

Biodiversity Development Assessment Report

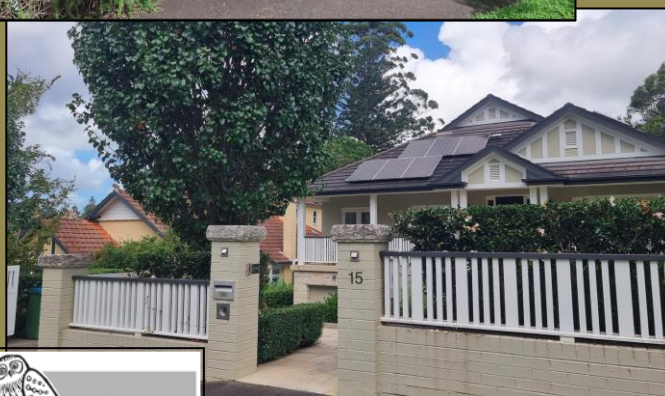
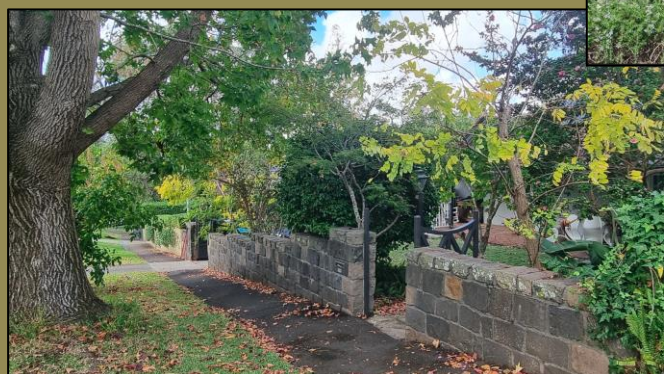
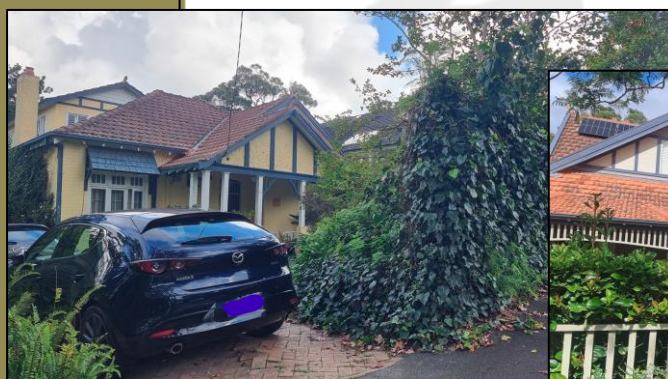
11, 15, 17, and 19 Middle Harbour Road

**Lindfield
Ku-ring-gai LGA**

For: Castle Hill No. 7 Pty Ltd

REF: KMC 25-1294

23rd May 2025



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Ku-ring-gai LGA**

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23rd May 2025

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Author:
Elizabeth Ashby

| 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 23 rd May 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 photograph: Street frontages of each of the four houses. Photo: E. Ashby, 23 rd April 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 the Castle Hill No. 7 Pty Ltd to assess the likely impacts of a proposed development upon state-listed flora and fauna, and their habitats at the following four lots in Lindfield in the Ku-ring-gai Local Government Area (LGA):

- Lot A DP 349665, 11 Middle Harbour Road
- Lot B DP 349665, 15 Middle Harbour Road
- Lot 9 DP 4665, 17 Middle Harbour Road
- Lot 10 DP 465, 19 Middle Harbour Road

As a State Significant Development Application (SSDA), the Biodiversity Offsets Scheme is automatically triggered, and requires submission of a Biodiversity Development Assessment Report (BDAR) in accordance with the *Biodiversity Conservation (BC) Act 2016*. A BDAR waiver has not been sought for this project as it is anticipated that it will result in a small impact to native biodiversity.

The development site is currently zoned R2 Low Density Residential, and the subject lots occupy a total area of approximately 5,187 square metres (0.52 hectares). Each of the lots is developed with long established dwellings and formal gardens, including pools (see Figure 1). The proposal is for construction of a multi-storey residential development and is illustrated in Figure 2. The proposal comprises:

- Demolition of existing improvements;
- Clearing of the site;
- Consolidation of the lots;
- Construction of a U-shaped 9 level apartment building and basement parking; and
- Landscaping of common spaces.



Figure 1: Most recent aerial imagery of the proposed development site (red outline, house numbers shown in yellow).
Nearmap photomap, 20th January 2025.

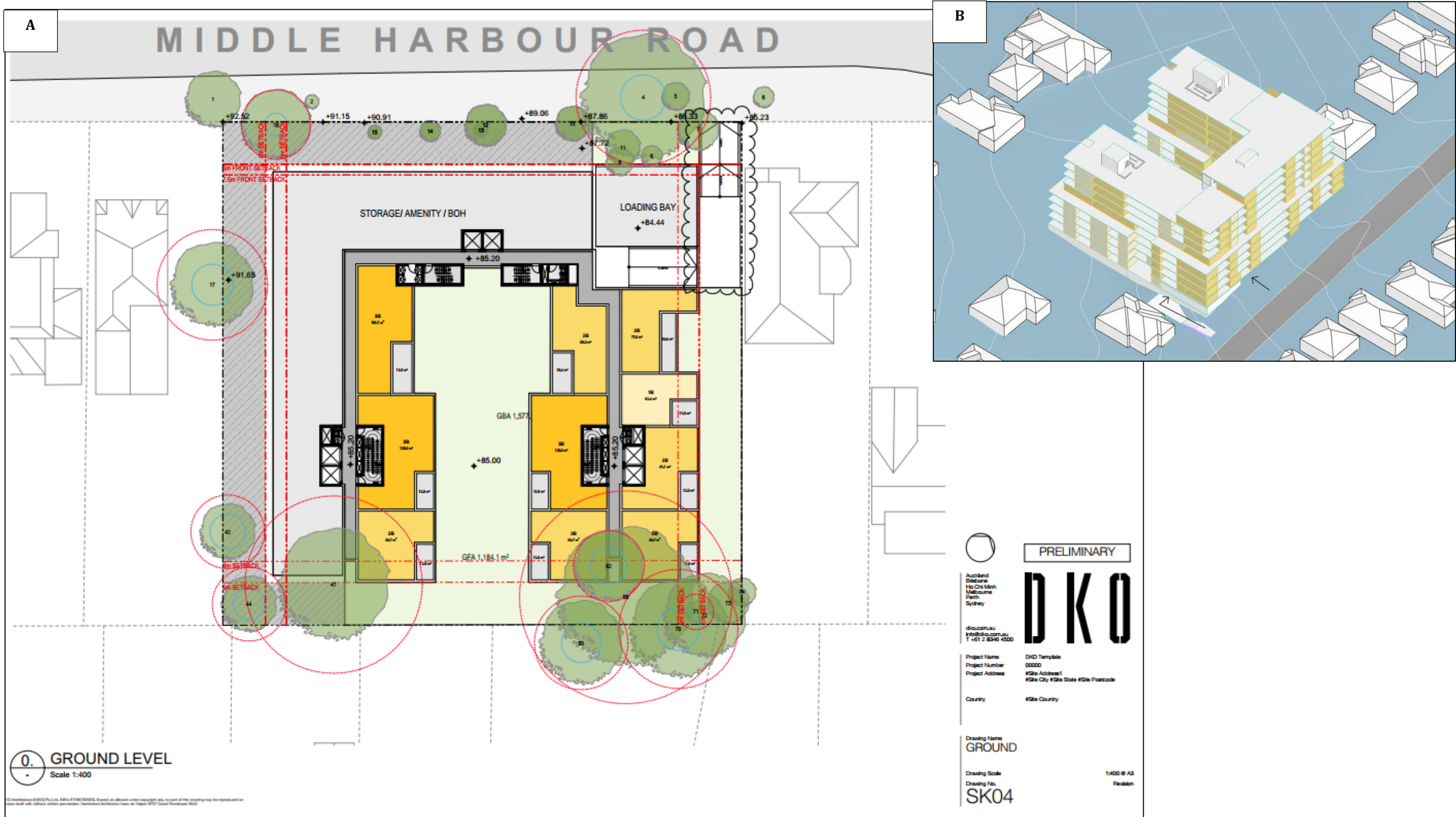


Figure 2: Preliminary site plan of Ground Floor (A) showing the extent of the footprint and retained trees, and northern elevation (B).

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.
- BioNet NSW (Mitchell) Landscapes – Version 3.1.
- 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 SIXMaps Aerial Imagery Tool (<https://maps.six.nsw.gov.au/>).
- SEED (2024) Sharing and enabling environmental data online portal. NSW Government, Sydney
<https://geo.seed.nsw.gov.au/vertigisstudio/web/?app=cabd04d595ec43c1aaf4298e80e83ec2>



Figure 3: Areas of Biodiversity Value (purple) mapped on and near the development site (red). BVMAT last accessed 22nd May 2025.

2 LANDSCAPE AND SITE CONTEXT

Relevant landscape features are mapped in Figure 4.

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 **grid reference** 330854 E, 6267798 N (GDA 2020-MGA 56).

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

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.

Blue Gum, *Syncarpia glomulifera* Turpentine, *Eucalyptus pilularis* Blackbutt, *Eucalyptus globoidea* 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 **extent of native vegetation within the assessment area** is estimated to total 103.44 hectares which represents 13.8% of the total assessment area of 749.98 hectares.

The **pattern of native vegetation within the assessment area** is uneven, being comprised of a large area of intact riparian bushland at the head of the tributaries of Gordon Creek in Garigal National Park to the north east and similar (but smaller) patches of riparian vegetation riparian vegetation in the headwaters of tributaries of the Lane Cove River in Lane Cove National Park.. In addition, native vegetation occurs in smaller patches more typical of urban vegetation such as on the development site. These are made up of street trees, parks and reserves, and trees in large backyards and may also include exotic species.

Patch size for the assessment area has been assessed in accordance with BAM 2020 and is estimated to be 0.08 hectares, which is within the <5 hectare class.

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 are shown in Figure 4.

The closest mapped stream to the development site is Gordon Creek, where its head is located in the rear garden of number 38 Middle Harbour Road, 280 metres to the north east. As a first order stream, it attracts a protected riparian zone of 10 metres width. As the development site is located outside of this area, it is considered not to impose impacts to the hydrological function of this stream and therefore is not subject to any specific constraints.

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.

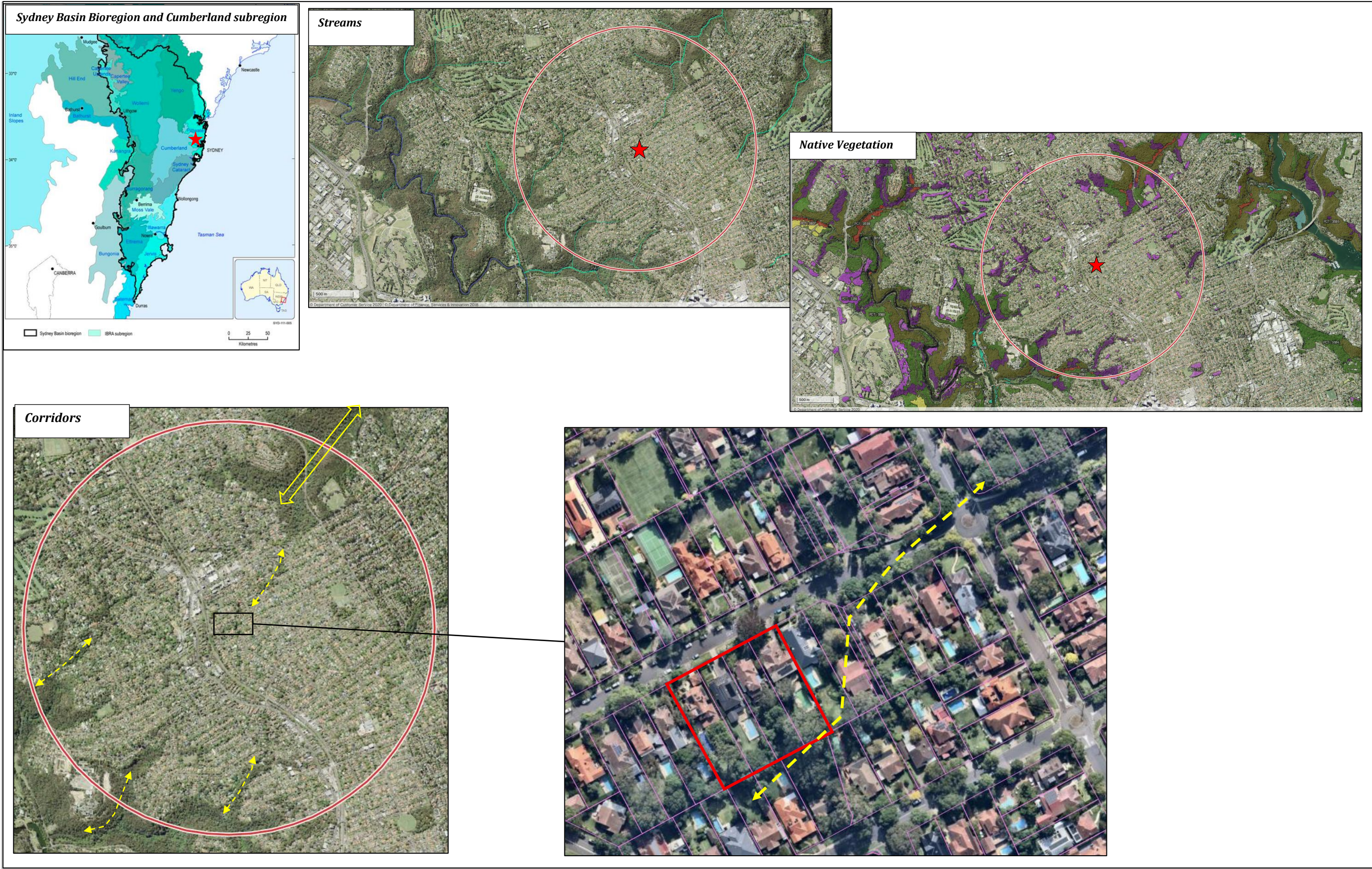


Figure 4: Landscape features in the assessment area (pink) including streams, mapped PCTs (small scattered fragmented patches of PCT 3262 and PCT 3136 on the plateau), and potential movement corridors.

3 NATIVE VEGETATION

The European history of Lindfield began in the early 1800s with land clearing for timber, which then evolved into farming of the cleared land (fruit trees and market gardens) in the late 1800s. These farms were then eventually cleared in turn to give way to urbanisation in the 1900s. Substantial dwellings and large gardens were established on the development site in the early 20th century; natural features of the site and surrounds have therefore been transformed by urbanisation for almost a century. The exception to this observation is the group of native trees in the rear garden of number 11: these are evident as a clump of large trees in 1943, the earliest available aerial photography.

The development site is made up of long established dwellings and well maintained landscaped gardens dominated by exotic species. Native vegetation is restricted to a handful of trees (see Figure 5) and some scattered occurrences of forbs and grasses in the shadier parts of the lawns.

3.1 Data Collection

A number of sources of information were used to aid in the sampling and identification of vegetation on site:

- Recent high quality aerial photography;
- BioNet atlas of NSW Wildlife - for records of common and threatened species; and
- BioNet Vegetation Classification – formerly known as the Vegetation Information System (VIS). This is the standard database for plant community types for NSW, and underpins the analytical tools applied as part of the BAM. The database facilitates vegetation classification by a series of queries of critical features (e.g. structure, location, canopy dominants), and inspection of all related data relevant to each recognised plant community type.
- Sharing and Enabling Environmental Data (SEED) – for vegetation mapping information, flora plot survey records, flora and fauna records and threatened species records.

A BAM plot (Plot 1) was measured for this BDAR on 23rd April 2025. Its location is shown in Figure 5 and the data collected are provided in Table 1. It was located such that it captured the maximum number of locally native trees that are considered to be naturally occurring and therefore the best representation of the native vegetation of the site.

3.2 Vegetation Type Analysis

In order to determine the Plant Community Types (PCT) represented by the natural vegetation, the filter function available in the BioNet Vegetation Database was used. The 11 factors used for matching were the 9 species native to NSW recorded on site considered to be naturally-occurring, the Bioregion (Sydney Basin), and subregion (Cumberland). This filtering resulted in 58 possible PCTs with matches from 2 to 10 factors.

The top 3 candidate PCTs (with 10 matches each) were rejected because they represented formations that did not match (Rainforest and Dry Sclerophyll Forest). The next 2 candidate PCTs both had 13 matches:

- PCT 3176 Sydney Enriched Sandstone Moist Forest;
- PCT 3262 Sydney Turpentine Ironbark Forest; and
- PCT 3136 Blue Gum High Forest

The suitability of these PCTs were further explored by interrogation of the full descriptions provided in the Bionet Vegetation Database, as reproduced in Table 3.

The analysis of additional features shown in Table 3 (such as geographic location, landscape position, and associated species) supported the selection of PCT 3262 Sydney Turpentine Ironbark Forest as the best match.

The species listed in the Scientific Description provided in the BioNet Vegetation Database for PCT 3262 were then compared with those species recorded across the site. This analysis further supports the selection of PCT 3262 with all of the naturally occurring locally native trees and ground covers being listed as a component of PCT 3262.

This also accords with the published mapping of extant vegetation for the site and surrounds (NSW State Vegetation Type Map), where PCT 3262 is mapped in small scattered patches across this ridge and its associated slopes.

Further support for PCT 3262 is also provided by the modelled distribution of vegetation in 1750 (prior to European occupation), where PCT 3262 dominates this part of the Hornsby Plateau – see Figure 6.

PCT 3262 has an associated Threatened Ecological Community (TEC), the Critically Endangered Sydney Turpentine Ironbark Forest (STIF). This TEC has an equivalent listing under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, but the federally-listed entity requires certain condition and area of occurrence thresholds to be met. The occurrence on site is far too small and modified to constitute this entity.

The overall condition of PCT 3262 is considered to be poor, with a highly simplified structure comprising only a few remnant trees and some native forbs within gardens.

The current nature of the area of native vegetation on site is shown in a photograph at Figure 7.

The extent of PCT 3262 STIF is shown in Figure 8 and reflects the areas occupied by native STIF trees.

Only one Vegetation Zone (VZ1) has been defined. The measured vegetation integrity values for VZ1 are:

- Composition Integrity Score: 7.3

- Structural Integrity Score: 42.8
- Function Integrity Score: 41

These provide an overall Vegetation Integrity (VI) score for PCT 3262 on site of 23.4.



Figure 5: BAM plot location.

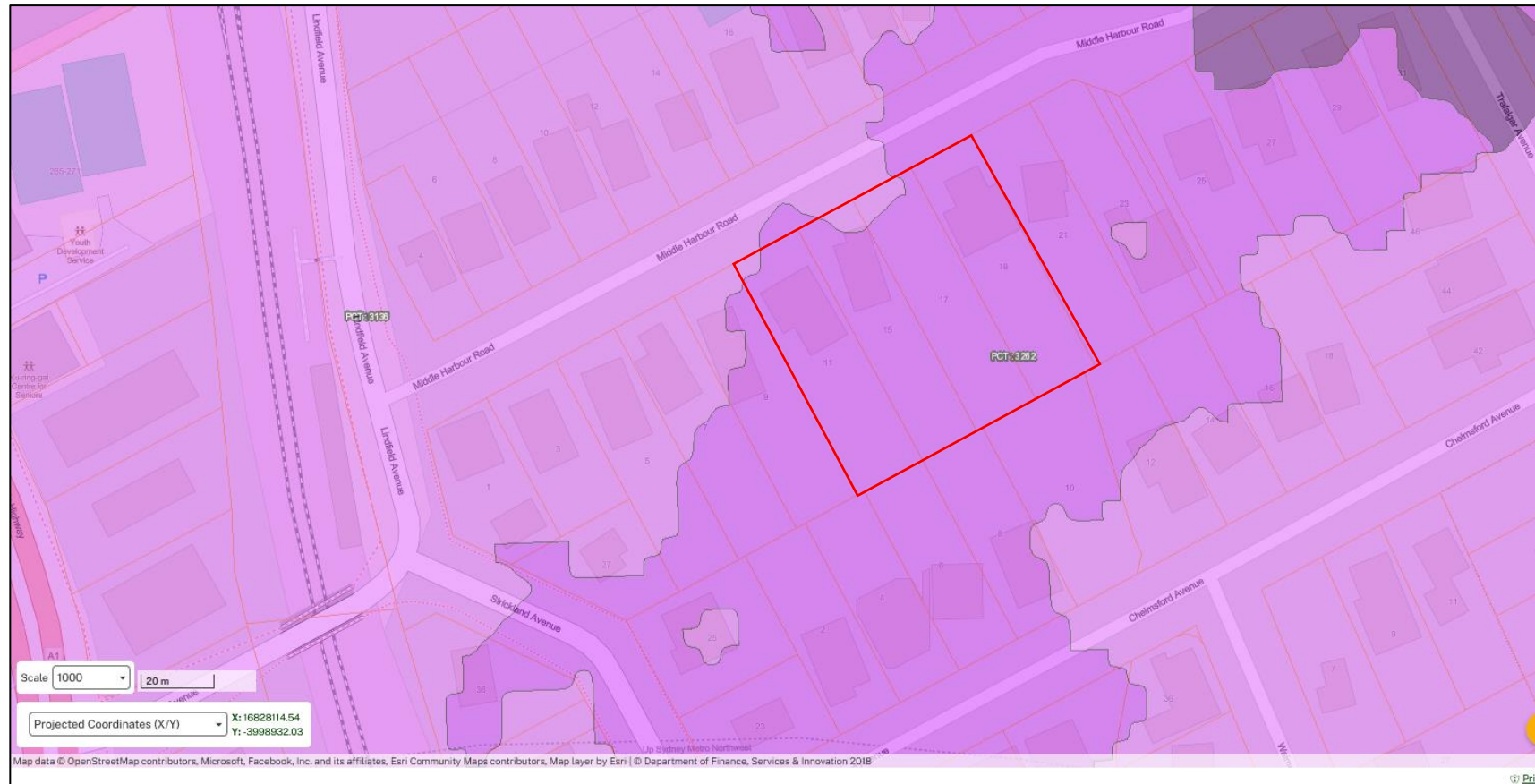


Figure 6: Modelled vegetation in 1750 shows PCT 3262 Sydney Turpentine Ironbark Forest dominating the development site and surrounding lands.
Source: SVTM_NSW_1750_PCT.

Table 1: BAM Plot – data.

| | |
|----------------|-----------------------------------|
| Project | 11-19 Middle Harbour Rd Lindfield |
|----------------|-----------------------------------|

| | | | | | |
|-------------|-----------|----------------|----|-----------------|-----------------|
| Date | 23-Apr-25 | Plot ID | Q1 | Recorder | Elizabeth Ashby |
|-------------|-----------|----------------|----|-----------------|-----------------|

| | | | |
|----------------|--------|-----------------|---------|
| Zone | 56 | Datum | GDA2020 |
| Easting | 330707 | Northing | 6260952 |

| | |
|-----------------------------------|-----|
| Orientation of midline | 60° |
|-----------------------------------|-----|

| | |
|-------------------|----------------|
| Dimensions | 20x20m, 20x50m |
|-------------------|----------------|

| | |
|-----------------|--|
| Photo ID | |
|-----------------|--|

| | |
|--------------------|------|
| Veg Zone ID | VZ 1 |
|--------------------|------|

| Species recorded in 20 x 20 m quadrat | | | | |
|---------------------------------------|-------------|------------------------------------|---------|---------|
| GF code | BAM GF Code | Species | N,E,HTW | Cover % |
| T | TG | <i>Brachychiton acerifolius</i> | N | 25 |
| T | TG | <i>Eucalyptus resinifera</i> | N | 50 |
| T | TG | <i>Syncarpia glomulifera</i> | N | 30 |
| F | FG | <i>Oxalis exilis</i> | N | 0.1 |
| F | FG | <i>Dichondra repens</i> | N | 0.1 |
| S | SG | <i>Syzygium australe</i> | N | 5 |
| | | <i>Ficus carica</i> | E | 0.5 |
| | | <i>Cymbopogon citratus</i> | E | 0.1 |
| | | <i>Morus nigra</i> | E | 5 |
| | | <i>Ophiopogon japonicus</i> | E | 0.1 |
| | | <i>Parthenocissus quinquefolia</i> | E | 0.2 |
| | | <i>Triadica sebifera</i> | E | 5 |
| | | <i>Ehrharta erecta</i> | E,HTW | 0.1 |
| | | <i>Brugmansia x candida</i> | E,HTW | 5 |
| | | <i>Stenotaphrum secundatum</i> | E,HTW | 25 |

| COMPOSITION | |
|-------------|-------------|
| Form | No. species |
| Trees | 3 |
| Shrubs | 1 |
| Grasses | 0 |
| Forbs | 2 |
| Ferns | 0 |
| Other | 0 |

| STRUCTURE | |
|-----------|-------------|
| Form | Cover total |
| Trees | 105 |
| Shrubs | 5 |
| Grasses | 0 |
| Forbs | 0.2 |
| Ferns | 0 |
| Other | 0 |
| HTW | 2.1 |

| FUNCTION | | | |
|----------|-----|---------|---------|
| DBH | Euc | Non Euc | Hollows |
| 80+ cm | 4 | | |
| 50-79cm | | 1 | |
| 30-49cm | | 1 | |
| 20-29cm | | | |
| 10-19cm | | | |
| 5-9cm | | | |
| <5cm | | | |

| | |
|----------------|---|
| Length of logs | 0 |
|----------------|---|

| | |
|-----------------------|----|
| Natural Regeneration? | No |
|-----------------------|----|

| Litter plots | | | | | |
|--------------|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| % | 0 | 0 | 0 | 0 | 0 |
| average | 0 | | | | |

Table 2: All flora species observed on the development site. Exotic species denoted by asterisk.

| Family | Scientific Name | Common Name |
|------------------|---------------------------------------|-------------------------|
| Aceraceae | <i>Acer negundo</i> * | Box Elder |
| Aceraceae | <i>Acer</i> sp. (cultivar)* | Japanese Maple |
| Agapanthaceae | <i>Agapanthus praecox</i> * | African Lily |
| Amaryllidaceae | <i>Clivia miniata</i> * | Bush Lily |
| Apocynaceae | <i>Plumeria obtusa</i> * | Frangipani |
| Araceae | <i>Monstera deliciosa</i> * | Fruit-salad Plant |
| Araliaceae | <i>Hedera helix</i> * | English Ivy |
| Araucariaceae | <i>Araucaria heterophylla</i> * | Norfolk Island Pine |
| Arecaceae | <i>Archontophoenix cunninghamiana</i> | Bangalow Palm |
| Arecaceae | <i>Phoenix canariensis</i> * | Canary Island Date Palm |
| Arecaceae | <i>Trachycarpus fortunei</i> * | Chinese Fan Palm |
| Asparagaceae | <i>Asparagus aethiopicus</i> * | Ground Asparagus |
| Aspleniaceae | <i>Asplenium australasicum</i> | Birds Nest Fern |
| Asteliaceae | <i>Cordyline australis</i> * | Cabbage Tree |
| Asteraceae | <i>Bidens pilosa</i> * | Cobbler's Pegs |
| Asteraceae | <i>Conyza</i> sp.* | - |
| Asteraceae | <i>Gamochaeta purpurea</i> * | Cudweed |
| Asteraceae | <i>Hypochaeris radicata</i> * | Flatweed |
| Asteraceae | <i>Taraxacum officinale</i> * | Dandelion |
| Basellaceae | <i>Anredera cordifolia</i> * | Madeira Vine |
| Bignoniaceae | <i>Jacaranda mimosifolia</i> * | Jacaranda |
| Blechnaceae | <i>Doodia aspera</i> | Rasp Fern |
| Cannabaceae | <i>Celtis sinensis</i> * | Japanese Hackberry |
| Caprifoliaceae | <i>Viburnum</i> sp.* | - |
| Commelinaceae | <i>Tradescantia fluminensis</i> * | Trad |
| Convallariaceae | <i>Ophiopogon japonicus</i> * | Mondo Grass |
| Convolvulaceae | <i>Dichondra repens</i> | Kidney Weed |
| Convolvulaceae | <i>Ipomoea cairica</i> * | Blue Morning Glory |
| Cunoniaceae | <i>Ceratopetalum gummiferum</i> | Christmas Bush |
| Cupressaceae | <i>Thuja orientalis</i> * | Oriental Arbor-vitae |
| Cyperaceae | <i>Cyperus gracilis</i> | - |
| Dicksoniaceae | <i>Calochlaena dubia</i> | Rainbow Fern |
| Euphorbiaceae | <i>Triadica sebifera</i> * | Chinese Tallow |
| Fabaceae | <i>Robinia pseudoacacia</i> * | Black Locust |
| Fagaceae | <i>Quercus robur</i> * | English Oak |
| Hamamelidaceae | <i>Liquidambar styraciflua</i> * | Sweet Gum |
| Iridaceae | <i>Dietes bicolor</i> * | Spanish Iris |
| Lamiaceae | <i>Rosemarinus officinalis</i> * | Rosemary |
| Lauraceae | <i>Cinnamomum camphora</i> * | Camphor Laurel |
| Lauraceae | <i>Persea americana</i> * | Avocado |
| Liliaceae | <i>Aspidistra elatior</i> * | Aspidistra |
| Lomariopsidaceae | <i>Nephrolepis cordifolia</i> | Fish-bone Fern |
| Lythraceae | <i>Lagerstroemia indica</i> * | Crepe Myrtle |
| Magnoliaceae | <i>Liriodendron tulipifera</i> * | Tulip Tree |

| Family | Scientific Name | Common Name |
|----------------|---|------------------------------|
| Magnoliaceae | <i>Magnolia sp.*</i> | - |
| Malvaceae | <i>Hibiscus sp.*</i> (cultivar) | Hibiscus |
| Mimosaceae | <i>Acacia elata</i> | Cedar Wattle |
| Moraceae | <i>Ficus carica*</i> | Fig Tree |
| Moraceae | <i>Morus nigra*</i> | Black Mulberry |
| Myrtaceae | <i>Callistemon sp.</i> (cultivar) | - |
| Myrtaceae | <i>Eucalyptus grandis</i> | Flooded gum |
| Myrtaceae | <i>Eucalyptus resinifera subsp. resinifera</i> | Red Mahogany |
| Myrtaceae | <i>Lophostemon confertus</i> | Brush Box |
| Myrtaceae | <i>Melaleuca quinquenervia</i> | Broad-leaved Paperbark |
| Myrtaceae | <i>Syncarpia glomulifera</i> | Turpentine |
| Myrtaceae | <i>Syzygium australe</i> | Brush Cherry |
| Nandinaceae | <i>Nandina domestica 'Nana'*</i> | Dwarf Sacred Bamboo |
| Ochnaceae | <i>Ochna serrulata*</i> | Mickey Mouse Plant |
| Oleaceae | <i>Jasminum polyanthum*</i> | Jasmine |
| Oleaceae | <i>Ligustrum lucidum*</i> | Large-leaved Privet |
| Oleaceae | <i>Trachelospermum jasminoides*</i> | Star Jasmine |
| Passifloraceae | <i>Passiflora mollissima*</i> | Banana Passionfruit |
| Poaceae | <i>Ehrharta erecta*</i> | Panic Veldtgrass |
| Poaceae | <i>Oplismenus aemulus</i> | Basket Grass |
| Poaceae | <i>Stenotaphrum secundatum*</i> | Buffalo Grass |
| Polypodiaceae | <i>Platynerium bifurcatum subsp. bifurcatum</i> | Elkhorn |
| Proteaceae | <i>Grevillea robusta</i> | Silky Oak |
| Rosaceae | <i>Pyrus calleryana*</i> | Ornamental Pear |
| Rosaceae | <i>Rosa sp.</i> (cultivar)* | Rose |
| Rubiaceae | <i>Gardenia sp.</i> (cultivar)* | Gardenia |
| Sapindaceae | <i>Cardiospermum grandiflorum*</i> | Balloon Vine, Love in a Puff |
| Saxifragaceae | <i>Hydrangea sp.*</i> | Hydrangea |
| Solanaceae | <i>Brugmansia x candida*</i> | Angel's Trumpets |
| Sterculiaceae | <i>Brachychiton acerifolius</i> | Illawarra Flame Tree |
| Strelitziaceae | <i>Strelitzia sp.*</i> | Bird of Paradise |
| Theaceae | <i>Camellia sasanqua*</i> | Camellia |
| Theaceae | <i>Polyspora axillaris*</i> | Fried Egg Plant |
| Vitaceae | <i>Parthenocissus quinquefolia*</i> | Virginia Creeper |

Table 3: Candidate PCTs following vegetation analysis. Descriptions sourced from PCT data provided in Bionet Vegetation Classification. The important factors are shown in bold.

| # matches | PCT | TEC | Description |
|-----------|---|--|--|
| 10 | 3176 Sydney Enriched Sandstone Moist Forest 23.11% cleared | Hygrocybeae Community of Lane Cove Bushland Park in the Sydney Basin, Bioregion Critically Endangered Ecological Community (BC Act 2016) Note: This TEC Relates to the NSW Hygrocybeae Community of Lane Cove Bushland Park TEC when occurring in the catchment of Gore Creek including Lane Cove Bushland Park, as per paragraph 5 of the Final Determination. | A very tall, occasionally extremely tall moist shrubby and ferny sclerophyll open forest found in enriched sandstone gullies of the Sydney coastal sandstone plateaus. The tree canopy very frequently includes a high cover of <i>Angophora costata</i> , <i>Syncarpia glomulifera</i> and <i>Eucalyptus pilularis</i> with occasional <i>Eucalyptus piperita</i> . <i>Eucalyptus saligna</i> is rare however abundant on creek lines downslope of shale soils. Commonly there is a tall mid-stratum of <i>Allocasuarina torulosa</i> , less frequently <i>Allocasuarina littoralis</i> , with <i>Elaeocarpus reticulatus</i> , <i>Pittosporum undulatum</i> and <i>Notelaea longifolia</i> . A smaller shrub layer includes <i>Leucopogon lanceolatus</i> and <i>Polyscias sambucifolia</i> . Typically the ground layer is ferny, very frequently with a high cover of <i>Calochlaena dubia</i> , <i>Pteridium esculentum</i> and occasionally <i>Blechnum cartilagineum</i> . A diversity of graminoids, small climbers and grasses adds to a high ground cover amongst the sandstone boulders. This PCT is most extensively distributed within the low elevation gullies that incise the shale rich landscapes of the north shore of Sydney where rainfall exceeds 1100 mm per annum. However, the degree of shale influence and sheltering also sustains the persistence of the PCT in lower rainfall outliers near Campbelltown and Menai. This community grades into PCT 3592 on exposed adjoining slopes and occasionally into rainforest PCT 3038 in narrow bands along creek lines. |
| 10 | 3262 Sydney Turpentine Ironbark Forest 95.91% cleared | Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion, Critically Endangered Ecological Community (BC Act 2016) | 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 <i>Syncarpia glomulifera</i> 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 <i>Eucalyptus pilularis</i> , <i>Angophora costata</i> and <i>Eucalyptus punctata</i> , rarely with one of several species from the ironbark, stringybark or mahogany eucalypt groups of which <i>Eucalyptus paniculata</i> , <i>Eucalyptus globoidea</i> and <i>Eucalyptus resinifera</i> are the most frequent of each group. The mid-stratum is layered, with a sparse cover of small trees that includes eucalypts, occasionally <i>Acacia parramattensis</i> and <i>Allocasuarina torulosa</i> , rarely with <i>Allocasuarina littoralis</i> . The lower shrub layer very frequently includes <i>Pittosporum undulatum</i> and <i>Leucopogon juniperinus</i> , commonly with <i>Breynia oblongifolia</i> , <i>Polyscias sambucifolia</i> , <i>Ozothamnus diosmifolius</i> and <i>Notelaea longifolia</i> . The ground layer includes a diverse cover of grasses that very frequently includes <i>Microlaena stipoides</i> and <i>Entolasia stricta</i> , commonly with <i>Imperata cylindrica</i> , <i>Entolasia marginata</i> and <i>Themeda triandra</i> . Small forbs including <i>Lobelia purpurascens</i> are also very frequent, together with <i>Lomandra longifolia</i> . This PCT occurs as small remnants in mosaics of urban land use in the shale-dominated landscapes in higher rainfall zones of the Sydney Metropolitan area . The northern suburbs between Baulkham Hills and Ku-ring-gai include the highest number of remnants, however small areas remain in Sutherland, Heathcote, Menai, lower Blue Mountains and Oakdale plateau west of Picton. Only a small number of remnants remain on the Wianamatta Shales of the eastern Cumberland Plain between Villawood and Bankstown. This community grades into tall moist shrub forests PCT 3136 in higher rainfall shale-rich soils on the north shore, or into PCT 3620 in sandstone environments. On the margins of the Cumberland Plain it may grade into dry forests PCTs 3321 or 3616 with increased exposure. |
| 10 | 3136 Blue Gum High Forest 99% cleared | Equivalent to Blue Gum High Forest in the Sydney Basin Bioregion Critically Endangered Ecological Community (BC Act 2016) | A very tall to extremely tall sclerophyll open forest with a mesophyll shrub layer and a grassy and herbaceous ground layer found on clay rich shale soils in the high rainfall districts of Sydney's north shore and surrounding suburbs. The tree canopy very frequently includes a high cover of <i>Eucalyptus saligna</i> , commonly with <i>Eucalyptus pilularis</i> and occasionally <i>Syncarpia glomulifera</i> . The mid-stratum is layered, with a sparse cover of small trees that very frequently includes <i>Pittosporum undulatum</i> and occasionally <i>Elaeocarpus reticulatus</i> . There is often also at least one of a suite of tall <i>Acacia</i> species of which <i>Acacia parramattensis</i> is most frequent and the others are rarely occurring. The lower shrub layer also includes very frequently <i>Pittosporum undulatum</i> , commonly with <i>Breynia oblongifolia</i> , <i>Polyscias sambucifolia</i> and <i>Pittosporum revolutum</i> , occasionally with <i>Leucopogon juniperinus</i> and <i>Clerodendrum tomentosum</i> . The ground layer is variable in both composition and cover. It may be ferny, grassy or herbaceous and include a diversity of small mesic climbers depending on topographic situation and disturbance history. Species very frequently include <i>Microlaena stipoides</i> , <i>Entolasia marginata</i> , <i>Oplismenus aemulus</i> , <i>Pseuderanthemum variabile</i> and <i>Pandorea pandorana</i> , commonly with <i>Dichondra repens</i> , <i>Tylophora barbata</i> and <i>Adiantum aethiopicum</i> , occasionally with <i>Calochlaena dubia</i> . This PCT occurs on a range of shale or shale-influenced substrates including gullies, ridgelines and slopes underlain by Wianamatta shales. It also occurs on small gully heads where downslope movement of shale soil lies above sandstone bedrock where outcrops may be present. It is found at elevations of 30-190 metres ASL. This community has been extensively cleared across low slope ridgelines between Castle Hill and St Ives, with many remaining examples restricted to steeper slopes including in the suburbs of Ryde, Lane Cove and Willoughby. It grades into tall forests PCT 3262 on thinner shale soils that adjoin, or PCT 3176 downslope in sandstone gullies. |



Figure 7: The rear garden of number 11 Middle Harbour Rd where the BAM plot was located.



Figure 8: Distribution of Vegetation Zone 1 (yellow = PCT 3262) on site, totalling 445 square metres (0.04 hectares).

4 THREATENED SPECIES

Section 5 of BAM 2020 details the process for determining the habitat suitability for threatened species. For the purposes of assessing impact and offset obligations under the BAM, threatened species are separated into two types, 'ecosystem' and 'species' credit species:

- **Ecosystem credit species** are those threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. The Threatened Biodiversity Data Collection (TBDC) identifies the threatened species assessed for ecosystem credits. A targeted survey is not required to identify or confirm the presence of ecosystem credit species; and
- **Species credit species** are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitat. These species are identified in the TBDC. A targeted survey or an expert report is required to confirm the presence of these species on the subject land. Alternatively, for a development, activity, clearing or biodiversity certification proposal only, the proponent may elect to assume the species is present.

Some threatened species may be identified as both ecosystem and species credit species, with different aspects of the habitat and life cycle representing different credit types. Commonly, threatened fauna species may have foraging habitat as an ecosystem credit, while their breeding habitat represents a species credit.

4.1 Predicted Species

A list of predicted ecosystem credit species derived from the BAM-C is provided in Table 4. All but 5 of the species identified in the BAM-C were retained for the analysis (see below), as habitat attributes relevant to each are present and therefore could not reasonably be excluded.

The 5 excluded species and the reasons for their exclusion are:

- ***Calyptorhynchus lathami* Glossy Black-Cockatoo.** Foraging habitat for this species is specifically noted as the habitat constraint that contributes to offset ecosystem credits. It is a specialist feeder on the seeds of *Allocasuarina* species and (to a lesser degree) on *Casuarina* species. Neither of these tree species occur on site and therefore this species is excluded.
- ***Ephippiorhynchus asiaticus* Black-necked Stork.** Key habitat for this species includes floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers. Secondary habitat comprise minor floodplains, coastal sandplain wetlands and estuaries. The presence of such habitats on site or within 300 metres of the site are detailed in the BAM-C as habitat constraints that require inclusion of this species for the calculation of ecosystem offsets. No such habitats occur on or near the site and therefore this species is excluded.
- ***Grantiella picta* Painted Honeyeater.** This species is a specialist feeder on Mistletoe fruit and Mistletoes must be present at a density of greater than five mistletoes per hectare for

a site to be considered to be suitable and counted as requiring offset consideration. There are no Mistletoes present on site and therefore this species is excluded.

- ***Haliaeetus leucogaster* White-bellied Sea-Eagle.** Foraging habitat for this species is specifically noted as the feature that contributes to credits. Foraging habitat is defined as occurring in or within 1 kilometre of rivers, lakes, large dams, or other waterbodies. The site is not within 1 kilometre of such critical habitat features, nor does it contain such habitat. and therefore this species is excluded
- ***Ixobrychus flavicollis* Black Bittern.** This species relies on well-vegetated waterbodies for foraging, breeding, and sheltering. The BAM-C defines areas with such habitat features and those within 40 metres of such habitat features as being relevant for consideration and offsetting. However, as the development site and surrounds do not support waterbodies of any kind, this species is excluded.

No additional predicted species were included in the BAM-C.

4.2 Candidate Species

The potential candidate threatened species (species credit species) are detailed in Table 4, and have arisen from them being associated with PCT 3262, the vegetation type identified on the development site. All have been excluded from analysis, with justifications detailed within the table.

No additional candidate species were included in the BAM-C.

Table 4: Predicted threatened species generated by the BAM-C.

| Species (Habitat element) | Included or excluded from consideration | Geographic Limitations | Habitat Constraints | Sensitivity to gain |
|---|---|---------------------------|--|---------------------|
| <i>Anthochaera phrygia</i> Regent Honeyeater (foraging habitat) | Included | None | None | High |
| <i>Artamus cyanopterus cyanopterus</i> Dusky Woodswallow | Included | None | None | Moderate |
| <i>Callocephalon fimbriatum</i> Gang-gang Cockatoo | Included | None | None | Moderate |
| <i>Calyptorhynchus lathamii</i> Glossy Black-Cockatoo | Excluded | None | • Presence of <i>Allocasuarina</i> and <i>Casuarina</i> species | High |
| <i>Chthonicola sagittata</i> Speckled Warbler | Included | None | None | High |
| <i>Climacteris picumnus victoriae</i> Brown Treecreeper (eastern subspecies) | Included | None | None | High |
| <i>Daphoenositta chrysoptera</i> Varied Sittella | Included | None | None | Moderate |
| <i>Dasyurus maculatus</i> Spotted-tailed Quoll | Included | None | None | High |
| <i>Ephippiorhynchus asiaticus</i> Black-necked Stork | Excluded | None | <ul style="list-style-type: none"> • Swamps • Shallow open freshwater or saline wetlands or shallow edges of deeper wetlands within 300m of these swamps / waterbodies • Shallow lakes, lake margins and estuaries within 300m of these waterbodies | Moderate |
| <i>Glossopsitta pusilla</i> Little Lorikeet | Included | None | None | High |
| <i>Grantiella picta</i> Painted Honeyeater | Excluded | None | • Mistletoes present at a density of greater than five mistletoes per hectare | Moderate |
| <i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle (foraging habitat) | Excluded | None | • Within 1 km of rivers, lakes, large dams, or other waterbodies | High |
| <i>Hieraaetus morphnoides</i> Little Eagle | Included | None | None | |
| <i>Hirundapus caudacutus</i> White-throated Needletail | Included | None | None | High |
| <i>Ixobrychus flavicollis</i> Black Bittern | Excluded | None | • Waterbodies | Moderate |

| Species (Habitat element) | Included or excluded from consideration | Geographic Limitations | Habitat Constraints | Sensitivity to gain |
|--|---|---------------------------|--|---------------------|
| | | | <ul style="list-style-type: none"> Land within 40m of freshwater and estuarine wetlands, in areas of permanent water and dense vegetation | |
| <i>Lathamus discolor</i> Swift Parrot (foraging habitat) | Included | None | None | Moderate |
| <i>Lophoictinia isura</i> Square-tailed Kite | Included | None | None | Moderate |
| <i>Melanodryas cucullata cucullata</i> Hooded Robin (south-eastern form) | Included | None | None | Moderate |
| <i>Micronomus norfolkensis</i> Eastern Coastal Free-tailed Bat | Included | None | None | High |
| <i>Miniopterus australis</i> Little Bent-winged Bat (foraging habitat) | Included | None | None | High |
| <i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat (foraging habitat) | Included | None | None | High |
| <i>Pandion cristatus</i> Eastern Osprey | Included | None | None | |
| <i>Petroica phoenicea</i> Flame Robin | Included | None | None | Moderate |
| <i>Pteropus poliocephalus</i> Grey-headed Flying fox (foraging habitat) | Included | None | None | High |
| <i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail-bat | Included | None | None | High |
| <i>Stagonopleura guttata</i> Diamond Firetail | Included | None | None | |

Table 5: Candidate threatened species.

| Species | SAII potential | Sensitivity to gain | Reason for exclusion | Particulars of Habitat Constraints or Known Requirements | Justification |
|---|----------------|---------------------|--------------------------------|---|---|
| <i>Acacia prominens</i> - endangered population Gosford Wattle | No | Moderate | Geographic limitations | Endangered population defined in Final Determination as occurring in the Hurstville and Kogarah LGAs plus Georges River LGA. | Development site is not within relevant LGAs. |
| <i>Acacia pubescens</i> Downy Wattle | No | High | Habitat degraded | Occurs on alluviums, shales and at the intergrade between shales and sandstones in n open woodland and forest, in a variety of open woodlands / forests but principally Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. The soils are characteristically gravelly soils, often with ironstone, and concentrated around the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. | The development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No habitat for this species occurs on site and given the known habitat features of this species, it may never have provided suitable habitat. |
| <i>Anthochaera phrygia</i> Regent Honeyeater | Yes | High | Habitat constraints (breeding) | <ul style="list-style-type: none"> As per the important habitat map | The development site does not support an area identified as important habitat for this species nor is it within an area where breeding has been recorded. |
| <i>Burhinus grallarius</i> Bush Stone-curlew | No | High | Habitat constraints | <ul style="list-style-type: none"> Fallen / standing dead timber including logs. | The development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No habitat for this species occurs on site. |
| <i>Callistemon linearifolius</i> Netted Bottle Brush | No | Moderate | Habitat degraded | Grows in dry sclerophyll forest. | The development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No habitat for this species occurs on site and given the known habitat features of this species, it may never |

| Species | SAII potential | Sensitivity to gain | Reason for exclusion | Particulars of Habitat Constraints or Known Requirements | Justification |
|---|----------------|---------------------|-----------------------------------|---|--|
| | | | | | have provided suitable habitat. |
| <i>Callocephalon fimbriatum</i> Gang-gang Cockatoo | No | High | Habitat constraints (breeding) | <ul style="list-style-type: none"> Hollow-bearing trees Eucalypt tree species with hollows at least 3m above the ground and with hollow diameter of 7cm or larger | The development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No hollow-bearing trees occur on the development site. |
| <i>Calyptorhynchus lathami</i> South-eastern Glossy Black Cockatoo | No | High | Habitat constraints (breeding) | <ul style="list-style-type: none"> Hollow-bearing trees Living or dead tree with hollows greater than 15cm diameter and higher than 8m above the ground | The development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No hollow-bearing trees occur on the development site. |
| <i>Cercartetus nanus</i> Eastern Pygmy-possum | No | High | Habitat degraded | This species occurs in a broad range of vegetation types but relies on the availability of sufficient supplies of nectar and pollen and a relatively predator-free environment. Urban records are restricted to locations adjacent to bushland. They also require suitable shelter sites (such as tree hollows, holes in the ground, possum dreys or thickets of vegetation). occurred where relied on proximity The closest record dates from 2004 and is over 2km away in Stony Creek gully, which is part of a large network of reserved bushland. | This is a candidate species because it has been associated with PCT 3262. However, the development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. Any suitable habitat for this species on or near the development site has been cleared and profoundly changed long ago. |
| <i>Chalinolobus dwyeri</i> Large-eared Pied Bat | Yes | Very High | Habitat constraints | <ul style="list-style-type: none"> Cliffs Within 2 km of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices Within 2 km of old mines or tunnels | The development site does not conform with the required habitat constraints. |
| <i>Darwinia peduncularis</i> | No | High | Habitat constraints | <ul style="list-style-type: none"> Rocky areas or within 50m of same | The development site does not conform with the required habitat constraints. |
| <i>Epacris purpurascens</i> var. <i>purpurascens</i> | No | Moderate | Habitat degraded | Found in a range of habitat types, most of which have a strong shale soil | This is a candidate species because it has been associated with PCT 3262. |

| Species | SAII potential | Sensitivity to gain | Reason for exclusion | Particulars of Habitat Constraints or Known Requirements | Justification |
|--|----------------|---------------------|---|---|--|
| | | | | influence. | However, the development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. Local records are all associated with substantial areas of intact bushland. Any suitable habitat for this species on or near the development site has been cleared and profoundly changed long ago. |
| <i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle | No | High | Habitat constraints (breeding) | <ul style="list-style-type: none"> Living or dead mature trees within suitable vegetation within 1km of rivers, lakes, large dams or creeks, wetlands and coastlines | This species is highly selective in nesting locations and the development site does not conform with the required habitat constraints. |
| <i>Haloragodendron lucasii</i> | Yes | Very High | Habitat constraints Geographic limitations | <ul style="list-style-type: none"> Seepage zone or within 100m of same Within Hornsby and Ku-ring-gai LGAs | While the development site is within an appropriate LGA, it does not conform with the required habitat constraints. |
| <i>Hibbertia puberula</i> Hibbertia puberula | No | High | Habitat degraded | It typically occurs in dry sclerophyll woodland communities, low heath on sandy soils or rarely in clay. | This is a candidate species because it has been associated with PCT 3262. However, the development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No habitat for this species occurs on site and given the known habitat features of this species, it may never have provided suitable habitat. |
| <i>Hibbertia spanantha</i> Julian's Hibbertia | Yes | High | Habitat degraded | Restricted to six known locations in bushland on shale - sandstone soil transition. | This is a candidate species because it has been associated with PCT 3262. However, the development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No habitat for this |

| Species | SAII potential | Sensitivity to gain | Reason for exclusion | Particulars of Habitat Constraints or Known Requirements | Justification |
|--|----------------|---------------------|--------------------------------|--|--|
| | | | | | species occurs on site. |
| <i>Hieraaetus morphnoides</i> Little Eagle | No | Moderate | Habitat constraints (breeding) | <ul style="list-style-type: none"> Nest tree – live (occasionally dead) large old treed within vegetation | The development site does not conform with the required habitat constraints. |
| <i>Lasiopetalum joyceae</i> Lasiopetalum joyceae | No | Moderate | Habitat degraded | Grows in heath on sandstone on lateritic to shaley ridgetops, restricted to the Hornsby Plateau south of the Hawkesbury River. | This is a candidate species because it has been associated with PCT 3262. However, the development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No habitat for this species occurs on site and given the known habitat features of this species, it may never have provided suitable habitat. |
| <i>Lathamus discolor</i> Swift Parrot | Yes | Moderate | Habitat constraints (breeding) | <ul style="list-style-type: none"> As per the important habitat map | The development site does not support an area identified as important habitat for this species nor is it within an area where breeding has been recorded as it breeds in Tasmania. |
| <i>Leucopogon fletcheri</i> subsp. <i>fletcheri</i> | No | High | Habitat constraints | <ul style="list-style-type: none"> Slopes nearby rocky areas or within 50m of same Rocky areas, weathered laterite over sandstone on sandstone ridges, outcrops | The development site does not conform with the required habitat constraints. |
| <i>Litoria aurea</i> Green and Golden Bell Frog | No | High | Habitat constraints | <ul style="list-style-type: none"> Semi-permanent / ephemeral wet areas or within 1 km of same Swamps, within 1km of same Waterbodies, within 1km of same | The development site does not conform with the required habitat constraints. |
| <i>Lophoictinia isura</i> Square-tailed Kite | No | Moderate | Habitat constraints (breeding) | <ul style="list-style-type: none"> Nest trees | The development site does not conform with the required habitat constraints. |
| <i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> – endangered population | No | Moderate | Geographic limitations | Endangered population defined in Final Determination as occurring in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas | Development site is not within relevant LGAs. |
| <i>Meridolum corneovirens</i> | No | High | Habitat degraded | Primarily inhabits Cumberland Plain | This is a candidate species because it |

| Species | SAII potential | Sensitivity to gain | Reason for exclusion | Particulars of Habitat Constraints or Known Requirements | Justification |
|--|----------------|---------------------|--------------------------------|---|--|
| Cumberland Plain Land Snail | | | | Woodland and requires the presence of at least native bark and leaf litter although it will shelter under rubbish. | has been associated with PCT 3262. There are no records of this species within 10km of the development site. No habitat for this species occurs on site. |
| <i>Miniopterus australis</i> Little Bent-winged Bat | Yes | Very High | Habitat (breeding) constraints | <ul style="list-style-type: none"> • Caves • Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding • Bionet records with descriptors “in cave” or “nest-roost”, or with numbers of individuals >500 • Records from the scientific literature | The development site does not conform with the required habitat constraints. |
| <i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat | Yes | Very High | Habitat (breeding) constraints | <ul style="list-style-type: none"> • Caves • Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding • Bionet records with descriptors “in cave” or “nest-roost”, or with numbers of individuals >500 | The development site does not conform with the required habitat constraints. |
| <i>Myotis macropus</i> Southern Myotis | No | High | Habitat constraints | <ul style="list-style-type: none"> • Waterbodies • Waterbodies with permanent pools / stretches 3m or wider, including rivers, large creeks, billabongs, lagoons, estuaries, dams and other waterbodies, on or within 200m of the site | The development site does not conform with the required habitat constraints. |
| <i>Ninox connivens</i> Barking Owl | No | High | Habitat constraints | <ul style="list-style-type: none"> • Hollow-bearing trees, a living or dead tree with a hollow >20cm diameter that occurs >4m above the ground | The development site does not conform with the required habitat constraints. |
| <i>Ninox strenua</i> Powerful Owl | No | High | Habitat constraints | <ul style="list-style-type: none"> • Hollow-bearing trees, a living or dead tree with a hollow >20cm diameter that occurs >4m above the ground | The development site does not conform with the required habitat constraints. |

| Species | SAII potential | Sensitivity to gain | Reason for exclusion | Particulars of Habitat Constraints or Known Requirements | Justification |
|--|----------------|---------------------|--------------------------------|---|---|
| <i>Pandion cristatus</i> Eastern Osprey | No | Moderate | Habitat constraints (breeding) | <ul style="list-style-type: none"> Presence of stick nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting | The development site does not conform with the required habitat constraints. |
| <i>Perameles nasuta</i> - endangered population Long-nosed Bandicoot population in inner western Sydney | No | High | Geographic limitation | Endangered population defined in Final Determination as occurring in the Marrickville, Canada Bay, Canterbury, Ashfield, and Leichhardt LGAs. | Development site is not within relevant LGAs. |
| <i>Petaurus norfolcensis</i> Squirrel Glider | No | High | Habitat degraded | Inhabits mature or old growth woodlands and forest west of the Great Dividing Range forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Relies on large old trees with abundant hollows for breeding and sheltering. These trees are also critical for movement and typically need to be closely-connected (i.e. no more than 50 m apart). | This is a candidate species because it has been associated with PCT 3262. However, the development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No habitat for this species occurs on site. |
| <i>Phascolarctos cinereus</i> Koala | No | High | Habitat constraints | <ul style="list-style-type: none"> Presence of Koala use trees per Threatened Biodiversity Data Collection | The trees on site known as a Koala use trees include <i>Syncarpia glomulifera</i> and <i>Eucalyptus grandis</i> . However, these trees are isolated from other available habitat by hostile development – houses, fenced yards, backyard pools, and roads. The development site is located within a large block identified as having a low likelihood (0.00-0.25) of containing Koalas. The nearest sighting occurred in Garigal NP at Forestville in 1940. No habitat for this species occurs on site. |
| <i>Pomaderris prunifolia</i> - endangered population | No | High | Geographic limitation | Endangered population defined in Final Determination as occurring in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas | Development site is not within relevant LGAs. |
| <i>Pommerhelix duralensis</i> | No | High | Habitat degraded | This species is a shale-influenced- | This is a candidate species because it |

| Species | SAII potential | Sensitivity to gain | Reason for exclusion | Particulars of Habitat Constraints or Known Requirements | Justification |
|--|----------------|---------------------|--------------------------------|--|--|
| Dural Land Snail | | | | habitat specialist, and occurs in low densities along the western and northwest fringes of the Cumberland IBRA subregion on shale-sandstone transitional landscapes. favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. Migration and dispersal is limited. | has been associated with PCT 3262. The closest record of this species dates from 2025 in shale-sandstone vegetation 7km away near Terrys Ck. No habitat for this species occurs on site. |
| <i>Pseudophryne australis</i> Red-crowned Toadlet | No | Moderate | Habitat degraded | This species inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings. It shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter. | This is a candidate species because it has been associated with PCT 3262. However, no habitat for this species occurs on site. |
| <i>Pteropus poliocephalus</i> Grey-headed Flying-fox | No | High | Habitat constraints (breeding) | <ul style="list-style-type: none"> Breeding camps | A long-term significant maternity camp of this species occurs in Stony Ck gully over 2 km to the north of the development site. No breeding habitat for this species occurs on site. |
| <i>Rhizanthella slateri</i> Eastern Australian Underground Orchid | Yes | High | Habitat degraded | This is a highly cryptic species recorded from a number of different vegetation types with a broad distribution from SE Qld to SE NSW. However, as it spends its entire life cycle underground, the absence of soil disturbance is likely to be critical to its survival. Also, it is considered to rely on a highly specialised pollinator. | This is a candidate species because it has been associated with PCT 3262. However, the development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. Such profound and long-term changes undoubtedly wrought on the soil structure has removed any potential habitat that the site may have contained. |
| <i>Rhodamnia rubescens</i> Scrub Turpentine | Yes | Very High | Habitat degraded | This is species that was once common in moist forest and rainforest but is now Critically Endangered due to its susceptibility to Myrtle Rust, a threat that is classifies as "beyond control". | This is a candidate species because it has been associated with PCT 3262. However, the development site has been transformed from its natural state to one that supports substantial dwellings and formal landscaped (chiefly exotic) gardens for at least almost a century. No habitat for this species occurs on site. |

| Species | SAII potential | Sensitivity to gain | Reason for exclusion | Particulars of Habitat Constraints or Known Requirements | Justification |
|---|----------------|---------------------|----------------------|---|--|
| <i>Tyto novaehollandiae</i> Masked Owl | No | High | Habitat constraints | <ul style="list-style-type: none"> Hollow-bearing trees, a living or dead tree with a hollow >20cm diameter that occurs >4m above the ground | The development site does not conform with the required habitat constraints. |

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.

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 generally unsuitable for native fauna. The exotic trees to be removed may provide shelter and foraging resources for some common urban fauna species (particularly birds), and the mature *Phoenix canariensis* Canary Island Date Palms may provide foraging resources used by *Pteropus poliocephalus* Grey-headed Flying-fox.

Habitat connectivity. This is considered to be a minor consideration, as local connectivity is primarily provided by vegetation that occurs offsite. This is illustrated in Figure 4: vegetation along the head of the gully of Gordon Creek to the north east is loosely connected to Garigal National Park via patches of exotic and native vegetation in neighbouring properties. 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 upper slope occupied by the development site

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. Its proximity to public transport is an important feature of the proposal, and so additional vehicle movements are considered to be minimal. While the development may potentially increase the numbers of vehicle movements, there are no threatened species likely to use the site that would be adversely affected by traffic movements to and from the site.

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 site supports 0.04 hectares of PCT 3262, comprising a small group of 4 remnant trees at the rear of formal gardens. The direct impact of the proposed development on this PCT is illustrated in Figure 9.

This site is somewhat constrained by its sloping nature and the retention of trees is constrained by the nature of the development.

Basement parking is required for this development type, which in turn requires significant excavation. The root protection zones of the large native trees comprising STIF at the rear of number 11 are also very large. The retention of these trees would sterilise approximately 15% of the site and cannot be accommodated in the current proposal.

The loss of 4 STIF trees across 0.04 hectares will be mitigated by the implementation of the Landscape Plan with replacement tree planting and enrichment of both floristics and vegetation structure.

These measures and outcomes are considered adequate in satisfying the “avoid and minimise” rule.



Figure 9: The extent of PCT 3262 (VZ1, 0.04 hectares), and the impact of the footprint is demonstrated in the colour of the VZ1 polygon (red = direct loss, totalling 0.04 hectares).

7 ASSESSMENT OF IMPACTS

7.1 Vegetation

Direct impacts comprise the removal of native vegetation:

- 0.04 hectares of PCT 3262, which is associated with a TEC, Sydney Turpentine Ironbark Forest.

This will result in the following reduction in VI score:

- VZ 1 (PCT 3262) current VI of 23.4 will be reduced to zero.

This score is too low to generate an offset obligation for ecosystem credits.

7.2 Threatened Species

The site does not provide habitat for any candidate threatened species. Therefore, no offset obligation is generated for species.

7.3 Indirect Impacts

The following indirect impacts have the potential to occur during or as a result of the proposed works:

- Presence of companion animals.
- Potential establishment of nuisance plant species from landscape areas into VMP area or nearby PCT 3262 Sydney Turpentine Ironbark Forest.
- Increased nutrients in runoff from development area, potentially favouring weed species.
- 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

A number of mitigation measures have been identified that will be implemented to minimise impacts of the proposal – see Table 6 for a complete list.

Retain and restore native vegetation. The opportunities for retention of locally native trees are few, given their distribution across the development site. However, the opportunity for restoration and enrichment of native vegetation is afforded in the areas of deep soil to be the subject of the Landscape Plan. The planting palette will rely heavily on species characteristic of the CEEC STIF and PCT 3262. Importantly, a diverse understorey can be restored with all structural layers planted. This will deliver a significant qualitative improvement in the composition of PCT 3262 pre-development.

Retain, replace, and enhance fauna habitat. The replacement plantings and enrichment plantings will provide long term habitat and the boundary plantings will connect with offsite vegetation, thus enhancing local connectivity.

Protect resident fauna. The Project Ecologist will supervise the removal of all trees and potential fauna habitat. A thorough pre-clearing / pre-demolition inspection shall be undertaken prior to clearing. Fauna will be removed from harm's way, relocated into suitable on-site habitat, or placed into veterinarian care if injured.

Erosion/sedimentation. Standard sedimentation and erosion control measures will be installed, and checked regularly.

Exotic weed species. Due to its close horticultural management, few significant weeds occur on site. However, ongoing weed control must be implemented during all phases of the development. Any weeds removed are not to be stockpiled but instead disposed of at a suitable green waste facility. All loads are to be covered during transportation to minimise the risk of spread.

Pathogens and disease. Although no pathogens were in evidence, to avoid the introduction and/or spread of soil borne pathogens and disease, appropriate hygiene procedures as recommended will minimise the risk of any significant impacts as a result of the proposal.

Table 6: Measures to avoid and minimise impacts.

| Impact | Extent | Timing and Frequency | Mitigation |
|---|--|--|--|
| 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. |
| Potential impact to fauna species potentially occupying tree hollows and / or other specific habitat features. | No hollows observed, but there is the potential for hollow sections to occur that cannot be observed from the ground. | During civil works. Once off. | Clearing to be conducted under ecological supervision and using a professional bee rescue service in accordance with appropriate licences and approvals. |
| <p>Potential adverse impacts on native wildlife due to the increased presence of humans, presence of uncontrolled companion animals (particularly Cats).</p> <p>Potential impacts include abandonment or avoidance of previously occupied or otherwise suitable habitat and retreat into other areas.</p> <p>For territorial species, this can further result in antagonistic behaviours with conspecifics.</p> | Potentially relevant to all of the retained vegetation and vegetated landscaped areas on site that provide wildlife habitat. | Any time and infrequent. Ongoing. | <p>Educational material is to be provided to all residents regarding the potential impacts to biodiversity of uncontrolled pets and human activity.</p> <p>Residents to be encouraged to keep Cats indoors or within an enclosure at all times and not allowed to roam.</p> |
| 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 | <p>The Landscape Plan to rely on planting species consistent with those that occur naturally in STIF or those that are not known to have weed potential.</p> <p>Regular sweeps for weeds and low impact controls to be implemented per the Landscape Plan and scheduled maintenance.</p> |

| Impact | Extent | Timing and Frequency | Mitigation |
|--|---|---|---|
| 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 STIF 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 bats). | 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. |
| 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. |

9 THRESHOLDS

The potential for Serious and Irreversible Impacts (SAIIs) to arise from the proposed development works must be considered in terms of the following four SAII principles:

- Principle 1 – Species or ecological community currently in a rapid rate of decline;
- Principle 2 – Species or ecological communities with very small population size;
- Principle 3 – Species or area of ecological community with very limited geographic distribution; and
- Principle 4 - Species or ecological community that is unlikely to respond to management and is therefore irreplaceable.

BAM 2020 requires additional information to be provided to help guide the decision maker in their determination whether the proposal will result in a Serious and Irreversible Impact (SAII). Within the development site, the only entity that occurs that is classified as at risk of a SAII is Sydney Turpentine Ironbark Forest (STIF), being the TEC associated with PCT 3262.

The information required for this SAII assessment is detailed in Table 7.

Table 7: Additional impact assessment provisions for threatened ecological communities at risk of an SAIL.

Ecological community: Sydney Turpentine Ironbark Forest (STIF)

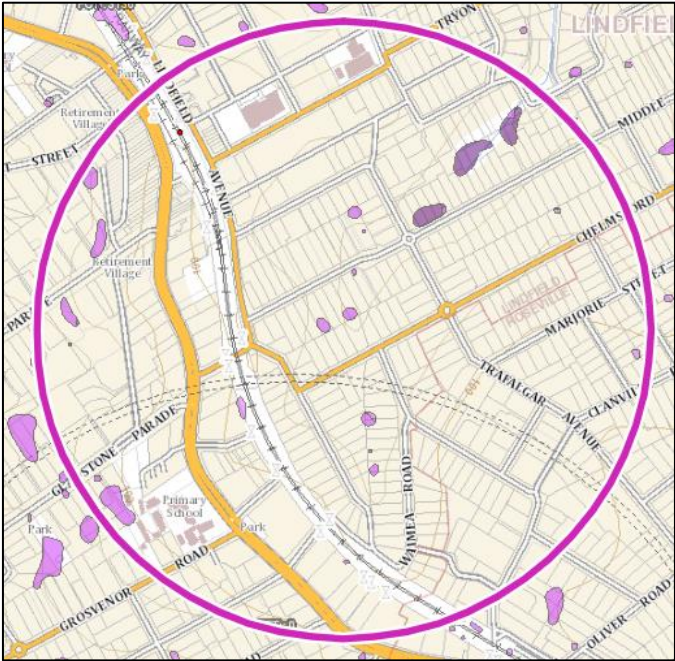
SAIL information for STIF

| Principle | Current SAIL Status | SAIL Fields | BAM 2020 summary data <u>prior</u> to any additional assessment impact |
|--------------------|---------------------|-------------------------|---|
| Principle 1 | Yes | – | ≥80% reduction in distribution over a 50-year period |
| Principle 2 | Yes | – | Reduction in ecological function. Community with very high levels of either environmental degradation or disruption of biotic processes, and interactions have an increased risk of failure to sustain their characteristic native species assemblages. >95% cleared. |
| Principle 3 | No | AOO, EOO, or Locations? | - |
| | | AOO (km2) | 1200 |
| | | EOO (km2) | 4479 |
| | | Locations | unknown |
| | | Total extent (ha) | 1038 |
| Principle 4 | – | – | – |

Applying Section 9.1.1 of the BAM for this scenario

| Avoid and minimise (9.1.1(1)) | | | |
|--|-----------|--|---|
| Refer to BDAR section '6: Avoid and minimise impacts' for actions taken to avoid and minimise impacts to STIF. | | | |
| Current Status (9.1.1(2)) | | | |
| SAIL Principle | SAIL risk | BAM criteria | Current status of Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion |
| Principle 1 | At risk | (2.a) Reduction in geographic distribution | Clearing of STIF for agricultural development commenced in the inner west of Sydney soon after European settlement and accelerated following the expansion of Sydney's suburbs in the nineteenth and early twentieth centuries (Benson and Howell 1994). Although the pre European extent of STIF is uncertain, there is general agreement among sources that the reduction in extent exceeds 90%. Recent mapping indicates that up to 2940 ha may remain (rather than the 1038 ha quoted above), but it is agreed that less than 10% of its original extent remains, its condition is severely fragmented, and remnants are mostly small isolated pockets. Notwithstanding the potential increase in known area remaining, STIF still meets SAIL Principles 1 and 2 due to the significant reduction in geographic distribution and ecological function. |

| | | | |
|---|-----------------------|--|---|
| Principle 2 | At risk | (2.b) Reduction in ecological function | STIF's remaining area is highly fragmented, highly restricted, and is poorly represented in the formal reserve network. Ongoing threats include continuing attrition through clearing for routine land management practices (e.g. fencing, APZs) due to the majority of remnants being located in close proximity to rural land or urban interfaces. Remnant are subject to ongoing weed invasion exacerbated by the proximity of remnants to areas of rural and urban development and the associated influx of both weed propagules from gardens and nutrients contained in stormwater runoff, dumped garden refuse, and animal droppings. |
| Principle 3 | Not currently at risk | (2.c.i) EOO | EOO is currently estimated at 4479 km ² or 447,900 hectares (as per DPIE dataset). |
| | | (2.c.ii) AOO | AOO is currently estimated at 1200 km ² or 120,000 hectares (as per DPIE dataset). |
| | | (2.c.iii) Threat-defined locations | Threat-defined locations currently unknown (as per DPIE dataset). |
| Principle 4 | – | – | – |
| Projected Impacts (9.1.1(3,4,5)) | | | |
| Impacts from the proposal | SAIL risk | BAM criteria | Projected impact to Sydney Turpentine Ironbark Forest in the Sydney Basin Bioregion |
| | | (3) Data deficient | The TEC is not data deficient. |
| Impact on geographic extent and distribution (Principles 1 and 3) | At risk | (4.a.i) In hectares | The geographic extent of the proposal is 0.04 hectares. |
| | | (4.a.ii) As a percentage of geographic extent in NSW | The current geographic extent of STIF in NSW is estimated at 1038 hectares (BioNet Vegetation Classification for PCT 3262) or 2940 hectares (per figures quoted in the 2019 Final Determination). The proposal will therefore reduce the current geographic extent of STIF in NSW by between 0.001% and 0.004%. |
| Impact on environmental degradation or | At risk | (4.b.i) Estimated size of remaining (but now isolated) areas | An area of 0.04 hectares of STIF will be impacted, which represents 0.00001% of its EOO and 0.00003% of its AOO. |

| | | | |
|-----------------------------------|--|--|--|
| biotic processes (Principle 2) | | (4.b.ii) Connectivity and fragmentation of remaining areas | <p>The proposal will remove all of the current extent of STIF on site, comprising 4 characteristic trees. STIF is already highly fragmented in its local occurrence, with 10 small patches totalling only 5,990 square metres within 500 metres of the development site:</p>  |
| | | | <p>These do not represent important areas of habitat and therefore the loss of the small isolated patches on site will not significantly increase fragmentation or isolation. Connectivity across the landscape will be virtually unaltered with no appreciable increase in distance between fragments in the immediate vicinity.</p> |
| | | (4.b.iii) Vegetation Integrity Score | <p>The TEC's current vegetation integrity score is 23.4 on the subject land. This low VI score is a result of the occurrence of STIF on site being restricted to 4 remnant canopy trees and some ground covers within the context of formal well-maintained gardens.</p> |
| | | (4.b.iii) Composition Condition Score | <p>The Composition Condition Score is 7.3 for the subject land's single Vegetation Zone.</p> |
| | | (4.b.iii) Structure Condition Score | <p>The Structure Condition Score is 42.8 for the subject land's single Vegetation Zone.</p> |
| | | (4.b.iii) Function Condition Score | <p>The Function Condition Score is 41 for the subject land's single Vegetation Zone.</p> |

10 NO NET LOSS

The proposal will result in the following potential impacts:

- Direct impact to a maximum of 0.04 hectares of PCT 3262.

The proposal has been assessed in accordance with BAM 2020 and it is determined that the offset obligation to achieve no nett loss is:

- 1 ecosystem credit of PCT 3262

The BAM-C credit reports are provided at Appendix 1.

11 LOCAL MATTERS

The *Ku-ring-gai Local Environmental Plan (LEP) 2015* applies to the majority of lands located within the Ku-ring-gai LGA, and is applicable to the development site. The *KLEP 2015* is to be read in conjunction with the *Ku-ring-gai Development Control Plan (DCP) 2022* to assess planning and development applications. The development site is affected by Greenweb matters (Canopy Remnant - see Figure 10).

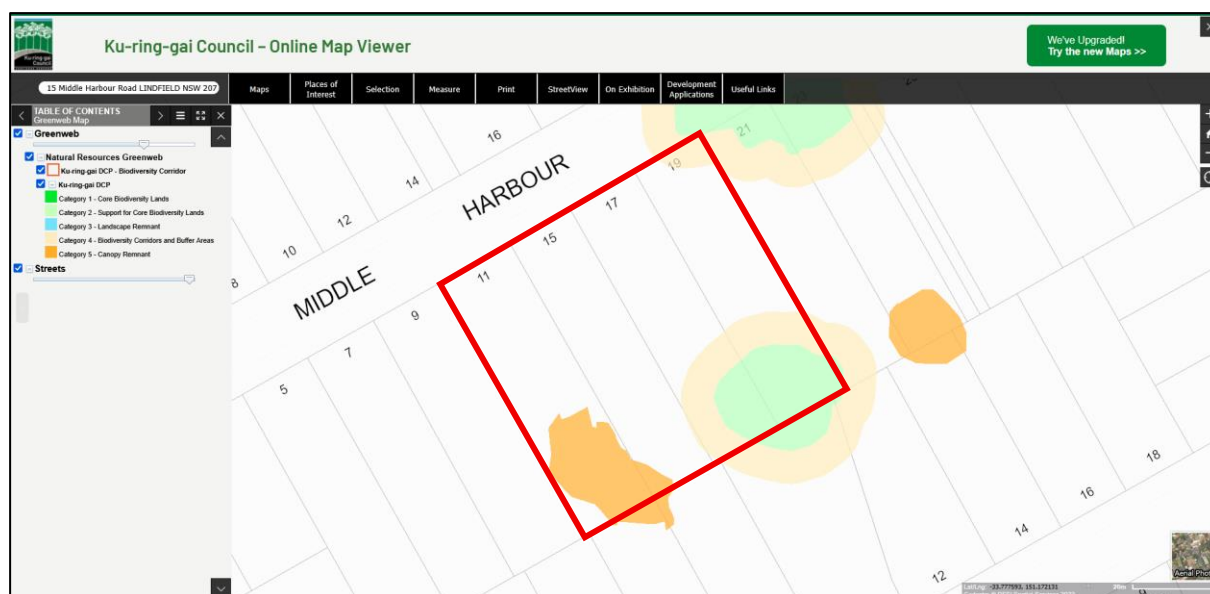


Figure 10: Greenweb mapping and the development site.

Controls for Biodiversity and Greenweb lands are addressed in Part 18 of the *KDCP 2022*. Controls relating to these mapped areas are detailed in section 18.6 of *KDCP 2022* and addressed here as the BOS does not deactivate the EPI controls.

Two types of Greenweb polygons are mapped on site:

- **Canopy Remnant** - Patches Key Vegetation Communities (excluding areas containing vegetation in good or moderate condition) that are <0.1ha in size. Good condition vegetation includes canopy, midstorey and understorey in good condition, with regeneration occurring within all layers, and native species dominant within all layers. Moderate condition vegetation, includes native medium to dense tree overstorey, with native shrub and ground layers, and native species dominant within 2 layers.
- **Support for Core Biodiversity Lands and Buffer Areas** - Includes all areas within 8 metres of lands mapped as Core Biodiversity Lands or Support for Core Biodiversity Lands. Including both vegetated and non-vegetated areas that are not already included within other categories.

It is noted that the patches of trees on the development site that comprises these mapped Greenweb polygons do not satisfy the definitions detailed above. Therefore, technically, the controls do not apply and are not further explored here.

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APPENDIX 1

BAM-C REPORTS

Proposal Details

| | | |
|--------------------------------|---|--|
| Assessment Id | Proposal Name | BAM data last updated * |
| 00057624/BAAS17045/25/00057625 | SSDA 11-19 Middle Harbour Rd Lindfield | 28/10/2024 |
| Assessor Name | Report Created | BAM Data version * |
| Elizabeth Ashby | 23/05/2025 | Current classification (live - default) (80) |
| Assessor Number | BAM Case Status | Date Finalised |
| BAAS17045 | Finalised | 23/05/2025 |
| Assessment Revision | | Assessment Type |
| 2 | | Major Projects |

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

| Zone | Vegetation zone name | TEC name | Current Vegetation integrity score | Change in Vegetation integrity (loss / gain) | Area (ha) | Sensitivity to loss (Justification) | Species sensitivity to gain class | BC Act Listing status | EPBC Act listing status | Biodiversity risk weighting | Potential SAI | Ecosystem credits |
|------|----------------------|----------|------------------------------------|--|-----------|-------------------------------------|-----------------------------------|-----------------------|-------------------------|-----------------------------|---------------|-------------------|
| | | | | | | | | | | | | |

BAM Credit Summary Report

Sydney Turpentine Ironbark Forest

| | | | | | | | | | | | | |
|---|-----------------|---|------|------|------|-----------------|--------------------------|--|------------|------|-----------------|----------|
| 1 | 3262_Classname1 | Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion | 23.4 | 23.4 | 0.04 | Population size | High Sensitivity to Gain | Critically Endangered Ecological Community | Not Listed | 2.50 | True | 1 |
| | | | | | | | | | | | Subtotal | 1 |
| | | | | | | | | | | | Total | 1 |

Species credits for threatened species

| Vegetation zone name | Habitat condition (Vegetation Integrity) | Change in habitat condition | Area (ha)/Count (no. individuals) | Sensitivity to loss (Justification) | Sensitivity to gain (Justification) | BC Act Listing status | EPBC Act listing status | Potential SAIL | Species credits |
|----------------------|--|-----------------------------|-----------------------------------|-------------------------------------|-------------------------------------|-----------------------|-------------------------|----------------|-----------------|
|----------------------|--|-----------------------------|-----------------------------------|-------------------------------------|-------------------------------------|-----------------------|-------------------------|----------------|-----------------|

BAM Candidate Species Report

Proposal Details

| | | |
|--------------------------------|--|--|
| Assessment Id | Proposal Name | BAM data last updated * |
| 00057624/BAAS17045/25/00057625 | SSDA 11-19 Middle Harbour Rd Lindfield | 28/10/2024 |
| Assessor Name | Report Created | BAM Data version * |
| Elizabeth Ashby | 23/05/2025 | Current classification (live - default) (80) |
| Assessor Number | Assessment Type | BAM Case Status |
| BAAS17045 | Major Projects | Finalised |
| Assessment Revision | | Date Finalised |
| 2 | | 23/05/2025 |

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List of Species Requiring Survey

| Name | Presence | Survey Months |
|------|----------|---------------|
|------|----------|---------------|

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

| Common name | Scientific name | Justification in the BAM-C |
|---------------------------------------|------------------------|----------------------------|
| Barking Owl | Ninox connivens | Habitat constraints |
| Bush Stone-curlew | Burhinus grallarius | Habitat constraints |
| Cumberland Plain Land Snail | Meridolum corneovirens | Habitat degraded |
| Darwinia peduncularis | Darwinia peduncularis | Habitat constraints |
| Downy Wattle | Acacia pubescens | Habitat degraded |
| Dural Land Snail | Pommerhelix duralensis | Habitat degraded |
| Eastern Australian Underground Orchid | Rhizanthella slateri | Habitat degraded |
| Eastern Osprey | Pandion cristatus | Habitat constraints |

BAM Candidate Species Report

| | | |
|--|--|---|
| Eastern Pygmy-possum | <i>Cercartetus nanus</i> | Habitat degraded |
| <i>Epacris purpurascens</i> var. <i>purpurascens</i> | <i>Epacris purpurascens</i> var. <i>purpurascens</i> | Habitat degraded |
| Gang-gang Cockatoo | <i>Callocephalon fimbriatum</i> | Habitat constraints |
| Gosford Wattle, Hurstville and Kogarah Local Government Areas | <i>Acacia prominens</i> - endangered population | Refer to BAR |
| Green and Golden Bell Frog | <i>Litoria aurea</i> | Habitat constraints |
| Grey-headed Flying-fox | <i>Pteropus poliocephalus</i> | Habitat constraints |
| <i>Haloragodendron lucasii</i> | <i>Haloragodendron lucasii</i> | Habitat constraints Geographic limitations |
| <i>Hibbertia puberula</i> | <i>Hibbertia puberula</i> | Habitat degraded |
| Julian's Hibbertia | <i>Hibbertia spanantha</i> | Habitat degraded |
| Koala | <i>Phascolarctos cinereus</i> | Habitat constraints |
| Large Bent-winged Bat | <i>Miniopterus orianae oceanensis</i> | Habitat constraints |
| Large-eared Pied Bat | <i>Chalinolobus dwyeri</i> | Habitat constraints |
| <i>Lasiopetalum joyceae</i> | <i>Lasiopetalum joyceae</i> | Habitat degraded |
| <i>Leucopogon fletcheri</i> subsp. <i>fletcheri</i> | <i>Leucopogon fletcheri</i> subsp. <i>fletcheri</i> | Habitat constraints |
| Little Bent-winged Bat | <i>Miniopterus australis</i> | Habitat constraints |
| Little Eagle | <i>Hieraaetus morphnoides</i> | Habitat constraints |
| Long-nosed Bandicoot population in inner western Sydney | <i>Perameles nasuta</i> - endangered population | Refer to BAR |
| <i>Marsdenia viridiflora</i> R. Br. subsp. <i>viridiflora</i> population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas | <i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> - endangered population | Refer to BAR |
| Masked Owl | <i>Tyto novaehollandiae</i> | Habitat constraints |
| Netted Bottle Brush | <i>Callistemon linearifolius</i> | Habitat degraded |
| <i>P. prunifolia</i> in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas | <i>Pomaderris prunifolia</i> - endangered population | Refer to BAR |
| Powerful Owl | <i>Ninox strenua</i> | Habitat constraints |

BAM Candidate Species Report

| | | |
|-------------------------------------|--|---------------------|
| Red-crowned Toadlet | <i>Pseudophryne australis</i> | Habitat degraded |
| Regent Honeyeater | <i>Anthochaera phrygia</i> | Habitat constraints |
| Scrub Turpentine | <i>Rhodamnia rubescens</i> | Habitat degraded |
| South-eastern Glossy Black-Cockatoo | <i>Calyptorhynchus lathami lathami</i> | Habitat constraints |
| Southern Myotis | <i>Myotis macropus</i> | Habitat constraints |
| Square-tailed Kite | <i>Lophoictinia isura</i> | Habitat constraints |
| Squirrel Glider | <i>Petaurus norfolcensis</i> | Habitat degraded |
| Swift Parrot | <i>Lathamus discolor</i> | Habitat constraints |
| White-bellied Sea-Eagle | <i>Haliaeetus leucogaster</i> | Habitat constraints |

BAM Predicted Species Report

Proposal Details

| | | |
|--------------------------------|--|--|
| Assessment Id | Proposal Name | BAM data last updated * |
| 00057624/BAAS17045/25/00057625 | SSDA 11-19 Middle Harbour Rd Lindfield | 28/10/2024 |
| Assessor Name | Report Created | BAM Data version * |
| Elizabeth Ashby | 23/05/2025 | Current classification (live - default) (80) |
| Assessor Number | Assessment Type | BAM Case Status |
| BAAS17045 | Major Projects | Finalised |
| Assessment Revision | | Date Finalised |
| 2 | | 23/05/2025 |

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Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

| Common Name | Scientific Name | Vegetation Types(s) |
|--|---------------------------------|--|
| Brown Treecreeper (eastern subspecies) | Climacteris picumnus victoriae | 3262-Sydney Turpentine Ironbark Forest |
| Diamond Firetail | Stagonopleura guttata | 3262-Sydney Turpentine Ironbark Forest |
| Dusky Woodswallow | Artamus cyanopterus cyanopterus | 3262-Sydney Turpentine Ironbark Forest |
| Eastern Coastal Free-tailed Bat | Micronomus norfolkensis | 3262-Sydney Turpentine Ironbark Forest |
| Eastern Osprey | Pandion cristatus | 3262-Sydney Turpentine Ironbark Forest |
| Flame Robin | Petroica phoenicea | 3262-Sydney Turpentine Ironbark Forest |
| Gang-gang Cockatoo | Callocephalon fimbriatum | 3262-Sydney Turpentine Ironbark Forest |
| Grey-headed Flying-fox | Pteropus poliocephalus | 3262-Sydney Turpentine Ironbark Forest |
| Large Bent-winged Bat | Miniopterus orianae oceanensis | 3262-Sydney Turpentine Ironbark Forest |

BAM Predicted Species Report

| | | |
|--------------------------------|---------------------------------|--|
| Little Bent-winged Bat | Miniopterus australis | 3262-Sydney Turpentine Ironbark Forest |
| Little Eagle | Hieraaetus morphnoides | 3262-Sydney Turpentine Ironbark Forest |
| Little Lorikeet | Glossopsitta pusilla | 3262-Sydney Turpentine Ironbark Forest |
| Regent Honeyeater | Anthochaera phrygia | 3262-Sydney Turpentine Ironbark Forest |
| South-eastern Hooded Robin | Melanodryas cucullata cucullata | 3262-Sydney Turpentine Ironbark Forest |
| Speckled Warbler | Chthonicola sagittata | 3262-Sydney Turpentine Ironbark Forest |
| Spotted-tailed Quoll | Dasyurus maculatus | 3262-Sydney Turpentine Ironbark Forest |
| Square-tailed Kite | Lophoictinia isura | 3262-Sydney Turpentine Ironbark Forest |
| Swift Parrot | Lathamus discolor | 3262-Sydney Turpentine Ironbark Forest |
| Varied Sittella | Daphoenositta chrysoptera | 3262-Sydney Turpentine Ironbark Forest |
| White-throated Needletail | Hirundapus caudacutus | 3262-Sydney Turpentine Ironbark Forest |
| Yellow-bellied Sheath-tail-bat | Saccolaimus flaviventris | 3262-Sydney Turpentine Ironbark Forest |

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

| Common Name | Scientific Name | Plant Community Type(s) |
|-------------------------------------|---------------------------------|--|
| Black Bittern | Ixobrychus flavicollis | 3262-Sydney Turpentine Ironbark Forest |
| Black-necked Stork | Ephippiorhynchus asiaticus | 3262-Sydney Turpentine Ironbark Forest |
| Painted Honeyeater | Grantiella picta | 3262-Sydney Turpentine Ironbark Forest |
| South-eastern Glossy Black-Cockatoo | Calyptorhynchus lathami lathami | 3262-Sydney Turpentine Ironbark Forest |
| White-bellied Sea-Eagle | Haliaeetus leucogaster | 3262-Sydney Turpentine Ironbark Forest |

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

BAM Predicted Species Report

| Common Name | Scientific Name | Justification in the BAM-C |
|-------------------------------------|--|----------------------------|
| Black Bittern | <i>Ixobrychus flavicollis</i> | Habitat constraints |
| Black-necked Stork | <i>Ephippiorhynchus asiaticus</i> | Habitat constraints |
| Painted Honeyeater | <i>Grantiella picta</i> | Habitat constraints |
| South-eastern Glossy Black-Cockatoo | <i>Calyptorhynchus lathami lathami</i> | Habitat constraints |
| White-bellied Sea-Eagle | <i>Haliaeetus leucogaster</i> | Habitat constraints |



BAM Vegetation Zones Report

Proposal Details

| | | |
|--------------------------------|--|--|
| Assessment Id | Assessment name | BAM data last updated * |
| 00057624/BAAS17045/25/00057625 | SSDA 11-19 Middle Harbour Rd Lindfield | 28/10/2024 |
| Assessor Name | Report Created | BAM Data version * |
| Elizabeth Ashby | 23/05/2025 | Current classification (live - default) (80) |
| Assessor Number | Assessment Type | BAM Case Status |
| BAAS17045 | Major Projects | Finalised |
| Assessment Revision | | Date Finalised |
| 2 | | 23/05/2025 |

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Vegetation Zones

| # | Name | PCT | Condition | Area | Minimum number of plots | Management zones |
|---|-----------------|--|------------|------|-------------------------|------------------|
| 1 | 3262_Classname1 | 3262-Sydney Turpentine Ironbark Forest | Classname1 | 0.04 | 1 | |



BAM Biodiversity Credit Report (Like for like)

Proposal Details

| | | |
|--------------------------------|---|---|
| Assessment Id | Proposal Name | BAM data last updated * |
| 00057624/BAAS17045/25/00057625 | SSDA 11-19 Middle Harbour Rd Lindfield | 28/10/2024 |
| Assessor Name | Assessor Number | BAM Data version * |
| Elizabeth Ashby | BAAS17045 | Current classification (live - default) (80) |
| Proponent Names | Report Created | BAM Case Status |
| | 23/05/2025 | Finalised |
| Assessment Revision | | Assessment Type |
| 2 | | Major Projects |
| Date Finalised | * Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet. | |
| 23/05/2025 | | |

Potential Serious and Irreversible Impacts

| Name of threatened ecological community | Listing status | Name of Plant Community Type/ID |
|---|--|--|
| Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion | Critically Endangered Ecological Community | 3262-Sydney Turpentine Ironbark Forest |
| Species | | |
| Nil | | |

BAM Biodiversity Credit Report (Like for like)

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

| PCT |
|------------|
| No Changes |

Predicted Threatened Species Not On Site

| Name |
|---|
| Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo |
| Ephippiorhynchus asiaticus / Black-necked Stork |
| Grantiella picta / Painted Honeyeater |
| Ixobrychus flavicollis / Black Bittern |
| Haliaeetus leucogaster / White-bellied Sea-Eagle |

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

| Name of Plant Community Type/ID | Name of threatened ecological community | Area of impact | HBT Cr | No HBT Cr | Total credits to be retired |
|--|---|----------------|--------|-----------|-----------------------------|
| 3262-Sydney Turpentine Ironbark Forest | Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion | 0.0 | 0 | 1 | 1 |

BAM Biodiversity Credit Report (Like for like)

| 3262-Sydney Turpentine Ironbark Forest | Like-for-like credit retirement options | | | | | |
|---|--|---------------|-----------------|-----|---------|---|
| | Name of offset trading group | Trading group | Zone | HBT | Credits | IBRA region |
| | Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion This includes PCT's: 3262 | - | 3262_Classname1 | No | 1 | Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site. |

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id

00057624/BAAS17045/25/00057625

Assessor Name

Elizabeth Ashby

Proponent Name(s)

Assessment Revision

2

Date Finalised

23/05/2025

Proposal Name

SSDA 11-19 Middle Harbour Rd Lindfield

Assessor Number

BAAS17045

Report Created

23/05/2025

BAM data last updated *

28/10/2024

BAM Data version *

Current classification (live - default) (80)

BAM Case Status

Finalised

Assessment Type

Major Projects

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

| Name of threatened ecological community | Listing status | Name of Plant Community Type/ID |
|---|--|--|
| Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion | Critically Endangered Ecological Community | 3262-Sydney Turpentine Ironbark Forest |
| Species | | |
| Nil | | |

Additional Information for Approval

PCT Outside Ibra Added

None added

BAM Biodiversity Credit Report (Variations)

PCTs With Customized Benchmarks

| PCT |
|------------|
| No Changes |

Predicted Threatened Species Not On Site

| Name |
|---|
| Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo |
| Ephippiorhynchus asiaticus / Black-necked Stork |
| Grantiella picta / Painted Honeyeater |
| Ixobrychus flavicollis / Black Bittern |
| Haliaeetus leucogaster / White-bellied Sea-Eagle |

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

| Name of Plant Community Type/ID | Name of threatened ecological community | Area of impact | HBT Cr | No HBT Cr | Total credits to be retired |
|--|---|----------------|--------|-----------|-----------------------------|
| 3262-Sydney Turpentine Ironbark Forest | Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion | 0.0 | 0 | 1 | 1.00 |

| | | | | | | |
|---|---|---------------|------------------|-----|---------|--|
| 3262-Sydney Turpentine Ironbark Forest | Like-for-like credit retirement options | | | | | |
| | Class | Trading group | Zone | HBT | Credits | IBRA region |
| | Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion This includes PCT's: 3262 | - | 3262_Class name1 | No | 1 | Cumberland,Burraborang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site. |

Species Credit Summary

No Species Credit Data

Credit Retirement Options Like-for-like options