

Biodiversity Development Assessment Report

**1 - 1A Edward Street
and
25 - 27 Rosedale Road**

Gordon

Ku-ring-gai LGA

For: Edward St Residence DM Pty Ltd

REF: KMC 25-1310

4th December 2025



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CERTIFICATION
I certify that this BDAR has been prepared on the basis of the requirements of (and information provided under) the current Biodiversity Assessment Method (2020).  Assessor Number BAAS17045 4 th December 2025

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Keystone Ecological <i>Flora and Fauna Specialists</i> Mail: PO Box 5095 Empire Bay NSW 2257 Email: office@keystone-ecological.com.au ABN: 13 099 456 149	Cover photo: Aerial view of the four development lots. Source: Nearmap, dated 27 th November 2025.
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DEFINITIONS

Some terms require definition for the Biodiversity Development Assessment Report and largely include those as per the *Biodiversity Conservation (BC) Act 2016* and Biodiversity Assessment Method (2020) for matters listed under NSW legislation.

BAM: The Biodiversity Assessment Method (2020).

Critically endangered ecological community (CEEC): an ecological community specified as critically endangered in Schedule 2 of the *BC Act 2016* and/or listed under Part 13, Division 1, Subdivision A of the *EPBC Act 1999*.

Development: has the same meaning as development at section 4, or an activity in Part 5, or development as defined in section 115T of the *NSW Environmental Planning and Assessment Act 1979 (EPA Act 1979)*.

Development footprint: the area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.

Development site: an area of land that is subject to a proposed development that is under the *EPA Act 1979*. It is also taken to include the clearing footprint, except where the reference is to a small area development or major project development.

DIWA: Directory of Important Wetlands.

Endangered ecological community (EEC): an ecological community specified as endangered in Schedule 2 of the *BC Act 2016*, or listed under the *EPBC Act 1999*.

Habitat: an area or areas occupied, or periodically or occasionally occupied, by a species or ecological community, including any biotic or abiotic component.

Habitat component: the component of habitat that is used by a threatened species for breeding, foraging, or shelter.

High threat exotic plant cover: plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species. Also referred to as high threat weeds or high threat exotic vegetation. Plants considered to be high threat weeds are listed on the high threat weeds list published in the BAM-C.

Hollow-bearing tree: a living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1m above the ground. Trees must be examined from all angles.

IBRA region: a bioregion identified under the Interim Biogeographic Regionalisation for Australia (IBRA) system, which divides Australia into bioregions on the basis of their dominant landscape-scale attributes.

IBRA subregion: a subregion of a bioregion identified under the IBRA system.

Major project: State Significant Development and State Significant Infrastructure.

Native ground cover: all native vegetation below 1 metre in height, including all such species native to NSW (i.e. not confined to species indigenous to the area).

Native ground cover (grasses): native ground cover composed specifically of native grasses.

Native ground cover (other): native ground cover composed specifically of non-woody native vegetation (vascular plants only) less than 1 m in height that is not a grass (e.g. herbs, ferns).

Native ground cover (shrubs): native ground cover composed specifically of native woody vegetation less than 1 m in height.

Native mid-storey cover: all vegetation between the over-storey stratum and a height of 1m (typically tall shrubs, under-storey trees and tree regeneration) and including all species native to NSW (i.e. native species not local to the area can contribute to mid-storey structure).

Native over-storey cover: the tallest woody stratum present (including emergent) above 1m and including all species native to NSW (i.e. native species not local to the area can contribute to over-storey structure). In a woodland community the over-storey stratum is the tree layer, and in a shrubland community the over-storey stratum is the tallest shrub layer. Some vegetation types (e.g. grasslands) may not have an over-storey stratum.

Native vegetation: species endemic to NSW as defined in Section 1.6 of the *BC Act 2016* and Section 60B of the *LLS Act 2013*.

Number of trees with hollows: a count of the number of living and dead trees that are hollow bearing.

Prescribed impact: means the prescribed impacts identified in clause 6.1 of the BC Regulation. Prescribed impacts can be direct or indirect impacts.

Subject lot(s): The lot(s) within proposed works as identified by the Lot number and Deposited Plan (DP) number.

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1 INTRODUCTION

Keystone Ecological has been contracted by Edward St Residence DM Pty Ltd to assess the likely impacts of the State Significant Development Application SSDA-85549710 upon state-listed flora and fauna, and their habitats at the following four lots in Gordon in the Ku-ring-gai Local Government Area (LGA):

- Lot A DP 189351, 1 Edward Street
- Lot C DP 189351, 1A Edward Street
- Lot A DP 334965, 27 Rosedale Road
- Lot B DP 334965, 25 Rosedale Road

The development site is currently zoned R2 Low Density Residential, and the subject lots occupy a total area of 5,945 square metres (0.59 hectares). Each of the lots is developed with long established dwellings and formal gardens, and also includes an in-ground swimming pool and a tennis court (see Figure 1). The proposal is to construct two residential flat buildings (Buildings A and B) of nine storeys each, as illustrated in Figures 2A and 2B.

The proposal comprises:

- Demolition of existing improvements;
- Partial clearing of the site;
- Construction of 2 residential flat buildings that includes 119 units with each building comprising 9 levels (including affordable rental housing) and 2 basement parking levels;
- Landscaping of common spaces (ground and rooftop levels) including deep soil planting; and
- Associated infrastructure.

As a State Significant Development Application, the Biodiversity Offsets Scheme (BOS) is automatically triggered, and requires submission of a Biodiversity Development Assessment Report (BDAR) in accordance with the *Biodiversity Conservation (BC) Act 2016*. Although the site is not mapped as having Biodiversity Values and does not support native vegetation (see Section 2), a BDAR waiver has not been sought for this project as it is anticipated that there is the potential for a small prescribed impact arising from the proximity of the development site to an important colony of *Pteropus poliocephalus* Grey-headed Flying-fox.



Figure 1: Recent aerial imagery of the proposed development site (red outline, house numbers shown in yellow).
Nearmap photomap, 5th October 2025.



Figure 2A: Proposed site plan showing the extent of the footprint. Source plan: PMDL, Revision A, dated 26th September 2025.



Figure 2B: Rendering of the proposal, looking south east. Source plan: PMDL, Revision B, dated 14th November 2025.

The following specific plans and reports were relied upon for this BDAR:

- **Architectural Plans**, prepared by PMDL, revisions A to D, most recently dated 25th November 2025.
- **Arboricultural Impact Appraisal and Method Statement - SSDA**, prepared by eziGROW, dated 25th September 2025.
- **Landscape Documentation Set for SSDA**, prepared by Studio IZ, revision P4, dated 14th November 2025.
- **Stormwater Management Plans, prepared by Hydracor**, issue C, dated 25th November 2025.

The following external sources of information were relied upon for this BDAR, satisfying section 1.4.1 of the BAM 2020:

- BioNet Vegetation Classification (formerly known as the NSW Vegetation Information System Classification Database).
- BioNet Threatened Biodiversity Data Collection (TBDC, formerly known as the Threatened Species Profile Database).
- BioNet Atlas (formerly known as the NSW Wildlife Atlas).
- Directory of Important Wetlands in Australia.
- NSW Interim Biogeographic Regions of Australia (IBRA region and subregion) – Ver 7.
- Biodiversity Assessment Method (2020). Biodiversity Assessment Method, Environment, Energy and Science, Department of Planning Industry and Environment, October 2020, Sydney NSW.
- NearMaps aerial imagery tool (<http://maps.au.nearmap.com/>).
- NSW Government mapping tool Explorer v 1.2 (<https://portal.spatial.nsw.gov.au/explorer/index.html>).
- SEED (2024) Sharing and enabling environmental data online portal. NSW Government <https://geo.seed.nsw.gov.au/vertigisstudio/web/?app=cabd04d595ec43c1aaf4298e80e83ec2>

2 PLANTED NATIVE VEGETATION

The development site was inspected on 23rd July 2025.

The inspection established that the 4 lots are occupied entirely by large residences and their associated formal gardens. The gardens are all well maintained and dominated by exotic plantings with 64 of the 80 assessed trees being exotic. Other than one small *Pittosporum undulatum*, native Australian species are restricted to the following 15 planted trees on and adjacent to the development site (tree locations are shown in Figure 3):

- *Callistemon viminalis* (T13 and T29) – This species of small tree / large shrub is popular in horticulture and not native to the Central Coast Botanical Subdivision. Instead it is naturally occurring in the northern parts of NSW and beyond into Queensland. The specimen on the development site (T29) has been planted in the front garden of number 27 Rosedale Road.
- *Howea forsteriana* Kentia Palm (T34) – This species occurs naturally only on Lord Howe Island and is therefore technically native to NSW. It is widely cultivated, with the germination and export of Kentia Palms one of the major industries of Lord Howe Island. This specimen occurs in the front garden of number 27 Rosedale Road.
- *Leptospermum petersonii* Lemon-scented Teatree (T33) – This species of small tree / large shrub is popular in horticulture and not native to the Central Coast Botanical Subdivision. Instead it is naturally occurring in the northern parts of NSW and beyond into Queensland. The specimen on the development site has been planted in the front garden of number 27 Rosedale Road.
- *Lophostemon confertus* Brush Box (T6, T7, T8, and T9) – This species is a native of rainforests in coastal NSW, north from Bulahdelah and is a popular street tree planting. These specimens have all been planted within the council verge on Rosedale Road.
- *Melaleuca bracteata* Black Tea-tree (T36) – This species occurs naturally in northern NSW and beyond into Queensland, Northern Territory, and South Australia; it is not native to the Central Coast Botanical Subdivision of NSW. This specimen has been planted in the garden of number 27 Rosedale Road.
- *Schefflera actinophylla* Umbrella Tree (T12 and T35) – This species is native to north Queensland but often cultivated as an ornamental and is occasionally naturalized in coastal districts. The specimen on the development site (T35) has been planted in the garden of number 27 Rosedale Road.
- *Stenocarpus sinuatus* Firewheel Tree (T78) - This species of tree is popular in horticulture and not native to the Central Coast Botanical Subdivision. Instead it is naturally occurring in the northern parts of NSW and beyond into Queensland. The planted subject specimen is in the garden of one of the neighbouring properties to the south of the development site.
- *Syzygium australe* Brush Cherry (T37) – This species occurs naturally in rainforest, often along streams, in coastal districts north from Batemans Bay and therefore is technically locally native. However, it is one of a suite of Lilly Pillies that are very popular in horticulture, with many cultivars and hybrid varieties available. The specimen on the development site (T37) has been planted and grown as a hedge in number 27 Rosedale Road.

- *Tristaniopsis laurina* Water Gum (T4 and T5) – This small tree is a popular choice for street tree planting in Ku-ring-gai due to its manageable size and affinity with local vegetation communities. These specimens have been planted on the Council verge on the Edward Street frontage.

In addition to the species composition and their landscaped locations within the gardens, further evidence of these being planted and not examples of naturally-occurring remnant vegetation is provided by the available historical aerial imagery – see Figure 4.

This aerial image demonstrates that in 1943 the development site comprised three large properties and a smaller property, all with dwellings and grounds made up almost entirely of cleared open lawns. The Brush Box trees on Rosedale Road (T6-T9) and the Camphor Laurel (T3) on Edward Street are evident in that photography.

The development site does not appear to be supporting any natural vegetation in that 1943 image. However, even if some of the vegetation in 1943 was remnant and native, it is now long gone and replaced with the manicured gardens seen today.

The only truly locally native species that is also likely to be naturally occurring on the development site is the individual *Pittosporum undulatum* Sweet Pittosporum (T21). It is a multi-stemmed small tree, growing in amongst the row of exotic trees (T19, T20, T22) planted along the southern boundary of number 27 Rosedale Road.

With a canopy spread of 4 metres, this single small tree occupies a maximum area of 12.5 square metres, which is insufficient to be identified as a Vegetation Zone.

Therefore, as it has been determined that the vegetation on site is made up of exotic gardens and planted native vegetation within the context of urban gardens, the decision-making key (D.1) in Appendix D of the BAM has been applied and is reproduced below. Choices are indicated by boxed text:

1. Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?

- i. Yes The planted native vegetation must be allocated to the best-fit PCT and the BAM must be applied.
- ii. No..... Go to 2.

2. Is the planted native vegetation:

- a. planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and**
- b. the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?**

- i. Yes The planted native vegetation must be assessed in accordance with

Chapters 4 and 5 of the BAM.

ii. No..... Go to 3.

3. Is the planted/translocated native vegetation individuals of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under one of the following:

- a. a species recovery project**
- b. *Saving our Species* project**
- c. other types of government funded restoration project**
- d. condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat**
- e. legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act)**
- f. ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or**
- g. approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW *Water Management Act 2000*)?**

i. Yes The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM.

ii. No..... Go to 4.

4. Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation?

i. Yes..... Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).

ii. No..... Go to 5.

5. Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?

i. Yes Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).

ii. No..... Go to 6.

6. Is the planted native vegetation a species listed as a widely cultivated native species on a list approved by the Secretary of the Department (or an officer authorised by the Secretary)?

- i. Yes Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).
- ii. No..... There may be other types of occurrences of planted native vegetation that do not easily fit into the decision-making key above. Assessors should contact the BAM Support mailbox at bam.support@environment.nsw.gov.au for further advice on using the BAM to assess other types of occurrences of planted native vegetation.

This analysis has established that the native vegetation on the development site is part of urban gardens and planted for functional, aesthetic, or horticultural purposes, and not as part of a consent or management plan, or for conservation purposes. Thus, it is necessary to consider whether the planted native vegetation provides habitat for threatened species credit species.

The list of potential threatened species for consideration was developed by interrogation of threatened species that have been recorded within the 1500 metre radius Area Of Interest (AOI) around the development site. The species credit species that have been recorded in the AOI and further considered in Section 4 comprise the following 6 species (1 plant, 1 frog, 3 birds, and 1 mammal):

- *Deyeuxia appressa*
- *Pseudophryne australis* Red-crowned Toadlet
- *Haliaeetus leucogaster* White-bellied Sea-Eagle
- *Lathamus discolor* Swift Parrot
- *Ninox strenua* Powerful Owl
- *Pteropus poliocephalus* Grey-headed Flying-fox



Figure 3: Locations and provenance of trees on and adjacent to the development site (white).
Blue: locally native; yellow: native to NSW but not locally native; orange: native to Qld; Pink: exotic.



Figure 4: Aerial photograph of the development site and surrounds in 1943.

3 LANDSCAPE AND SITE CONTEXT

Relevant landscape features are mapped in Figure 5.

The development site is located within the **Cumberland subregion** in the **Sydney Basin IBRA bioregion**.

The Sydney Basin IBRA Bioregion¹ occupies over 3.6 million hectares and extends from just north of Batemans Bay to Nelson Bay on the central coast, and almost as far west as Mudgee. It includes a significant proportion of the catchments of the Hawkesbury-Nepean, Hunter and Shoalhaven river systems, all of the smaller catchments of Lake Macquarie, Lake Illawarra, Hacking, Georges and Parramatta Rivers, and smaller portions of the headwaters of the Clyde and Macquarie rivers.

The Cumberland IBRA subregion² contains low rolling hills and wide valleys in areas of rain shadows below the Blue Mountains on Triassic Wianamatta shales and sandstones. It has intrusions by small volcanic vents that are partly covered by tertiary river gravels and sands, with quaternary alluvial soils occurring along the main streams.

Soils are typically red and yellow with brown clays on volcanics. At least three terrace levels are evident in gravel splays with volcanics occurring from low hills in shale landscapes. Swamps and lagoons occur in floodplain areas of the Nepean River.

Vegetation is typically divided by soil influences. *Eucalyptus moluccana* Grey Box, *Eucalyptus tereticornis* Forest Red Gum, *Eucalyptus crebra* Narrow-leaved Ironbark woodland with some *Corymbia maculata* Spotted Gum occurs on rolling shale hills. *Eucalyptus sclerophylla* Hard-leaved Scribbly Gum, *Angophora floribunda* Rough-barked Apple and *Banksia serrata* Old Man Banksia occur on alluvial sands and gravels. *Angophora subvelutina* Broad-leaved Apple, *Eucalyptus amplifolia* Cabbage Gum, and *Eucalyptus tereticornis* Forest Red Gum with abundant *Casuarina glauca* Swamp Oak occur on river flats, with tall rushes and *Eucalyptus parramattensis* Parramatta Red Gum in lagoons and swamps.

The centre of the site is approximately at **-33.753990 latitude and 151.157590 longitude**.

The site occurs within the **Pennant Hills Ridges Mitchell Landscape**.

The Pennant Hills Ridges Mitchell Landscape³ occurs on rolling to moderately steep hills on horizontal shales and siltstones with an elevation between 10 metres to 90 metres ASL and a local relief of 60 metres ASL. Soils consist of deep red textured soils on narrow hillcrests with red to brown, yellow soils on slopes and becoming harsher in drainage areas.

Native vegetation is generally made up of tall open forest comprising *Eucalyptus saligna* Sydney Blue Gum, *Syncarpia glomulifera* Turpentine, *Eucalyptus pilularis* Blackbutt, *Eucalyptus globoidea*

¹ Sydney Basin Bioregion, at <http://www.environment.nsw.gov.au/bioregions/SydneyBasinBioregion.htm>

² Sydney Basin – subregions, at <http://www.environment.nsw.gov.au/bioregions/SydneyBasin-Subregions.htm>

³ Department of Environment and Climate Change NSW (2002) Descriptions for NSW (Mitchell) landscapes, version 2, based on descriptions compiled by Dr. Peter Mitchell.

White Stringybark, *Eucalyptus paniculata* Grey Ironbark, *Angophora floribunda* Rough-barked Apple, and *Allocasuarina torulosa* Forest Oak. Rainforest elements - including *Pittosporum undulatum* Sweet Pittosporum, *Glochidion ferdinandi* Cheese Tree, *Ficus coronata* Sandpaper Fig and *Callicoma serratifolia* Black Wattle - occur in the heads of protected moist gullies.

The **pattern of native vegetation within the assessment area** is uneven. The areas on the broad ridge that is dissected by the Pacific Highway and the main northern railway line is highly urbanised, with vegetation restricted to that within gardens and street plantings. Otherwise in the buffer area, native vegetation is more or less restricted to the gullies to the north east and south west. Both slopes lead to large areas of reserved land (e.g. Garigal National Park to the north east and Lane Cove National Park to the south west).

A subregional **Biodiversity Corridor** has been recognised in the gully system to the north east of the development site. This takes in the area occupied by the Gordon colony of the Grey-headed Flying-fox in Stony Creek and beyond, up to and including Dalrymple-Hay Nature Reserve outside of the buffer area. As part of the Ku-ring-gai Local Environmental Plan, Terrestrial Biodiversity has been mapped by Council. This is a more expansive interpretation of biodiversity corridors, relying on smaller and more fragmented stepping stones that may not actually function as such for anything but the most highly mobile species of fauna. For example, the transport corridor along the central ridge acts as a barrier for most terrestrial species and is also known to account for the death of many volant species as well. Otherwise, uninterrupted corridors of habitat are restricted to the bushland gullies that connect with bushland off the plateau and then on to large natural reserves.

Rivers and streams recognised under the *Water Management Act 2010* are those shown as blue lines on 1:25,000 topographic maps. The significance of the streams and the protections they attract are determined by their stream order, according to the Strahler system. In essence, this is defined by the number and types of upper branches.

Within the buffer area of the development site there are a number of mapped streams, and their orders have been determined by inspection of the Hydroline Spatial Map associated with the *Water Management Act 2010*. The streams in the assessment area (shown in Figure 5) are restricted to the upper reaches of creeks that drain from the plateau to the north and south. These are distant from the development site, which is situated at the centre of the Hornsby plateau. The closest stream is the mapped head of Rocky Creek, 250 metres to the south.

As part of the Greenweb mapping, Council has also recognised an additional level of riparian land above that of the first order streams identified in the Hydroline Spatial Map. These are also shown in Figure 5 as green strips.

There are no **wetlands** within the buffer area or otherwise nearby recognised under the *State Environmental Planning Policy Coastal Management 2018*.

No karsts, caves, crevices, cliffs rocks or other forms of **geological** features occur on site. There are no areas of formally or informally recognised geological significance within the buffer area or on the subject lot.

At the time of preparation of this BDAR, declared **Areas of Outstanding Biodiversity Values** (AOBVs) are confined to those already declared as Critical Habitat under the *Threatened Species Conservation Act 1995* (now repealed), being:

- Cabbage Tree Island, critical breeding habitat for Gould's Petrel near Port Stephens;
- Manly Cove, critical breeding habitat for Little Penguins;
- Stotts Island Nature Reserve, critical habitat for Mitchell's Rainforest Snail near Murwillumbah; and
- All known extant areas of the Wollemi Pine and the surrounding habitat in the catchment, occupying some 5,000 hectares within Wollemi National Park.

No areas of AOBV declared under the *Biodiversity Conservation Act 2016* occur within or near the site.

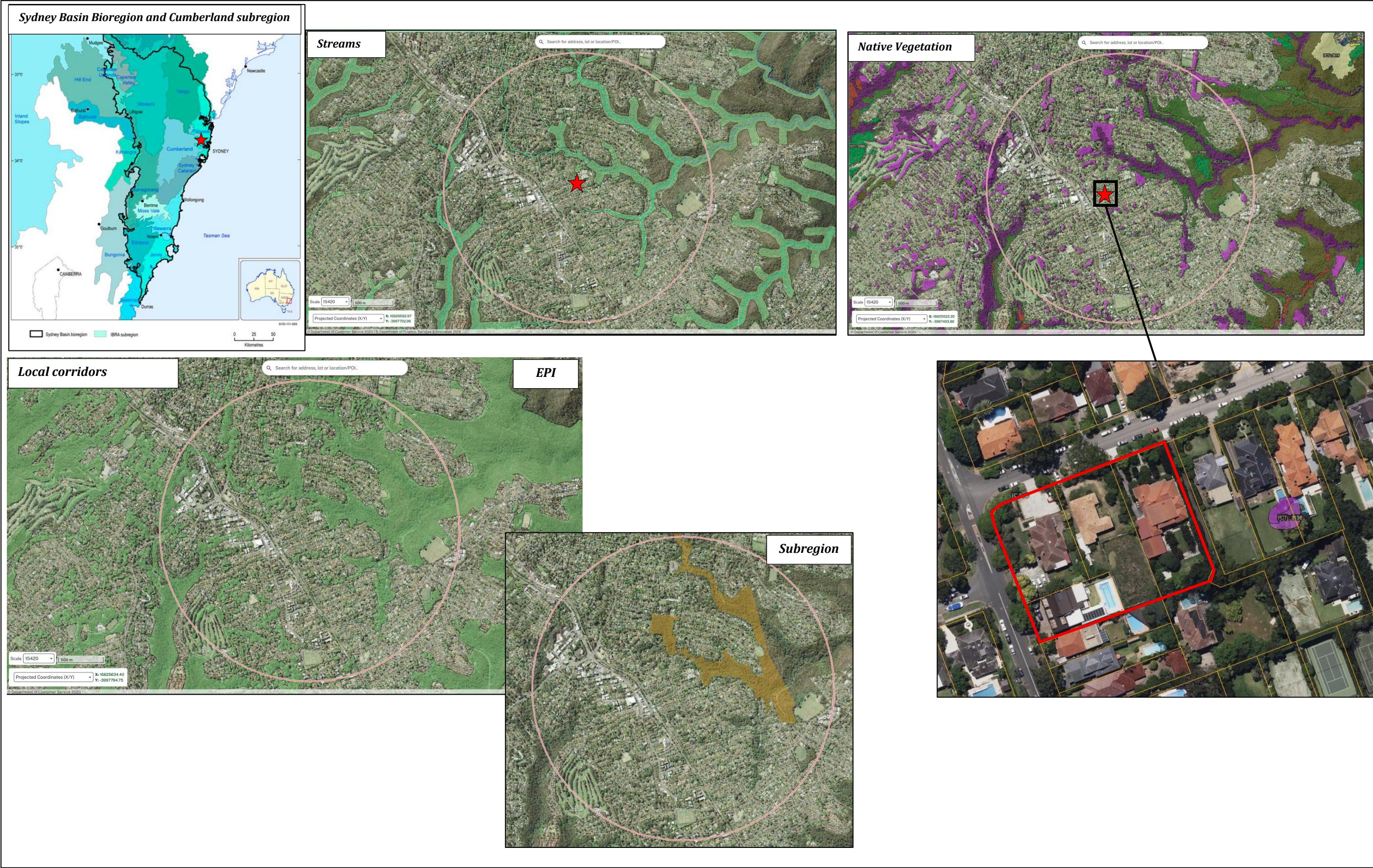


Figure 5: Landscape features in the 1500 m radius assessment area including bioregion and subregion, streams, mapped PCTs, and recognised habitat corridors.

4 THREATENED SPECIES

As a result of the decision-making key in Appendix D of the BAM, it was determined that the development site contains planted native vegetation and that the potential for the site to support species credit threatened species needs to be considered.

The list of 6 candidate species for consideration was compiled by filtering out species credit species from the Bionet records for the 1500 metre radius Assessment Area. The potential for the development site to provide habitat for each of these species is explored below.

- *Deyeuxia appressa*
- *Pseudophryne australis* Red-crowned Toadlet
- *Haliaeetus leucogaster* White-bellied Sea-Eagle
- *Lathamus discolor* Swift Parrot
- *Ninox strenua* Powerful Owl
- *Pteropus poliocephalus* Grey-headed Flying-fox

Deyeuxia appressa

It is listed as Endangered, and is a species credit species with the potential to experience a Serious and Irreversible Impact.

There are two records of this plant species from the Assessment Area, both dating from 1941.

This species has not been seen since 1941, and so nothing is known about its habitat or ecological preferences. However, the Threatened Biodiversity Data Collection (TBDC) lists this species as associated with a number of PCTs, based on inferences from taxonomically similar species.

The vegetation modelled as occurring on the development site in 1750 prior to European disturbance¹ comprises PCT 3136 Blue Gum High Forest mapped across almost all of the four lots, with PCT 3262 Sydney Turpentine Ironbark Forest skimming the northern garden of number 1 Edward Street.

Notably, this species is not associated with either of these PCTs.

It is considered highly unlikely that this species would occur on the development site given the profound and long-standing changes the site has experienced, the absence of evidence that this species occurs in the vegetation likely to have occurred on site prior to clearing and urbanisation, and the likelihood for the species to be extinct.

***Pseudophryne australis* Red-crowned Toadlet**

This species is listed as Vulnerable, and is a species credit species.

¹ Dataset *SVTM NSW 1750 PCT*, available on SEED website.

There are 5 recorded locations in the Assessment Area of this frog calling, dating from 2001 to 2022. These locations are all within the riparian habitats associated with Rocky Creek and Stony Creek to the north of the development site.

This species occurs within moist leaf litter in the heads of bushland gullies. The development site does not now and probably never did support such habitat.

***Haliaeetus leucogaster* White-bellied Sea-Eagle**

It is listed as Vulnerable, and is a dual ecosystem and species credit species, depending on the presence of breeding habitat.

There are only two records of this species from the Assessment Area, dating from 2004 and 2020, both being over the Stony Creek gully to the north of the development site.

The TBDC details the breeding habitat of this species as mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.

No such potential breeding habitat occurs on or near the development site.

***Lathamus discolor* Swift Parrot**

It is listed as Critically Endangered, and is a dual credit species, being a species credit species in areas identified in the Important Habitat Map.

There is only one record of this species from the Assessment Area, dating from 2007.

The development site is not within a mapped area of Important Habitat and so it does not provide suitable habitat for this species.

***Ninox strenua* Powerful Owl**

This species is listed as Vulnerable, and is a species credit species.

There are 69 records of this species from the Assessment Area, dating from 2001 to 2025. The large number of records is a result of the Powerful Owl Project undertaken by Birdlife Australia that mobilised a small army of citizen scientists, many from the northern suburbs of Sydney.

There are no records of this species from the development site, instead generally restricted to well-vegetated gullies. The closest verified sightings (including of fledged chicks) are from Stony Creek² to the north of the development site, a location that also supports a large colony of one of its favoured prey species, *Pteropus poliocephalus* Grey-headed Flying-fox.

² Locations reported by citizen scientists on eBird (ebird.org)

A major habitat constraint for this species is its particular requirements regarding breeding habitat: a living or dead tree with a hollow >20 centimetres in diameter and that occurs >4 metres above the ground. The nest trees are also preferably located within a densely vegetated gully, with a suitable roost site near the nest's entrance from which the male guards his partner and young. This species will use patches of habitat within fragmented areas especially as foraging habitat but also for roosting and occasionally nesting, but such habitat must always have a dense canopy.

Powerful Owls need large home ranges to provide adequate prey resources, with 2,000 hectares being a reasonable estimated standard to expect in many habitats occupied by the species. The development site is likely to be within the territory of at least one breeding pair, with juveniles having been reported in Stony Creek by citizen scientists.

The presence of high quality habitat within the Assessment Area means that a foraging territory may be smaller than average, and is likely to be used more intensively than poor quality urban gardens near busy transport corridors (such as on the development site). The most preferred prey species of the Powerful Owl is Ringtail Possum, but no dreys or dense understorey habitat suitable for the Ringtail Possum was observed on the development site.

The development site is overwhelmingly made up of small garden spaces dominated by exotic trees. This provides poor quality potential foraging habitat in an area where known pairs occur in well-connected bushland with breeding habitat and a mosaic of habitats for its prey species.

The likelihood of the gardens on the development site being used by the Powerful Owl is considered to be low.

***Pteropus poliocephalus* Grey-headed Flying-fox**

This species is listed as Vulnerable, and is a dual ecosystem and species credit species, depending on the presence of breeding habitat (camps). The TBDC details that this species is retained as dual credit because foraging habitat is broad ranging but breeding camps are localised and, if impacted, must be offset by protecting and enhancing another breeding camp.

There are 1,243 records of this species from the Assessment Area, recorded from 1975 to 2024. The large number is a direct result of the development site's proximity (between 300 and 500 metres) to the long-established maternity camp in Stony Creek that has been regularly monitored and studied for decades.

The development site does not contain habitat suitable for roosting or breeding, but is well within the foraging distance of this species. Of the tree species on and around the site, the Ku-ring-gai Bat Conservation Society lists only *Pittosporum undulatum* fruit as a potential food tree. The local area supports large expanses of significant canopy trees with high quality blossom and fruit resources. The likelihood of this single small tree growing within a garden bed of exotic trees situated between two closely aligned buildings to be exploited by this species is considered to be low.

5 PRESCRIBED IMPACTS

Impacts for which there is not a formal offset procedure are “prescribed impacts” as per Part 6 Division 6.1 of the BCR 2017. Prescribed impacts are detailed in Chapter 6 of the BAM and each discussed below.

Karst, caves, crevices, cliffs, rocks and other geological features of significance. The site does not support any such features.

Water bodies, water quality and hydrological processes. The development area does not have recognised drainage lines or other features associated with water bodies.

Wind farm developments. This is not a wind farm development, and so any such related indirect impacts are not relevant.

Vehicle strikes. The proposed development occurs in an already urbanised area with established traffic loads. The development may potentially increase the numbers of vehicle movements.

Human-made structures and non-native vegetation. All of the existing improvements on the development site will be removed along with the formal gardens that includes some exotic vegetation. The dwellings are well maintained and unsuitable for native fauna (such as possums or microbats). However, the mature trees on site may provide shelter and roost sites and foraging resources in their canopies, particularly for some common urban fauna species (such as birds).

Habitat connectivity. This is considered to be a minor consideration for most species, as local connectivity is primarily provided by gully vegetation that occurs offsite. The major local connections are via riparian habitats leading down to the large reserves of Garigal National Park and Lane Cove National Park, away from the plateau occupied by the development site

However, this proposal has the potential to impose prescribed impacts to *Pteropus poliocephalus* Grey-headed Flying-fox due to an increased chance of vehicle strike, building collision, and interruption of habitat connectivity. The potential reasons, significance, and mitigations of such impacts are explored below in late sections of this BDAR.

6 AVOID AND MINIMISE IMPACTS

The *Biodiversity Conservation Act 2016* requires as a legislative imperative that impacts are to be avoided, then minimised by implementation of ameliorative measures, with offsetting only of unavoidable impacts. Prior to the commencement of this Act, this cascade of principles was only good practice and not enforceable.

Chapter 7 of the BAM details a number of ways in which a proposed development can demonstrate avoidance and minimisation of impacts. Relevant to this small areas assessment is the analysis of alternatives, including:

- Modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology;
- Alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location; and
- Alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site.

The development site supports large residences and planted gardens, some of which comprises mature exotic and native trees. However, analysis provided in Sections 2, 3, 4, and 5 above established that the vegetation does not represent any Plant Community Type (PCT) and that the resources provided by these garden trees are unlikely to be exploited to any significant degree by any relevant threatened species known to occur in the local area.

Thus, the biodiversity impacts have been avoided by the nature of the development site's natural features.

The direct impact of the proposed development to the garden trees is detailed in the arboricultural impact assessment. Of the 80 trees on and directly around the site, 52 will be removed and 28 will be retained in accordance with the following breakdown:

Provenance	Remove	Retain
Exotic	46	18
Not Locally Native (ex-NSW)	1 ^A	1 ^A
Not Locally Native (NSW)	3 ^B	7
Locally Native	2 ^C	2

Notes:

A - these trees are both *Schefflera actinophylla* Umbrella Tree (T12 and T35), a native to north Queensland.

B - The trees to be removed are *Callistemon viminalis* (T29), *Howea forsteriana* (T34), and *Melaleuca bracteata* (T36).

C - the 2 trees to be removed are the mature *Pittosporum undulatum* (T21) in a garden bed with exotics, and *Syzygium australe* (T37) a Lilly Pilly that has been grown as a hedge.

These measures and outcomes are considered adequate in satisfying the “avoid and minimise” rule in terms of the vegetation and the habitats it might provide.

7 ASSESSMENT OF IMPACTS

It has been determined that the mature gardens of the development site do not represent any PCT and that the resources provided by these garden trees are unlikely to be exploited to any significant degree by any relevant threatened species known to occur in the local area.

Therefore, no further consideration of direct impacts is required and no offsets need to be applied.

However, there are potential prescribed impacts to *Pteropus poliocephalus* Grey-headed Flying-fox that need to be further considered, being the potential for collisions with the new buildings, increased collisions with vehicles, and interruption of flyways.

Unlike microbats, flying-foxes do not use ultrasound and instead have excellent eyesight. Their large forward-facing eyes provide binocular vision for precise navigation and assessment of distance, shape and texture. They also have a high number of rod cells compared with cones in their retina, such that they have superior vision in low light.

They are also very intelligent animals with good memories and, combined with a strong sense of smell, they have an exceptional capacity for navigation, finding food and camp sites across their enormous range from Queensland south to South Australia.

However, despite these superior capacities, conflicts with man-made structures and vehicles still account for a proportion of known mortality.

Research into the mortality of Grey-headed Flying Foxes from banding returns (Tidemann and Nelson 2011) indicated that from 1989 to 2002 the major causes of death were hyperthermia (33.7%), electrocution (18.6%), and entanglement in fruit-tree netting (5.8%) or barbed wire (4.7%). Only 1.2% of records were from vehicle collisions, and none were the result of collisions with buildings.

More recent data collected by wildlife rehabilitation organisations have been collated by NSW Environment and Heritage and are available on a data dashboard.³ The data collected for Grey-headed Flying-foxes across NSW in 2022-2023 are currently available, and the breakdown of the reasons for the 1,326 rescues are listed as (from highest to lowest):

- 327 dependent young resulting from being abandoned / orphaned (178), fallen from a tree (93), or as a result of a parent being taken into care (56)
- 283 resulting from unknown causes;
- 211 from entanglement with netting (49), wire (140), marine debris (3), or other (19);
- 209 resulting from electrocution;
- 107 resulting from collision with motor vehicle (37), building (57), or other (13);
- 74 resulting from attack by dog (34), cat (4), bird (24), or other (12);
- 26 resulting from weather events including storms (16), extreme heat (4), and flood (3);

³ <https://www.environment.nsw.gov.au/topics/animals-and-plants/native-animals/rehabilitating-native-animals/wildlife-rehabilitation-data-and-reporting/wildlife-rehabilitation-data-dashboard>

- 14 resulting from human interaction including tree removal (9) or intentional harm (3);
- 5 resulting from entrapment;
- 3 resulting from ingestion of poison (1) or a foreign object (2); and
- 2 resulting from disease.

Nevertheless, the rehabilitation dataset indicates that the construction of tall buildings close to the Grey-headed Flying-fox camp has the potential to increase the chance of collisions during their nightly exit from and early morning return to the camp. The 57 collisions with buildings across NSW as detailed above represents 4% of total rescues. The season for the highest number of collisions was autumn, so presumably they were dominated by juveniles who had less well developed navigational skills. Almost all of the animals that collided with buildings eventually died.

It is not known what types of buildings they collided with, but as the largest percentage of building collisions occurred in the LGAs of the City of Sydney (25%), the Inner West (14%), and Wollongong (12%), it is reasonable to conclude that collisions with tall buildings (although of unknown nature and height) accounted for many of these deaths. Their proximity to a colony is also unknown, and thus it is unknown whether they were collisions during flyouts / flyins or a different type of encounter entirely.

Notably, no collisions with buildings were recorded in the Ku-ring-gai LGA despite the presence of the Gordon colony.

This colony has been well-studied, with regular counts conducted primarily from the bridge on Rosedale Road, as the principal direction for the nightly flyout is up the gully to the north west. Of course not all animals fly out in the same direction, and so animals that may also fly low over the development site would have an increased potential to collide with the new buildings.

However, in general such collisions are rare (4% of rehabilitation records), and only a minority of of the colony's population might fly in the direction of the proposed buildings. Notwithstanding the low numbers likely to be affected, such impacts can and should be mitigated.

Vehicle collisions accounted for only 3% of the reported mortality of this species across the state, and none within Ku-ring-gai in the year of reporting. Nevertheless, despite its rarity, collisions can and do occur and should also be addressed and mitigated where possible.

Of the 10 rescued animals in the Ku-ring-gai LGA, 5 had unknown causes but the remaining reasons for going into care included cat attack, abandonment of young, electrocution, and entanglement in netting.

If the low number of rescues in the Ku-ring-gai LGA are indicative of a low rate of mortality, then it is probably a reflection of a combination of factors. These undoubtedly include the presence of large swathes of intact vegetation that provide good foraging resources, thus minimising the potential for conflict with people and their habitats. It might also reflect the particular awareness of this local community to the needs of this species due to the long-term advocacy of passionate individuals and organisations such as the Ku-ring-gai Bat Conservation Association. The

area occupied by the Gordon colony is now managed by Council under an approved conservation program and continues to be the subject of monitoring and research.

However, there is a cautionary note to the long term viability of the Gordon colony, irrespective of any potential prescribed impacts from this or other similar development proposals.

Recent research into the effects of the extreme heat events over the 2019-2020 summer (Mo et al. 2022) has revealed that the Gordon colony is particularly vulnerable. Mass mortalities were recorded across south east Australia, with a minimum estimated 72,175 individual flying-foxes that died during those heat events. Deaths were not evenly spread - 8 camps that accounted for 76% of the deaths. Gordon was among the worst, being one of 4 camps that each comprised more than 9% of the total estimate of heat mortalities. This may have been partially explained by the failure of a number of large trees in the Gordon colony caused by a windstorm on 26th November 2019. This resulted in the loss of substantial shade just prior to the early January 2020 heatwave. It is estimated that approximately 7,000 individuals died in the Gordon colony alone (Mo et al., 2022). Additional undocumented deaths may also have occurred due to starvation effects from drought or further direct losses arising from the subsequent catastrophic Black Summer bushfires.

This result represents the highest recorded mortality of Australian flying-foxes within a single summer. It is predicted that such heat events and bushfires will become increasingly more frequent with the worsening of climate change. Mo et al. (2022) concluded that it “highlights a need to restore vegetation in flying-fox foraging areas and camps, address anthropogenic climate change and gather more empirical data to inform heat stress interventions to minimise flying-fox mortalities.”

The Gordon colony is currently managed for conservation purposes and has been since 1991. In a 2024 presentation by Ku-ring-gai Council's Haley Henning to the National Flying-fox Forum, she lamented that despite formal protection of the gully within which the camp occurred, consistent and successful removal and control of weeds, substantial planting of native trees, implementation of a buffer to neighbouring development, noise, and other activity, and education of the community, there has been an inexorable decline in occupancy over the years. As at November 2024, the camp had been “largely vacant for the previous 3 years with only small, transient groups stopping by unpredictably.”

Thus, despite the Gordon camp being formally managed for the benefit of the flying-foxes for three decades, it suffered some of the greatest losses to the extreme heat during the 2019-2020 summer. Whether it will be re-populated in future is yet to be seen.

It is likely that the abandonment of this camp has been brought about at least in part by a combination of the 2019 windstorm, the subsequent extreme weather of early 2020, and ensuing loss of foraging habitat and individuals to the Black Summer fires. It is tempting to conclude that local conservation actions and development mitigations are of little consequence when a species is faced with an existential threat on the scale of that imposed by climate change. Nevertheless, as is required by legislation, mitigation actions are proposed.

In addition to the potential prescribed impacts to *Pteropus poliocephalus* Grey-headed Flying-fox, the following indirect impacts also have the potential to occur during or as a result of the proposed works:

- Potential establishment of nuisance plant species from landscape areas into local occurrences of natural vegetation.
- Intensification of stormwater runoff.
- Erosion and mobilisation of soil with stormwater runoff during construction.
- Spread of weeds during civil works.
- Introduction of soil pathogens.

8 MITIGATION AND MANAGEMENT OF IMPACTS

The principle potential impact requiring management is the potential for Grey-headed Flying-foxes to collide with the buildings or resident's vehicles during their flights in and out of the nearby Gordon camp (assuming that this species will re-establish the colony).

The main mitigation strategies to prevent building collisions are:

1. The judicious use of lighting that will maximise the buildings' visibility to Grey-headed Flying-foxes); and
2. A planting palette that avoids use of species that will particularly attract the Grey-headed Flying-foxes to the site. The trees for planting as detailed in the Landscape Plan have been carefully chosen and exclude the local trees that provide preferred blossom (such as *Eucalyptus saligna* Sydney Blue Gum) or soft rainforest fruits (such as *Ficus rubiginosa* Port Jackson Fig).

A strategy to deal with injured animals is to be prepared and implemented as part of the strata management of the site. Importantly, this will highlight the need to avoid handling sick or injured bats and include emergency contact details for suitably qualified and vaccinated veterinarians and / or wildlife rehabilitation experts.

In terms of potential vehicle collisions, the proposed principal mitigation is the education of residents. An educational pamphlet is to be prepared and provided to all residents, as well as displayed prominently in the parking basements. This pamphlet will recommend slow careful driving at all times near the colony, but particularly at dusk and dawn. It will also include the important message regarding avoidance of handling sick or injured animals and the need to contact suitably qualified and vaccinated veterinarians and / or wildlife rehabilitation experts in the event of an emergency.

The mitigation measures for all potential impacts have been detailed in Table 1.

Table 1: Measures to avoid and minimise impacts.

Impact	Extent	Timing and Frequency	Mitigation
Direct impact to Grey-headed Flying-foxes colliding with the buildings.	May occur anywhere on the external face of the buildings.	Any time and infrequent. Ongoing	Judicious use of lighting that maximises the buildings' visibility to Flying-foxes. Implementation of a planting palette that does not include tree or vine species that provide desirable foraging resources to Grey-headed flying-foxes, such as locally-trees with high quality blossom (e.g. <i>Eucalyptus saligna</i> Sydney Blue Gum) or soft fruit (e.g. <i>Ficus rubiginosa</i> Port Jackson Fig). Adoption of a management strategy that provides guidance regarding handling of sick or injured Flying-foxes. Only suitably experienced and vaccinated personnel are to handle sick or injured animals.
Direct impact to Grey-headed Flying-foxes colliding with residents' vehicles.	May occur anywhere on roadways near the Gordon colony.	Most likely at dawn and dusk, and infrequent. Ongoing	Provision of educational material to residents advising of the need for slow and careful driving particularly around dawn and dusk. The pamphlet / information poster is also to be placed in a prominent location in the parking basement levels. This material will also emphasise that only suitably experienced and vaccinated personnel are to handle sick or injured animals.
Direct impact to resident individuals of fauna species residing in habitat in the development footprint.	May occur anywhere across the works area.	During civil works. Once off.	Clearing to be conducted under ecological supervision. Adaptive management strategies to be employed such as pre-clearing surveys, relocation of individuals, care for injured wildlife, and euthanasia of feral species in accordance with appropriate licences and approvals.
Landscaping species becoming a nuisance in the nearby bushland.	The extent of potential incursions of propagules depend on the species present.	Any time and infrequent. Ongoing	The Landscape Plan to rely on planting species consistent with those that occur naturally in Blue Gum High Forest (BGHF - the major local EEC) or those that are not known

Impact	Extent	Timing and Frequency	Mitigation
			to have weed potential. Note that trees attractive to Grey-headed Flying-foxes are not to be used. Regular sweeps for weeds and low impact controls to be implemented per the Landscape Plan and scheduled maintenance.
Landscaped areas induce disruptions to foraging guilds of birds, encouraging a super abundance of aggressive Noisy Miners.	This effect may occur across the whole site.	Daily and ongoing. Ongoing	The Landscape Plan not to rely heavily on species (e.g. Grevilleas) known to favour Noisy Miners.
Increased spill over of noise, activity, scent, and light into the nearby bushland areas.	The nearby BGHF patches are currently embedded in an urban matrix and so resident fauna are likely to be habituated to these disturbances. However, additional lights can interfere with foraging activities of fauna (particularly microbats).	Daily and ongoing. Duration and timing of these disturbances related to seasons and weather. In perpetuity.	Install external lighting only where necessary for safety. Prohibit external uplights, lights directed into the retained trees, or any bright lighting that spills into nearby bushland, other than that required to make the building maximally visible to Flying-foxes.
Introduction of soil-borne pathogens, particularly <i>Phytophthora cinnamomi</i> .	All native vegetation is susceptible to disease to some degree.	During works that involve exposure and movement of soil and vehicles. During landscaping, diseased plant material can be introduced.	Standard hygiene controls are to be observed as part of the civil management works plan. All plant material to be introduced to the site must be certified as disease-free.
Increased soil nutrients from changes to runoff that may provide further opportunities for weed infestations.	Likely to have minor impacts given the shale soils and long history of urban use of the site.	Anytime and infrequent. More likely after heavy rainfall events. Ongoing.	Weeds arising from this potential impact to be controlled by actions detailed in the Landscape Plan and as part of ongoing maintenance.
Possible impacts on water quality in remaining native habitats, with pollutants in runoff (herbicides / fertilisers) carried from landscaped areas to nearby habitats.	Likely to have minor impacts on the edges of vegetated landscape zone.	Anytime and infrequent. Ongoing.	A carefully chosen planting palette using native species will require fewer chemical inputs. Therefore, it is important that the planting list in the Landscape Plan is appropriate to serve to mitigate this potential impact at its source.

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