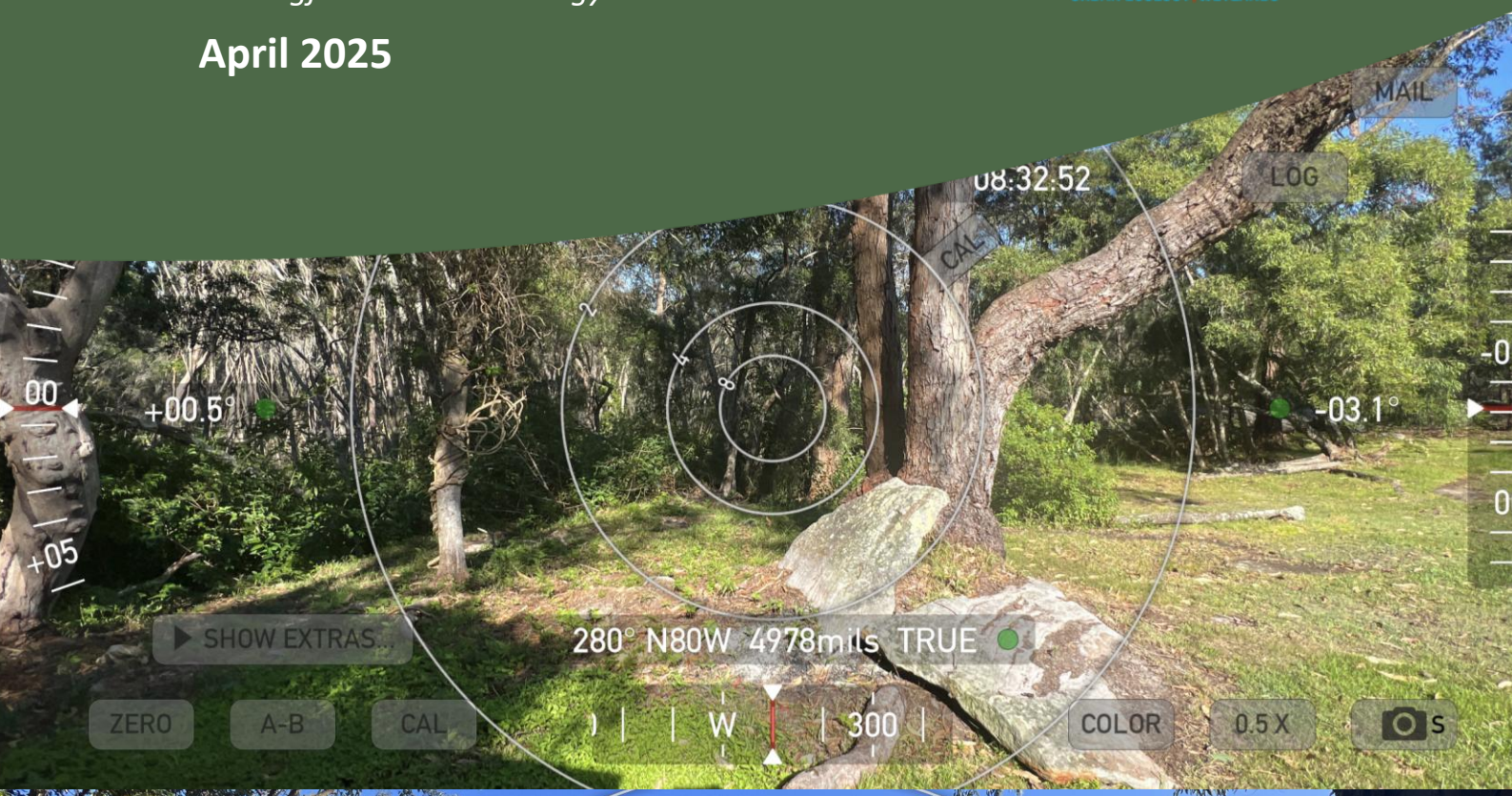
Flora and Fauna Assessment

Demolition of existing dwelling and construction of new dwelling

22 Cicada Glen Road, Ingleside

Prepared by Ecological Consultants Australia Pty Ltd
TA Kingfisher Urban Ecology and Wetlands

April 2025



About this document

Report:	Flora and Fauna Assessment 22 Cicada Glen Rd, Ingleside
Prepared for:	Elcom Developments Pty Ltd
Prepared by:	Kingfisher Urban Ecology and Wetlands
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Information present in this document is based on an objective study undertaken in response to the brief provided by the client. Any opinions expressed in this document are the professional, objective opinions of the authors and are not intended to advocate any proposal or pre-determined position.

Report certification

This report was prepared by:

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1	November 2024	Elaway (Geraldene) Dalby-Ball	Draft
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Shortened forms

Shortened form	Description
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BOS	Biodiversity Offsets Scheme
CEEC	Critically Endangered Ecological Community
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DBH	diameter at breast height
DPE	Department of Planning and Environment
ECA	Ecological Consultants Australia Pty Ltd
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EEC	Endangered Ecological Community
FFA	Flora and Fauna Assessment
HTW	high threat weed
LEP	Local Environmental Plan
LGA	Local Government Area
LLS Act	*Local Land Services Act 2013* (NSW)
MNES	Matters of National Environmental Significance
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VEC	Vulnerable Ecological Community
VMP	Vegetation Management Plan
WoNS	Weeds of National Significance

1 Introduction

1.1 Background

Ecological Consultants Australia Pty Ltd (ECA) was engaged by Elcom Developments Pty Ltd, on behalf of the landowner, to undertake a Flora and Fauna Assessment (FFA) to support a Development Application (DA) for the demolition of the existing dwelling and construction of a new dwelling at 22 Cicada Glen Road, Ingleside.

1.2 Subject site

The subject site is located at 22 Cicada Glen Road, Ingleside NSW 2101, and is legally described as Lot 243 in Deposited Plan (DP) 752046. The total area of the site is approximately 1,618.7 square metres, as illustrated in Figure 1.1.

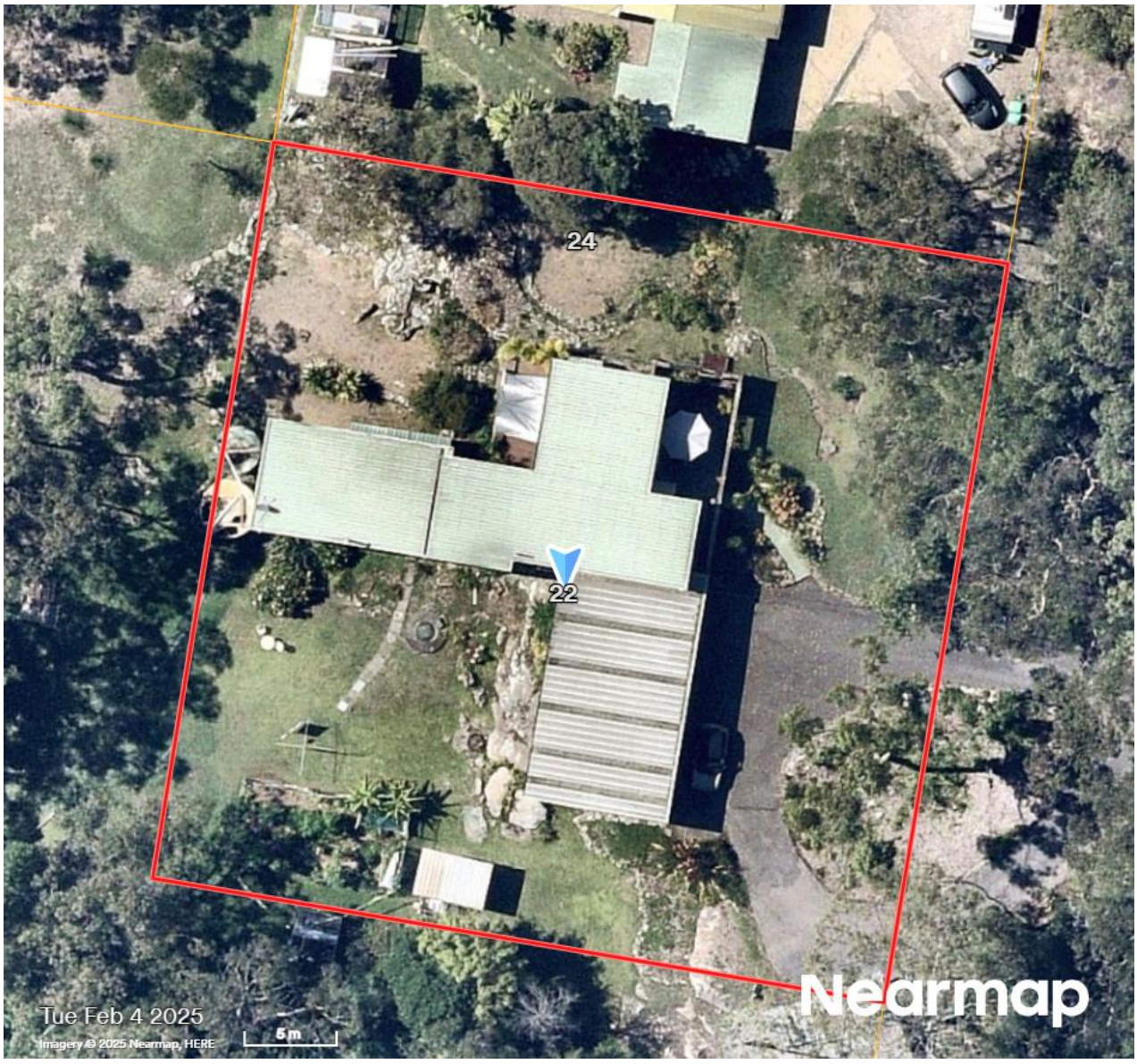


Figure 1.1. Subject site.
Source: Nearmap.

1.2.1 Location

The site is located in the suburb of Ingleside, within the Northern Beaches Council Local Government Area (LGA), approximately 23 kilometres north-east of the Sydney Central Business District (CBD).

1.2.2 Land use

Under the *Pittwater Local Environmental Plan 2014* (Pittwater LEP), the site is zoned 'RU2 – Rural Landscape', as indicated in yellow in Figure 1.2.

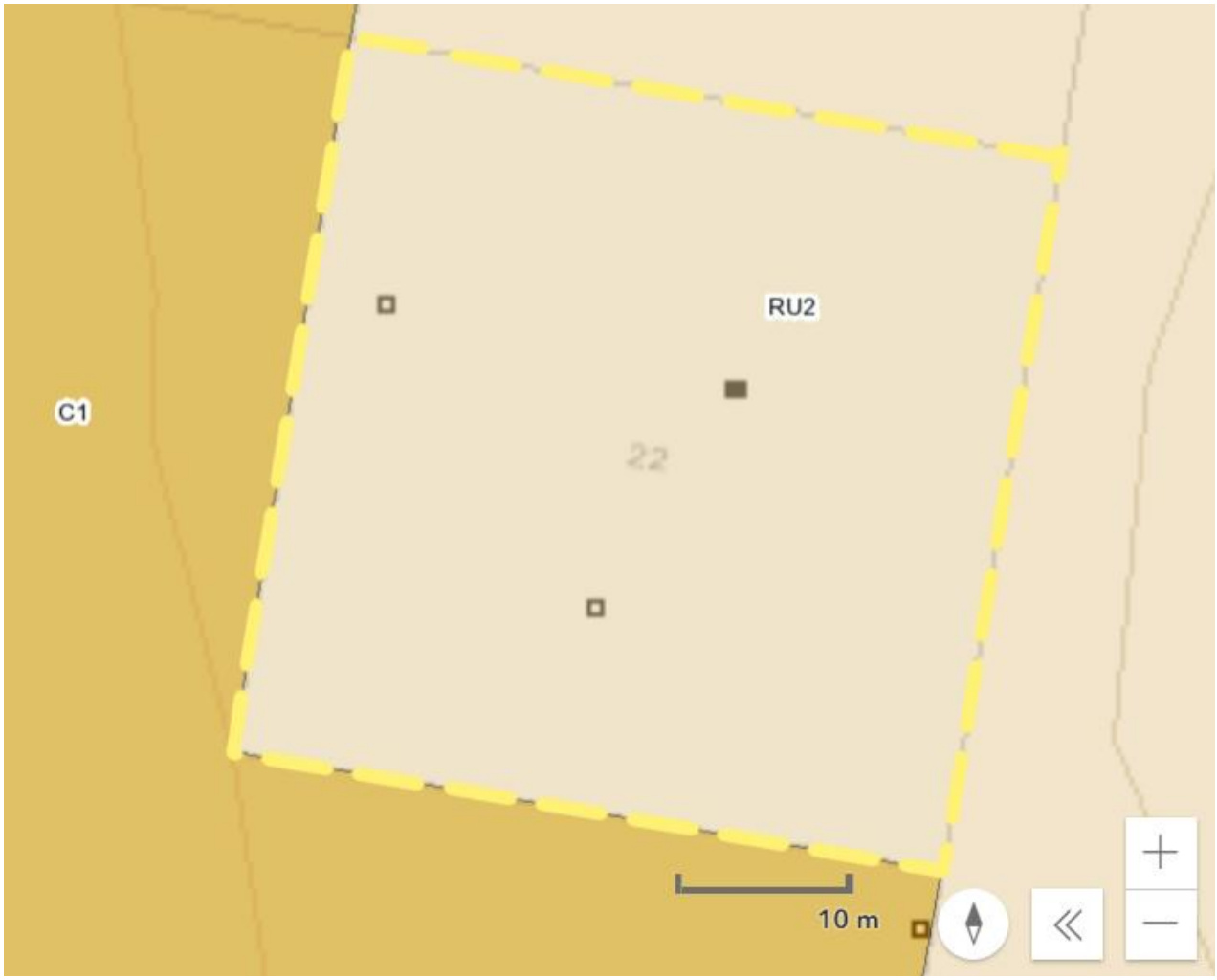


Figure 1.2. Land zoning.

Source: NSW Planning Portal Spatial Viewer.

1.2.3 Geology and Soils

A review of eSPADE v2.2 indicates that the property is underlain by the Somersby soil landscape, as shown in Figure 1.3. The Somersby Soil Landscape occurs on gently undulating to rolling rises of the deeply weathered Hawkesbury Sandstone plateau, primarily across the Hornsby Plateau (e.g., Ingleside, Terrey Hills) and parts of the Erina Hills physiographic region (e.g., Kilcare Heights, Brisbane Water National Park). The landscape features broad convex crests and narrow concave valleys, with local relief up to 40 metres and slope gradients generally less than 15%. Rock outcrop is absent.

Soils range from moderately deep to deep (100–300 cm), comprising Red and Yellow Earths over lateritic gravels and clays on crests and upper slopes, with Yellow Earths and Earthy Sands on mid-slopes. Lower slopes and drainage lines support Grey Earths, Leached Sands, and Siliceous Sands, while poorly drained areas contain Gleyed Podzolic Soils.

The landscape was originally characterised by low eucalypt open-woodland and scrub, dominated by species such as *Eucalyptus haemastoma*, *E. sieberi*, *Angophora costata*, and *Banksia serrata*. Poorly drained areas support *Banksia ericifolia* and *Leptospermum* spp. Much of the original vegetation has been cleared for land uses including market gardening, nurseries, horse facilities, quarries, and residential development, although pockets of bushland and conservation areas remain.

Land limitations include localised high watertables, areas of laterite and stony soils, very low fertility, and high permeability. Erosion is typically minor to moderate, with sheet, rill, and gully erosion evident in areas cleared or disturbed by agriculture, roadworks, or quarrying.

Figure 1.3. Soil landscape.

Source: eSPADE v2.2.

1.2.4 Hydrology

The site is situated east of Cicada Glen Creek and in proximity to the ridgeline, as indicated by the black dot in Figure 1.4. Surface water from the site is directed towards Cicada Glen Road and is expected to naturally drain both eastward, towards the road, and westward, towards Cicada Glen Creek within the adjoining National Park.

According to the NSW *Water Management (General) Regulation 2018* Hydroline Spatial Data v1.0, two first-order drainage lines are present—one to the north and one to the south of the site—both of which converge with Cicada Glen Creek, as shown by the blue lines in Figure 1.4.

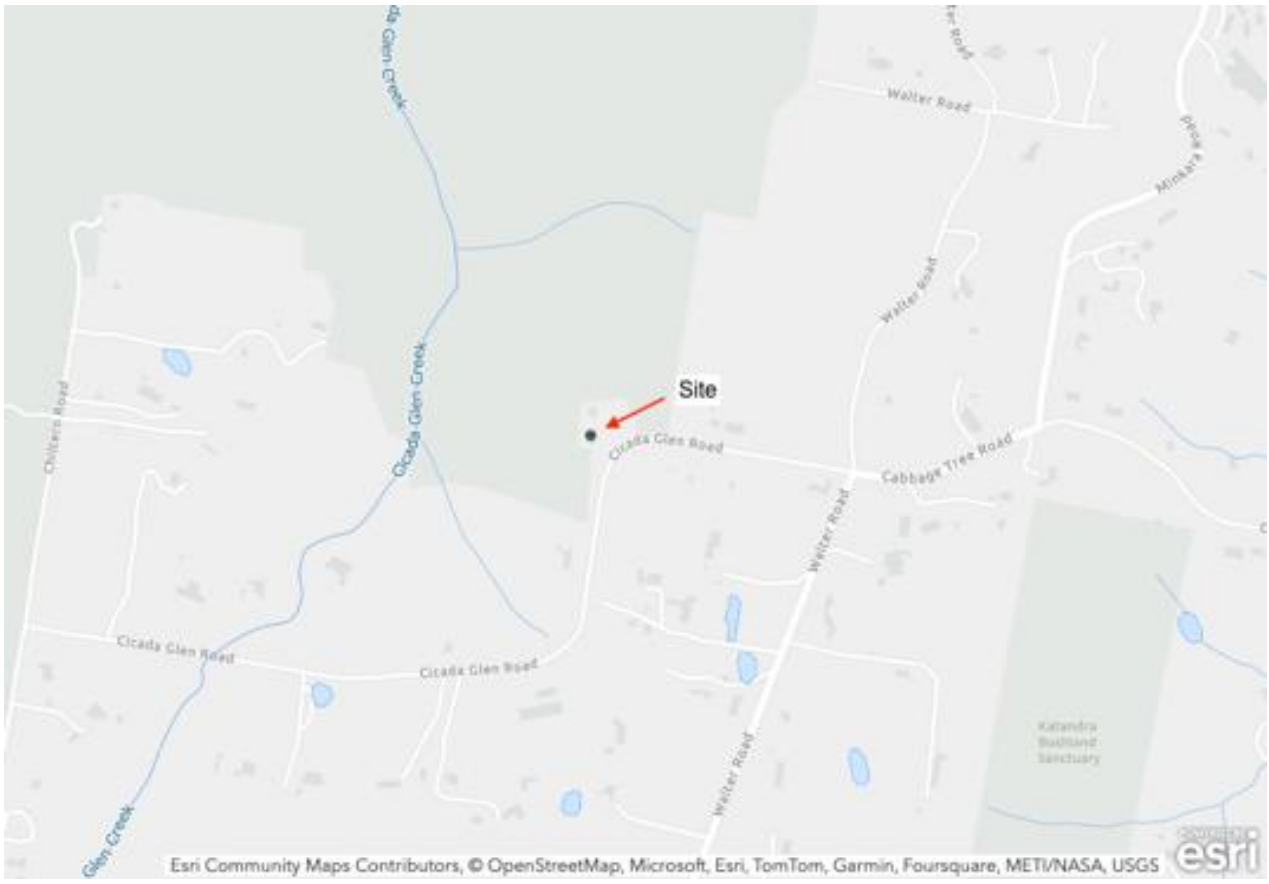


Figure 1.4. Catchment context.

Source: Water Management (General) Regulation 2018 hydroline spatial data 1.0

1.2.5 Disturbance history

The site currently comprises exotic turf, rockery gardens containing exotic plant species, and patches of fringing native vegetation that connect to adjoining vegetation within the National Park. Native vegetation beyond the site boundary, including along the nature strip, is more diverse and comprises tall forest. The area within the site boundaries has been subject to disturbance since at least the early 1970s, as illustrated in Figure 1.5.

Figure 1.5. The site in 1975.
Source: Historical Imagery Viewer.

Aerial imagery from 2009 and 2013 shows the existing dwelling, along with larger forest trees along the nature strip to the east, and a lower, more open woodland structure in the rear portion of the site to the west.

Figure 1.6. The site in 2009.

Source: Nearmap.

Figure 1.7. The site in 2013.

Source: Nearmap.

Figure 1.8. The site in 2020.

Source: Nearmap.

Figure 1.9. The site in April 2024.

Source: Nearmap.

Figure 1.10. The site in February 2025.
Source: Nearmap.

1.2.6 Bushfire prone land

The site is located within an area mapped as bushfire prone land (refer to Figure 1.11). A Bushfire Hazard Assessment has been prepared by Clarke Dowdle & Associates, confirming that the site currently meets the requirements for an adequate Asset Protection Zone (APZ).

Figure 1.11. Bushfire prone land mapping.

Source: NSW Planning Portal Spatial Viewer.

1.3 Proposed development

The DA seeks approval for the demolition of the existing dwelling and the construction of a new dwelling, as shown in Figures 1.12 to 1.14.

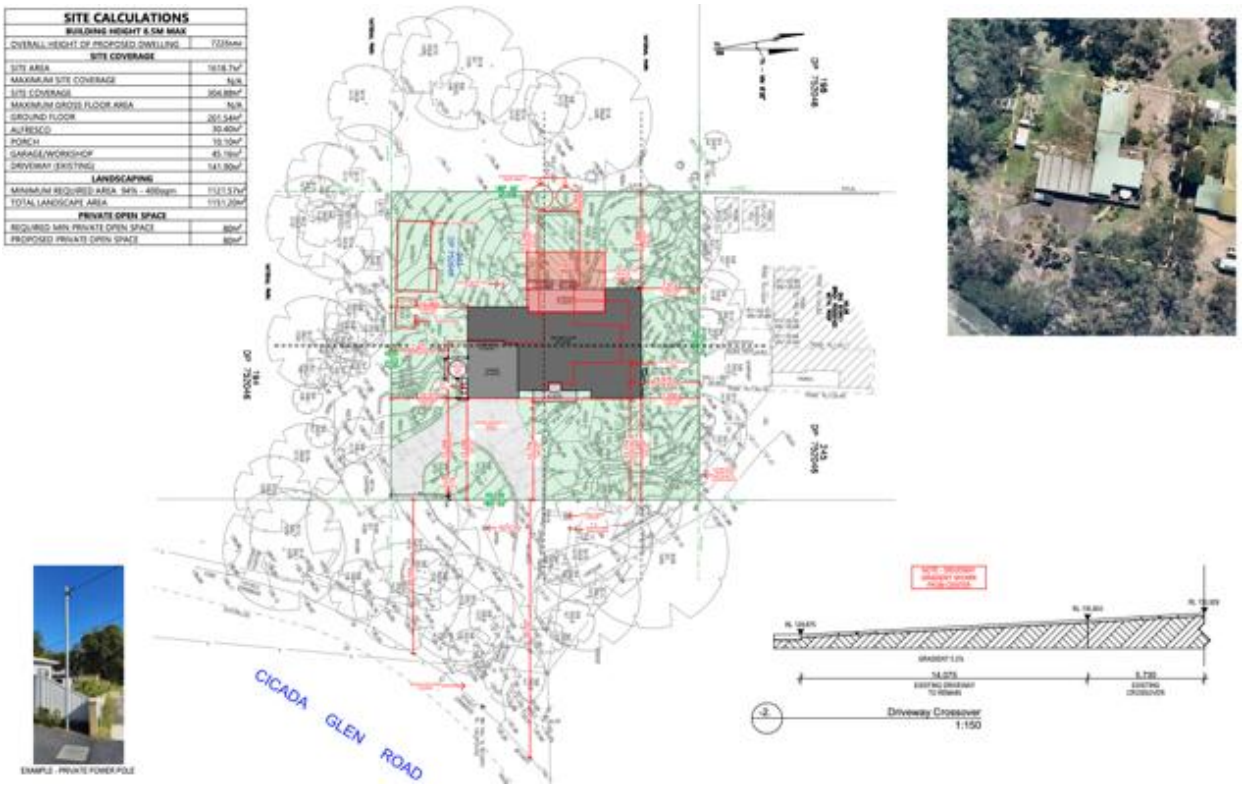


Figure 1.12. Proposed Site Plan.
Source: Elcom Homes, Rev C, 30/01/2025.

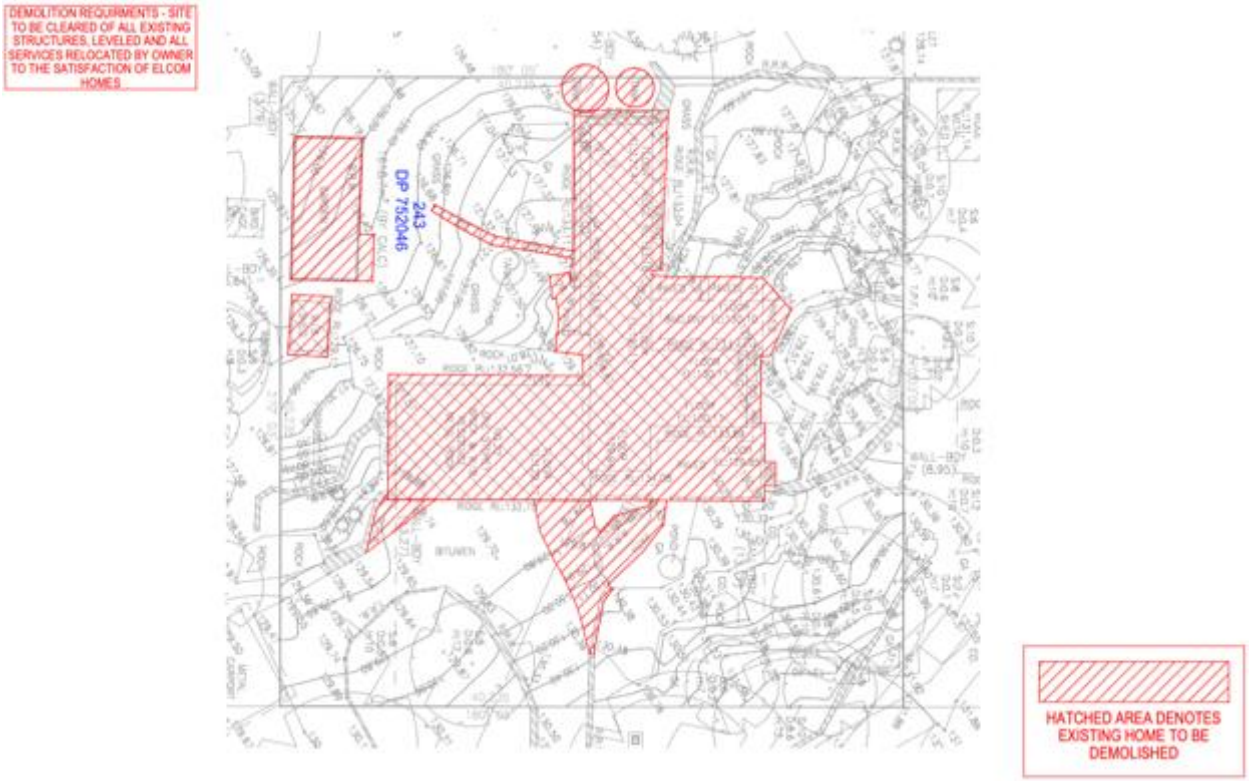


Figure 1.13. Demolition Plan

Source: Elcom Homes, Rev C, 30/01/2025.

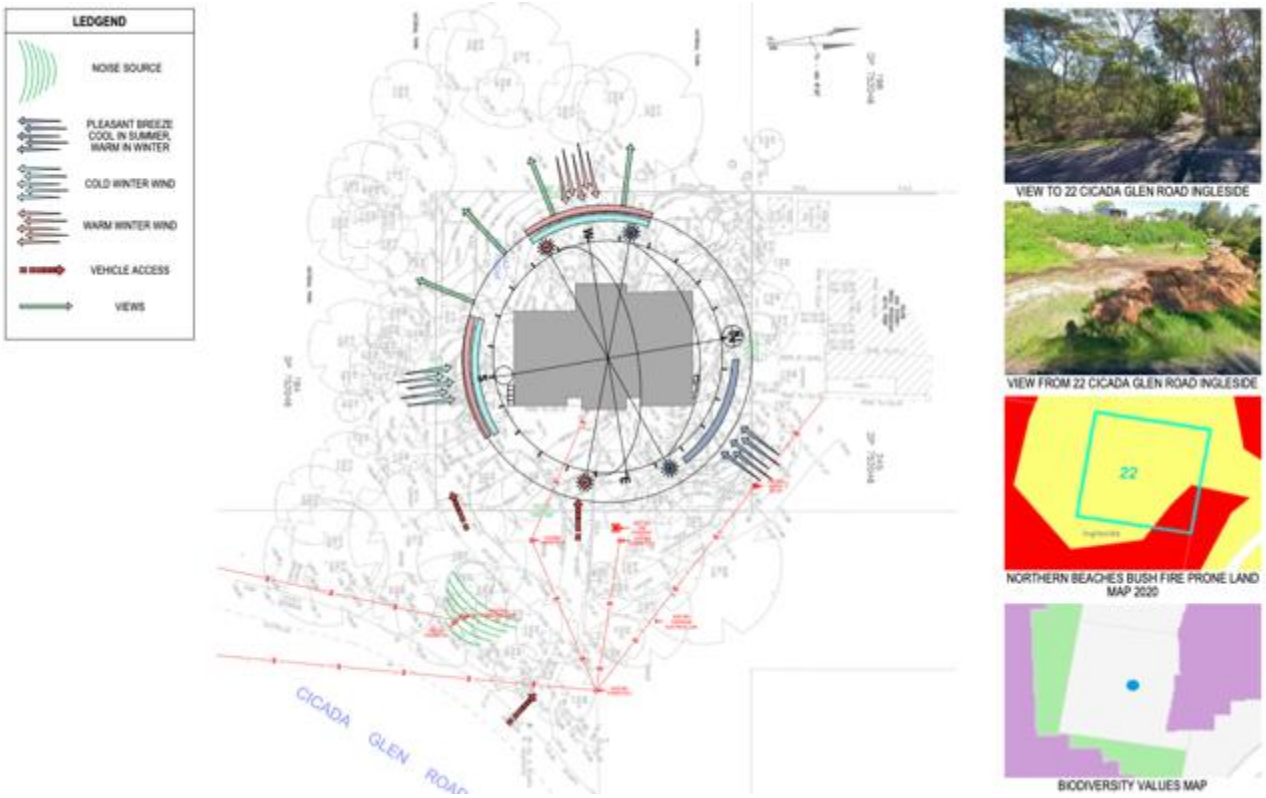


Figure 1.14. Site Analysis Plan.

Source: Elcom Homes, Rev C, 30/01/2025.

2 Legislative framework

Commonwealth and State legislation and policies, as well as local policies apply to the assessment, planning and management of the environment within the site. A brief outline of the relevant Commonwealth and State Acts and policies, and local policies relevant to the proposed development are provided below.

2.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is Australia's main national environmental legislation, which provides for the protection and management of nationally and internationally important plants, animals, habitats and places. The Act refers to the living things (including plants and animals), habitats and places that need protecting as 'matters of national environmental significance' (MNES). MNES include:

- World Heritage Properties
- National Heritage Places
- Wetlands of International Importance (listed under the Ramsar Convention)
- Great Barrier Reef Marine Park
- Commonwealth Marine Areas
- Listed threatened species and listed ecological communities
- Listed migratory species (protected under international agreements)

Under the EPBC Act an action will require approval from the minister if the action has, will have, or is likely to have, a significant impact on any of the above listed MNES. The general test for significance is whether an impact is 'important, notable or of consequence, having regard to its context or intensity'.

Appendix III provides an assessment of the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (DoE 2013) with respect to threatened species and migratory species that could utilise the subject land. This assessment aims to assist the applicant to decide whether they should submit a referral to Department of Climate Change, Energy, the Environment and Water for a decision by the minister on whether assessment and approval is required under the EPBC Act.

2.2 NSW Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulation 2000

The NSW Environmental Planning and Assessment Act 1979 (EP&A Act) and the Environmental Planning and Assessment Regulation 2000 (EP&A Reg.) institutes and sets out a system for environmental planning and assessment in NSW and includes Part 4 which deals with development applications on private land and state significant development.

This proposal falls under a Part 4 development and requires development consent.

2.3 NSW Biodiversity Conservation Act 2016 and Biodiversity Conservation Regulation 2017

The NSW *Biodiversity Conservation Act 2016* (BC Act) is the key legislation that enables the conservation of biodiversity within the state of NSW. The BC Act facilitates the assessment and on-going protection of flora and fauna, including threatened species and ecological communities. The BC Act outlines assessment and offsetting requirements for activities with the potential to impact threatened species and ecological communities in NSW, and the clearing of native vegetation.

The *Biodiversity Conservation Regulation 2017* (BC Reg) sets out the threshold level for when the Biodiversity Offsets Scheme (BOS) will be triggered. The threshold has two elements:

1. Whether the amount of native vegetation being cleared exceeds an area threshold

The BOS does not apply to the proposal, as the area of impact on native vegetation does not exceed the threshold for this site. The area of impact encompasses the proposed works and the APZ.

2. Whether the impacts occur on an area mapped on the Biodiversity Values Map published by the Environment Agency Head

The BV Map identifies land of high biodiversity value, as defined by clause 7.3(3) of the BC Reg. The BOS applies to the clearing of native vegetation and other biodiversity impacts prescribed by clause 6.1 of the BC Reg on land identified on the BV Map. The site is located within an area mapped on the BV Map, as shown in Figure 2.1. No native vegetation removal is proposed.

Figure 2.1. Biodiversity Values Map

Source: Biodiversity Values Map and Threshold Tool.

2.4 NSW Biosecurity Act 2015

The *Biosecurity Act 2015* repealed and replaced the *Noxious Weeds Act 1993*. The Act introduces the premise that biosecurity is a shared community responsibility and introduces the legally enforceable concept of a 'General Biosecurity Duty'. All landowners have a general biosecurity duty to control invasive weeds on their property and prevent them from spreading to other properties or native bushland. The objectives of the Act are to manage and eradicate weeds that cause a high level of environmental, economic or social harm.

With the removal of and management of weeds (noting few present) on the property the proposal will be compliant with the objectives of the Act. Focus will be the zone between the grass and the bushland.

2.5 State Environmental Planning Policy (Biodiversity and Conservation) 2021

The NSW *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Bio Con SEPP) *Chapter 4 Koala Habitat Protection 2020* applies to the land.

2.5.1.1 Chapter 4 Koala Habitat Protection 2020

Step 1—Is the land potential koala habitat?

potential koala habitat means areas of native vegetation where trees of the types listed in Schedule 1 (being Koala Food Trees [KFTs]) constitute at least 15% of the total number of trees in the upper or lower strata of the tree component as listed in Table 2.1. The site does not currently contain any KFTs.

Table 2.1. Schedule 1 Feed tree species–Chapter 3.

Scientific name	Common name
Eucalyptus tereticornis	Forest red gum
Eucalyptus microcorys	Tallowwood
Eucalyptus punctata	Grey gum
Eucalyptus camaldulensis	River red gum
Eucalyptus haemastoma	Broad leaved scribbly gum
Eucalyptus signata	Scribbly gum
Eucalyptus albens	White box
Eucalyptus robusta	Swamp mahogany

Step 2—Is the land core koala habitat?

core koala habitat means an area of land with a resident population of koalas, evidenced by attributes such as breeding females, being females with young, and recent sightings of and historical records of a population.

There are no recent sightings or historical records of a koala population within the site, as indicated in Figure 2.2. No koalas were observed during the field survey, and the site is not considered to constitute core koala habitat.

Figure 2.2. Koala sightings within the locality.

Source: SEED Koala Species Sightings 2025.

2.6 Pittwater Local Environmental Plan 2014

A portion of the site is mapped as biodiversity land on the Council's Terrestrial Biodiversity Map, as shown in Figure 2.3. As such, Clause 7.2 (Terrestrial Biodiversity) of the *Pittwater Local Environmental Plan 2014* is addressed below.

The proposed development, including the APZ, falls within the Terrestrial Biodiversity Mapped area. Given that the entire site is designated as Terrestrial Biodiversity land, there are no alternative locations for the proposed works. Native flora, fauna, and their habitats within the mapped area will be preserved and protected. As a result, the proposal aligns with the objectives of Clause 7.2, ensuring there is no direct impact on biodiversity-designated land.

The APZ areas will be managed to maintain their current condition, with no native vegetation required for removal. Ongoing management of the APZ will include preventing the establishment of shrubs and limiting the growth of new native trees within the APZ zone.

Figure 2.3. Terrestrial Biodiversity Map

Source: NSW Planning Portal 2025

2.7 Pittwater Development Control Plan 2014

The proposed development has been assessed in accordance with the relevant Development Control Plan (DCP) controls. The primary controls applicable are B4.11 (Land Adjoining Bushland) and B4.18 (Heath/Woodland Vegetation), with the requirements outlined in these controls addressing the broader set of applicable guidelines. Compliance with both B4.11 and B4.18 can be ensured through conditions in the Development Application (DA) or a Vegetation Management Plan (VMP).

B4.11 Land Adjoining Bushland

Outcomes

- To protect bushland from impacts associated with development on adjoining land. (En) Biodiversity, ecological processes and other bushland values are conserved. (En)

Controls

- Development shall not adversely impact on the adjoining reserve.
- Development shall ensure that at least 80% of any new planting incorporates native vegetation (as per species found on the site or listed in Native Plants for Your Garden available on the Pittwater Council website).

- Landscaping works are to be outside areas of bushland and do not include Environmental Weeds.
- Compliance with Council's Water Management for Development Policy is required.
- Domestic animals will be restricted from entering bushland.
- Development shall not result in a significant loss of canopy cover or a net loss in native canopy trees.
- Fencing, where permitted, shall be passable to native wildlife.

B4.18 Heathland/Woodland Vegetation

Outcomes

- Conservation of intact heathland. (En)
- Regeneration and/or restoration of fragmented and / or degraded heathland. (En)
- Reinstatement of heathland to link remnants. (En)
- Long-term viability of locally native flora and fauna and their habitats in the Pittwater LGA through conservation, enhancement and/or creation of habitats and wildlife corridors. (En)
- Long-term sustainability of hanging swamps and other wetlands (En).

Controls

- Development shall retain and enhance habitat and wildlife corridors for threatened species, endangered populations, endangered ecological communities and other locally native species.
- Development shall not reduce or degrade habitat for locally native species, threatened species, endangered populations or endangered ecological communities.
- Wastewater shall receive tertiary treatment and not be discharged directly into heathland.
- Compliance with Council's Water Management for Development Policy is required.
- Caretakers of domestic animals shall prevent them from entering wildlife habitat areas.
- Fencing, where permitted, shall allow the safe passage of native wildlife.
- Development shall not negatively impact on heathland.
- Development shall ensure long-term sustainability of wetlands and must include an appropriate buffer - minimum of 10 metres from wetland edge.
- Development shall ensure that at least 80% of any new planting incorporates native vegetation (as per species found on the site or listed in Native Plants for Your Garden available on the Pittwater Council website).
- Landscaping works are to be outside areas of bushland and do not include environmental weeds.

B4.22 Preservation of Trees and Bushland Vegetation

No trees or bushland are proposed for removal.

3 Methods

3.1 Preliminary investigations

The NSW State Vegetation Type Map was reviewed to assist in identifying the Plant Community Types (PCTs) present within and around the site. The most appropriate PCT was determined based on the floristic attributes and descriptions in the BioNet Vegetation Classification database, as well as species composition data collected during the field survey.

On 25 February 2025, a search of the NSW BioNet Atlas was conducted, generating a list of threatened flora and fauna species with the potential to occur within a 10 km radius of the site. Additionally, threatened species and ecological communities listed under the *Environmental Protection and Biodiversity Conservation (EPBC) Act* were identified using the Protected Matters Search Tool (PMST) within the same 10 km radius.

The likelihood of these species, populations, ecological communities, and their habitats occurring on-site was assessed based on habitat descriptions published by the Australian Government Department of the Environment and the NSW Government Office of Environment and Heritage, as outlined in Appendix I. Aerial imagery, soil mapping, topography, and vegetation maps were also reviewed to identify potential habitat constraints for threatened species.

3.2 Vegetation surveys

Vegetation surveys were conducted during daylight hours in November 2024 and March 2025, and in the evenings of December 2024 and March 2025 (refer to Table 3.1). These surveys involved the identification of native and exotic species within the proposed development area, as well as observations of vegetation adjoining the area. The surveys followed a random meander approach across the study area, with additional targeted surveys outlined in Section 3.3.

Targeted flora surveys were performed as walked transects and included searches for threatened species, where applicable, in accordance with the *Department of Planning, Industry and Environment's Surveying Threatened Plants and Their Habitats – NSW Survey Guide for the Biodiversity Assessment Method 2020*.

Surveys conducted between November and March coincided with the flowering periods of many species, as detailed in the attached list of surveyed species.

3.3 Fauna surveys

Targeted fauna surveys were not conducted. Instead, the likelihood of species being present or utilising the site was assessed through a review of published observations and research, alongside an evaluation of habitat features during the field survey.

3.4 Habitat assessment

Habitat assessment was conducted in conjunction with walked transects. Preliminary assessment of threatened species likely to occur in the site provided details of required habitat.

Habitat identification and assessment targeted:

- Hollow bearing trees
- Loose bark
- Roosting trees
- Dead trees
- Large woody debris and logs
- Rocks
- Exposed bedrock
- Scats
- Nesting trees
- Fruiting and flowering plants
- Bare branches
- Scrapes or diggings
- Hair
- Burrows
- Waterbodies
- Aquatic vegetation

- Tree scratching
- Long grass and leaf litter

3.5 Weather conditions

Table 3.1. Environmental conditions during field surveys.

Survey undertaken	Date	Time	Temperature (°C)		Rainfall (mm)	Wind
			Min.	Max.		
Random meanders Walked transects Habitat assessment	26 November 2024	10:00 – 14:00	17.4	31.9	0	Light
Random meanders Walked transects Habitat assessment	8 December 2024	19:00 – 21:00	20.2	29.4	8.2	Light
Random meanders Walked transects Habitat assessment	16 March 2025	06:30 – 08:30 20:30 – 22:30	22.8	36.1	0	Light

3.6 Limitations

Limitations of the study may arise due to the potential presence of cryptic plant species, which may exist as soil-stored seed or subterranean vegetation structures. Some species, such as certain orchids, are only identifiable above ground under specific environmental conditions, including factors like periodic fire frequency, intensity, seasonality, soil moisture regimes, and biological life-cycle patterns.

Given the inherent seasonal and ecological variability of some species, surveys conducted over a single year cannot be expected to detect all species present, or likely to occur, in the study area. Some species may (a) be seasonal, (b) utilise different areas periodically as part of a broader home range, or (c) become dormant during particular periods of the year.

Considering the site characteristics and habitat availability, ECA is confident that the survey is representative of the likely species and vegetation communities present. Future surveys conducted at different times are unlikely to alter the conclusions of this report.

The surveys were conducted between November and March over three separate events, including two daytime and two nighttime surveys.

Anabat equipment was not used, as no microbat roosting habitat is being impacted. It is assumed that bats could forage along the edges of the site.

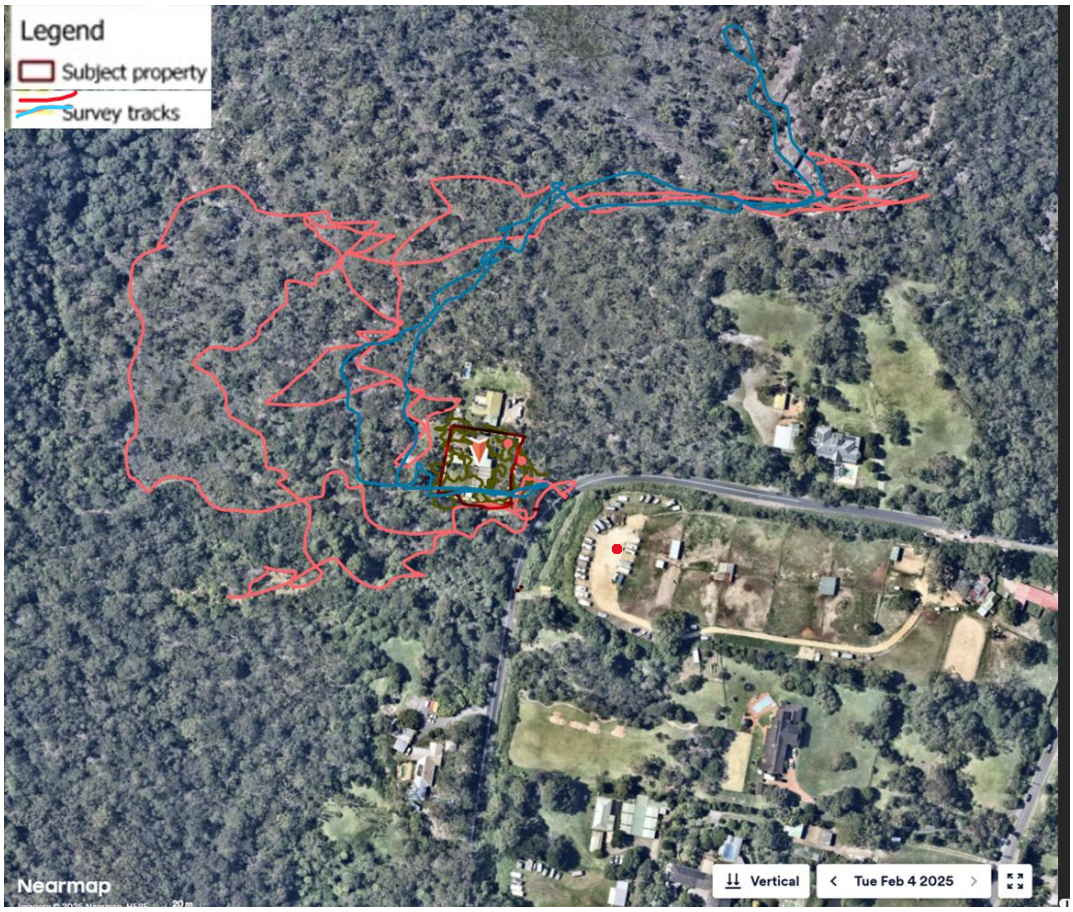


Figure 3.1. Field survey locations – blue tracks (December 2024) – red tracks (March 2025).

Figure 3.2. Field survey locations – November 2024.

4 Results

4.1 Vegetation

The site is located within the Sydney Bioregion.

A review of the NSW State Vegetation Type Map (SVTM) indicates two PCTs occur within the site:

- PCT 3230 – Central Coast Escarpment Moist Forest
- PCT 3814 – Woronora Plateau Heath-Mallee

Figure 4.1 shows the location and extent of native vegetation on and in the vicinity of the site.

Figure 4.1. Location and extent of vegetation on the site.
Source: SEED NSW State Vegetation Type Map (accessed 25 February 2025).

4.2 Flora on-site

The nature strip, located outside the lot boundary, is primarily dominated by native canopy trees, followed by shrubs, with an understory of exotic species, including asparagus fern and weedy garden escapes. Within the site boundary, the area is landscaped, with the ground cover predominantly consisting of exotic turf, primarily Buffalo grass, and rockery garden beds planted with landscape species. Native species persisting in these rockery areas include *Dichondra repens* and *Commelina cyanea*.

Native flora observed during the site visit, including in the buffer area just outside the site boundary along the bushland edge, are listed below. Photographs of these species are provided in Section 4.6.

Trees:

1. *Angophora costata* – Sydney Red Gum
2. *Angophora floribunda* – Rough-barked Angophora
3. *Corymbia gummifera* – Red Bloodwood
4. *Eucalyptus haemastoma* – Scribbly Gum
5. *Eucalyptus piperita* – Sydney Peppermint
6. *Corymbia gummifera* – Red Bloodwood (note: listed again for clarity)

7. *Allocasuarina distyla* – Forest Sheoak

Shrubs:

1. *Banksia ericifolia* – Heath Banksia
2. *Banksia serrata* – Old Man Banksia
3. *Acacia linifolia* – Linear-leaved Wattle
4. *Acacia suaveolens* – Soft Wattle
5. *Hibbertia aspera* – Rough Guinea Flower

Ground Plants:

1. *Gahnia sieberiana* – Giant Sword Sedge
2. *Centella asiatica* – Gotu Kola
3. *Commelina cyanina – Blue Commelina*
4. *Dichondra repens – Kidney Weed*
5. *Adiantum aethiopicum* – African Maidenhair Fern
6. *Lomandra longifolia* – Mat Rush
7. *Dianella caerulea* – Blue Flax-lily
8. *Eragrostis brownii* – Brown's Lovegrass
9. *Stephania* – (Possible genus, but incomplete without species clarification)
10. *Actinotus helianthi* – Flannel Flower

4.3 Connectivity

Native vegetation surrounding the site is well connected to other native vegetation in the locality, as shown in Figure 4.2. The site lies on the edge of the National Park, though it is not part of a formal corridor. Nonetheless, it is still an important location, particularly as it supports different vegetation types compared to much of the National Park. Specifically, the nature strip area consists of tall forest, while the western portion of the site transitions into woodland.

Figure 4.2. Native vegetation patch in the context of the locality, illustrating contiguous vegetation areas.

4.4 Weeds

No priority weeds listed in the *South East Regional Strategic Weed Management Plan 2023-2027* were observed on the site. However, common environmental weeds were present, primarily annuals and Fishbone Fern. Across the road, there is an abundance of Morning Glory, which, if it reaches the site, must be rapidly removed.

4.5 Fauna

The site has undergone vegetation clearance associated with the development of the existing dwelling. Native vegetation remains around the development footprint, consisting of extensive tracts of dry sclerophyll forest and grassy woodland, which provide habitat for a variety of native flora and fauna.

This vegetation offers a source of pollen, nectar, and fruit for local fauna, as well as opportunities for nesting, foraging, and hunting. Habitat complexity is evident through the presence of dead trees, fruiting and flowering plants, fallen timber, waterbodies, mistletoe, loose bark, and patches of mature and regenerating vegetation across various strata.

The following species were observed during field surveys (all off-site):

- *Colluricincla harmonica* (Grey Shrikethrush)
- *Dacelo novaeguineae* (Kookaburra)
- *Platycercus eximius* (Eastern Rosella)
- *Manorina melanocephala* (Noisy Minor)
- *Gymnorhina tibicen* (Australian Magpie)
- *Eopsaltria australis* (Eastern Yellow Robin)
- *Crinia signifera* (Common Eastern Froglet)
- *Oryctolagus cuniculus* (Rabbit)

No threatened native fauna were identified within the site during the survey.

4.6 Site photos

Photo 1. Front entrance.

Photo 2. Front entrance.

Photo 3. Bloodwood.

Photo 4. *Acacia* in nature strip.

Photo 5. Entrance with planted vegetation and turf.

Photo 6. Bushland outside the property boundary.

Photo 7. Bushland outside the property boundary.

Photo 8. Rockery near existing dwelling.

Photo 9. Possum scratches on tree in nature strip.

Photo 10. Nature strip with canopy.

Photo 11. Spotted Gum.

Photo 12. Stag in neighbouring bushland – watched during spotlighting.

Photo 13. Bushland area outside of lawn dominated by native grass and *Centella*.

Photo 14. Side of property – bushland.

Photo 15. On-site looking to rear (west) bushland.

Photo 16. From site boundary looking towards existing house showing the extensive lawn (Buffalo grass).

Photo 17. Trees and shrubs in bushland off-site.

Photo 18. Weeds on-site Lantana (since removed).

Photo 19. Weedy edge (Ginger) since removed.

5 Impact assessment

5.1 Vegetation removal and APZ management

The current proposal does not require the removal of vegetation for the demolition of the existing dwelling or construction of the new dwelling or for the establishment of an APZ.

The site's current APZ will be maintained in accordance with an Inner Protection Area (IPA) (Figure 5.1). In practical terms the IPA typically consists of mown lawn and well-maintained gardens.

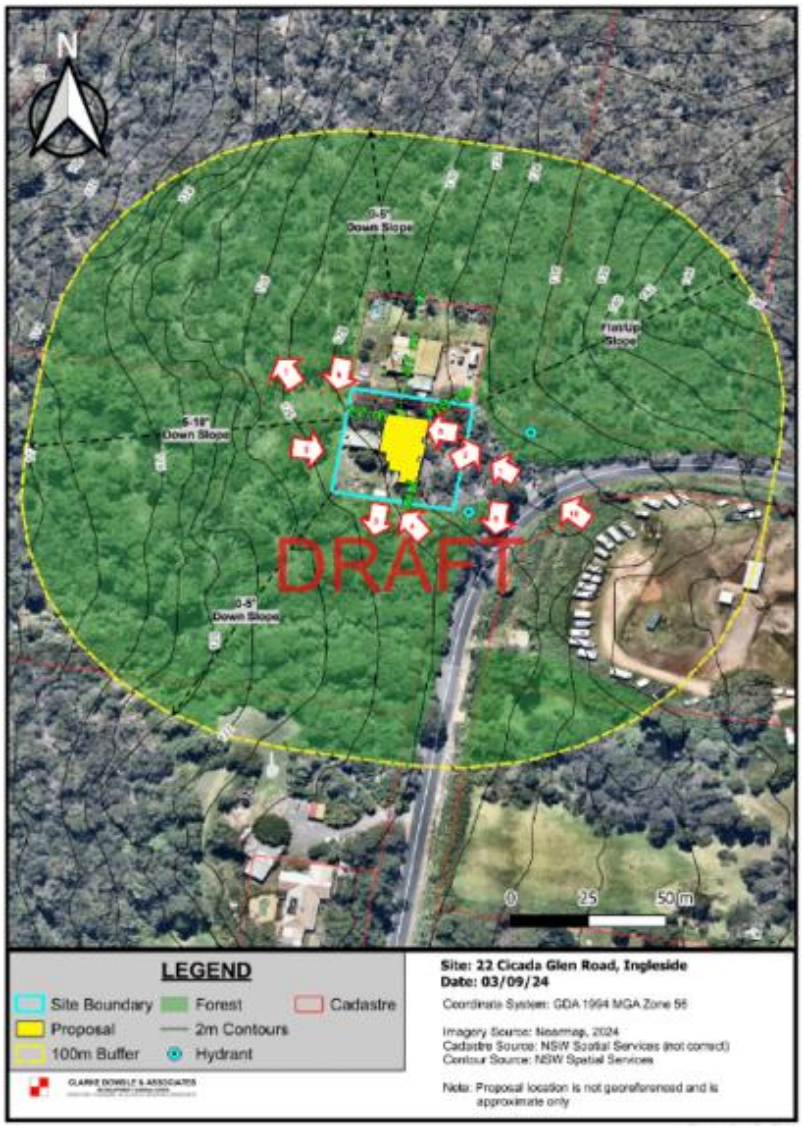


Figure 5.1. Bushfire Site Plan.
Source: Clarke Dowdle & Associates, Sept 2024

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity.
- trees at maturity should not touch or overhang the building.
- lower limbs should be removed up to a height of 2m above the ground.
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided.
- shrubs should not be located under trees.
- shrubs should not form more than 10% ground cover: and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- grass should be kept mown (as a guide, grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed

5.2 Indirect Impacts

The proposed works may result in a range of minor indirect impacts on species and communities. The primary concerns include the potential for weed expansion, as well as the effects of domestic cats and dogs on wildlife and their habitats. Additionally, lighting may impact the use of the bushland area by nocturnal fauna.

5.2.1 Weed growth and invasion

Weeds are present on the site and must be effectively managed to prevent their spread into surrounding areas. In the direct works zone, weed management will include measures to stop seed dispersal via machinery, tools, equipment, and worker clothing (e.g., boots). Additionally, following weed removal around the construction perimeter, continuous site maintenance will be necessary to prevent exacerbated weed growth, as weeds present prior to the works may proliferate. Weeds will likely colonise and pioneer any cleared areas, so management must be maintained throughout the duration of the project and continue post-works.

5.2.2 Introduction of pathogens

The introduction of pathogens to the site and surrounding remnant bushland may occur through machinery, tools, equipment, and worker clothing (e.g., boots). Diseases to be cautious of include Phytophthora (commonly known as Root Rot, a type of water mold) and Myrtle Rust (*Puccinia psidii*, a type of fungus). For detailed protocols on bushland hygiene concerning Phytophthora, refer to the Appendix.

5.2.3 Domestic animals

Domestic animals, particularly cats, can have a significant impact on wildlife, and this effect is well documented.

6 Recommendations

6.1 Mitigation measures

The following mitigation measures are proposed should the development be approved:

6.1.1 Delineation of work areas

To minimise impacts on the site and retained vegetation, work areas will be clearly delineated. Access should be restricted to the development footprint only, with an exclusion zone established around the vegetation outside the work areas.

6.1.2 Native species landscaping

On-site planting will align with the APZ and use only locally native species. No environmental weeds (or exotic landscape plants) will be planted to prevent their spread into the surrounding bushland.

6.1.3 Erosion and sediment controls

Sediment controls will be implemented as needed, including but not limited to sediment fencing, jute matting, crushed sandstone, and coir logs. These controls will be inspected during site inspections or after significant rainfall (greater than 10 mm in 24 hours) to ensure they remain effective. Controls must ensure that no sediment settles in retained vegetation areas. Sediment fences will remain in place for as long as practical, with monitoring required to avoid concentrated flows and erosion. If necessary, coir log baffles will be installed to mitigate erosion.

6.1.4 Weed management

Weeds are present on-site and must be managed to prevent their spread. Continuous maintenance of the site vegetation is necessary to prevent exacerbated weed growth, particularly due to the high abundance of weeds in the boundary area prior to works. Weeds will colonise cleared grounds, requiring ongoing management during the works and post-works. The Key Weed Removal Methods are provided in the Appendix. It is recommended that the client consult a qualified bush regeneration contractor or ecologist for advice on weed removal and bush regeneration. All chemical bush regeneration activities will adhere to the NSW Pesticides Act 1999, with herbicides not applied while exotic plants are setting seed. The weed removal program will be broad and sustained, promoting natural regeneration and controlling weeds effectively.

Although soil-borne pathogens are not considered Key Threatening Processes, their accidental spread is possible. To prevent the introduction of pathogens such as *Phytophthora* (Root Rot) and *Myrtle Rust* (Puccinia psidii), Bushland Hygiene Protocols outlined in the Appendices must be followed. Given the site's proximity to water and moist soil, care must be taken to manage potential pathogen spread.

6.1.5 Companion Animals

Domestic animals, particularly cats, should not be permitted to enter National Park areas. It is recommended that cats be prohibited on-site, in line with relevant B4 DCP controls.

6.1.6 Dark Sky Friendly Lighting

All lighting will adhere to Dark Sky recommendations, including proper placement and lighting types, to minimise upward light pollution. The proposed lighting plan complies with best practices set out by the following organisations:

- Australasian Dark Sky Alliance (ADSA) approved lighting link
- Urban Night Sky Place exhibition on Palm Beach link
- NSW Department of Planning, Industry and Environment link
- International Dark Sky link

Lighting will be from ADSA-approved fixtures, offering the required illumination while minimising light escape. All lighting will feature:

- Upward Waste Light of 0%
- Colour Temperature ≤3000K
- On/Off control
- Very High Uplight (FVH & BVH) ≤2.0%

Post-construction, ongoing light management will be implemented, including resident education on dark sky practices and the use of motion sensors, timers, and dimmers to reduce light levels.

6.1.7 Increased noise

Construction noise should be avoided during owl breeding season (April–August) to prevent disturbance to aerial fauna species.

6.1.8 Runoff

The proposed works could result in sediment transport off-site due to increased stormwater runoff. Erosion and sediment controls will be implemented to prevent runoff into the unnamed creek.

6.1.9 Nest boxes

While not critical, the installation of a single microbat nest box is recommended to provide additional roosting habitat for threatened microbat species.

6.1.10 Pathogen prevention

To prevent the spread of pathogens, Bushland Hygiene Protocols outlined in Appendix III will be followed. The site's proximity to drainage channels and moist soil conditions increases the risk of pathogen spread, particularly *Phytophthora*. Strict adherence to the hygiene protocols is recommended to minimise this risk.

Phytophthora infected vegetation. (Image by Rasbak, licensed under the Creative Commons Attribution-Share Alike 3.0 Unported, 2.5 Generic, 2.0 Generic and 1.0 Generic license.)

Myrtle Rust generally infects new leaf growth. (Image by John Tann, licensed under the Creative Commons Attribution 2.0 Generic license.)

7 Appendices

7.1 Appendix I – Threatened Species Likelihood of Occurrence

Table 7.1. Threatened flora records within a 10 km radius of the site.

Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Callistemon linearifolius	Netted Bottle Brush	V,3		5	Long-term mowing and clearing have been carried out along the property boundary, resulting in dense Buffalo grass. As a result, none of the species are likely to be present within the property boundaries due to the ongoing clearing. However, potentially suitable habitat may be present in the surrounding bushland. Species that could occur in the surrounding bushland, but were not observed during the surveys, include: • ***Tetratheca glandulosa***, for which habitat is present and has been observed by the author on other sites. • ***Epacris purpurascens var. purpurascens***. • ***Pimelea curviflora var. curviflora***, which was observed flowering by the author in Maroota on sandstone in March 2025. No threatened plant species were observed within the surveyed areas, which are located outside of the impact zone. Surveys were conducted from November to March, and the species listed above were not observed. Regarding orchids, the habitat is not suitable for Onion Orchids, as the area is too dry. Additionally, other orchid species are not expected in the turf area due to the frequent mowing of the site.	No
Chamaesyce psammogeton	Sand Spurge	E1		16		No
Genoplesium baueri	Bauer's Midge Orchid	E1,P,2	E	2		No
Grammitis stenophylla	Narrow-leaf Finger Fern	E1,3		2		No
Grevillea caleyi	Caley's Grevillea	E4A,3	CE	1610		No
Epacris purpurascens var. *purpurascens*		V		1		No
Eucalyptus camfieldii	Camfield's Stringybark	V	V	10		No

Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	3		No
Kunzea rupestris		V	V	1		No
Lasiopetalum joyceae		V	V	2		No
Macadamia integrifolia	Macadamia Nut		V	6		No
Melaleuca deanei	Deane's Paperbark	V	V	1		No
Microtis angusii	Angus's Onion Orchid	E1,P,2	E	165		No
Persoonia hirsuta	Hairy Geebung	E1,P,3	E	1		No
Pimelea curviflora var. curviflora		V	V	5		No
Prostanthera densa	Villous Mint-bush	V	V	1		No
Rhodamnia rubescens	Scrub Turpentine	E4A	CE	34		No

Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	20		No
Tetratheca glandulosa		V		70		No

Table 7.2. Threatened fauna records within a 10 km radius of the site.

Class	Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Amphibia	*Heleioporus australiacus*	Giant Burrowing Frog	V,P	V	58	Very low	No
Amphibia	*Litoria aurea*	Green and Golden Bell Frog	E1,P	V	3	Very low	No
Amphibia	*Pseudophryne australis*	Red-crowned Toadlet	V,P		152	Very low	No
Aves	*Anthochaera phrygia*	Regent Honeyeater	E4A,P,2	CE	39	Very low	No
Aves	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		3	Possible in the trees surrounding the site but low on-site.	No
Aves	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E	3	None	No
Aves	*Burhinus grallarius*	Bush Stone-curlew	E1,P		38	Very low	No
Aves	*Callocephalon fimbriatum*	Gang-gang Cockatoo	E1,P,3	E	3	Possible	No
Aves	*Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	V,P,2	V	123	Possible in the trees surrounding the site.	No

Class	Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Aves	*Daphoenositta chrysoptera*	Varied Sittella	V,P		3	None on-site	No
Aves	*Diomedea exulans*	Wandering Albatross	E1,P	V	1	None	No
Aves	*Esacus magnirostris*	Beach Stone-curlew	E4A,P		1	None	No
Aves	*Gallinago hardwickii*	Latham's Snipe	V,P	V,J,K	1	None	No
Aves	*Glossopsitta pusilla*	Little Lorikeet	V,P		11	Possible in the trees surrounding the site but low on-site.	No
Aves	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P		7	None	No
Aves	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P		54	Flying over possible	No
Aves	*Hieraaetus morphnoides*	Little Eagle	V,P		8	Flying over possible	No
Aves	*Hirundapus caudacutus*	White-throated Needletail	V,P	V,C,J,K	16	Flying over possible	No
Aves	*Ixobrychus flavicollis*	Black Bittern	V,P		21	None	No

Class	Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Aves	*Lathamus discolor*	Swift Parrot	E1,P	CE	32	No suitable shrubs within the property boundary.	No
Aves	*Lophoictinia isura*	Square-tailed Kite	V,P,3		6	Flying over possible	No
Aves	*Macronectes halli*	Northern Giant-Petrel	V,P	V	1	None	No
Aves	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		1	No suitable shrubs within the property boundary.	No
Aves	*Neophema pulchella*	Turquoise Parrot	V,P,3		2	Very unlikely	No
Aves	*Ninox connivens*	Barking Owl	V,P,3		36	Possibly foraging and open/forest fringe. No breeding habitat.	No
Aves	*Ninox strenua*	Powerful Owl	V,P,3		583	Possibly foraging and open/forest fringe. No breeding habitat.	No
Aves	*Numenius madagascariensis*	Eastern Curlew	E4A,P	CE,C,J,K	4	None	No
Aves	*Onychoprion fuscata*	Sooty Tern	V,P		1	None	No
Aves	*Pandion cristatus*	Eastern Osprey	V,P,3		44	Flying over possible	No

Class	Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Aves	*Petroica boodang*	Scarlet Robin	V,P		2	No shrub habitat on-site. Possible in surrounds.	No
Aves	*Ptilinopus regina*	Rose-crowned Fruit-Dove	V,P		4	Low No fruiting plants suitable – and too dry relative to typical habitat.	No
Aves	*Ptilinopus superbus*	Superb Fruit-Dove	V,P		6	Low No fruiting plants suitable – and too dry relative to typical habitat.	No
Aves	*Rostratula australis*	Australian Painted Snipe	E1,P	E	3	None	No
Aves	*Stictonetta naevosa*	Freckled Duck	V,P		1	None	No
Aves	*Thalassarche cauta*	Shy Albatross	E1,P	E	4	None	No
Aves	*Thalassarche chrysostoma*	Grey-headed Albatross	P	E	1	None	No
Aves	*Thalassarche melanophris*	Black-browed Albatross	V,P	V	1	None	No
Aves	*Tyto novaehollandiae*	Masked Owl	V,P,3		7	No breeding trees on-site. Unlikely to have food sources onsite due to lack of prey habitat.	No

Class	Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Aves	*Tyto tenebricosa*	Sooty Owl	V,P,3		2	No breeding trees on-site. Unlikely to have food sources onsite due to lack of prey habitat.	No
Aves	*Tringa nebularia*	Common Greenshank	E1,P	E,C,J,K	1	None	No
Aves	*Xenus cinereus*	Terek Sandpiper	V,P	V,C,J,K	2	None	No
Insecta	*Petalura gigantea*	Giant Dragonfly	E1		2	None – No open water or swamps.	No
Mammalia	*Cercartetus nanus*	Eastern Pygmy-possum	V,P		502	Not on-site – no suitable trees or large shrubs suitable within the site boundary.	No
Mammalia	*Chalinolobus dwyeri*	Large-eared Pied Bat	E1,P	E	20	Possibly foraging and open/forest fringe. No breeding habitat.	No
Mammalia	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	17	Unlikely	No
Mammalia	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P		3	Possibly foraging and open/forest fringe. No breeding habitat.	No
Mammalia	*Isoodon obesulus obesulus*	Southern Brown Bandicoot (eastern)	E1,P	E	48	None – not heath or suitable habitat. Long-nosed bandicoot possible but unlikely.	No
Mammalia	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	V,P		26	Possibly foraging and open/forest fringe. No breeding habitat.	No

Class	Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Mammalia	*Miniopterus australis*	Little Bent-winged Bat	V,P		66	Possibly foraging and open/forest fringe. No breeding habitat.	No
Mammalia	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		113	Possibly foraging and open/forest fringe. No breeding habitat.	No
Mammalia	*Myotis macropus*	Southern Myotis	V,P		56	No open water within 300m.	No
Mammalia	*Petaurus norfolcensis*	Squirrel Glider	V,P		27	Not on-site – no suitable trees or large shrubs suitable within the site boundary.	No
Mammalia	*Petaurus norfolcensis*	Squirrel Glider on Barrenjoey Peninsula, north of Bushrangers Hill	E2,V,P		1	Not on-site – no suitable trees or large shrubs suitable within the site boundary.	No
Mammalia	*Phascolarctos cinereus*	Koala	E1,P	E	69	Not on-site – not trees within the site boundary.	No
Mammalia	*Pseudomys novaehollandiae*	New Holland Mouse	P	V	3	No habitat – too exposed.	No
Mammalia	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	229	In the area – no breeding habitat close. Unlikely to have food sources onsite due to lack of trees. Likely in neighbouring properties and bushland.	No

Class	Scientific name	Common name	NSW status	Comm. status	Records	Likelihood of occurrence	Test of Significance required?
Mammalia	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		6	Possibly foraging and open/forest fringe. No breeding habitat.	No
Mammalia	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P		12		No
Mammalia	*Vespadelus troughtoni*	Eastern Cave Bat	V,P		3		No
Reptilia	*Varanus rosenbergi*	Rosenberg's Goanna	V,P		70	Could walk through going between habitat (heath). No termite mounds (no breeding).	No

7.2 Appendix II – BC Act Threatened Species Test of Significance (5-part Test)

The Threatened Species Test of Significance (5-part Test) is applied to species and ecological communities listed in Schedules 1 and 2 of the BC Act. The assessment sets out factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether further assessment is required via a Biodiversity Development Assessment Report (BDAR) at the DA stage. All factors must be considered and an overall conclusion made based on all factors in combination. The assessment of impact has been conducted with consideration to the assessment of significance criteria from the Threatened Species Test of Significance Guidelines (OEH 2018) as outlined in the text box below.

Threatened Species Test of Significance 5-part Test

a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

c. in relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species or ecological community in the locality,

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The proposed development is considered unlikely to constitute a significant impact on the species listed in Tables 7.1 and 7.2 given the following:

- the development has been situated where the existing house is proposed to be removed from and existing cleared area
- no known roosting or nesting habitat will be directly impacted
- the microbats, owls, flying foxes and cockatoos are mobile species with preferred habitat areas and could utilise the national park and vegetation fringing 22 Cicada Glen Road (national park and road side)
- no habitat will be isolated or fragmented
- habitat that could potentially grow if not an APZ is not currently present – and the impact of future loss is not essential to the long term survival of the potentially affected species.

Therefore, the Biodiversity Offsets Scheme (BOS) has not been triggered for Threatened Species and a BDAR is not required.

7.3 Appendix III – EPBC Act Assessment of Significance

A search of the Protected Matters Search Tool (PMST) was conducted to identify Matters of National Environmental Significance (MNES) within a 10 km radius of the site (the search area). The PMST predicts 8 threatened ecological communities, 112 threatened species and 58 migratory species occur within the search area.

One national heritage place, and no world heritage properties, Ramsar wetlands or Commonwealth marine areas occur within the search area.

Threatened species with potential relevance to the site have been assessed and habitat is not present. Most are marine species (wading birds).

No other EPBC Act matters are of relevance to the site.

Significant impact assessment

Threatened species

The threatened species identified above have been considered in accordance with the significant impact criteria for vulnerable, endangered and critically endangered species in the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (DoE 2013).

When taking into consideration all stages and components of the proposal, and all related activities and infrastructure, there is the potential for impacts, including indirect impacts, on MNES, being mainly loss of a potential foraging habitat. However, it is considered unlikely that any of such species will be adversely impacted by the proposal, because:

- Suitable breeding habitat for most of the species is absent within the site. For those species that could utilise the habitats within the site, there are not likely to be local populations present wholly within the site or reliant on the site for their survival in isolation. Any such populations present within the locality will not be rendered locally extinct by the proposed development. This is based on the large ranges of these species and the small area of habitat, and the nature and condition of the habitats present within the site.
- The site is not assessed as likely to contain habitat critical to the survival of a species.
- The site was not found to support an important population (as defined by DoE 2013) of any threatened species.
- The proposal is situated in an existing cleared area.
- The proposed mitigation measures will mitigate or reduce impacts on threatened species.

With reference to the criteria for vulnerable, endangered and critically endangered species, the proposal is not likely to:

- Lead to a long-term decrease in the size of an important population of a species
- Reduce the area of occupancy of an important population
- Fragment an existing important population into two or more populations
- Adversely affect habitat critical to the survival of a species
- Disrupt the breeding cycle of an important population
- Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that a species is likely to decline
- Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
- Introduce disease that may cause a species to decline, or
- Interfere substantially with the recovery of any of these species

The proposed development is highly unlikely to disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of any migratory species.

Hence the proposal is not likely to have a significant impact on any listed migratory species under the EPBC Act.

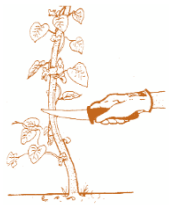
Conclusion

On the basis of this assessment, it is not likely that the proposed development will have a significant impact on any MNES listed under the EPBC Act. Referral of the development application to the Commonwealth Department of Climate Change, Energy, the Environment and Water is not warranted.

7.4 Appendix IV – Key Weed Removal Methods

Physical removal

Technique	Method	Equipment
Hand Removal 	Seedlings and smaller weed species where appropriate will be pulled out by hand, without risk of injury to workers. The size that this can occur varies throughout the treatment area. Generally, it ranges from post seed to approximately 300mm in height. Rolling and raking is suitable for larger infestations of Wandering Jew. The weed can be raked and stems and plants parts rolled. The clump of weed material can then be bagged and removed from site.	Tools: Gloves, Rakes, Knife and Weed Bags
Crowning 	Plants that possess rhizomes or bulbs might not respond to various removal techniques and may need to be treated with crowning. A knife, mattock or trowel is to be driven into the soil surrounding the bulb or rhizome at an angle of approximately 45 degrees with surrounding soil, so as to cut any roots that may be running off. This is to occur in 360 degrees around the bulb/rhizome. The rhizome or bulb is to be bagged and removed from the site and disposed of at an appropriate waste recycling facility Soil disturbance is to be kept to a minimum when using this technique.	Tools: Knife, mattock, trowel, impervious gloves, and all other required P.P.E.
Cut and Paint Stems 	Weed species deemed unsuitable for hand removal shall be cut. Those that have persistent of vigorous growth will be cut and painted with Roundup® Biactive Herbicide or equivalent. Juvenile and smaller weed species will be cut with secateurs at base of plant, and herbicide applied via applicator bottle. Stem to be cut horizontally as close to the ground as possible, using secateurs, loppers or a pruning saw. Horizontal cuts to be made on top of stem to prevent the herbicide running off the stump.	Tools: loppers, secateurs, pruning saw, herbicide applicator/sprayer, impervious gloves, Roundup® Biactive

	Apply herbicide to the cut stem immediately, within 10-20 seconds, before the plant cells close and the translocation of the herbicide is limited. Herbicide is not to reach sediment or surrounding non-targeting plants.	Herbicide and all other required P.P.E.
Scrape and Painting 	More resilient weed species, where other techniques are less reliable are to be scraped with a knife or chisel and painted with undiluted Roundup® Biactive Herbicide. Works to be carried out by a contractor with a current herbicide license. Weed species will be scraped with a knife or chisel up the length of the trunk, and herbicide applied via applicator bottle. Scrape the trunk from as close to the ground as possible to approximately ¾ of the plant height. Where trunk diameters exceed approximately 5 cm a second scrape shall be made on the other side of the trunk. Apply undiluted herbicide to the cut trunk immediately, within 10-20 seconds, before the plant cells close and the translocation of the herbicide is limited. All care must be taken by the contractor not to spill herbicide onto sediment or surrounding non-targeting plants. Follow up treatment may be required. If plants resprout, scrape and paint the shoots using the same method after sufficient regrowth has occurred.	Tools: knife, chisel, protective clothing, safety glasses herbicide applicator/sprayer, impervious gloves, Roundup® Biactive Herbicide, and all other required P.P.E.
Cut with a Chainsaw and Paint 	Larger size weed species, too large for cutting with hand tools, shall be cut with a chainsaw and painted with undiluted Roundup® Biactive Herbicide. Works to be carried out by a contractor with a current chainsaw and herbicide license. Larger weed species will be cut with a chainsaw at base of plant, and herbicide applied via applicator bottle. Cut the stem horizontally as close to the ground as possible, using the chainsaw. Remove upper branches to reduce bulk of plant. If cutting at the base is impractical, cut higher to get rid of the bulk of the weed, then cut again at the base and apply herbicide. Make cuts horizontal to prevent the herbicide running off the stump. Apply undiluted herbicide to the cut trunk immediately, within 10-20 seconds, before the plant cells close and the	Tools: chainsaw, ear muffs, protective clothing, safety glasses herbicide applicator/sprayer, impervious gloves, Roundup® Biactive Herbicide, and all other required P.P.E.

	translocation of the herbicide is limited. Ensure there is no runoff of poison. All care must be taken by the contractor not to spill herbicide into water, onto sediment, or surrounding non-targeting plants. Follow up treatment will be required. If plants resprout, cut and paint the shoots using the same method.	
Spot Spraying	AVOID HERBICIDE USE – herbicide for cut and poison preferred and avoid all spray of herbicide. If essential then: Spot spraying involves spraying non-seeding annuals and grasses, and for regrowth of weeds once an area has been cleared or brushcut. Works to be carried out by a contractor with a current herbicide license. Herbicide will be mixed up according to the manufacturer's directions for the particular weed species being targeted. Mixed herbicide shall be applied to the targeted weed species with a backpack sprayer. All care must be taken by the contractor not to spill herbicide onto sediment or surrounding non-targeting plants.	Tools: protective clothing, safety glasses, herbicide sprayer, impervious gloves, Herbicide, and all other required P.P.E.

7.5 Appendix V – Bushland Hygiene Protocols for Phytophthora

- Always assume that the area you are about to work in is free of the disease and therefore needs to be protected against infection.
- Always assume that the activity you are about to undertake has the potential to introduce the disease.
- Arrive at site with clean shoes, i.e.: no dirt encrusted on them.
- If you arrive with shoes that are encrusted with dirt, they will have to be completely soaked in metho or disinfectant and allow a few minutes to completely soak in. NEVER scrape untreated dirt off your shoes onto the ground.
- Before you move onto the site spray the bottom of your shoes with 70 % metho. Bleach solution (1% strength) or household/commercial disinfectant (as per label) are also suitable.
- Check all tools and equipment that comes in contact with soil are clean before entering the area (they should have been cleaned on site at the end of the previous work session). If there is any dirt on them, spray them with 70% metho.
- Clean all tools at the end of each work session while still on site ensuring this is done away from drainage lines and adjacent work areas. Knock or brush off encrusted dirt and completely spray with 70 % metho. Replace in storage/transport containers.
- Preferably compost all weed material on site.
- Never drag vegetation with exposed roots and soil through bushland.
- When removing weeds from site, remove as much soil as possible from them in the immediate work area and carefully place vegetative material into plastic bags.
- Try not to get the bag itself dirty; don't put it on/in a muddy area.
- Always work from the lower part of a slope to the upper part.
- Always work in areas known to be free of the pathogen before working in infected areas.
- Minimise activities wherever possible when the soil is very wet.
- Vehicles should not be driven off track or into reserves (unless vehicle decontamination is carried out before and after entering a single work site)
- Only accredited supplies of plants/mulch to be used.

Kit should contain: 1 bucket, 1 scrubbing brush, 1 spray bottle (metho 70% solution), 1 bottle tap water, 1 bottle methylated spirits.

Facts about Phytophthora

Phytophthora cinnamomi (Phytophthora) is a microscopic, soil borne, water-mould that has been implicated in the death of remnant trees and other plants in Australian bushland. Phytophthora is not native to Australia. It is believed to have been introduced sometime after European settlement. Phytophthora is a national problem and is listed as a key threatening process under the Commonwealth's Environmental Protection and Biodiversity Conservation Act 1999.

Symptoms including Dieback

"Dieback" simply means dying or dead plants. There are many causes of dieback; Phytophthora is just one of them. Often dieback is the result of a combination of factors such as changed drainage patterns and nutrient loads (e.g.: increased stormwater run-off) or changed soil conditions (e.g.: dumped fill or excavation of/near root zone). Plants that are stressed are more vulnerable to Phytophthora.

Initial symptoms of Phytophthora include wilting, yellowing and retention of dried foliage, loss of canopy and dieback. Infected roots blacken and rot and are therefore unable to take-up water and nutrients. Severely infected plants will eventually die. Symptoms can be more obvious in summer when plants may be stressed by drought. If you suspect that Phytophthora is on your site, please contact the Bushcare team to collect a soil sample to be lab tested. This is usually done in the warmer months where conditions are optimum for the disease.

Infection

There is no way of visually telling if Phytophthora is present in the soil as its structures and spores are microscopic (invisible to the naked eye). Phytophthora requires moist soil conditions and warm temperatures for infection, growth, and reproduction. Spores travel through moist soil and attach to plant roots. Once Phytophthora has infected a host plant it can grow inside plant root tissue independent of external soil moisture conditions. After infection, Phytophthora grows through the root destroying the tissue which is then unable to absorb water and nutrients.