Appendix O

Ecological Constraints Assessment
prepared by
Eco Logical Australia

Ecological Constraints Assessment
Dunmore St, Pendle Hill

Fresh Hope Care

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Abbreviations

Abbreviation	Description
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BC Act	*NSW Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
BV Map	Biodiversity Values Map
CEEC	Critically Endangered Ecological Community
EEC	Endangered Ecological Community
ELA	Eco Logical Australia
EPA Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999* (Commonwealth)
FFA	Flora & Fauna Assessment
HBT	Hollow-bearing Tree
LEP	Local Environmental Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
REP	Regional Environmental Plan
SAII	Serious and Irreversible Impacts
TEC	Threatened Ecological Community

Executive Summary

Fresh Hope Care are proposing to lodge a planning proposal for a study area at Dunmore Street, Pendle Hill within the Cumberland local government area. The study area is currently used as a seniors precinct including Pendle Hill Retirement Village and Ashwood Residential Care Service and contains the historic Dunmore House (built 1936). A masterplan has been prepared by ThomsonAdsett, GMU and Taylor Brammer (2020) for the rezoning and redevelopment of the site to enhance the existing uses and create a vibrant seniors precinct.

A desktop review was conducted based on soil landscape mapping, threatened species database searches, previous vegetation mapping and other relevant studies. This was followed by a site inspection which mapped the vegetation as predominately 'planted native vegetation', 'weeds and exotics' and a small area (approximately 0.15 ha) of remnant Cumberland Plain Woodland (CPW) trees along the northern boundary of the study area. CPW is listed as a critically endangered ecological community (CEEC) under the *Biodiversity Conservation Act 2016* (BC Act) and the *Commonwealth Environment Protection and Biodiversity Conservation Act* (EPBC Act). However, the condition of CPW in the study area does not meet the condition thresholds for CPW listed under the EPBC Act.

The planted native vegetation includes species native to NSW and is considered a moderate constraint to development based on the foraging habitat it provides to the threatened Grey-headed Flying-fox and should be retained where possible. The CPW trees are a high ecological constraint and should be retained. Two of the CPW trees contain hollows, which is potential habitat for threatened microbats. If these trees are impacted at the DA stage, further survey will be required to determine they are occupied by threatened microbats.

Under the BC Act, removal of more than 0.25 ha of vegetation native to NSW will trigger the Biodiversity Offset Scheme (BOS). There is approximately 0.67 ha of planted native vegetation within the study area (including both CPW CEEC and planted native vegetation). The area of native vegetation to be cleared under the masterplan will be assessed at the DA stage, to determine whether the BOS is triggered.

The BOS is also triggered when a development is likely to have a significant impact on threatened species, population or communities. This will be determined at the DA stage, when an impact assessment will be required for Grey-headed Flying-fox and any threatened microbats confirmed to be present within the tree hollows, following additional survey.

If the BOS is triggered a Biodiversity Development Assessment Report (BDAR) will be required to accompany a DA. The BDAR will require field survey and report preparation consistent with the Biodiversity Assessment Method (BAM) and will calculate the number of offsets required.

The Grey-headed Flying-fox is also listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act* (EPBC Act) and will require an assessment of significance under the EPBC Act at the DA stage.

1. Introduction

Fresh Hope Care are proposing to lodge a planning proposal for a study area at Dunmore Street, Pendle Hill within Cumberland LGA (Figure 1). The study area is approximately 7.3 ha and is currently used as a seniors facility including Pendle Hill Retirement Village and Ashwood Residential Care Service and contains the historic Dunmore House (built 1936).

Eco Logical Australia (ELA) was engaged by Fresh Hope Care to provide an ecological constraints assessment of the study area. This report outlines the ecological constraints to inform the master planning process and will be submitted as part of a planning proposal for the study area. Table 1 outlines the applicable Local Environmental Plan (Holroyd LEP 2013) planning layers for the study area.

Table 1: Applicable planning layers under Holroyd LEP 2013

Planning Instruments	Study area, Dunmore Street Pendle Hill
Land Zoning	R2 (Low Density Residential), R3 (Medium Density Residential) and R4 (High Density Residential)
Minimum Lot Size	Class G - 450 m^2 and Class T - 900 m^2
Heritage	'Ashwood House', Inter-war Georgian Revival residence, and 'Dunmore', Victorian Italianate residence and garden setting
Terrestrial Biodiversity	No
Scenic Protection Land	No
Riparian Lands and Watercourse	No

Figure 1: Location of Study Area

2. Legislative context

Table 2 addresses relevant biodiversity legislation in relation to the study area.

Table 2: Legislative context

Name	Relevance to the project
Commonwealth	
Environment Protection and Biodiversity Conservation Act 1999	The Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect Matters of National Environmental Significance (MNES), including vegetation communities and species listed under the EPBC Act. If a development is likely to have a significant impact on MNES, it is likely to be considered a 'Controlled Action' by the Commonwealth and requires assessment and approval by the Commonwealth in order to proceed. The desktop review identified several MNES that have been recorded within a 5 km radius of the site. Given the study area is within a highly modified urban environment dominated by planted natives and exotic species, the habitat values for fauna species listed as MNES under the EBPC is limited and likely to be restricted to foraging by *Pteropus poliocephalus* (Grey-headed Flying-fox).
State	
Environmental Planning and Assessment Act 1979	The *Environmental Planning and Assessment Act 1979* (EP&A Act) provides the framework for land use planning in NSW. The planning proposal will be assessed under Part 3 of the EP&A Act.
Biodiversity Conservation Act 2016	The *Biodiversity Conservation Act 2016* (BC Act) came in to effect on 25 August 2017 replacing the *Threatened Species Conservation Act 1995* (TSC Act). The BC Act outlines the assessment requirements to determine whether a proposed development (Part 4 of the EP&A Act) is likely to significantly affect threatened species or ecological communities, or their habitats under section 7.3 of the Act; and whether the Biodiversity Offsets Scheme (BOS) will be triggered by a proposed development. This report makes a preliminary assessment of the likely impacts that would occur at the Development Application (DA) stage. Based on the minimum lot size, clearing of more than 0.25 ha of vegetation native to NSW will trigger the BOS. The implications of triggering the BOS is discussed in Section 6. Given the site is a highly modified urban environment dominated by planted natives and exotic species, the habitat values for threatened fauna species is limited and likely to be restricted to foraging by *Pteropus poliocephalus* (Grey-headed Flying-fox). The tree hollows may provide habitat for threatened microbat species and if they are impacted, further survey at the DA stage to confirm presence/absence of threatened microbats will be required.
Biodiversity Conservation Regulation 2017	The Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. At the time of preparing this report, the study area did not contain land identified on the BV Map (accessed 17 February 2020).

Name	Relevance to the project
Planning Instruments	
State Environmental Planning Policy 44 – Koala Habitat Protection	This SEPP does not apply to planning proposals under Part 3 of the EP&A Act. From 1 March 2020, SEPP44 will be replaced with an updated Koala Habitat Protection SEPP. At the DA stage, the implications of this new SEPP will require review. Given the highly urbanised land use of the study area and surroundings, potential koala habitat is unlikely to be present within the study area.
State Environmental Planning Policy (Coastal Management) 2018	This SEPP does not apply to planning proposals under Part 3 of the EP&A Act. At the DA stage, this SEPP will not apply, as the study area does not occur on land protected under this SEPP.

3. Methodology

3.1 Desktop review

A review of readily available datasets pertaining to the ecology and environmental features of the study area and surrounding area, and existing vegetation mapping was conducted to identify records of threatened species, populations and communities and their potential habitat.

Datasets and vegetation mapping reviewed included:

- eSPADE v2.0 (OEH 2018) https://www.environment.nsw.gov.au/eSpade2WebApp to determine the soil landscape mapping of the study area
- *Soil Landscapes of the Penrith 1:100,000 Sheet* (Bannerman and Hazelton, 1990) was consulted for soil landscape descriptions
- BioNet (Atlas of NSW Wildlife) database search (5 km) for threatened species, populations and threatened ecological communities (TECs) listed under the BC Act and/or EPBC Act (7 December 2018)
- The Native Vegetation of the Sydney Metropolitan Area - Version 3.1 (OEH, 2016) VIS_ID 4489
- NSW DPE Planning Viewer https://www.planningportal.nsw.gov.au
- Final determinations for threatened matters under the BC Act
- Fresh Hope Care, Pendle Hill - Final Master Plan (ThomsonAdsett, GMU and Taylor Brammer, 2020)
- Greater Sydney Region Plan: A Metropolis of Three Cities (Greater Sydney Commission 2018)

Aerial photography (Sixmaps) of the study area and surrounds were also used to investigate the extent of vegetation cover and landscape features. In addition, relevant GIS datasets (soil, geology, drainage) and local studies were reviewed.

Table 3 lists the ecological constraint classes and the ecological values/features that apply to each constraint class. This table has been used to determine the ecological constraints of the study area.

Table 3: Ecological constraint classes

Ecological Constraint	Ecological features/values
Low	Non-native vegetation Areas dominated by weeds Highly disturbed landscapes with low fauna habitat values Lack of connectivity with areas of native vegetation
Moderate	Planted native vegetation or non-threatened vegetation communities Stepping-stone habitat or local wildlife corridors for highly mobile species Foraging habitat for highly mobile threatened species including birds and bats
High	Vegetation that corresponds to a threatened ecological community listed under the BC Act that is in low to moderate condition Non-threatened vegetation communities that form regional habitat corridors Habitat features that support foraging for threatened fauna species listed under the BC Act or EPBC Act
Very high	Vegetation that corresponds to a threatened ecological community listed under the BC Act in good to very good condition Vegetation that corresponds to a threatened ecological community listed under the EPBC Act Fauna habitat features that support the potential breeding habitat for threatened species listed under the BC Act or EPBC Act

3.2 Field survey

A field survey of the study area was undertaken on 10th December 2018 and 8th May 2019 by ELA Senior Ecologist Karen Spicer. During the December survey, the weather was fine, humid and 28°C with light rain developing in the afternoon. During the May survey, the weather was fine and 20 °C. Approximately 8 hours were spent undertaking the field survey in total. The aim of the field survey was:

- to validate the vegetation present
- stratify the vegetation into vegetation zones (vegetation community type and condition)
- record the location of important habitat features including hollow-bearing trees
- create a flora species list
- record opportunistic fauna observations

4. Results

4.1 Desktop review

Soil landscape mapping by Bannerman and Hazelton (1990), shows that the study area occurs within the Blacktown (Bt) soil landscape. The underlying geology is Wianamatta Group Shale and soils consist of clay derived red, brown and yellow podzolic soils.

The BioNet database was searched for previous records of state and federally listed threatened flora, fauna and listed migratory species within 5km from the study area (Figure 2). The closest fauna records include Grey-headed Flying-fox, which has been recorded sporadically throughout the surrounding urban landscape and threatened microbat species, which have been recorded from riparian areas and bushland remnants in the region.

The closest flora record is *Syzygium paniculatum* (Magenta Lilly Pilly). This record was made in 2018 and is located within Darcy Street Public School, Wentworthville. This species typically occurs in littoral rainforest but also occurs on gravels, sands, silts and clays in riverside gallery rainforests (OEH 2017). The species is also widely planted in gardens and parklands.

Based on the desktop assessment, the only threatened species considered likely to occur in the study area is *Pteropus poliocephalus* (Grey-headed Flying-fox). This species is listed as vulnerable under both the BC Act and the EPBC Act, is highly mobile and forages widely on native and planted vegetation.

Previous vegetation mapping of the study area and immediate surrounds by OEH (2016) is shown in Figure 3. This demonstrates that the study area has not been previously mapped as containing a native vegetation community. Small areas along the northern and southern boundary of the study area is mapped as "Urban Exotic/Native". The closest native mapped vegetation community is 'Cumberland Riverflat Forest', which has been mapped along a stretch of Pendle Creek to the northwest of the study area. This vegetation community is listed as an endangered ecological community (EEC) under the BC Act.

Cumberland Shale Plains Woodland has been mapped to the northeast of the site within Civic Park, a recreation area managed by Cumberland Council. Cumberland Shale Plains Woodland is a sub-community of Cumberland Plain Woodland (CPW), which is listed as a 'critically endangered ecological community (CEEC)' under the BC Act and EPBC Act.

The Greater Sydney Region Plan *A Metropolis of Three Cities* (Greater Sydney Commission 2018) sets a 40-year vision (to 2056) and a 20-year plan to manage growth and change for Greater Sydney in the context of social, economic and environmental matters. The study area is located within the Central City District area. The Central City District Plan informs local strategic planning statements and local environmental plans, the assessment of planning proposals as well as community strategic plans and policies. Main findings of this plan that relate to the study area and planning proposal are:

- between 2016 – 2036, population growth in the 64-85 year bracket is expected to increase by 95% and the 85+ age growth is expected to grow by 183%. Therefore, there is a future demand for aged care facilities.

- Coordinated and additional health, social and aged care services and collaborative responses across government and industry are needed to meet the expected increase in demand for local aged care facilities and respite services, including home care options (with associated visitor parking). This approach will also need to address care for people with specific needs such as those with dementia and the frail aged.

- This focus on accessibility, inclusion and safety when designing and building neighbourhoods, public transport and transport interchanges, places and homes will encourage a greater cross-section of people to lead physically active and socially connected lives. This is especially important for the health of people ageing in community and also benefits people with a disability and families.

- Councils are in the best position to investigate and confirm which parts of their local government areas are suited to additional medium density opportunities. Residential land around local centres where links for walking and cycling help promote a healthy lifestyle.

- For the Central City District an integrated approach to improving sustainability can be achieved by the following Planning Priorities:

    - Protecting and enhancing bushland, biodiversity and scenic and cultural landscapes

    - Increasing urban tree canopy cover and delivering Green Grid connections

- Remnant vegetation should be recognised as an asset that can be incorporated into the planning and design of neighbourhoods, for example in parks, school grounds and streets.

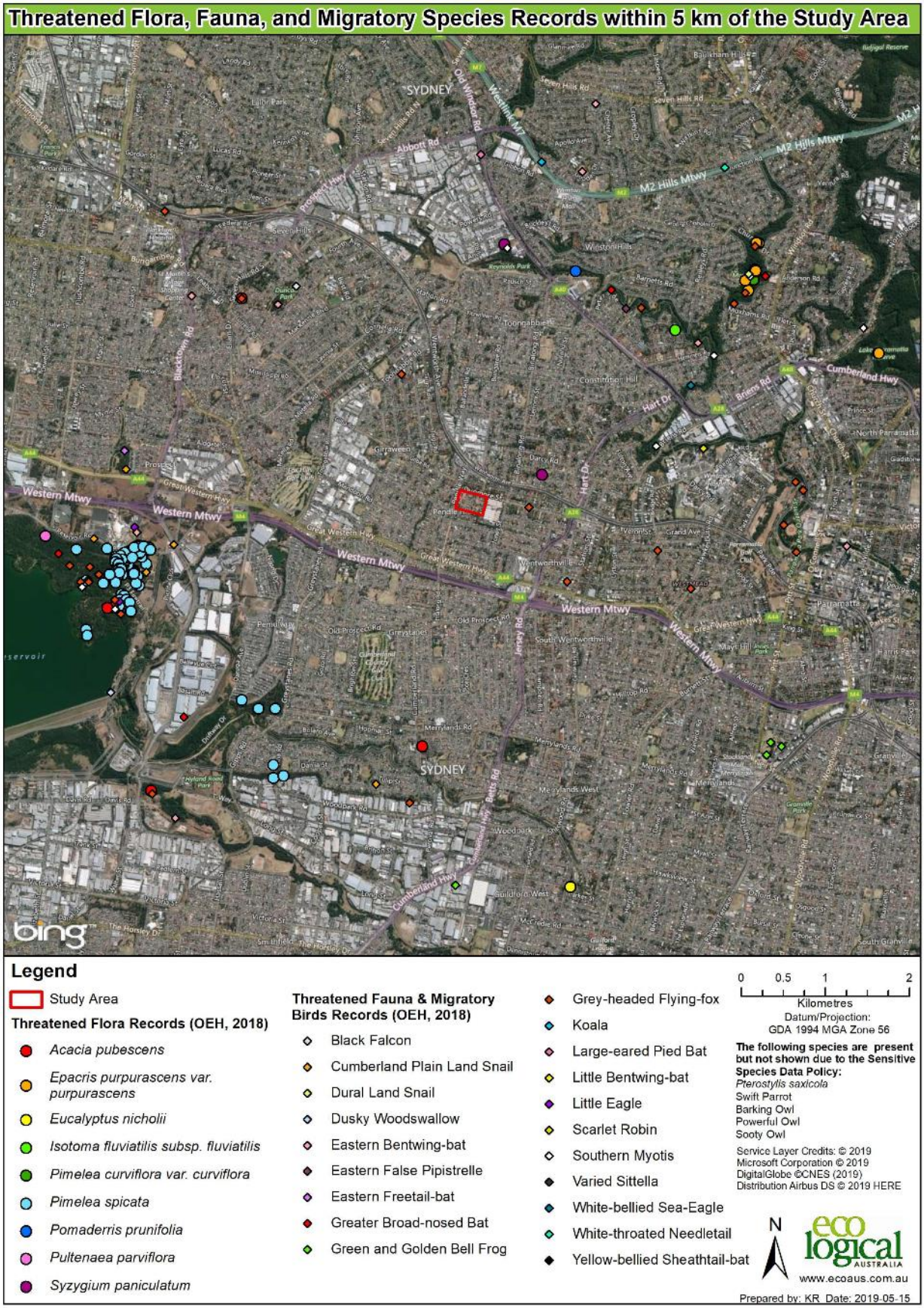

Figure 2: Bionet results for threatened and migratory species listed under the BC Act and EPBC Act within 5km of the study area

Figure 3: Previous vegetation mapping

4.2 Field survey

4.2.1 Vegetation communities

Figure 4 shows the validated vegetation map for the study area. The vegetation communities that occur within the study area include:

- Planted vegetation that is native to NSW – approximately 0.67 ha
- Shale plains woodland (CPW CEEC) – approximately 0.15 ha

Areas not mapped in Figure 4 include environmental weeds, exotic species and planted native species that are not native to NSW. Such species include *Araucaria bidwillii* (Bunya Pine), *Cinnamomum camphora* (Camphor Laurel), *Corymbia* citriodora (Lemon-scented Gum), *Ficus macrocarpa* (Chinese Banyan), *Jacaranda mimosifolia* (Jacaranda), *Ligustrum lucidum* (Broad-leaved Privet), *Photinia robusta* (Red Leaved Photinia), *Pinus radiata* (Radiata Pine), *Olea europaea* subsp. *cuspidata* (African Olive) and *Triadica sebifera* (Chinese Tallowood).

The areas of planted native vegetation include *Angophora floribunda* (Rough-barked Apple), *Araucauria cunninghamii* (Hoop Pine), *Callistemon viminalis* (Weeping Bottlebrush), *Corymbia maculata* (Spotted Gum), *Elaeocarpus reticulatis* (Blueberry Ash), *Eucalyptus microcorys* (Tallowood), *Eucalyptus punctata* (Grey Gum), *Ficus macrophylla* (Moreton Bay Fig), *Ficus suberba* (Deciduous Fig), *Grevillea robusta* (Silky Oak), *Leptospermum petersonii* (Lemon-scented Tea-tree), *Lophostemon confertus* (Brushbox), *Podocarpus elatus* (Plum Pine), *Melaleuca armillaris* (Bracelet Honey-myrtle), *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Westringia fruticosa* (Coastal Rosemary).

The CPW CEEC is of low condition and consists of potential remnant trees of *Eucalyptus moluccana* (Grey Box) and *Eucalyptus tereticornis* (Forest Red Gum). These trees are relatively large and are mostly located along the northern boundary of the study area near the existing entry and exit driveways. The size, species and positioning of the trees suggests they haven't been planted. Hence they are considered to be potential remnant CPW trees.

All the vegetation within the study area is highly modified and consists of managed/landscaped gardens and mown lawn. Exotics and weeds dominate the understorey and ground cover. In a few locations, beneath the canopy of planted trees where conditions were shaded and moist, some native grasses and forbs were present including *Dichondra repens* (Kidney Weed), *Commelina cyanea Glycine microphylla* (Small-leaf Glycine), *Glycine tabacina* and *Microlaena stipoides* (Weeping Grass). Beyond the tree crowns, the groundcover was dominated by exotic lawn grasses dominated by *Stenotaphrum secundatum* (Buffalo Grass).

The plant community type (PCT) of best fit for the CPW native vegetation community present is *Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion* (PCT 849). Given this PCT is present as a highly disturbed community consisting of potential remnant trees, the condition is low. The listing of CPW CEEC under the EPBC Act requires particular condition thresholds to be met, including patch size greater than 0.5 ha and native species dominant in each vegetation strata. As such, the CPW present within the study area would not meet these condition thresholds. However, CPW listed under the BC Act does not require condition thresholds.

Figure 4: Validated vegetation map of the study area

4.2.2 Fauna habitat

'A summary of the fauna habitat values for the study area is outlined in Table 4. Fauna habitat is generally poor given that the study area is highly disturbed and not connected with any local or regional habitat corridors. The trees present would provide foraging habitat for common native fauna including birds and arboreal mammals and the threatened Grey-headed Flying-fox. Scratch marks were common on the *Eucalyptus punctata* (Grey Gums) that have been planted along the eastern boundary, indicating that arboreal mammals (likely Brush-tailed Possums) are present.

Two hollow-bearing trees were observed within the remnant CPW trees on the northern boundary of the site. These hollows are potential habitat for threatened microbat species.

Table 4: Fauna habitat values

Habitat Features	Guild	Occurrence
Remnant native vegetation	Birds, microchiropteran bats (microbats), megachiropteran bats (fruit bats), arboreal mammals, reptiles	Approximately 10 trees were mapped as potentially remnant CPW trees (0.15 ha). While the study area features mature and semi-mature native trees, it is most likely that all these trees have been planted.
Winter flowering species	Winter migratory birds, arboreal mammals and megachiropteran bats (fruit bats).	*Corymbia maculata, Eucalyptus molucanna* and *Eucalyptus sideroxylon* can all flower in winter. Thus a total of 18 winter-flowing trees are present within the study area.
Hollow-bearing trees	Birds and arboreal mammals (gliders and microbats)	Two hollow-bearing trees were present within the subject site (Figure 4). One occurs within a *Eucalyptus molucanna* located near the entrance driveway. The hollow is approximately 10 cm diameter, located high in the tree. Another tree hollow occurs in *Eucalyptus tereticornis* located along the northern property boundary. The hollow is approximately 30cm wide and is located 2 m from the ground. These tree hollows are potential habitat for threatened microbats and will require further assessment to determine the presence /absence at the DA stage.
Stags	Birds, particularly birds of prey, reptiles, amphibians, micro bats	No stags were present on the subject site.
Leaf litter	Reptiles, amphibians, invertebrates	Generally poor, as the study area is regularly maintained and all vegetation is present in garden beds or lawns.
Coarse woody debris	Terrestrial mammals, reptiles, invertebrates	Absent.
Watercourse	Amphibians, water birds, aquatic fauna	No natural watercourses or drainage lines are present within the study area.
Vegetative corridor	Birds, reptiles, arboreal and small mammals	The study area is surrounded by the urban development and does not form part of a vegetated corridor.

5. Ecological constraints

The ecological constraints of the study area have been assigned based on the criteria listed in Table 3 . 'The study area's ecological constraints are illustrated in Figure 5. Areas mapped as 'high ecological constraint' include the potential remnant trees associated with the CPW CEEC. This vegetation also contains two tree hollows which are potential habitat for threatened microbats. These areas should be retained.

Areas of native planted vegetation have been assigned as a 'moderate ecological constraint'. These areas provide foraging and roosting habitat for locally common native fauna species (birds, bats and possums) and foraging habitat for the threatened Grey-headed Flying-fox. These areas should be retained where possible.

The remaining areas of vegetation are 'weeds and exotics' and have been assigned a 'low ecological constraint'. Such areas are not a constraint to future redevelopment of the study area.

Figure 5: Ecological constraints of the study area

6. Conclusion and recommendations

Based on a desktop review and field survey, the study area comprises approximately 0.67 ha of native planted vegetation and 0.15 ha of potential remnant trees associated with native vegetation community Cumberland Plain Woodland (CPW). CPW is listed as a critically endangered ecological community under the BC Act and EPBC Act, however the condition of the CPW within the study area would not meet the EPBC Act condition thresholds. This vegetation type also contains two trees with hollows.

The remaining vegetation within the study area consists of weeds and exotic species. All the vegetation within the study area is highly modified and consists of managed/landscaped gardens and mown lawn. Exotics and weeds dominate the understorey and ground cover.

The planted native vegetation and remnant CPW trees form potential foraging habitat for *Pteropus poliocephalus* (Grey-headed Flying-fox) and roosting and foraging habitat for locally common native birds, bats and arboreal mammals. Grey-headed Flying-fox is listed under the BC Act and EPBC Act as a vulnerable species, and an assessment of significance under both Acts will be required at the DA stage, for any loss of foraging habitat.

The two tree hollows recorded are potential habitat for a number of threatened microbats. It appears that the proposed masterplan will retain these trees. However, further survey would be required at the DA stage to determine if any threatened species are utilising these tree hollows, should these trees require removal.

Under the BC Act, a development must demonstrate that impacts to biodiversity have been avoided, minimised and offset. The Biodiversity Offset Scheme (BOS) will be triggered if more than 0.25 ha of vegetation native to NSW is cleared. Approximately 0.67 ha of vegetation native to NSW has been mapped within the study area.

The area of native vegetation to be cleared under the masterplan will be assessed at the DA stage, to determine whether the BOS is triggered. If more than 0.25 ha of planted native vegetation is proposed to be cleared, the BOS will be triggered and a Biodiversity Development Assessment Report (BDAR) will be required to accompany a DA. The BDAR will require field survey and report preparation consistent with the Biodiversity Assessment Method (BAM) and will calculate the number of offsets required.

The BOS is also triggered when a development is likely to have a significant impact on threatened species, population or communities. This will be determined at the DA stage, depending whether Grey-headed Flying-fox foraging habitat and/or hollow-bearing trees are proposed to be impacted. At this stage, we believe the masterplan will not result in a significant impact to threatened flora and fauna or threatened ecological communities.

Overall, the study area presents a moderate constraint to future redevelopment of the site in areas mapped as planted native vegetation and a high constraint to areas containing CPW trees and tree hollows. Existing planted native vegetation should be retained where possible and the highly constrained CPW trees should be retained. Most of the CPW vegetation occurs along the northern edge of the study area at the entrance and exit driveways.

7. References

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