides of the Great Dividing Range. 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. They occur in a broad range of habitats including rainforest, wet and dry sclerophyll forest, paperbark forest and open grasslands. Has a fast, direct flight and forages for flying insects (particularly moths) above the tree canopy and along waterways.
Myotis macropus	Southern Myotis		VU		2021	Both	High	Suitable foraging and roosting habitat both present, in Bardwell Valley and Annandale.	Scattered, mainly coastal distribution extending to South Australia along the Murray River. Roosts in caves, mines or tunnels, under bridges, in buildings, tree hollows, and even in dense foliage. Colonies occur close to water bodies, ranging from rainforest streams to large lakes and reservoirs. They catch aquatic insects and small fish with their large hind claws, and also catch flying insects.
Notamacropus parma	Parma Wallaby	VU	VU		#	Both	Negligible	Habitat absent.	Occurs in wet and dry sclerophyll forest with a thick, shrubby understorey associated with grassy patches. They may also occur in rainforest but prefer the wet sclerophyll forest (Strahan, 1995 134 /id). This species feed on grasses and herbs (Strahan, 1995 134 /id).
Perameles nasuta	Long-nosed Bandicoot population in inner western Sydney		EN pop.		2018	Dulwich Hill - Marrickville HIA only	Known	Recorded within the study area, most recent record 2018	The exact area occupied by the population is not clearly defined, and includes the local government areas (LGA) of Marrickville and Canada Bay, with the likelihood that it also includes Canterbury, Ashfield and Leichhardt LGAs. This population is disjunct from the nearest records of the Long-

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
								at Waratah Mills.	nosed Bandicoot, which occur north of the Parramatta River or much further south at Holsworthy Military Reserve. Species shelters mostly under older houses and buildings, and forages in parkland and back-yards. There are apparently no large blocks of suitable habitat, likely to support a large source population, on the Cooks River to the south, or along the southern foreshore of Parramatta River and Sydney Harbour to the north
Petauroides volans	Greater Glider (southern and central)	EN	EN		#	Both	Negligible	Habitat absent.	The distribution of the Greater Glider includes the ranges and coastal plain of eastern Australia, where it inhabits a variety of eucalypt forests and woodlands. Presence and density of Greater Gliders is related to soil fertility, eucalypt tree species, disturbance history and density of suitable tree hollows. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe.
Petaurus australis australis	Yellow-bellied Glider (south-eastern)	VU	VU		#	Both	Negligible	Habitat absent.	Restricted to tall native forests in regions of high rainfall along the coast of NSW. Preferred habitats are productive, tall open sclerophyll forests where mature trees provide shelter and nesting hollows. Critical elements of habitat include sap-site trees, winter flowering eucalypts, mature trees suitable for den sites and a mosaic of different forest types.
Phascolarctos cinereus	Koala	EN	EN		2023	Both	Low	Preferred habitat absent. Mobility would limit this species	In NSW the Koala mainly occurs on the central and north coasts with some populations in the western region. Koalas feed almost exclusively on eucalypt foliage, and their preferences vary regionally. Primary feed trees include *Eucalyptus robusta, E. tereticornis, E. punctata, E. haemastoma* and E. *signata.* They are solitary with varying home ranges.

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
								from occurring within study area or 5 kilometre radius.	
Pseudomys gracilicaudatus	Eastern Chestnut Mouse		VU		2019	Both	Negligible	Habitat absent.	The Eastern Chestnut Mouse is most common in dense, wet heath and swamps, but also occurs in open woodlands and dry sclerophyll forests with a grassy understorey. Density of the ground layer is a determining factor. It relies on a variety of food sources, including fungi, seeds, insects and stems.
Pseudomys novaehollandiae	New Holland Mouse, Pookila	VU			2023#	Both	Negligible	Habitat absent.	The New Holland Mouse currently has a disjunct, fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Across the species' range the New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes. The home range of the New Holland Mouse can range from 0.44 ha to 1.4 ha. The New Holland Mouse is a social animal, living predominantly in burrows shared with other individuals. The species is nocturnal and omnivorous, feeding on seeds, insects, leaves, flowers and fungi, and is therefore likely to play an important role in seed dispersal and fungal spore dispersal. It is likely that the species spends considerable time foraging above-ground for food, predisposing it to predation by native predators and introduced species. Breeding typically occurs between August and January, but can extend into autumn.

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
Pteropus poliocephalus	Grey-headed Flying-fox	VU	VU		2023#	Both	Known	Recorded within study area and 5 kilometre radius. Foraging habitat present. No breeding colonies recorded within study area.	Occurs along the NSW coast, extending further inland in the north. This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Roosts in large colonies, commonly in dense riparian vegetation.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat		VU		2021	Both	Negligible	Habitat absent.	Found throughout NSW in habitats including wet and dry sclerophyll forest, open woodland, acacia shrubland, mallee, grasslands and desert. They roost in tree hollows in colonies and have also been observed roosting in animal burrows, abandoned Sugar Glider nests, cracks in dry clay, hanging from buildings and under slabs of rock. Forages for insects above the canopy in forests.
Amphibians									
Crinia tinnula	Wallum Froglet		VU		1999	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	The Wallum Froglet is a coastal species, confined to acid, paperbark swamps and sedge swamps of the "wallum" country. The species occurs from near Noosa in southern Queensland south to the central coast of NSW, with a disjunct population on Kurnell Peninsula. The species is a late winter breeder and males call in choruses from within sedge tussocks or at the water edge.

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
Heleioporus australiacus	Giant Burrowing Frog	VU	VU		#	Both	Negligible	Habitat absent.	Prefers hanging swamps on sandstone shelves adjacent to perennial non-flooding creeks. Can also occur within shale outcrops within sandstone formations. Known from wet and dry forests and montane woodland in the southern part range. Individuals can be found around sandy creek banks or foraging along ridge-tops during or directly after heavy rain. Males often call from burrows located in sandy banks next to water. Spends the majority of its time in non-breeding habitat 20-250m from breeding sites.
Litoria aurea	Green and Golden Bell Frog	VU	EN		2023#	Both	Low	Preferred habitat absent. No standing water bodies.	Most existing locations for the species occur as small, coastal, or near coastal populations, with records occurring between south of Grafton and northern VIC. The species is found in marshes, dams and stream sides, particularly those containing bullrushes or spikerushes. Preferred habitat contains water bodies that are unshaded, are free of predatory fish, have a grassy area nearby and have diurnal sheltering sites nearby such as vegetation or rocks , although the species has also been recorded from highly disturbed areas including disused industrial sites, brick pits, landfill areas and cleared land. Breeding usually occurs in summer. Tadpoles, which take approximately 10-12 weeks to develop , feed on algae and other vegetative matter. Adults eat insects as well as other frogs, including juveniles of their own species.
Mixophyes balbus	Stuttering Frog	VU	EN		#	Ashfield - Croydon HIA only	Negligible	Habitat absent.	This species is usually associated with mountain streams, wet mountain forests and rainforests. It rarely moves very far from the banks of permanent forest streams, although it will forage on nearby forest floors. Eggs are deposited in leaf

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
									litter on the banks of streams and are washed into the water during heavy rains.
Reptiles									
Hoplocephalus bitorquatus	Pale-headed Snake		VU		2021	Both	Low	Preferred habitat absent.	Found in a variety of habitats from wet sclerophyll forest to dry eucalypt forest on the western slopes of NSW. Feeds largely on frogs and lizards.
Hoplocephalus bungaroides	Broad-headed Snake	VU	EN		#	Both	Negligible	Habitat absent.	Mainly occurs in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they generally use rock crevices and exfoliating rock during the cooler months and tree hollows during summer.
Varanus rosenbergi	Rosenberg's Goanna		VU		2012	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	This species is a Hawkesbury/Narrabeen sandstone outcrop specialist. Occurs in coastal heaths, humid woodlands and both wet and dry sclerophyll forests. Termite mounds are a critical habitat component.
Fish									
Macquaria australasica	Macquarie Perch	EN		EN	#	Both	Negligible	Habitat absent.	Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
Prototroctes maraena	Australian Grayling	VU		EN	#	Both	Negligible	Habitat absent.	The Australian Grayling occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range from Sydney southwards to the Otway Ranges in Victoria, and Tasmania. Australian grayling do not occur in the inland Murray–Darling Basin system. Grayling is a diadromous species; migrating between freshwater streams and the ocean. This species has been found in clear, gravel-bottomed streams with alternating pools and riffles, and granite outcrops, and also in muddy-bottomed, heavily silted habitats.
Gastropods									
Meridolum maryae	Maroubra Woodland Snail, Maroubra Land Snail	EN	EN		#	Dulwich Hill - Marrickville HIA only	Negligible	Habitat absent.	This species can be found in leaf litter within coastal vegetation communities and is typically active at night. During dry conditions, the species can dig several centimetres deep into the soil. The species is known to occur between Royal National Park and Palm Beach, in New South Wales.
Pommerhelix duralensis	Dural Land Snail	EN	EN		#	Ashfield - Croydon HIA only	Negligible	Habitat absent.	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. The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris. 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

Scientific Name	Common Name	Conservation status			Most recent record	Occurrence in HIA	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM					
									and light woody debris.

* - habitat descriptions have been adapted by qualified ecologists from the Cth DCCEEW Species Profile and Threats (SPRAT) Database, NSW DCCEEW Threatened Species online profiles and the NSW Scientific Committee final determinations for listed species, references within the above table are provided within the report reference list.

Appendix 2 Flora and fauna recorded in the study area

Appendix 2.1. Flora species recorded from the study area

Below is a list of flora species recorded from the study area during the present assessment.

Flora species in these tables are listed in alphabetical order.

Notes to tables:

Status – Exotic
– Native species outside natural range
* – priority weed species declared under the Biosecurity Act

Table 17 Flora species recorded from the study area

Scientific name	Common name	Commonwealth status	NSW status
Native species			
Acacia decurrens	Black Wattle		
Acacia parramattensis	Sydney Green Wattle		
Allocasuarina torulosa	Forest She-oak		
Angophora costata	Smooth-barked Apple		
Angophora floribunda	Rough-barked Apple		
Archontophoenix cunninghamiana	Bangalow Palm		
Banksia serrata	Old Man Banksia		
Brachychiton acerifolius	Illawarra Flame Tree		
Breynia oblongifolia	Coffee Bush		
Bursaria spinosa	Native Blackthorn		
Callistemon citrinus	Crimson Bottlebrush		
Callistemon sp.	Bottlebrush		
Carex sp.	Sedge		
Casuarina glauca	Guman (Cadigal) - Swamp Oak		
Corymbia citriodora #	Lemon-scented Gum		
Corymbia eximia	Yellow Bloodwood		

Scientific name	Common name	Commonwealth status	NSW status
Corymbia gummifera	Red Bloodwood		
Corymbia maculata	Spotted Gum		
Cupaniopsis anacardioides	Tuckeroo		
Cyathea cooperi	Lacy Tree Fern		
Dianella caerulea	Blue Flax-lily		
Dichondra repens	Kidneyweed		
Doryanthes excelsa	Gymea Lily		
Einadia hastata	Berry Saltbush		
Elaeocarpus reticulatus	Blueberry Ash		
Eleocharis sp.			
Entolasia marginata	Bordered Panic Grass		
Eucalyptus botryoides	Bangalay		
Eucalyptus crebra	Muggago (D'harawal) – Narrow-leaved Ironbark		
Eucalyptus microcorys #	Tallowwood		
Eucalyptus pilularis	Blackbutt		
Eucalyptus piperita	Sydney Peppermint		
Eucalyptus punctata	Grey Gum		
Eucalyptus robusta	Swamp Mahogany		
Eucalyptus saligna	Sydney Blue Gum		
Eucalyptus scoparia #	Wallangarra White Gum	E	V
Eucalyptus sideroxylon	Mugga Ironbark		
Exocarpus cupressiformis	Native Cherry		
Ficus macrophylla subsp. *macrophylla* #	Moreton Bay Fig		
Ficus rubiginosa	Port Jackson Fig		
Geranium solanderi	Native Geranium		
Glochidion ferdinandi	Cheese Tree		

Scientific name	Common name	Commonwealth status	NSW status
Grevillea robusta #	Silky Oak		
Grevillea sp.	Grevillea cultivars		
Hakea sericea	Needlebush		
Imperata cylindrica	Blady Grass		
Juncus usitatus			
Kunzea ambigua	Tickbush		
Lepidosperma laterale			
Leptospermum polygalifolium	Tantoon		
Lomandra longifolia	Durawi (D'harawal) - Spiny-headed Mat-rush		
Lophostemon confertus #	Brush Box		
Melaleuca bracteata #	Black Tea-tree		
Melaleuca decora	-		
Melaleuca quinquenervia	Broad-leaved Paperbark		
Microlaena stipoides	Weeping Meadow Grass		
Nephrolepis cordifolia #	Fishbone Fern		
Notelaea sp.			
Oplismenus aemulus	Basket Grass		
Ozothamnus diosmifolius	White Dogwood		
Persicaria sp.	Knotweed		
Pittosporum undulatum	Sweet Pittosporum		
Podocarpus elatior	Plum Pine		
Pteridium esculentum	Bracken Fern		
Solanum aviculare	Kangaroo Apple		
Syncarpia glomulifera	Turpentine		
Syzygium australe	Brush Cherry		
Syzygium sp.	Lilly Pilly		

Scientific name	Common name	Commonwealth status	NSW status
Tristaniopsis laurina	Water Gum - Kanooka		
Westringia fruticosa	Coastal Rosemary		
Exotic species			
Acer campestre	Common Maple		
*Anredera cordifolia**	Madeira Vine		
Agapanthus sp.	Agapanthus		
Agave sp.			
*Araujia sericifera**	Moth Vine		
Asparagus aethiopicus	Ground asparagus		
Celtis sinensis	Chinese celtis		
Cenchrus clandestinus	Kikuyu		
*Cestrum parqui**	Green cestrum		
*Cinnamomum camphora**	Camphor Laurel		
Citrus × sinensis	Orange, lemon		
Ehrharta erecta	Panic Veldt-grass		
Ficus carica	Fig		
Ficus macrocarpa	Curtain Fig		
Plumeria sp.	Frangipani		
Ipomea indica	Morning glory		
Lagerstroemia sp.	Crepe Myrtle		
*Lantana camara**	Lantana		
Ligustrum lucidum	Privet (Large-leaf)		
*Ligustrum sinense**	Privet (Small-leaf)		
*Mimosa pigra**	Mimosa		
Monstera deliciosa	Fruit Salad Plant		
Ochna serrulata	Mickey mouse plant		
Olea europaea subsp. *cuspidata**	African Olive		

Scientific name	Common name	Commonwealth status	NSW status
Phoenix canariensis	Canary Island Date palm		
Schinus spp.*	Pepper Tree		
Strelitzia nicholii	Bird of Paradise		
Syagrus romanzoffiana	Cocos Palm		
Trachelospermum jasminoides	Star Jasmine		
Triadica sebifera	Chinese Tallow Tree		
Ulmus parvifolia	Chinese Elm		
Yucca sp.	Yucca		

Appendix 2.2. Fauna species recorded from the study area

Below is a list of fauna species recorded from the study area during the present assessment. Fauna species in these tables are listed in alphabetical order within their taxonomic group.

Table 18 Vertebrate fauna recorded from the study area (current assessment)

Scientific name	Common name	Commonwealth status	NSW status
Birds			
*Acridotheres tristis**	Common Myna		
Alectura lathami	Australian Brush-turkey		
Alisterus scapularis	Australian King-Parrot		
Anas superciliosa	Pacific Black Duck		
Anthochaera carunculata	Red Wattlebird		
Cacatua galerita	Sulphur-crested Cockatoo		
Cacatua sanguinea	Little Corella		
Coracias strepera	Pied Currawong		
Corvus coronoides	Australian Raven		
Eudynamys orientalis	Eastern Koel		
Gallinula tenebrosa	Dusky Moorhen		
Grallina cyanoleuca	Magpie-lark		
Gymnorhina tibicen	Australian Magpie		
Malurus cyaneus	Superb Fairy-wren		
Manorina melanocephala	Noisy Miner		
Phylidonyris novaehollandiae	New Holland Honeyeater		
Platycercus eximius	Eastern Rosella		
Scythrops novaehollandiae	Channel-billed Cuckoo		
Sphecotheres vieilloti	Figbird		
Threskiornis molucca	Australian White Ibis		
Trichoglossus moluccanus	Rainbow Lorikeet		


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